Anshuman Khare · Deborah Hurst
*Editors*

# On the Line

## Business Education in the Digital Age

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# Preface

## Objective and Background

Business organizations today are looking for work-ready graduates to whom they invest in continuing education to support employees – a quick return on investment. Concurrently, online delivery of courses and programs is on the rise benefitting both individuals and their employers. Engaging in online education often mirrors the way work is done in organizations while also containing costs. The debate about the quality of online versus on-campus business education continues to rage. While some resist the move to virtual campuses and learning, it is hard to deny the preferences of a connected population who seek increasingly flexible, accessible learning opportunities, course materials, classrooms, faculty, and associated services anytime and from anywhere. This is causing disruption to how educators do business. Business schools today are involved in the evolution of virtual courses and classrooms as an opportunity to reach remotely located and international students, as well as students in immediate vicinities given demand for greater access and opportunity without adversely disrupting careers and lives.

The intent of this edited book is to present different perspectives of *online business education* – how it is best designed and delivered and how it supports advances in management disciplines. Through the endeavor of linking theory to practice, the authors describe online platforms in their provision of timely, excellent, and relevant business education.

This book intends to contribute insights for use to business educators in design and implementation of online learning. We present and discuss technologies for class facilitation and preparation, the "secret sauce" regarding meeting and exceeding collaboration expectations, adaptive content, tools used to bring content and issues to life, disruptive approaches, and new emerging directions.

## Audience for This Book

This book is targeted at business educators and administrators who have an interest in delivering high-quality business education using online platforms and tools. Lessons learned, insights, and challenges have been discussed from various perspectives for those looking to gain insight into developing new educational programs that through collaborative online learning tools create aligned knowledge and skill. This book is also intended for use of business practitioners interested in the development of work-ready graduates and further learning opportunities that may support their organizations.

## Book Structure

The main theme of the book is *online business education*. The book draws from the experience of academics involved with the development and implementation of online business education, administrators, and researchers who investigate the technologies and closely watch marketplace trends. The book also presents perspective papers from individuals who are involved with the development of online learning approaches and systems as well as those who have taken online business programs. The perspective papers capture graduates and consultants from different parts of the world who provide interesting comments on their experiences of online business education. It is our premise that educators, graduates, and consultants alike have much to share and learn from one another to encourage further development of online business education.

The book is divided into three parts.

Part 1 presents papers on "why" business education is viable and sustainable in today's context. The book starts by examining the emergence of online business education. Treating education as a service, this part describes new techniques for creating a better online business education experience. It also looks at the role advanced data analytics can play in enhancing the quality of online business education.

Part 2 delves into "how" online business education works. It presents conceptual models for teaching in specific disciplines and learning design that describes what business educators do and how programs work. This part also addresses performance assessments and quality assurance measures that help to demonstrate the efficacy of online pedagogy. Practical applied papers are used in this part to highlight the use of learning platforms, tools, and their application specific to businesses that build knowledge and skills and make students "work ready."

Part 3 of the book addresses the "so what?" or the outcomes and impacts of online business education. This part targets where business education needs to take learning next, for example, to support sustainable business, ethical decision making, and inclusive and collaborative leadership. Papers deal with topics such as how

distributed online environments may work better to support knowledge and soft skill building directly relevant for organizations today. Other learning outcomes showing the value of online business education are discussed.

Integrated into each part are short papers that present student, consultant, or online educational user "perspectives." These short chapters both support the content within some of the chapters and question approaches with the customer perspective. They are intended to create an ongoing conversation with interesting themes emerging to connect real-world practices and approaches.

It is our view that engaging in online business education is like a marathon where an educator must plan, pace, and manage the learning. While online business education intends to help individuals achieve personal goals, they recognize too that some may miss out on important in-person learning gained through the physical presence of other classmates. Thus, at times the need for specialized blended degrees in topics such as leadership, change management, supply chain management, project management where students benefit from face time with other students, or the broader business perspectives may be beneficial. It is important to provide opportunities for students to leverage both place-based and online business education for knowledge and skill building within a broader educational ecosystem.

Edmonton, AB, Canada

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# Review Process

Proposals submitted were reviewed by the editors, and an initial structure of the book was created. After a shortlisting process, selected authors were invited to submit full papers. Research and perspective papers submitted were double peer-reviewed by a team of academics and practitioners from around the world. The review process was coordinated by the editors and an editorial board. The editors and the editorial board members are introduced later in this book.

The editors would like to thank all those involved in peer-reviewed process for their timely and constructive feedback that challenged the authors to raise the quality of their chapter.

# Acknowledgments

The editors are thankful to the contributors to this book (editorial board members and the authors) who helped to showcase the excellent work being done in online business education in institutions across the world.

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**Part II "How?": Building Knowledge and Skills**



**Part III "So What?": Outcomes and Impacts**

# About the Editors

**Anshuman Khare** is professor in operations management at Athabasca University, Canada. He joined Athabasca University in January 2000. He is an Alexander von Humboldt fellow and has completed two postdoctoral terms at Johannes Gutenberg Universität in Mainz, Germany. He is also a former Monbusho scholar, having completed a postdoctoral assignment at Ryukoku University in Kyoto, Japan. He has published a number of books and research papers on a wide range of topics. His research focuses on environmental regulation impacts on industry, just-in-time manufacturing, supply chain management, sustainability, cities and climate change, online business education, etc. He is passionate about online business education. In 2003, Anshuman was awarded the Craig Cunningham Memorial Award for teaching excellence by Athabasca University as a testament to his commitment to exceptional online education, and in 2015, he was awarded Athabasca University Graduate Students' Association (AUGSA) Outstanding Distinction Award (2015) which acknowledges and honors faculty members who display exemplary leadership, support, and engagement with graduate students. Anshuman serves as the editor of *IAFOR Journal of Business and Management* and associate editor of *International Journal of Sustainability in Higher Education* published by Emerald and is on the Editorial Board of *International Journal of Applied Management and Technology*.

**Deborah Hurst** is dean, Faculty of Business, and associate professor of organization studies, Athabasca University, Canada. She joined Athabasca University in 1995 as an academic coach in the world's first online M.B.A. She later joined AU full time as an associate professor in January 2001, and since that time she has held veracious roles including associate dean and new business development and M.B.A. program director. Deborah obtained her B.A. from the University of Toronto and her M.A. and Ph.D. from the University of Alberta. Prior to obtaining her graduate education, Deborah worked for General Motors of Canada Limited. Her time over a 10-year period included experience within the departments of material control, parts distribution, export operations, and traffic. During her M.A. studies, she worked for a summer at the nonprofit organization, Edmonton Social Planning Council, as a research assistant and later during her Ph.D. for the Alberta Public

Service as a human resource consultant and manager over a 4-year period. All of these private, nonprofit, and public sector work experiences continue to inform Deborah's research, teaching, and administrative duties. Deborah's guiding career vision and goals have always been focused on improving the human experience of workplaces through a better understanding of the cultural aspects of organization life. She is interested in how to best design online learning to develop excellence in graduate knowledge and professional skill as leaders and in business disciplines to directly support and mirror current workplace requirements. In her role as dean, Deborah draws from her background in organization behavior/theory, work and organizational sociology, leadership development, and management education to lead the creation and provision of highly relevant, transformative, and accessible online management education.

# About the Editorial Board

**Maria Argyropoulou**[*]**,** Ph.D., is a program director at Laureate Online Education and holds the title of honorary lecturer in the University of Liverpool in UK for online programs. She is also adjunct faculty at the Hellenic Open University. She received her Ph.D. from Brunel Business School, UK, and her M.B.A. from the Strathclyde University, Scotland. She also holds an M.Sc. in decision science from the Athens University of Economics and Business. She obtained her B.Sc. degree from the Physics and Mathematics School, University of Athens. Her research and teaching interests focus on operations/supply chain management, project management, and IT systems implementation and evaluation. Her work has appeared in various peer-reviewed journals, book chapters, and conference proceedings. She has been involved in several EU research projects with the Athens University of Economics and Business (AUEB). Apart from her academic career, she is also a consultant with extensive experience in business process reengineering and information systems implementation. She has worked for international companies for more than 10 years specializing in operations management, global supply chains, and international trade. She has consulted for many companies and public organizations and was responsible for executive and educational seminars in her areas of expertise.

**Will Baber** has combined education with business throughout his career, teaching business students in Japan and Europe and working in economic development for the State of Maryland and language services in Washington, DC. In his work he has frequently encountered cross-cultural conflicts and synergies. He studies these issues as an associate professor in the Graduate School of Management of Kyoto University. Research interests include cross-cultural adaptation and the impact of expatriates on the workplace.

[*] Indicates members who also contributed a chapter.

**Terry Beckman*** received his Ph.D. in marketing from Queen's University and his M.B.A in international business from the University of Victoria. He teaches marketing management, global marketing, and international business management in an online environment. In addition to over 6 years teaching and developing courses for an online university, he has also done some research in pedagogy and online learning. Prior to Athabasca University, he taught at Queen's University, the Royal Military College of Canada, and the University of Victoria. His background includes over 12 years of industry experience, including work with IBM Canada Ltd. and the Canadian High Commission in Malaysia and business consulting. His research interests are primarily in marketing strategy, corporate branding, international business, and corporate social responsibility. He has published one edited book and a variety of articles in his areas of research interest. Terry has a keen interest in the changing of management practices and processes due to the emergence of digital technologies that have forced transformation of businesses in every walk of life.

**Joyce Fortune** is emeritus professor of technology management at the Open University in the UK. She has worked for the institution for over 30 years, designing, writing, and presenting distance-teaching materials at undergraduate and postgraduate levels. Originally these materials were in print but switched to online as the technology developed. This change has not only brought the advantages associated with blended learning but also meant that study materials can be updated very regularly and any problems rectified very quickly. Joyce obtained a B.Sc. from Loughborough University and a Ph.D. from Nottingham University's Faculty of Engineering and went on to work in industry before becoming a career academic. Her main subject areas are systems thinking, project management, and quality management, and in much of her teaching and research, she brings together all three of these subject areas. She has supervised a number of students to successful completion of their Ph.D. and has published widely in journals as well as coauthored three books. Her recent externally funded research looks at the adoption of technological innovations in healthcare and at policing in the UK.

**Kam Jugdev*** is a professor of project management and strategy in the Faculty of Business at Athabasca University. Prior to becoming an academic, Kam worked in both the public and private sector industry as a project manager. Kam develops and teaches project management courses at both the undergraduate and graduate levels. Kam's collaborative research program spans project management as a source of competitive advantage using the resource-based view of the firm, lessons learned, project management tools and techniques, and project success/failure. Kam enjoys being able to relate theory to practice with students and through her research.

**Helen Lam*,** Ph.D., is a professor of human resource management in the Faculty of Business, Athabasca University, Canada. She obtained her business Ph.D. degree from the University of Alberta in year 2000. Since then, she has been working in the online business education environment. Courses she has overseen include strategic

human resource management, negotiations and conflict management, high-performance work systems, business law, program evaluation, business research methods, and an international school in Singapore. She is also a Certified Human Resources Professional with an interest in research work involving significant practical implications. Her published papers cover a broad range of topics such as business ethics, employee rights and representation, legal issues and best practices in human resource management, and management education. Specifically, for management education, she has written on areas of online examinations, online quantitative courses, e-cheating, and international programs.

**Oliver Mack** is researcher, entrepreneur, coach, and consultant located in Salzburg and Vienna, Austria. He studied business administration and law at the University of Mannheim and got his Ph.D. in political science at Johannes Gutenberg University of Mainz, Germany. He is author of several publications and speaker at international conferences and meetings, and he is academic teacher in international organizations. Mack is founder of mack:consulting, a consulting company helping companies and organizations in the third mode of consulting, a combination of traditional top management consulting and systemic change consulting in the main areas of project orientation, new organizational design, change, and complexity. Mack is network partner of OSB International Vienna, a leading systemic consulting company in Europe. He is also founder of the xm:institute, an organization doing applied research and application of ideas for management and leadership in the next society. He is also active in various associations. Mack is closely involved in online education at various universities in Austria, Germany, and Canada.

**Udo Mildenberger** is professor for accounting/controlling at the Media University Stuttgart (Germany). Furthermore, he is currently dean of the Faculty Information and Communication. He has an M.B.A. from the University of Mannheim (Germany) and Ph.D. from the University of Mainz (Germany). He has published four books and a number of research papers on a wide range of topics, including financial and management accounting, quality management, supply chain management, sustainable management, corporate social responsibility, competence-based strategic management, and modern system theory. He started the first online M.B.A. at Media University Stuttgart and has experience with design of online classrooms, learning platforms, and online multimedia technologies.

**Stephen Murgatroyd**[*]**,** Ph.D., is an experienced business educator, innovator, and entrepreneur. As the first executive director of the world's first fully online Executive M.B.A. at Athabasca University and an innovator in work-based learning at Middlesex University and the developer of online collaboration and innovation systems, Stephen has initiated a great many new approaches to online business education. A prolific author with over 40 books and 60 book chapters, Stephen writes and consults for organizations around the world. His special expertise includes future developments in online learning.

**Iain Reid*** is a senior lecturer in operations management at the University of Huddersfield's Business School having held previous faculty positions at the University of Liverpool's Management School. Iain was the director of studies for the M.Sc. in operations and supply chain management (online) where he coordinated the program's accreditation with the Chartered Institute of Purchasing and Supply (CIPS) in 2010, which is the only CIPS-accredited program delivered solely online. Iain is currently the program leader for M.Sc. in operations and supply chain management and director of the University of Huddersfield's Agility Centre, which supports local businesses through numerous knowledge transfer initiatives in order to create business resilience and excellence. Prior to embarking upon an academic career, Iain worked as the senior project manager on an EU-funded ERDF project supporting over 80 manufacturing organizations, improving operational processes, management information systems, and supply chain integration, of which a number of them became knowledge transfer partnerships (KTPs). Iain's research is broadly focused around lean thinking and service modularity, particularly the engagement of professional service operations management within the legal profession developing the concept of leaner law and knowledge transfer.

**Brian Stewart*** is the deputy CIO at the University of Alberta. His role is to provide strategic leadership, vision, and direction for information services and technology and to direct project, change, and benefit management and is leading a lean initiative for continuous operational improvement. Brian's background is in strategic operational and technology management in the printing industry and higher education, and he has written and spoken widely on these topics. Brian has an M.A. in economics from University College Cork and an M.B.A. from Athabasca University.

**Conor Vibert,** Ph.D., is a professor of business strategy at Acadia University. An entrepreneur situated in academia, Conor teaches in the area of business and organization strategy and has built a successful track record of creating and commercializing innovative educational products. He is a cofounder of Casenet Media Inc., a cloud-hosted platform that streams multimedia teaching cases. He is also the author of five books on management-related topics and has published in the *Journal of Education for Business*, the *Journal of Applied Learning Technology*, the *Journal of International Business Education*, the *Journal of Entrepreneurship and Small Business, Education and Information Technologies*, the *Journal of Instruction Delivery Systems*, and the *Journal of Interactive Instruction Development*.

# About the Authors

**Ana Azevedo** joined the Faculty of Business, Athabasca University, in October of 2010. She is currently associate professor of entrepreneurship and teaches "new venture development" and "visionary and entrepreneurial thinking." Ana also serves as the academic coordinator for the undergraduate entrepreneurship course. She received her Ph.D. in business administration from Florida International University (Miami, USA), her master of business administration (M.B.A.) degree from Federal University of Rio de Janeiro (COPPEAD-UFRJ, Brazil), and her bachelor of science degree in economics from Federal University of Rio de Janeiro (FEA-UFRJ, Brazil). Ana's current research interests include management education, cultural diversity, and entrepreneurship. She is passionate about nurturing skills development in management education and about promoting cultural intelligence and entrepreneurial thinking in working professionals, business leaders, and entrepreneurs.

**Rodney Beard** is visiting professor at International College Beijing; he received his Ph.D. from the University of Queensland, Australia, and obtained a degree in economics, from the University of Konstanz, Germany, and a B.A. from Griffith University, Australia. He has taught in higher education in Australia, Canada, France, UK, and China. His research focusses on microeconomics with application to agricultural, environmental, energy, and resource economics, and he has published in microeconomics and applied mathematics. He has experience in both online teaching and teaching in blended learning modes including systems administration of learning management systems. His teaching makes extensive use of new technology.

**Larry Berglund's** supply chain experience includes leadership positions in the forest industry, public healthcare, municipal government, university operations, academia, and consulting services. He facilitates workshops and provides services on buying, inventory management, ethics, leadership, contract management, social procurement, operations management, supplier evaluations, operational reviews, competitive bidding, performance metrics, and corporate social responsibility courses and webinars. Larry was a recipient of the prestigious SCMA Fellow Award.

He has been teaching leadership and management development program for a Canadian university since 2016. His recently published a book *Good Planets Are Hard to Buy: A Management Handbook for Creating Conscious Capitalism, Sustainability Principles and Supply Chain Excellence*.

**Alison Bettley** is a senior lecturer in technology management at the Open University and has held posts as program director and associate dean for curriculum. She has extensive experience of writing PG distance-learning materials covering technology strategy, technological innovation management, and operations management and of face-to-face teaching. Before her academic career, Alison was an R&D project manager and business development manager in the electricity industry. Her research interests are focused on the management of technology-intensive services and technology management education. She has supervised Ph.D. students to completion, and her research has been published in conference proceedings, journals, and book chapters.

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**Gracia Castillo** majors in business and marketing from Universidad Tecnológica Centroamericana and holds an M.Sc. in global marketing from the University of Liverpool. Due to her work in the higher education field, she has gained experience in digital teaching and learning, online management systems, and online course development. She currently works with an international university network specializing in supporting strategic initiatives across Latin-American higher education institutions.

**Dana Coble** is a consultant who has been privileged to work with several exceptional companies in the development and implementation of their growth and sustainability strategies, particularly emphasizing operational efficiency, process improvement, change management, and succession planning. After having completed her M.B.A., obtained online from the Centre for Innovative Management (Athabasca University), Dana has been focused on economic development and capacity building in developing and emerging economies through enterprise feasibility assessments, business advising, and the building of collaborative networks to support the creation and development of innovative solutions and sustainable approaches.

**Murray Dalziel** is the dean of the University of Baltimore's Merrick School of Business. He is an academic thought leader, longtime business developer, and adviser to senior executives in a number of top global companies, particularly in the USA and Europe. Murray frequently coaches and advises senior executives and is active in advising and investing in early-stage businesses. His expertise is in the fields of organizational behavior, human resource management, and global business strategy. Murray's previous role as dean of the University of Liverpool's Management School, UK, led the team that obtained the school's AACSB accreditation.

**Kay Devine** is a professor and director of the doctor of business administration program in the Faculty of Business, Athabasca University. She received her Ph.D. in human resource management and labor relations from the University of Washington. Her current research focus is on best practices for effective doctoral student supervision.

**Gyula Julius Dobos** is an award-winning film- and music industry professional-turned educator in the field of media production, with emphasis on music production and start-up business development for new media. As a speaker, Dobos' interests include technology's effect on society and culture, the future of technology and education, and the relationship between art, creativity, and technology. As a consultant, his focus is on bridging industry and education, creating professional learning opportunities in education, and building collaborative learning environments. As a distinguished lecturer, Dobos advises large media projects and student portfolio projects at Cogswell College of Silicon Valley in California and serves as the audio director for its student-led client-serving media production studio, MediaWorks. This initiative was created in 2012 to fill the gaps between professional- and soft-skills development and between on-campus and real-time online collaboration for the business of media production. After 4 years of running with great success, the program has been responsible for collaborations between all participating students and organizations that include Fortune 500 companies and international brands.

**Deborah Dull** started her supply chain career in the Microsoft supply chain, first learning the operations of warehousing and logistics through data analysis and then through building and geo-expanding the Microsoft retail store supply chain. Experiences in these roles, as well as in the digital supply chain and channel operations, highlighted the importance of the customer voice. She uses her experience in incubation, launch, and corresponding change management as a health supply chain program officer at the Bill & Melinda Gates Foundation, where supply chain constraints range from lack of infrastructure and power to complex stakeholder dynamics. The reward for incremental improvements, however, means lives saved and improved.

**Abubaker Haddud** is a visiting scholar at Eastern Michigan University in the USA. He has many years of experience teaching online at universities in Europe and North America. He has a Ph.D. in engineering management from Eastern Michigan University, where he was a Fulbright scholar, and earned his M.B.A. from Coventry

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**Tanja Haller** is a project management professional with over 15 years of experience in project and program management. In 2005 she achieved a VZPM/IPMA degree level C and in 2013 she earned a master of science (with merit) in project management from the University of Liverpool Online Programs. Her main interests are agile project management methods, program and portfolio management, as well as P3M3. Tanja is a member of SPM/SGO organization in Glattbrugg, Switzerland, and a certified senior project manager of IAPM (International Association of Project Managers). Her current role is IT governance manager at the head office of a global logistics provider based in Switzerland.

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**Terri Hinkley** is the workforce innovation officer at the Association of Clinical Research Professionals (ACRP) with responsibility for leading ACRP initiatives to define and shape the future of the clinical research workforce and to support professionals in their career growth and development. Terri joined ACRP in September of 2013 after 18 years in the clinical research industry. In addition to working in the clinical research industry, Terri has experience as an educator, working as an instructor for the Michener Institute's Clinical Research Associate Program and as an adjunct instructor in the Clinical Research and Leadership graduate program at George Washington University in Washington, DC. Terri graduated from Centennial College's Diploma Nursing program in 1986 and completed her B.Sc.N. at York University in 2000 and her M.B.A. from Athabasca University in 2005. She is currently enrolled in the Doctorate in Human and Organizational Learning, Executive Leadership Program, at George Washington University.

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**Sabina Jeschke** has been the head of the Cybernetics Lab IMA/ZLW & IfU at the RWTH Aachen University since 2009. She studied physics, computer science, and mathematics at the Berlin University of Technology. After research stays at the NASA Ames Research Center/California and the Georgia Institute of Technology/ Atlanta, she gained a doctorate on "Mathematics in Virtual Knowledge Environments" in 2004. Following a junior professorship (2005–2007) at the TU Berlin with the construction and direction of its media center, she was head of the Institute of Information Technology Services (IITS) for electrical engineering at the University of Stuttgart from May 2007 to May 2009, where she was also the director of the Central Information Technology Services (RUS) at the same time. She was appointed full professor at the faculty of mechanical engineering, RWTH Aachen University (2009), and vice dean of the faculty from 2011 to September 2016. Sabina Jeschke is chairwoman of the board of management of the VDI Aachen and member of the supervisory board of the Körber AG. She is a member and consultant of numerous committees and commissions, alumni of the German National Academic Foundation (Studienstiftung des deutschen Volkes), IEEE senior, and fellow of the RWTH Aachen University. In the summer semester 2017, Sabina Jeschke will take a sabbatical at the Volvo Car Corporation in Gothenburg.

**Kriti Khare** has a master's in computing science from University of Alberta. While pursuing her master's in education, specializing in technology in education, she is involved with data analytics related to university services at Information Services and Technology Department, University of Alberta. Her research interests include educational psychology, use of technology in education, and data mining.

**Madelaine Kineshanko** has an Ed.D. in distance education and a M.A. in distributed learning. She has had extensive career in postsecondary business education as a teacher, department chair, and associate dean. She has been involved with online business education since 1999 and currently works as a program director for the Centre for Online and Distance Education at Simon Fraser University. Her interest with online communities and collaborative work groups began with master's research in 2002 focusing on the use of low-threshold technology to foster online networking and collaboration among business education faculty in a multicampus institution. Her doctoral research was an extensive thematic synthesis of Community of Inquiry (CoI) research from 2000 to 2014.

**Andreas Krämer** is marketing and strategy consultant, living in Bonn, Germany, and professor of customer value management and pricing at BiTS Business and Information Technology School, Iserlohn. He studied agricultural economics and earned his Ph.D. at the University of Bonn. After working for two strategy consultancies, he founded his own consulting firm in 2000: exeo Strategic Consulting AG

is focused on data-driven decision support in marketing – especially pricing and customer value management. He has also conducted two international studies on the market potential of online courses in general and explainer videos in particular. He is author of several books and numerous publications and speaker at international conferences and meetings.

**Ivo Kreyenbühl** is a supply chain professional with over 10 years of experience in different areas of supply chain management. His current role is to lead and develop the supply chain function at a manufacturing site of CSL Behring, a global biopharmaceutical company with manufacturing sites in Australia, Europe, and the USA. He is passionate about improving material flows, process simplification, and process automation. He enrolled for a master of science program in operations and supply chain management at the University of Liverpool in 2013 and graduated in 2016. He is a passionate runner and currently lives in the USA.

**Kristina Lahl** has been the head of the "Economic and Social Cybernetics" research group at the Institute for Management Cybernetics (IfU) at RWTH Aachen University since March 2015. After having studied German and English philology, as well as history, at the universities of Cologne, Prague, and Cambridge, Kristina Lahl completed her doctorate (Ph.D.) as a scholarship holder at the a.r.t.e.s. Graduate School for the Humanities Cologne. Her Ph.D. thesis focused on identity models in the transcultural space and used specific examples of German-speaking literature from Bohemia and Moravia in the Czech Republic. While a lecturer at the universities of Cologne and Olomouc and writing various publications, Kristina Lahl researched sociocultural references in German literature from the Age of Enlightenment to the present using transdisciplinary approaches. Her main areas of research are sociotechnical narratives, ritualization and human self-assurance in interaction with artificial intelligence, as well as second-order cybernetics and learning cultures in higher education.

**Natalie Solveig Mikhaylov** is an assistant professor of international business at the School of Economics and Business Administration, Pontificia Universidad Javeriana, in Cali, Colombia. She received her Ph.D. in management and organizations from the University of Turku, Finland, and an M.B.A. in HRM from Golden Gate University, San Francisco, USA. Natalie has extensive international teaching experience with most of it focused on cross-cultural and human resource management. Her research interests include knowledge sharing, PLN, social capital, and international business education, and the recent publications focus on the topics of international education, social capital, and cross-cultural competence. She has lived, worked, taught, and conducted research in eight countries on four continents.

**Fotios Misopoulos** is the director of studies for the online M.Sc. in project management program at the University of Liverpool, Management School. Fotios has a long teaching experience at higher education institutions in the USA, Greece, and UK. His research interests are in the area of green project management and online education,

and his work has been published in various peer-reviewed journals, book chapters, and conference proceedings. Fotios worked in numerous research-funded projects and served as a consultant and project manager in Information Technology and Supply Operations Management projects primarily in the Southeast European region.

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# Part I
# "Why?": The Business Case

# Online Business Education: An Economic Perspective

**Brian Stewart and Anshuman Khare**

**Abstract** The future of online business education will be determined, as with all market growth, by the simultaneous and interdependent developments in both its supply and demand. The demand side consists of the demonstrated needs of organizations desiring the skills and knowledge of business graduates whether for a degree, diploma, or upgrading. The efficiency and effectiveness of online provision will likely prove to be central tenets of the value proposition considered by potential consumers. Such consumers will consist of individuals and firms directly in terms of consumption and indirectly in terms of perceived value and income enhancement. The key drivers to demand will include employer perception of online programs and graduates and the fit with their needs, coincidentally with student access, experience, development, and return on invested time and capital.

On the supply side are the current distributors of educational services, publicly funded universities and colleges, and their for-profit counterparts. In addition, there is already a growing online presence through MOOCs extending business school brands. The drivers of the supply side will consist of a range of forces including current organizational mission and funding, professoriate preferences, skills set and research agendas, brand protection and extension, software platform design, and institutional business acumen.

This chapter will attempt to ascertain indicators of practice development and growth that will provide insights to organizations considering entering the field or consuming its output to sustain their ongoing businesses. It will therefore focus on identifying trends in both supply and demand of online business education consisting of comparative growth within disciplines, economic sectoral differences, employer perceptions, educational technological developments, and related investment patterns and student consumption preferences.

**Keywords** Perception of online programs • Students and graduates • Trends in both supply and demand of online business education

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## 1 The Origin and Purpose of Business Schools

Business schools were founded as a response to the need by businesses to the growing sophistication of business enterprises (Bennis & O'Toole, 2005), in particular, the growth of firm size and the impact on information exchange and the span of control brought about by the industrialization of economic activity after the first and second industrial revolutions.

Wikipedia (2017) states that the first business school was founded in 1819, the ESCP Europe in Paris. This was followed in 1855 by two schools opening in Antwerp. The first public business school was the Budapest Business School established in 1857. The University of Pennsylvania's Wharton School of Business was the first business school in the USA, opening in 1881. The UK and Canada were a little later in opening their business schools with Birmingham University's Business School and McGill School of Commerce opening in 1902 and 1906, respectively. The MBA started in Dartmouth College's Tuck School of Business opening in 1900. Thus, business schools have existed for over 200 years, with schools in the English-speaking domain having over 100 years of experience in the field (Wren & van Fleet, 1983). They have established a reputation as an essential component of management development across industry with graduation from a reputable program seen as a prerequisite for an upwardly mobile career path. Moreover, the increasing complexity of business engendered by integrated global supply and distribution chains, increasing marketing sophistication increasingly reliant on analytics, and the acceleration of technological innovation, demonstrated by product life cycles diminishing to a vanishing point, are continuing to drive demand for business school research and instruction (Lorange, Sheth, & Thomas, 2014).

## 2 The Development of Online Business Education

Distance learning, or its forerunner correspondence school, has existed for well over a century, initially utilizing the mail service to distribute course content and assessments. The development of communication technologies allowed these to migrate through the adoption of telecommunications, radio and television through computer-based platforms to online and mobile forms of delivery. In the context of this chapter, we define an online business program as a program providing content, instruction, assessment, and collaboration delivered through computer technology. Online business education adopted distance learning approaches more readily than other academic disciplines, partly in response to the needs of the student base to develop and obtain accreditation. For example, Canada has been a pioneer in the practice of online learning, likely due to its size and sparse population. The first online MBA program began with Athabasca University in Alberta Canada in 1994. The form has grown rapidly since then as the ability to retain employment and pursue a career-enhancing qualification has proven a very attractive option to middle career middle

managers, while the first MOOC on Connectivism and Connective Knowledge was offered by the University of Manitoba in 2008 (Parr, 2013; Tamburri, 2014).

## 3 Supply of Online Business Education

The supply of online business education needs to be understood within the context of the educational environment. Accreditation, reputation, initial investment costs, and government funding programs provide barriers to entry that distort the classical supply function. A higher price does not bring speculative entrepreneurs to offer more education and thereby lower the price through enhanced competition (Reed, 2013). The distortion allows both cost and price to increase and due to the investment nature of education for demand to increase at a faster rate than supply. The reasons for these market deviations are complex, entrenched in the traditions of delivery, expectation of benefits, and perception of knowledge and abilities that yield a human capital that is bestowed on educational holders, which transfers very effectively into economic benefit.

### *3.1 The Institutional Context*

Online business education exists in the milieu of campus-based faculties within institutions that have proven remarkably resistant to technological changes in pedagogy. Stewart and Khare (2015) point to an interesting theory by Perez (2003) which proposes that an existing framework created to manage the growth of a given set of technologies will be unsuited to a disruptive replacement. This will lead to an initial mismatch between the existing techno-economic and socio-institutional spheres, of the respective old and new technologies, with the process of reconciliation and adoption being complex, protracted, and painful. This tension may be reaching a critical level with online delivery representing a disruptive force.

The perceptions of faculty are subject to variation. Recent surveys of faculty show responses to the question that online courses could produce results equal to in-person courses, moving up and down between 2013 and 2015 (Straumsheim, 2014). Regarding a disciplinary preference, professional disciplines were seen as the most favorable to online delivery. Another nuance to the distribution here is the strength of difference between faculty that had and not taught an online course. Strong positive and negative responses were highly correlated to their teaching experience (Straumsheim). Another interesting finding of this survey was the almost total resistance shown to outside provision of degree programs. Moreover, courses developed by a professor are seen as their content, even to the point of bringing them to another institution should they wish to. Bichsel (2013) found that this view of insourcing extended to the IT realm also, with a desire to develop the tools,

systems, and supports within the institution. These indicate a strong sense of intellectual property rights and institutional ownership of online learning components, reinforcing the cultures of a closed shop and "not invented here." It should be noted that these are pre-cloud opinions, before learning or assessment systems were a credit card away, and the growing acceptance of its capabilities will likely influence the insourcing focus.

For institutions wishing to move into the online delivery, this implies that past practices and prevailing academic culture may create significant resistance to change. The sense of ownership of course and content in a classroom appears natural and appropriate. In the online mode, team production is necessary as, apart from a few pioneers, most professors do not have the required skillset to produce high-quality course material (Kolowich, 2013). Indeed, the production of an online course more resembles a stage or television production than it does an academic lecture. And this is set to grow with increased technological adoption infused into pedagogical approaches. Faculty also see online delivery as more difficult to both create and instruct, which is likely to be adding to the inertia represented in slow adoption rates. Academic engagement has been low, and no compelling case has been shown to exist to enthuse broad faculty adoption. An example of this trend is the utilization rate of learning management systems' advanced functionality, which remains at low levels when used in campus-based delivery. Professors forego the sophisticated features preferring to use the relatively easier elements to support on site course delivery.

## *3.2 The Real Cost of Higher Education*

The determination of the cost of a product or service requires a deep understanding of the activities that combine to deliver it. In industrial economics, the production function represents an algebraic expression of the quantitative interrelationships among sub-activities to produce a given output. While cost or management accounting is a discipline that focuses on analyzing and modeling cost behaviors, for online education, the ability to develop accurate cost accounting structures is both a necessity and an opportunity, the former to provide consistent planning, monitoring, and justification of expenditures and the latter to provide more relevant and precise information for decision-making than is generally available within higher educational institutions.

### 3.2.1 The Determination of Costs

Distance and online education cost breakdown was articulated by Rumble (1997), providing a comprehensive approach to the identification and calculation of the costs of distance education. He proposes that the main cost components are:

- Course material
- Instruction (and Assessment)
- Medium of delivery
- Student support

These represent the functional categories for costs to be allocated across for the development and delivery of distance learning. They hold for online learning also, with the difference in cost elements under the functional categories. As with all cost attribution, there are fixed and variable, as well as direct and indirect, categories. These become easier to calculate with regard to online courses as there is less diffusion of costs across the broader institution, making meaningful calculations very difficult.

### 3.2.2 Trends in Higher Education Cost

Third-level education has been increasing in real terms far more than standard measures of inflation such as the consumer price index. This is increasing the real cost of education to students and lowering the return on investment. The precise reasons for the acceleration of higher education have not been conclusively determined. One theory termed the cost disease was proposed by the economist William Baumol (1993). This holds that the delivery of education is not scalable, in the same manner that manufactured goods are, due the indivisibility of instructor costs across courses. Thus, in economic terms, the marginal cost of education does not decline significantly with scale and will therefore always suffer from an inability to lower costs as scale increases. An alternate theory put forward by Baumol's collaborator Bowen (2012) holds that it is the inability of higher educational institutions to reign in their appetites to expand their mission and the accompanying expenditures that lie at the root of ever-increasing costs. Apparently, as by association, with the escalating cost of attendance at an institution, other tuition-related costs also increased at a far faster rate than average inflation. The example of textbooks serves to demonstrate this trend. Up until the mid-1980s, textbook inflation mirrored the consumer price index; since then, it has escalated to approximately three times the average consumer rate of inflation (The Economist, 2014).

It is to the former that online education affords an ability to provide a solution. The intermediation of technology to offer scale to instruction would largely address Baumol's hypothesis. This may seem easier to achieve than it actually will be. For example, what is the long-run average cost curve for delivering an online course or program? Does this accord with the ability of instructors to teach at such scale? Will students accept this "dilution" of instruction? And at what price will students accept the delivery of such mass education? What is the ROI to both institutions and students of the investment costs in adopting and utilizing this form?

Recent history of MOOCs can provide insights here as MOOC provision seeks to move from cool idea through institutional promotion to effective business model. A study of MOOC business models by Fischer et al. (2014) indicates that the cur-

rent cost of MOOCs is not being recouped by user fees, and external financing is required to ensure the providers can continue to offer them. The development of specializations and micro credentials are ongoing refinements to achieving a sustainable model.

## 4 Demand for Online Business Education

The effective demand for online business education is primarily composed of students looking for improved human capital that will provide them enhanced earning power and better career options, often summed in the term "mission, mastery, and autonomy." Their selection of online, as opposed to on-campus delivery, is mainly driven by accessibility limitations on attending the latter, whether from economic, geographic, or temporal limitations. Furthermore, Evans and Haase (2001) undertook an empirical study of student expectations regarding online learning. They see online delivery offering a compatible experience and qualification they could not alternatively achieve. There is also a secondary demand from employers to either sponsor employees to take online education or to employ those that have. Their support in both cases is essential to the credibility of the mode of delivery. In many ways, their actions act as a final arbitrator on quality control even more than accrediting bodies such as the Association to Advance Collegiate Schools of Business (AACCSB), as the economic worth of their investment is reflected in the perceived value of employers.

### *4.1 Profile of Online Business Students*

An online business student is not the typical undergraduate student who is fresh from high school and seeks to continue their schooling at a higher level. Evans and Hasse (2001) suggest online students are either male or female, are aged between 25 and 54, have an annual income of over US$45,000, are working full time with any given level of education, and come from anywhere in the country. They prefer to take online courses for credit over degree programs or noncredit courses and are more interested in undertaking business than other disciplines. The main reasons they take courses are schedule flexibility in time and location, the frequency of offerings, the ability to complete faster, the wide selection of courses, less distraction to studies, and the desire to handle more than one course at a time and a less regimented approach. Offsetting these are concerns about course quality, online privacy and security, and lack of personal contact with professors and other students. These concerns also include personal abilities to be successful such as computer and web proficiency, the need to be a self-starter, courses being too flexible, and the lack of a campus experience.

Regarding student services, Evans and Hasse (2001) indicate that online students unsurprisingly want it online. Desired academic and administrative supports include online registration, availability of an online library and bookstore, accessible faculty, and advisement services.

As to the choice of institution, the key attributes reflect a very pragmatic and functional approach, including accreditation, tuition, reputation, ability to transfer credits, and the acceptance of prior credits. According to Evans and Hasse (2001), essentially online business students want to be able to use their existing credits in a reputable and accredited institution offering effective tuition with the ability to later transfer the credits to further courses of study. Online students are aware that online credentials are currently not seen as having quite the same status as on-campus institutions. In accordance with this, they overwhelmingly expect to pay less for online delivery. They do, however, see the value of online business education as equivalent to on-campus delivery, which suggests a complex interpretation of their perception and interpretation of value regarding return on investment.

The survey by Evans and Hasse (2001) confirms many of the "insider known" elements of effective online delivery and student perceptions. Students desire convenience over the full on-campus experience and are willing to trade this for a drop in credit prestige providing the tuition is of good quality and they can reuse their credits all coming at a lower price. The reusability of credits both in and out creates a value proposition for online delivery that on-campus delivery may find hard to replicate. The ability of technology to enable and simplify this offers business schools an opportunity to create more responsively interinstitutional programs that support ever-expanding professional designations.

## *4.2 Employer's Perceptions*

As mentioned earlier, an overriding factor of demand is the perception of employers. Employers are surveyed on a regular basis for their perceptions of business school graduates, often with mixed results. Online delivery has been considered in a number of these studies, generally with a negative perception.

Adams and DeFleur (2006) found that employers were highly resistant to hiring candidates with online degrees with 96% favoring traditional degree holders. The online takers' chances did improve to 25% if half their coursework was taken on campus. Adams (2008, p. 579) reviewed several studies where online graduates were only acceptable to 5% of the respective hiring groups with business professions averaging 4%. The reasons for this negative perception included a lack of "face to face classroom interaction with students, faculty and experts; program reputation for a rigorous curriculum; mentored research, teaching clinical or field experiences; opportunity to work with new technologies; and social experiences associated with residential programs." These can also be viewed as cultural resistance to a new technology adoption and can be expected to decrease over time as

hiring officers and management ranks are filled with online graduates who have a greater understanding of the strengths and weaknesses of online programs.

A later study by Bailey and Flegle (2012) agrees with this suggestion with half of a survey group of hiring managers responding that the environment the degree was earned in was not a factor in the hiring decision. Bailey and Flegle (2012, p.3) identified "accreditation, school recognition, group interaction, real-life scenarios, and group projects as factors that influenced a hiring manager's perception of value for an online MBA." They concluded that "the acceptance of online degrees has improved" since "participants in this study responded 10 out of 20 that the environment the degree was earned in (online or traditional classroom) would not be a factor in the value the degree held in the hiring or promotion process." They also concluded that "… a shift toward the acceptance of online degrees … leading to "educational institutions and students can now use this information to design, market, and choose the school that best fits their desired goals."

Employers are looking for employee-ready graduates with functional knowledge of a business domain, analytical/problem-solving skills, and interpersonal and communication skills allied to work/life experience that prepare them for the interdisciplinary nature of the business environment (Andrews & Higson, 2008; Kavanagh & Drennan, 2008). In addition, they are looking for educational experiences that provide group interaction and real-life scenarios, given by recognized accredited institutions (Bailey & Flegele, 2012).

The emphasis on softer skills presents both opportunities and problems for online educators as current modes of delivery tend to be asynchronous with students and instructors communicating in when available rather than at specific times. Online delivery can be very effective at the provision of domain knowledge and can assist with the development of communication skills and to some extent with interpersonal skills and the co-construction of knowledge. However, the provision of work experience and of higher-level interpersonal skills presents a significant challenge for online education as currently delivered.

### *4.3 Income Affects*

The private return to education is another key demand driver for higher education, perhaps the largest single factor. The returns to increasing education are well documented by the US Bureau of Labor Statistics (2017), Mark Swartz (2017), and Archibald and Feldman (2010), all demonstrating that while a differentiation exists between disciplines, the overall returns are significant and increase with successive levels. Pascharopoulos and Patrinos (2004) also show the variability of private returns to education by country, time, gender, public or private provision, and the level of education; however, in all cases, they are positive and significantly above the real bank deposit rate. The rate of return also appears to decline, as one would expect with a general increase in schooling levels, in keeping with theory, as the returns to a factor decline due to increasing availability of that factor. This suggests

that education remains a very good private investment with superior to market return for a comparative capital investment; however, as with all investments, the nexus is not simple and very dependent on the relative scarcity of the level and the perceived quality of education.

Arcidiacono, Cooley, and Hussey (2008) indicated that there is a positive relationship between an MBA and income. Depending on the school ranking and the type of program, full-time, part-time, or executive, the MBA has an average lifetime internal rate of return ranging from approximately 8 to 11%. The returns to part-time study for students taking an MBA outside the top 25 ranked schools did not provide a statistically significant coefficient. While financial return is an essential component of the demand function for undertaking a business education, particularly after an undergraduate degree, other factors include mobility of career, geographic location, industry, and job function. While financial return is an essential component of the demand function for undertaking a business education, particularly after an undergraduate degree, other factors include mobility of career, geographic location, industry, and job function. This may help explain the perceived value of the impact and contribution of a top 25 or more so of a top 10 on a qualification by employers.

The exact reasons for this perception are difficult to assess due to the interplay of many subfactors. For example, attending a top-tier institution provides access to an established network of fellow graduates that will prefer college peers. The reputation and brand of the institutions will also sway employers that are not part of the direct network group. The premium cost of the top institutions appears to be reflective of their economic value as the return to investment offsets the original investment cost (Graphiq Inc., 2017).

## *4.4 Price Affects*

As with any economic demand equation, the relative price of the good is central to the decision to accept the offer. In the educational market, the good can be considered an investment rather than a consumption good, as it is purchased not for the satisfaction it directly brings but for the stream of future satisfactions it will enable. This is reflected in the increasing demand for higher educational services even as the costs are increasing faster than almost all other goods and services in the economy (Sheets, Crawford, & Soares, 2012). While returns to education have been positive in the past, there is no guarantee that the benefit stream will continue. Further to this, the returns are not uniform with significant differences across disciplines with some showing negative lifetime returns (Swartz, 2017). From a standard economic theory perspective, the willingness to continue to purchase education in the hope of a better future is speculation and bears resemblance to behaviors that lead to an investment bubble where reason is replaced by belief and caution with certainty. This, however, would be too narrow an interpretation. Students also buy education to enhance their intellectual and social as well as earning positions.

Higher education provides a superior quality of life that is reflected in improved social position, health, and, by some studies, happiness in addition to higher earnings and wealth. Nonetheless, while higher education has a very strong value proposition, as with all goods, it will eventually face a downward-facing demand curve indicating that as price increases, quantity purchased declines. For those currently in the provision of online business education, however, this curve appears to be rather gently sloping, where large increases in price do not lead to proportionate decreases in quantity demanded.

## *4.5 The Effectiveness of Online Education*

There has and will continue to be continuous discussion as to the relative merits of online versus on-campus instruction. And while there is much merit to this discussion, there is also some merit in abstracting from it and focusing on the purpose of the instruction rather than the form. For example, if there is no other way to gain an education than by using online, its relative weaknesses against on-campus are not the key decision point. What is important is that the form by itself is legitimate and can achieve the required outcome. As the saying goes, "if it works, use it." Chute, Hancock, and Thompson (1998) provided ten benefits companies derive when using distance learning indicating its achievement of desired outcomes. These include better leverage of invested funds in producing outcomes; reduced travel time and cost; repeatable courses that allow for increase student intake, scalable both in size and speed; consistent and convenient experience; learner centered allows students to more easily go at their own pace, enables collaboration among groups, and provides easier access to materials and instructors. This suggests that from an employer perspective, online education provides an effective and efficient mode of delivery, particularly from a training perspective.

A study of 48 online MBA courses by Arbaugh (2014) found that the factors most impactful on delivery effectiveness are instructor expertise and social presence. These are normal in an on-campus delivered course, the difference in distance delivery being the ability to achieve both through an intermediated technology. Thus, it is a vital element of any technology used that faculty are willing and able to learn to use it expertly and that students can use it to relate to their peers to form social connections. A comparison study of the cost and effects of web-based and traditional face-to-face instruction for health professionals indicated that although the learning outcomes were equivalent, and the web-based alternative was clearly more efficient, participants still favored face-to-face delivery. The choice was not based on the quality of learning, rather on the perceived value of the mode of delivery. Online delivery is generally seen as having a lower cost, which should be reflected in its price. That a fee was charged in this case for online delivery conflicted with this common perception. Had the fee been eliminated or online provided at a lower comparative cost, preferrences woud have shifted (Maloney et al., 2012).

Online delivery does and will experience constraints with regard to facilitating experiential learning, where by definition, the experience needs to approach or be in

real-world situations (Nation, Reed, & Swank, 2014). Those parts of a job that are computer based such as email communication, or distributed collaborative work, virtual teaming, report and presentation generation, data analysis, and more recently analytics are well served by online delivery. Those requiring physical presence and interpersonal social skillsets including team building, mentoring, brainstorming, crisis management, job shadowing field practicums, and physical interaction with equipment, location, or events would find current online delivery methodologies insufficient.

Offered as at least a partial solution, the often-discussed game-based learning, simulated learning, augmented and artificial reality, and adaptive learning do offer much here. However, while investment has increased substantially in educational technologies (Adkins, 2016a), the impacts on degree-granting institutions have not been significant. From a business training perspective, safety and large equipment simulations are being adopted as these do not face the rigors of academic degree quality control or institutional and cultural resistance. Business owners and online providers can enter a relatively free market exchange where effectiveness and cost provide the constraints to adoption. And this may be the entry path of more rapid technological adoption, where barriers to entry are low and engagement with users facilitates rapid innovation and product development. While initially filling a training gap, it does not need too much imagination to vision scope creeping into what is currently the academic realm. Vendor-based certifications such as Oracle, Cisco, and Microsoft are prototypes of this expansion.

## 5 The Future

Given the foregoing trends, we can assess their trajectories to develop scenarios of the future of online business education, although it should be kept in mind that it is always a very hazardous enterprise to forecast the future of education, particularly regarding technological transformation. In 1913, no less an authority on invention than Thomas A. Edison predicted the demise of traditional delivery methods with the advent of motion-picture technology:

> Books, …. will soon be obsolete in the public schools. Scholars will be instructed through the eye. It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed inside of ten years. (The New York Dramatic Mirror, 1913)

### *5.1 Technology Development*

Underpinning the use of online education is the development of educational technology, which underwent a significant market expansion since 2005, but may now have reached a saddle point with invested funds beginning to stall (Straumsheim, 2017). Support for a cooling portfolio also comes from Ambient Insight who forecast a steep decline in the self-paced courseware product markets (Adkins, 2016b).

The LMS market will see revenues shrinking due to consolidation, commoditization, and the shift to significantly lower cost software-as-a-cloud cloud provision. The report does see strong growth potential in specific vertical market segments such as healthcare and continuing education for professional licensure. There is also potential in the managed services area in both corporate and K-20 segments, indicating the provision is moving up the stack from software to service. This could indicate a willingness of investors to fund educational service companies enabling a new mesh channel of educational provision outside the traditional structures. While continued increases in investment have slowed, the intensity of ed-tech companies to innovate is being driven by the greater competition. The increased functionality of learning platforms continues to grow apace, some driven by considered and researched practice and others by technophilic adoptions that work within specific context based use cases. Such developments are a double-edged sword as while they assist in providing an ever-deepening learning platform, they also create adoption hurdles through increasing complexity, difficulty to learn, and time to adopt.

## *5.2 Adoption*

The sine qua non of online business education is the adoption and use by educational institutions, namely, faculty. Without their active and passionate participation, the online potential will not be realized. Attempting to understand the process of technological change adoption models of technology have been developed. Stewart and Khare (2015) noted that the most widely known of these is Rogers, whose diffusion of innovations (Rogers, 1995) has become almost unchallenged in the business sector as the de facto description of innovation adoption. His model adopts a life cycle approach describing the stages and determinants that characterize a technology's adoption curve. Online education can be seen to be spread across three phases of the life cycle, pioneers for high-level functionality, early adopter for fully online delivery, and early majority for hybrid delivery. Rogers' diffusion theory holds that the adoption has four main drivers – innovation, communication to potential users, a supporting social system, and time. Of these the supporting social system would appear to represent the largest hurdle to more complete adoption in the educational context.

Stewart and Khare (2015) also observed that an alternate information technology adoption model developed and empirically tested by Davis, Bagozzi & Warshaw (1989), hypothesizes a direct link between perceived usefulness and perceived ease of use and that between a choice of two equally productive systems, the easiest to use will hold sway. Further empirical validation was obtained in Venkatesh and Davis (2000). As mentioned earlier for faculty online learning represents more, rather than less work, partly driven by the technology learning curve and partly by their traditional pattern of self-creation as opposed to team development. This in turn is driven by the cultural norms and desire of faculty to own any material they create. These resistant strains opposing adoption appear to be changing. And it may be that the killer application is "learning analytics" (see Siemens, 2010).

The growing need for institutions to improve retention and increase student success without sacrificing intellectual rigor has found analytics to provide significant value. The ability to use machine learning techniques to analyze big data sets to identify unidentified patterns and develop solution algorithms has gained wide acceptance across the commercial sector, education is a little late coming to the table. Nonetheless the ground can and will be made up quickly as many data sets already exist that can, with some massaging, provide the inputs for analysis. These will be built upon as the practice matures and information feedback loops are developed that both request and generate ever-improving data streams. These will guide, inform, and improve the design, delivery, and development of education and learning. While learning analytics is not purely an online capability, the digital nature of the form facilitates broader and deeper data sets that enable better analysis. In any event, the increasing use of online delivery in hybrid models will act as a catalytic gateway by increasing fluency and understanding, thereby increasing usage by the more traditional professoriate. This in turn will help fuel the shift to more online delivery.

Of critical importance to adoption will be institutions' motivation and evaluation of faculty through the augmentation of the reward system to include the innovative use of technology for teaching. A complexifying factor in designing new faculty evaluation systems is the tendency of online delivery to be less propietary to a single individual and more system oriented. The intrusion of more anonymous delivery methods undermines the human capital of faculty, thus reducing their bargaining power (Pringle & Huisman, 2011, p. 46). For traditional research-based institutions, which generally have the highest rankings and greatest market potential to avail of online delivery, this is not a simple matter and represents an institutional constraint to expanding online adoption and provision.

## *5.3 Brand and Market Share*

The growing acceptance of online education would seem to be a tide to raise all boats for online business education providers. And there is some solace to be found in this. But the silver lining comes wrapped in a cloud. The importance of brand, accreditation, and the perceived rigor of a program or the institution will likely hold greater sway than the technical quality of delivery. Thus, an eCornell qualification will be of greater standing to potential students than the University of Phoenix or Western Governors University, once their delivery platform meets the basic requirements. All this to say that technical wizardry and user experience will have a role to play, but it will be a secondary one.

In this increasing growth scenario, higher-ranked schools can expand enrollment into online business courses to the point of brand saturation (technically there are no limits to cohort size as MOOCs have demonstrated). At this point exclusivity effects and declining returns to investment provide an upper limit to expansion. As the highest tier of schools reaches the point of saturation, the next tier level can

accommodate the demand and so on as the demand trickles down the brand curve, very much as it currently does with on-campus-based schools. In addition, the bounds of space on traditional campus delivery are not so constrained in virtual space delivery, affording a scope opportunity for online growth across strong branded institutions, with the result that the competitive environment will become more national than local in character. Thus, the online intake cohorts will increase significantly as higher-tier institutions push their brand value to the limit. This strikes an ominous tone for lower-ranked schools, should such an expansion take place. The market share available to them may be unsustainable as the fixed and variable costs of provision may not be recoverable from the cohort size available to them. For lower-ranked schools wishing to remain competitive, innovative pedagogies, excellent student experience, employer agreements, and lower costs may be part of the answer. But it would seem safe to state that providing accessibility and convenience will not be sufficient to gain and hold a sustainable market position.

## *5.4 Market Segmentation*

Similar to the previous scenario, the market for online business education may disaggregate into vertical functional or industry specializations with institutions either individually or in groups focusing on providing integrated services developed to address like needs of similar groups. Alternately the market may be horizontally segregated with a focus on an educational level or required competency set across many industries or cohort groups. Lynda.com can be seen as a forerunner of this development with a focus on online training (Lynda.com, 2017). The focus on delivering ever-improving educational services within a narrow educational level provides an economy of scale at a lower market share than a broader service could provide.

## *5.5 Niche Schools*

Niche schools can be considered the long-tail option as discussed by Anderson (2006). This would consist of institutions serving market micro segments as with other forms of long-tail provision will very much be driven by supply side economics. The development of SaaS platforms that provide associated services such as instructor support, assessment test banking, invigilation, and ecommerce will enable subject matter experts to sustainably serve ever small groups. The key driver here is the breakeven point participation rate. This reflects the growing market potential for educational service provision mentioned above. It is in this case that technology-enhanced pedagogy has it greatest scope due to the ability to develop collectively with employers and instructors' industry accreditation bodies and associations. The feedback loops can be shortened to improve both the role and results of experimentation in technology-augmented pedagogy within the narrow range of the niche.

### *5.6 Aggregated Qualifications*

The ability to integrate institutions through database federation, more commonly termed Blockchain, allows institutions to partner to provide composite or aggregated qualifications. This creates an ecosystem allowing institutions to specialize in components of degree or certificate and to form alliances with other similarly positioned institutions to provide a broader curriculum or more advanced qualifications. An analogy with the airline industry is applicable here as airlines can expand their catchment area by exchanging access to routes that would be uneconomic for the any individual airline to operate on their own. In essence, this is the pursuance of an economy of scope through an interdependent ecosystem. The Blockchain scenario was articulated by Tapscott and Tapscott (2017), positing the impacts this technology can have on educational delivery. They suggest that it can play a transformational role in the delivery of education through the ability to share student's learning information in ever smaller components. Such would enable instruction to be delivered through multiple parallel channels rather than just through a serial process of one instructor in one institution. These conclusions were strongly disputed however (Usher, 2017), due to the institutional context outlined earlier. In May 2017, Melbourne University in Australia announced themselves as the first in the world to adopt blockchain technology for student records (Dodd, 2017).

## 6 Conclusion

Despite the almost incessant hyperbole, there is great potential for technology to play an increasingly impactful role not only on education administration but on the core mission of institutions in teaching and research. One needs to look no further than the growing field of learning analytics to grasp this underlying potential. Baumol's disease cited earlier (Baumol, 1993) can be ameliorated by distributive technologies that leverage the expertise of subject matter experts in the creation of content, the extension of instruction, and the automation of testing, all expanding the productivity of faculty. Such can be seen to be extensions of richness and reach hypothesis (Evans & Wurster, 2000), where the economies of information driven by IT innovation diminish the traditional trade-off between message richness and audience reach. For online business schools that are closer to commercial industries than most academic faculties, the opportunities are even greater. Online MBAs have become accepted qualifications in a very short timeframe demonstrating the ability to both use technology innovatively to deliver education while also providing a service to a market segment that was overlooked and underserved. The fulfillment of such potential is not without challenges and will require risk taking, creativity, adopting new cultures, and engaging in closer relationships among all stakeholders, certainly, not without its challenges, but with vision and leadership eminently achievable.

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# A Service-Dominant Logic and Value Co-creation Approach for Online Business Education

**Terry Beckman and Anshuman Khare**

**Abstract** The service-dominant (S-D) logic, of value creation in use, has merit for online business education. This chapter takes a closer look at service-dominant logic frameworks presented by researchers and explores their application to online business education. In particular, the five axioms of service-dominant logic are linked to online business education to show how the framework can be adapted. In addition, a five-phase process of the core service-dominant logic concept of co-creation of value is applied and explained in relation to online business education. These frameworks may provide useful insights for online business education effectiveness.

**Keywords** Service-dominant logic • Co-creation • Online education • Value creation

## 1 Introduction

The service-dominant (S-D) logic, as introduced by Vargo and Lusch (2004, p. 9), is "a mindset, a lens through which to look at social and economic exchange phenomena so they can potentially be seen more clearly." One of the core tenets of the S-D logic is the co-creation of value, where the customer is "a co-creator of value" (Vargo & Lusch 2008, p. 7) and an enterprise/organization offers a value proposition; together, the customer and organization create value. Although developed primarily in the marketing area, the S-D logic is applicable to areas other than the exchange of products and services. Chalcraft and Lynch (2011) suggest that higher education is amenable to analysis through the S-D logic lens.

Education is commonly thought of as being a service, and literature treats it that way in order to look at quality (Hill, 1995), student satisfaction (Mark, 2013; Woodall, Hiller, & Resnick, 2014), and students as customers (Saunders, 2014). Additionally, the North American Industry Classification System considers

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education to be a service (Stats Canada, 2016). Yet at this point, very little literature exists relating education to S-D logic. As a service then, it is logical and valuable to apply the lens of S-D logic to education, and S-D logic may even serve as an umbrella concept for the various education-as-a-service articles.

While there has been some research (Baron & Harris, 2006; Chalcraft & Lynch, 2011) that links S-D logic and higher education, the literature does so at a fairly high level. However, within the S-D logic, there are a number of concepts, axioms, specialized terms, and foundational premises at a lower, more applied level. The application of S-D logic concepts to the educational context may provide opportunities for improvement in educational effectiveness and student learning and will point to areas for further research, especially in the online education sector where one of the key success factors is student service where service includes not just knowledge creation but also support services that make the student experience with the higher education institution memorable.

In the education field, institutions provide access to courses, course materials, instructors, evaluations, and credentials, to potential students, who, through effort and work on their part, can co-create value. Co-creation of value is a core concept in S-D logic, whereby a supplier or manufacturer or service organization provides a good or service to a customer who, though use, and involvement in the process, gains value (e.g., Etgar, 2008; Payne, Storbacka, & Frow, 2008; Vargo & Lusch, 2004). The question may arise, "what is value to a student?"; this is an important question, which, however has no definitive answer. As discussed later in the chapter, the beneficiary (student) determines what value is for themselves. We can speculate though, as to some potential types of value for students: increased knowledge or knowledge creation, skill development, job readiness, self-satisfaction, or feelings of self-worth. As students will define value for themselves, this list could be much longer and could be different for each student. Further, online education is growing rapidly, and within the education sector, it seems that more independent motivation and effort are required on the part of students. They may, therefore, be more actively involved in the co-creation of value process. This in turn suggests that an online educational context may be even more relevant for the S-D logic than understood. This implies that how we look at students, potential students, educational institutions, and other stakeholders in the education sphere, and how they interact, is changing with the advances in technologies and collaborative tools used by higher education institutions.

Thus, this chapter sets out to examine how to apply the S-D logic to an educational context – specifically an online business school context. The goal is to examine the application of some S-D logic concepts to the educational system in an effort to suggest ways of thinking that have the potential to improve educational systems for institutions involved in imparting business education. This chapter first gives an overview of S-D logic, its five axioms, and looks at the co-creation process in relationship to education and online business education. The chapter then suggests how S-D logic concepts of co-creating value can be applied to online business education.

## 2 Service-Dominant Logic

Service-dominant logic comes out of the services marketing work that took strong root in the early 1980s (Vargo & Lusch, 2017). Services marketing is essentially differentiated between goods and services and goods marketing and services marketing. Scholars focused on the fact that services were fundamentally different from goods; thus, they needed to be understood differently and marketed differently. While there was a significant amount of research pursuing this theme, Vargo and Lusch (2004) felt that emerging out of the services marketing research over the years was a new orientation to marketing thought, and a new dominant logic for marketing, which they called the "service-dominant (S-D) logic" (Vargo & Lusch, 2016, p. 47). In their own words:

> *…marketing activity (and economic activity in general) is best understood in terms of* service-for-service exchange*, rather than exchange in terms of goods-for-goods or goods-for money. In other words, it is the* activities *emanating from specialized knowledge and abilities that people do for themselves and others…and the activities they want done for them,* not the goods, *which are only occasionally used in the transmission of this service, that represent the source of value and thus the purpose of exchange. Second, value is co-created, rather than created by one actor and subsequently delivered.*

In this view, goods-products are not produced for their own sake; rather, they deliver services from which customers realize value (Gummeson, 1995). Thus, customers realize that value in the use of the goods. Additionally, by using the goods, customers are *involved* in realizing the value, such that value is co-created.

The notion of value being co-created is one of the axioms of the S-D logic. In a goods-dominant logic, a manufacturer imbues a product with value and sells it to a customer, such that there is value in exchange. In an S-D logic, there is value in use; the customer, in essence, participates in the creation of value by using or being engaged with the product or service that is worked on by a manufacturer or service provider. Further to this, the value that is created is always in the eye of the beneficiary (Vargo & Lusch, 2017). Vargo and Lusch (2004, p. 6) say, "A S-D Logic implies that value is defined by and co-created with the consumer rather than embedded in output."

The interaction between the producer, manufacturer, or service provider and the consumer then has significant aspects of relationships inherent in the co-creation of value. Furthermore, within such a relationship, there actually may be more actors than the producer and consumer, implying that a network approach is appropriate within the S-D logic framework.

Early work on the S-D logic put forward eight foundational premises (Vargo & Lusch, 2004), which were expanded in later years to 10 (Vargo & Lusch, 2008). Later still, these were condensed into five axioms, from which all ten foundational premises could be derived. The five axioms of the S-D logic from Vargo and Lusch (2017, p. 47) provide the core aspects of the framework:

1. Service is the fundamental basis of exchange.
2. Value is co-created by multiple actors, always including the beneficiary.

3. All social and economic actors are resource integrators.
4. Value is always uniquely and phenomenologically determined by the beneficiary.
5. Value co-creation is coordinated through actor-generated institutions and institutional arrangements.

## 3 Service-Dominant Logic in the Educational Context

While the S-D logic was originally developed and presented in a marketing context (Vargo & Lusch, 2004), it was not intended to be restricted to the marketing area. Rather, Vargo and Lusch (2008, p. 3) contend that "S-D Logic is a generalizable mindset" and it can be applied in many different contexts, including education (e.g., Baron & Harris, 2006; Chalcraft & Lynch, 2011). Each of the five axioms can be tied directly into an educational context, although some of the terms and resources need to be slightly modified, for example, students rather than customers or consumers and universities rather than companies. Nonetheless, the S-D logic framework seems to be applicable, and thus what follows is its integration to an educational context.

### *3.1 Axiom 1: Service Is the Fundamental Basis of Exchange*

To begin with, Vargo and Lusch (2008, p. 2) say that service is "the process of using one's resources for the benefit of another entity" or, as stated by them earlier (Vargo & Lusch, 2004, p. 2), "the application of specialized competences (knowledge and skills) through deeds, processes and performances for the benefit of another entity." In order to do this, it is important to distinguish between two main types of resources: operand and operant. Operand resources are those "resources on which an operation or act is performed to produce an effect," while operant resources are those "which are employed to act on operand resources" (Vargo & Lusch, p. 2).

At its simplest level, education is an exchange of services. Professors use their resources to benefit students, with the goal of helping students learn new skills and acquire knowledge. Professors are, and use, operant resources to produce effects in students. Students can be considered to be beneficiaries of the professors' efforts to instill knowledge and skills. Knowledge and skills are inherently intangible and thus would be considered to be services. Even though there may be tangible objects used in the educational process (i.e., computers, books, paper), these are operand resources upon which the operant resources act to produce benefits. Students themselves can even be considered as operand resources, as they are, from a certain perspective, operated on by professors to be transformed with new skills and knowledge. What happens then is that rather than an exchange of goods to the students, the entire educational process is a service exchange.

In an online educational setting where students and professors engage in co-creation of value in a virtual environment, and the emphasis is on peer learning, students can be viewed as both operand and operant.

## *3.2 Axiom 2: Value Is Co-created by Multiple Actors, Always Including the Beneficiary*

Although originally S-D logic was based on a producer-customer relationship dyad, this language was found to be inconsistent with the co-creation of value premise (Vargo & Lusch, 2008). Thus, a variety of terms, such as "actors," "beneficiary," and "provider," have been adopted. This is important in the educational context, as there has been debate as to the role of a student. In line with the notion of providing excellent service, some authors have suggested that students are "customers" (Anshari, Alas, Yunus, Sabtu, & Hamid, 2015; Mark, 2013; Wong, 2017); others have suggested that this metaphor for a student as customer can have a negative impact on the students and staff (Laing & Laing, 2016; Saunders, 2014).

Chalcraft, Hilton, and Hughes (2015) linked students into the S-D logic framework by discussing their role as customer, collaborator, or co-creator. What is clear is that students are involved in the educational process and are not passive in the process. Active involvement is a key requirement in online education, which follows a collaborative learning approach. Considering students as customers has some implications that some product is delivered to them and from that then get value in use. However, as an "actor," the implication is that students are inherently part of the process and are active in co-creating the value.

The active nature of co-creating value is particularly apropos in an educational setting, as students must study; do assignments; work in groups; question professors and support staff; read, listen to, or watch materials; and generally put in effort – that is, apply their knowledge and skills as operant resources to the operand resources (the materials and exercises provided by the professor) in order to produce an effect. Students in this context are the primary beneficiary, and as they acquire skills and knowledge, this is the value spoken of in the S-D logic framework. Clearly, they participate in the creation of that value, and in fact, they co-create that value and learning.

As described above, students and professors are the primary actors in the educational context. There are, however, other actors who contribute to the co-creation of value. The university itself provides resources for both the professor and student to use, support staff contribute to the value, and other students – in particular, if there is group work – can be considered to be actors involved in the co-creation of value.

In an online business educational setting, there are some additional players, for example, organizations where students are employed or organizations that will employ the students in the future. Student experience is an important piece in the quality of the value created and this often comes from the students' organization.

### 3.3 Axiom 3: All Social and Economic Actors Are Resource Integrators

Within an educational setting, a network of actors is involved in the co-creation of value – for example, students, professors, support staff, information technology staff, classmates, teaching assistants, parents, and friends. In order to be part of the co-creation of value, each of these actors acts on resources and integrates them in a way that facilitates the process. Professors bring together materials from textbooks, articles, their own experiences, special speakers or contributors, and a variety of other sources. Students bring their time; their skills of reading, writing, and using the library; and their knowledge of prerequisite material, along with, perhaps, a computer, access to the Internet, and other tools for working on assignments and projects and communicating with the professor and others who are involved in the value co-creation process. In business schools, students also bring their experiences to class and that is integrated in a subtle manner or purposefully in the value creation process. Business schools can provide more value when they can harness the experience of students for new knowledge creation. The richness of this resource is invaluable when it comes to an online environment where students come from different regions, cultures, and backgrounds.

In short, in order for value to be realized in this setting, these resources must be brought together and they must interact. This interactivity allows for the creation of value. Thus, each of the actors functions as resource integrators.

### 3.4 Axiom 4: Value Is Always Uniquely and Phenomenologically Determined by the Beneficiary

Although multiple actors co-create value, it is the beneficiary who determines what that value is. In an educational setting, that beneficiary is the student. But what is value in education? It can be different things for different students. One student may want to increase their knowledge of a particular disciplinary concept, another may want to develop a specific skill set, and yet another may simply want a credential; there are probably as many different definitions of value as there are students. Vargo and Lusch (2008, p. 7) say that "value is idiosyncratic, experiential, contextual, and meaning laden." This is an interesting perspective when seen from an online business education viewpoint. In a virtual classroom, the receiver of service has an opportunity to choose which sources he or she would like to draw from to be effective in their job environment or development of a skill set. The choices in an interconnected institution present one with more opportunities than in a bricks-and-mortar setting.

### *3.5 Axiom 5: Value Co-creation Is Coordinated Through Actor-Generated Institutions and Institutional Arrangements*

Institutions are the taken for granted norms and beliefs that exist in a system. These are the unspoken rules which guide our behaviors and actions in relating to the world around us. The actors in an educational setting are guided by a set of norms. These influence how the actors integrate resources in co-creating value; some actions are unacceptable (e.g., plagiarism), some are encouraged (e.g., creating study notes from readings), but all work together to coordinate how value is co-created. In an online business educational setting, some new rules come into play (e.g., net etiquette), which fit with the opportunities it presents through connecting people, resources, and sometimes even industries. Value creation is not restricted from online business schools, but its management and coordination require a new set of rules and guidelines.

### *3.6 Concluding Remarks About Service-Dominant Logic in Online Education*

As illustrated above, the main axioms of S-D logic are readily applicable to an educational setting. As education is commonly thought of as a service, there is no difficulty in applying an S-D logic framework in that context. The question, though, is whether or not this application of S-D logic to an educational context is beneficial. The authors of this chapter believe that such an application is beneficial and can improve the overall effectiveness of education – in particular, online education. Business schools are involved in value creation for its students and, indirectly, organizations that employ these students. A better understating of the axioms helps institutions to figure out the right approach and process for value creation.

## 4 Co-creation of Value in Education

One of the most important facets of S-D logic is the co-creation of value. As is seen in the five axioms, three of those five are specifically tied to the co-creation of value, so even axiomatically, the importance of co-creation of value is primary. But given that value is co-created by students and professors and a host of other actors, how does this impact what a professor and a university does? Axiom 2 states that "value is co-created by multiple actors, always including the beneficiary" (Vargo & Lusch, 2017, p. 47). This requires engagement of some sort, and at some level by the beneficiary, or in our current context, the student.

Etgar (2008) uses the term co-production, which is very similar to co-creation, and has been largely accepted as being a linked and a nested subordinate concept of co-creation (Payne et al., 2008; Vargo & Lusch, 2008). Etgar (2008, p. 98) makes an interesting and critical point about the engagement of the consumer in co-creation, "co-production is an *explicit result of decision making* [emphasis added] by consumers reflecting their own preferences." This means that consumers (students) make a choice about whether or not to engage in the co-creation of value and how engaged they will be. On the positive side, this implies that if a professor or university can provide the opportunity, then students will be active in the co-creation of knowledge or some other type of value. However, to some degree, if a student refuses to engage, that is their decision, although some thought would need to be given to what opportunity was provided and how it was presented.

In order for learning to be effective then, students need to *decide* to engage in the co-creation process, and the co-creation process needs to be amenable to student engagement. In order to help address this situation, Etgar (2008, p. 99) developed a five-stage process of co-creation:

> *(1) development of antecedent conditions, (2) development of motivations which prompt consumers to engage in co-production, (3) calculation of the co-production cost-benefits, (4) activation when consumers become engaged in the actual performance of the co-producing activities, (5) generation of outputs and evaluation of the results of the process.*

Applying these stages to an educational context – and particularly in an online educational context – should provide a setting in which the co-creation of value can take place effectively and ultimately benefit the students. Online business programs place a significant amount of emphasis on student engagement and are always on the lookout for better approaches. Without student engagement or his or her willingness to learn, the virtual classroom would fail to deliver.

## *4.1 Development of Antecedent Conditions*

If students are going to engage in the co-creation of educational value, a set of conditions needs to first be in place. Broadly, these are macroenvironmental conditions, student-linked, service- or product-linked, and situationally linked conditions (Etgar, 2008). Etgar (2008) breaks the macroenvironmental conditions down even further into economic, cultural, and technological preconditions.

Economically, students must be in a position where they are able to pursue education. With online education, this precondition is less burdensome, as often there is no requirement to move to a new location, or to quit a job, or even to bear the costs of transportation to a specific location.

In mature economies (e.g., Western Europe, North America, and the Far East), there have been changes in the consumer culture whereby consumers are becoming more interested in customization and co-production (Gronroos, 1994; Palmer, 2005). At the same time, there is increasing demand for experiences, rather than just products (e.g., Arnould & Price, 1993; Pine & Gilmore, 1998). Both cultural shifts

are producing a context where students are more likely engage in co-creation of value or at least be more willing to do so. An educational system that taps into the customization and experiential aspects of the student culture could see an increase in co-creation engagement by those students.

Although almost all educational settings now seem to rely on technology, this is an absolute must for online programs. In today's digital world, technology is rapidly growing and changing. Students today have grown up with technology all around them, and they simply take it for granted. On the university side, providing access to systems, tools, and materials (e.g., library services, course web sites, statistics packages) is critical. This is part of the (new digital) ecosystem (Akaka & Vargo, 2015) in which the co-creation can take place. However, students also need the appropriate equipment (e.g., computer, tablet, smartphone) to access the systems. There can, thus, arise a tricky balancing act, where the development and use of new technology may not be compatible with older, legacy equipment on both sides, university and student. Getting this balance wrong can impede or even prevent value co-creation.

Etgar (2008) also suggests that there are individual differences in consumers/students that affect their predisposition to engage in co-creation. That is, "some consumers [students] are more prone to engage in co-production than others" (Etgar, 2008, p. 100). This is the case, as different students have different sets of resources (i.e., skills, knowledge, tools, and time) upon which to draw in co-creating value. One significant implication of this relates to the segmentation and targeting of students by universities. Universities need to understand the resources that students have and their general predisposition to engage in co-creation. The design of their own systems needs to match students' predisposition to co-creation. Therefore, university programs must match students' predispositions. Further, in marketing the programs, universities need to focus on the segment of students around which they designed their systems.

Customer predisposition to engage in co-creation can also be linked to the nature of the product or service, where some products and services are more amenable to co-production and co-creation of value. Customers are more likely to be willing to invest time and effort into co-creation of value in items and activities where there is the possibility of a significant difference in value arising from the effort (Etgar, 2008). Education is a service where the effort of the student can make a noticeable difference in the value received. These sum up why business schools see moving online as a great opportunity. They can lower the barriers to learning and provide an education that prepares a student for a job in any global setting. The mixing of cultures, experiences, and business practices in one classroom leads to higher level of value creation. Business schools often sell their product or service using these arguments.

## *4.2 Development of Motivations*

While there are a set of conditions that set the context for the co-creation of value, integrated into that context is the motivation of the student. Etgar (2008) says that there are three relevant drives for consumers: economic, psychological, and social.

These fit with students as well. Economic drives are directly linked to economic rewards (Lusch, Brown, & Brunswick, 1992). One of the primary reasons for students to attend higher education business institutions is that they can get a job when they graduate. Business students are usually aiming at jobs in industry where they have significant opportunities for economic rewards. Online business education provides another source of economic reward; the tuition fees may or may not be less in an online program, but not having to potentially move to a new location to attend classes and not having to give up one's current job provide significant motivation for online education. Being involved in the co-creation of their own educational outcomes can be very motivational for students.

Psychological motivations are also important. Holbrook (2006) suggests that there are intrinsic and extrinsic values which affect the psyche of consumers. Students may pursue education for the joy of learning and for the satisfaction of accomplishing something. These intrinsic factors fit well with motivating students to engage in co-creation in their own education. Extrinsic factors are also important in that students may be able to show their identity through achieving educational credentials. Or, as a means to achieving a specific job or promotion or position, the extrinsic value of education can motivate students to engage more fully in co-creation.

The third motivation drive is for social benefits. In general, students who are seeking status and social esteem (Holbrook, 2006) can be motivated to engage in co-creation in their educational endeavors. However, this could vary depending on the mode of education delivery. For example, online education provides a different social experience than a face-to-face, campus environment. Berthon and John (2006) suggest that there is enjoyment when people with similar interests share activities, which can be a motivator. We expect that this would be a stronger motivator in place-based education compared with online education. However, it is possible that because social contact is different in an online context, students might be *more* motivated to engage in co-creation of value, perhaps trying to compensate for the lack of face-to-face contact and interact with their co-creation partners.

### *4.3 Cost-Benefits*

In this stage of the process of determining the level of co-creation that will be engaged in, the benefits of co-creation are compared with the costs. Costs can be both economic (e.g., use of their resources, payment of fees) and noneconomic (e.g., time, psychological effort). Etgar (2008) suggests that the outcome of this comparison will be that a consumer will decide whether to engage in the co-creation process or not. In an educational context, there seems to be more than a binary choice. Students can vary the amount of effort they put into co-creation activities and thus vary the outcomes. For example, students can read all of the required readings plus the supplementary readings, and do extra research on the topic, or they can skim through the most important sections, gleaning just enough information to get

a pass. Thus, in an educational context, the cost-benefit analysis will determine how much effort a student will put into co-creation activities, rather than whether or not to engage. In an online setting, this analysis may be even more salient. That is, lacking the face-to-face, social aspect of a place-based setting, a student needs to deliberately decide for themselves how much to engage in co-creation activities, whereas in a place-based setting, their classmates may be able to physically encourage and motivate students. Thus, the nature of the costs and benefits can be different in an online educational context. In business schools offering online classrooms, these cost-benefits need to be well understood. Design of courses can go a long way in engaging students and assessment systems to ensure that the program goals are being met regularly and the benefits outweigh the costs.

### *4.4 Activation*

Once a student decides to engage in the co-creation process, he or she then moves to the final stage – activation. In Etgar's (2008) research, the focus was on consumers; thus, the activation phase was focused on consumption, distribution and logistics, assembly, manufacturing, design, and initiating. These do not exactly "fit" in an educational context. However, there are equivalents in education, particularly in online education – consumption/learning, distribution and logistics/online distribution, assembly/course production, manufacturing/course writing, design/course design, and initiating/curriculum planning.

The final of these steps is the learning step, in which the student is involved in the co-creation activities. Leading up to these are the sequence of steps starting with curriculum planning (setting up program learning goals) and deciding what courses are needed; designing courses, which will achieve program learning goals; and finally, gathering materials and writing the course. The course is then "assembled" in a course production area, which puts all of the materials together in a format that is amenable to learning, followed by publishing the course online, ready for the student to engage with the material for learning.

The distribution, or publishing of a course online and creating the learning environment, is quite a critical step in enabling co-creation with the student. It is here where the various actors – such as students, professors, teaching assistants, and support staff – will interact with each other. This is the service ecosystem where there are direct and indirect interactions between the various actors, as the co-creation of value – or learning – takes place (Akaka & Vargo, 2015). A service ecosystem is a "relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange" (Lusch & Vargo, 2014, p. 161). Within the ecosystem, co-creation of value can occur, but this also requires the engagement of the actors, in particular, the students (the beneficiaries) and the professors. Student engagement is also known to be important for effective student learning, especially in online education (Garrison, Anderson, & Archer, 1999), and an "engagement orientation urges firms

[universities] to co-create a wider range of activities with their customers [students]" (Venkatesan, 2017, p. 293). Therefore, the development of an educational course ecosystem where students can engage in the learning materials and also use their own resources in co-creation activities can enable effective learning. Online business schools tend to focus on this aspect with engaging learning material, online access to resources, and course designs that bring out the student experiences in a commonplace where value creation can take place. This leads to the final stage – evaluation.

## *4.5 Evaluation*

After activation, where the students engage in the co-creation of learning, they undertake an evaluation of the co-creation process. This involves a comparison of the end value (which as stated in S-D logic axiom 4) determined by the beneficiary (the student) and to the motivations which initially prompted the student to consider engaging in the co-creation to begin with.

Online business schools need to have effective measurement systems to capture this feedback. This helps with the continuous improvement system. Feedback can be captured at various levels, before the start of the program to get a view of the baseline expectations, after each course to track the progress and after the program to see the end result. Comparison helps in making an assessment on the effectiveness of the value creation process.

## *4.6 Discussion*

As has been described above, the S-D logic views service as the fundamental basis of exchange. Further, although the S-D logic was originally written in relation to the field of marketing, it is applicable to other fields as well (Vargo & Lusch, 2008). One of the core features of S-D logic is co-creation of value. Payne et al. (2008, p. 83) say, "the value-creation process…occurs when a customer consumes, or uses, a product or service, rather than when the output is manufactured." In the educational context, the same logic is applicable and relevant, whereby, the value to a student occurs when the student engages in the learning process (through studying, writing assignments, and exams) and literally co-creates the learning value. One additional, important factor is that students and other actors use their operant resources to act on the operand resources in the co-creation process and undertaking course and program improvements.

It is not a new thought that students have responsibility for their own learning. However, using the lens of S-D logic focuses our attention on what that responsibility entails. This is not simply a case of advising students to work hard, study hard, and do well. Rather, this is a recognition that there is an integration of resources and efforts between multiple actors to create value. That creation, or co-creation concept, goes much further than simply "working hard." The implication is that engagement

is required of the student, and there is a requirement for the professor and university to establish a context and ecosystem within which co-creation can flourish.

An interesting implication of this application of S-D logic to education is in relation to the type of students that are involved. That is, there is a more specific need to understand student characteristics in designing and delivering education. In particular, the mode of delivery in comparison to the student characteristics is important. Business schools have been able to see the need from the student and business perspective. They provide service to both by training one to meet the needs of the other.

In an online business university, there are more benefits to nonlocal students, who may be more willing to engage in co-creation activities from a distance, rather than if they had to travel to a campus for those co-creation activities. Additionally, if the ecosystem of an online university is developed to allow for multi-device access, students who may have quite a variety of digital devices would be more willing to engage in co-creation activities than if there was only one access point.

Developing and building an ecosystem for students (whether online or place based) need to be designed to allow and facilitate co-creation activities. That is, students need access to resources and people (e.g., professors, support staff) in their own time, so that they can easily be a part of the co-creation process. Difficulties in networking between all of the actors would hinder co-creation activities and thus have the potential to reduce the value to the students. However, in virtual classrooms, the interaction is fairly continuous as there are various tools available that enable co-creation activities.

## 5 Conclusion

This chapter has taken the first step toward examining the S-D logic for education. While detailed linkages between core axioms and concepts in S-D logic have been explored, further work can be done to find its application to online business education. The roles of each of the actors can be expanded, the various operand and operant resources can be explored, and the stages of the co-creation process can be more specifically developed in relation to a program or even at the course level. By developing these ideas further, we can more fully understand how to make learning more effective and how to provide an environment where students can realize value in their education.

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# Educational Data Mining (EDM): Researching Impact on Online Business Education

**Kriti Khare, Helen Lam, and Anshuman Khare**

**Abstract** Educational data mining (EDM) is an applied field of research that combines data mining, machine learning, and statistics in the educational setting at, but not limited to, schools, universities and intelligent tutoring systems, and MOOCs. Methods are developing and improving for analyzing the vast amount of data available in education to better understand learning behaviors and pedagogical outcomes by applying theories of educational psychology in order to improve the learning environment.

In this chapter, the authors explore the significance of data mining in the online education setting and how it can improve the student learning experience. We first review some commonly used data mining techniques that have been applied to education data, such as classification, clustering, and association rule mining. The new developments in knowledge tracing for modeling student data are also briefly described. We follow with an elaboration on the goals of educational data mining, for example, using the data related to student performance in an MOOC setting, some goals for data mining could be to predict how well the student will do on a new class activity or the probability of the student dropping the course. And we conclude with a look at how EDM applies to online business education and how learning systems can adapt to findings of this data analysis.

**Keywords** Educational data mining • Online business learning environment • Data analysis

## 1 Introduction to EDM

Educational data mining (EDM) is an emerging interdisciplinary field, aimed at analyzing educational data using statistics and computing science algorithms. The traditional and most frequently used teaching environment consists of delivery of content to the students in a face-to-face setting, which we term classroom. This is

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generally a data poor environment where the only data recorded relates to attendance and assignment grades. Thus, other potentially useful data such as the exact time when the student did the work; the number of attempts made before an assignment was submitted; students' social groups, study load, and cross impacts of other subjects; and other potentially revealing information is not available.

With the advancement of technology, a number of new data-rich educational environments have come into common practice. The twenty-first century has seen the use of technology in the classroom. With the emergence of online technologies for education, teaching is no longer limited to the classroom; there are online courses and websites that are used for content delivery, as distance education has adapted from the print and mail technologies to allow learning in a virtual environment, in a self-paced manner. The work of Siemens and Downey, building on the developments of the Open University in the UK, led to development of MOOCS (massive open online courses) that can be taken by anyone with access to a computer and an Internet connection. Online courses are producing data that makes it possible to keep track of a student's engagement in a course by tracking how often and for how long they access the content, participate in discussions, visit the course site, and complete the assignments. An additional advantage of MOOCs is the breadth of the data set, as it represents a diverse global community of learners that allows multifaceted analysis at different degrees of aggregation and grouping. Since the students are from across the globe, the data, if analyzed properly, can be used to better understand student behaviors around the world.

Other technologies that have emerged are intelligent tutoring systems (ITS). These are special software aimed at helping students learn subject matter. Some well-researched ITS are the Cognitive Tutor by Carnegie Mellon University for grades 9–12 math and ASSISTments developed by Worcester Polytechnic Institute in collaboration with Carnegie Mellon and SQL Tutor (Mitrovic & Ohlsson, 1999) for helping undergraduate students learn Structured Query Language (SQL). These tutoring systems incorporate artificial intelligence to facilitate student learning by noting concepts that a student performs below expectations, the amount of feedback they need, the type of feedback that is helpful to them, and so on. The data from ITS like Cognitive Tutor and ASSISTments is now used to evaluate new educational data mining algorithms that are in turn used to develop and build student models. The data not only has the time logs of the students but also information related to help-seeking, their previous knowledge, and the concept being studied. Researchers at Worcester Polytechnic Institute have analyzed the data from ASSISTments and answered various questions related to student modeling, such as whether skill information is more important than student information (Beck, Ostrow, & Wang, 2016), the benefits of using partial credit over binary credit (i.e., all or nothing), and the relationship between the time spent on the tutoring system and the mastery level of the student (Gong, Wang, & Beck, 2016; Kelly, Wang, Thompson, & Heffernan, 2015).

The educational data mining techniques discussed in this paper are best illustrated with a practical setting where the contextual characteristics can be described and the applicability of the techniques analyzed. For illustration purpose, the online business educational environment is selected.

### *1.1 Outline of This Chapter*

This chapter is organized as follows: in the next section, we elaborate on some basic data mining techniques that have been used in the educational setting. Recent advancements in the field are also mentioned. In Sect. 3, the various applications of educational data mining are covered. Here, we take a look at the broad categories in which educational problems can be divided and briefly look at how they have been tackled by researchers. In Sect. 4, we look at how EDM can be used in online business education. In Sect. 5, some areas of education where application of educational data mining has so far been challenging are mentioned, and in Sect. 6, we conclude the chapter and mention some other applications that are coming up.

## 2 Review of Some Basic Data Mining Algorithms Used in Education and the New State of Arts That Are Coming Up

Data mining or knowledge discovery in databases (KDD) aims at finding patterns in data to better understand learning behaviors and pedagogical outcomes by applying theories of educational psychology with the ultimate goal of improving learning effectiveness, efficiency, and outcomes through the design of improved pedagogies and learning environments. Romero and Ventura (2007) identified two categories of educational data mining techniques by tasks in web-based educational systems:

- Statistics and visualization that are direct application of statistics and use of tools to better visualize the results
- Web mining tools that encompass clustering, classification, sequential pattern mining, text mining, association rule mining, etc.

Baker (2010) presents another categorization: prediction techniques (e.g., classification and regression), clustering, relationship mining (e.g., association rule mining and sequential pattern mining), distillation of data for human judgment (e.g., visualization), and discovery with models. In addition, there are recommendation systems, which filter information to suggest items to users based on their previous history. One of their applications in education has been to suggest remedial classes to students (Ma, Liu, Wong, Yu, & Lee, 2000). Though knowledge tracing has been practiced in education since 1995 when Bayesian Knowledge Tracing (BKT) was proposed by Corbett and Anderson (1995), it has seen a growing interest in the last few years due to the advancements in computing science in the field of deep learning, allowing new techniques to be applied to knowledge tracing.

In education, both qualitative and quantitative research methodologies are prevalent (Creswell, 2014). Thus, statistical methods such as significance tests are used to analyze support for hypotheses, while visualization techniques help present the data collected in meaningful and easy to understand graphical representations. A review

of these techniques is beyond the scope of this chapter. Instead, we focus on computer science-related techniques used for analyzing educational data, as reflected in current literature. These are classification, cluster analysis, association rule mining, and knowledge tracing for discovery with models. Thus, in this section, we summarize each of these four techniques.

## *2.1 Classification*

In classification, a model known as a "classifier" is constructed to predict categorical labels. For example, given the grades of students, one can build a classifier to predict the grade of a new student. For example, one may discover the students' learning preferences, dropout rates, and intermediate and final grades. The key in classification is that some training data must be available to build the classifier. Once the model has been built, new data, unseen by the model while training, is assigned categories by the model. There are many techniques that fall under classification. These include decision trees, support vector machines, Bayesian belief networks, naive Bayes classifier, neural networks, etc.

- Decision trees are tree structures where each branch represents the outcome of a test (value of a property of the data) and the leaves hold the class labels (Han, Pei, & Kamber, 2011). When class label has to be found for new information, each property value is tested against the tree till a leaf node in the tree is reached. That class label is assigned to the data. Decision trees have been used to predict student performance (e.g., Agarwal, Pandey, & Tiwari, 2012; Al-Barrak & Al-Razgan, 2016).
- Support vector machines use mathematical functions to map data into a space where there is a distinct gap between different categories. In education, for example, they have been used to predict problem-solving performance of students (Lee, 2016), create automatic grading systems (Zhang, Shah, & Chi, 2016), and generate feedback (Gutierrez & Atkinson, 2011).
- Naive Bayes classifiers are a family of classifiers that are based on the assumption that one property of data is independent of the other. Bayesian networks are probabilistic graph models where each node of the model represents an event. Knowledge tracing techniques, examined in Sect. 2.3, use some well-known classifiers. For example, the famous knowledge tracing algorithm, BKT (Corbett & Anderson, 1995), uses a hidden Markov network, which is a special type of Bayesian network. BKT has been recently used to evaluate educational videos (McHardy & Pardos, 2015) and sequence educational content (David, Segal, & Gal, 2016) among other applications.
- Neural networks assume some correlation between properties. A class of neural networks is recurrent neural networks (RNN), where the connections between nodes of the model form a directed graph, and outputs are based not only on the current input but also those of the recent past. RNNs, however, suffer from the problem of *vanishing gradient problem* (Hochreiter, 1998) where the influence

of the input either exponentially decays or blows up as it cycles around the network. One of the architectures proposed to tackle this problem is long short-term memory (LSTM), where filtered long-term data is used for input, that is, with the presence of special *forget* gates, the influence of an input can be controlled as it moves through the network (Gers, Schmidhuber, & Cummins, 2000; Hochreiter and Schmidhuber, 1997). These neural networks have been used in deep knowledge tracing (DKT) (Piech et al., 2015; Xiong, Zhao, Van Inwegen, & Beck, 2016) for predicting student performance.

## 2.2 Cluster Analysis

Cluster analysis is the process of dividing the data into groups, with no prior knowledge about the actual assignment. Thus, the key difference between clustering and classification is that while classification has a training stage where data with labels is needed to create the model, clustering simply partitions data into subsets based on its properties, i.e., no labeled data is required. It can be used to group similar students, assignments, and courses together. By analyzing the properties of the data that led to this grouping, the characteristics of each group can be identified. A commonly used clustering algorithm is *k-means*. In this technique, the data is divided into $k$ groups (where $k$ is defined by the user) such that each observation is assigned to a cluster whose mean is closest to the observation itself. Among other applications, it has been used for clustering library usage data (Xu, Recker, Qi, Flann, & Ye, 2013) and identifying categories of speech acts in educational games (Rus, Graesser, Moldovan, & Niraula, 2012). Dutt, Aghabozrgi, Ismail, and Mahroeian (2015) present a review of clustering algorithms that have been used in education.

While techniques like $k$-means give one set of categories for the data, hierarchical clustering algorithms are able to derive multiple categories for the data, presenting a hierarchical structure where each data observation may belong to a different category at particular level of granularity. For example, suppose we wish to cluster students based on their attention span. Following an agglomerative hierarchical clustering approach where all students are initially assigned to individual "clusters," student clusters are merged into larger clusters if their attention span values are the same or close to each other. Eventually all students would be in one big cluster. What is obtained is a hierarchical grouping of the students representing the different attention spans at which they would be in the same group.

## 2.3 Discovery with Models: Knowledge Tracing

Educational models are created for the purpose of learning more about the students and the environment. One may examine the model to learn which factors are involved in predicting the construct, or apply the model to data from other students

and contexts to draw inferences and so on. One of the most used model construction method is knowledge tracing. As stated above, Bayesian knowledge tracing (BKT) was proposed by Corbett and Anderson in 1995. Today, many variations of BKT are used. These include fuzzy BKT (Yudelson, Medvedeva, & Crowley, 2008) and clustered-skills BKT (Ritter et al., 2009). Performance Factors Analysis (PFA), proposed by Pavlik, Cen, and Koedinger (2009), is another technique used in place of BKT. Recently, Piech et al. (2015) introduced deep knowledge tracing that uses neural networks.

While Bayesian knowledge tracing (BKT) is a highly structured model whose parameters have direct psychological interpretation, deep knowledge tracing (DKT) produces general nonparametric models that are difficult to interpret. BKT uses hidden Markov model, where one model must be built per skill, i.e., the input data consists of student responses to exercises that test only one kind of skill. Also, BKT assumes that a skill is either mastered from one question to another or it is not. It does not take into account the situations of forgetting and guessing. DKT, on the other hand, in its implementations so far, has used a vanilla RNN and LSTM (Piech et al., 2015). The model is created by taking into consideration the complete set of exercises (all skills), and the hidden layers in the model retain information from all past trials. As a result, there is no assumption that a student would have mastered a skill by answering only one question correctly.

Khajah, Lindsey, and Mozer (2016) analyzed the properties of BKT and DKT and propose extensions to BKT that would overcome its shortcomings. Though the extensions to BKT improved the original BKT's results, domain and structure knowledge about the data were required to propose these improvements. On the other hand, DKT does not require any such analysis to give good results.

## *2.4 Association Rule Mining*

Association rule mining is a data mining technique that identifies frequently occurring patterns, in the form of a set of if-else scenarios that occur together. The discovery of these frequently occurring patterns, association between different activities and correlation between the data has been found to be useful to decision analysis and business management (Han et al., 2011). The *market basket analysis* is a classic example that uses association rule mining. By looking at supermarket data, grocery items that are bought together regularly by customers have been identified (e.g., if milk is bought, then butter is also purchased), and this information has been used to organize the different products in supermarkets. To find only the top frequently occurring patterns, a confidence and support threshold has to be defined. The Apriori algorithm and frequent pattern growth (FP-growth) algorithms are commonly used associate rule mining algorithms. In the education context, García, Romero, Ventura, and Calders (2007) analyzed the challenges faced in using association rule mining in learning management systems and also proposed some solutions.

## 3 Goals for Educational Data Mining

There are many interesting problems that educational data mining strives to solve. Baker and Yacef (2009) identify four main applications for data mining in the educational setting. The first application is to improve student models. A student's current knowledge, motivation, metacognition, and attitude can be represented by a student model. By learning the student model, a software is better equipped with responding to individual differences between students and, hence, leads to improved learning. Sweeney, Lester, and Rangwala (2015) and Sweeney, Rangwala, Lester, and Johri (2016) predict whether the combination of courses that a student is taking in the current term would overwhelm the student. Thus, their research gives insight to students about courses they are taking, to counselors who advise the students about the course load and to instructors on considering differing course combinations. To make these predictions, historic data was used, that is, the cumulative GPA of students that have taken the course, the number of students who did well in it, and the other courses the students took. Researchers also identified the key information they needed regarding the student and the courses that the student wishes to take that would predict their success.

MOOCs allow a global student body to enroll in courses, based on interest and not prerequisites. There has been an increase in the dropout rate of students. Wang and Chen (2016) have shown that using the online data logs of users on xuetangX, one of the largest MOOC platforms in China and released for KDD Cup 2015, it is possible to predict if a student will drop out at the beginning and also, as the course progresses, the likelihood of the student dropping out. Liang, Yang, Wu, Li, and Zheng (2016) used a Gradient boosting decision tree model to predict the dropout rate in Edx-based MOOCs using data from xuetangX. For promoting self-paced learning, Chang et al. (2016) proposed a recommender system that creates a "keyword cloud" for each important topic to help the learner identify the topics the student has covered so far and which ones the student struggled with.

To use technology better in the classroom, for example, for grading purposes, EDM techniques have been applied. Though multiple choice questions, true/false and math questions are easy to evaluate as they have fixed solutions that the computer can also calculate, using technology to grade short answer questions, essays, and step-by-step math problems is a new venue that is being explored. Programs to grade short answer questions use text similarity to find the similarity between a student answer and the expected answer. These are also known as answer models. Zhang et al. (2016) developed an automatic grading technique for short answer questions where they utilize information from student models (i.e., information regarding previous test scores, the skills the student has successfully learnt, etc.), question models (i.e., the skills that the question tests), as well as answer models. Using these in conjugation with student clustering and six different classifiers, they found that deep belief networks (DBM) was the best classifier.

The second application Baker and Yacef (2009) identify is to improve or discover models of domain knowledge structure. Domain knowledge structure identifies

the key aspects relevant to the situation. For students to learn better, they require the domain knowledge as well as the procedural knowledge to apply what they have learnt. Mindtools such as concept maps, spreadsheets, and hypermedia enhance learning by organizing information into more accessible forms. Wang, Walker, and Wylie (2016) recently proposed a framework to evaluate concept maps built by students.

EDM also aims to analyze pedagogical support. To find the pedagogical support that is effective in different situations or for different group of students, EDM techniques have been applied to analyze learning in individuals as well as collaborative settings. In ITS, the kind of help-seeking and feedback and its frequency have been extensively studied to improve student performance. Gutierrez and Atkinson (2011) developed an adaptive feedback system using support vector machines and conditional random fields that selects feedback for the student, depending on the mistake they make. Mitrovic, Ohlsson, and Barrow (2013) observed the effects of positive feedback in SQLtutor, a constraint-based ITS.

Baker and Yacef (2009) explain that to gain deeper understanding of key factors that impact learning, empirical studies are conducted to test and refine educational theories, such as impact of self-discipline (Gong, Rai, Beck, & Heffernan, 2009) and consistency (Madhyastha & Tanimoto, 2009). Montague (1992) tested the theory that providing metacognitive support to students while teaching increases their problem-solving skills. Recent studies have incorporated this metacognitive support in different computer settings, analyzing when the support leads to higher performance, sometimes differentiating between students with disabilities and low-performing students (Kapa, 2007; Seo & Bryant, 2012).

## 4 Educational Data Mining in Online Business Education Setting

The educational data mining techniques discussed above are best illustrated within a practical setting where the contextual characteristics can be described and the applicability of the techniques analyzed. For this purpose, the online business educational environment is selected for several reasons. First, two of the authors are experienced in such a setting. Second, the online business environment described involves extensive collaboration among students in forums, thereby generating a large volume of interactive data with good substantive content to be examined. The system also includes instructional, administrative, and reporting tools, all available for analysis and course/program enhancement. Third, as statistics, management information system, and operations management all tend to be core areas in business programs, data mining that involves these disciplines is particularly suited for use in business education.

We will begin by describing the types of data that are available in a general online business setting. Starting with recruitment, the faculty obtains information

from potential students' enquiries, registrations for webinars and information sessions, and visits to admission-related webpages . On online applications, further profile information becomes available regarding education, professional status, industry, work experiences, location, employer sponsorship, the referral route, and other demographic information that are needed for administrative purposes rather than for selection. After registering in courses, online activities involve the provision of study guides with digital readings, discussion forums (generally organized by weekly topics), group project databases as appropriate, an announcement and queries board where questions related to either the course content or process can be asked, a social chatting database, and a course evaluation tool. Assignments and examinations are submitted online with feedback and grades archived in databases and grades recorded on the registration system. Administrative support data includes helpdesk queries on technical matters and student support advice provided to students such as on course scheduling. In addition, student or alumni surveys are done periodically and longitudinally for various purposes. The faculty also has access to student or alumni social media network interactions related to the university.

We will structure the next section of analysis based on some of the common data mining objectives outlined in Romero and Ventura (2010) (re: Sects. 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, and 4.7), with some additions as appropriate for the setting involved (re: Sects. 4.8, 4.9, and 4.10). Although we are using the online business setting for our analysis, most techniques that can be employed should be applicable to other educational settings with a similar setup as well.

## *4.1 Feedback for Instructors*

By analyzing students' online activities, such as their logs and posting contents, statistics and visualization can provide instructors, especially those of large class sizes, with critical information to determine grades (where participation counts for credit), offer feedback to students, and adapt the course instructions and activities as needed. Activity logs can produce not only simple frequency charts but also more sophisticated visualization tools. Social network analytics, such as Gephi as described by Hernandez-Garcia et al. (2016), can provide visual charts where, for example, nodes represent students and the edge connecting the nodes the interactions. Either the node size or the edge thickness can be used to reflect the degree of interaction. So, at a glance, the instructor can easily tell who is active, who is interacting with whom, and the extent of interaction. The parameters can be further differentiated into posting replies or initiating a discussion and interacting with other students or the instructor. Alternatively, nodes can represent forum postings, while the edges indicate which posts are connected. This provides useful information about the popularity of the forum topics. Similarly, analyzing access logs to different course materials and the duration of time spent on each type of materials can inform the instructor or course developer on the relevance of the materials and student preferences.

Going beyond the quantitative dimension, text in the forum postings can be analyzed using content analysis and text mining techniques. These help to identify commonly used keywords for the purpose of summarizing discussion contents and determining if the discussion coverage is as expected.

## *4.2 Recommendations for Students*

Tests and quizzes are often used to identify students' areas of weakness in order that remedial actions can be suggested. These can also involve self-reflection exercises, which show whether a concept needs to be further learned. A pattern generated by the data can even suggest appropriate courses to take to improve their fundamental skills that are critical for further business educational and career pursuits, such as a math or a writing course. Sweeney et al. (2015, 2016) analyzed student data from a traditional university environment (no online data) to predict the courses students should take in the next term. Students can also be clustered based on their learning preference, e.g., those preferring reading vs. posting, long vs. short responses, interacting with few vs. many classmates, reading resources of a wide vs. limited variety, etc., as reflected by the forum activities and web browsing behaviors, including visits to course website and materials accessed and library log information. Students in the same cluster can be recommended to form study groups and be provided with packages of materials and learning tools most appropriate for their learning style.

## *4.3 Predicting Student Performance*

Data on student profiles (e.g., past academic level and grades; professional, occupational, and industry experiences; employer educational sponsorship; and personal demographic information) is kept on the registration system. Over time, this provides a wealth of information that can be used in combination with surveys and/or course activity information (e.g., time spent on reading course materials online, number of postings, average length of postings, number of others' responses to the postings that can show interests and relevance, doing course activities earlier rather than later within the acceptable time frame, number of practice assignments tried, results of past tests and quizzes, etc.) to identify critical factors and create association rules to predict student performance (course grade or pass/fail status), their affective attributes (e.g., motivation and satisfaction), and dropout probability. Regression models can be used to predict a continuous dependent variable such as grades, while logistic regression can predict dichotomous outcomes, such as program completion vs. dropout. Automatic warning systems providing signals to students at risk of failing can help to redirect student efforts and remedy the situation before it is too late. By utilizing data captured in existing technological systems, the need to bombard students with multiple surveys for analysis will be much lowered

(Baepler & Murdoch, 2010). This has the additional benefit of significantly reducing survey bias where self-reporting surveys are subject to both construct errors and responder errors such as social desirability bias.

### *4.4 Detecting Undesirable Student Behaviors*

While this is not independent of the above objective areas, the focus is on the identification of problem areas. For example, outliers in class participation can be determined through social network analyses or the clustering or classification techniques, based on a large volume of online data. Neural networks that provide linkages over time are particularly appropriate for analyzing behaviors (e.g., those of free riders, slackers, and procrastinators) that tend to develop over a period and are consistently displayed.

### *4.5 Grouping Students*

Classification and clustering techniques can be used to group students according to their location, industry experience, learning style, etc., to determine appropriate project groups with students who are similar to each other. Alternatively, they can be used to establish diverse groups for discussions by not having students of similar characteristics in the same group. Group diversity can often promote the sharing of different views, insights, and experiences that could broaden one's perspective and potentially give rise to better solutions in problem situations. It can also help in the development of conflict management skills critical for one's professional and personal lives.

### *4.6 Constructing Courseware*

Using classification or clustering techniques, discussion forum information can generate concept maps that better organize the domain knowledge of the course. These techniques can also help to analyze the queries board to identify the types and frequencies of various types of questions. Visualization tools such as Many Eyes© can provide word cloud visualization or chord chart visualization of keywords used by students in discussion or social chat boards to determine discussion themes and student interests (see, e.g., Martin & Ndoye, 2016). The results can inform the areas that can require corresponding course changes. For example, concepts that are unclear can be better defined and explained, additional practice exercises for problem areas provided, and an FAQ page offered to proactively address student concerns, while themes involving much student interest could be expanded. Similar

analysis can be done on assignments and tests, especially involving short answers, to identify common terms and problem areas, which may be helpful in the establishment of a grading rubric. As discussed in Sect. 4.3 above, additional course-related predictors such as activity types, time required to be spent on various activities, number of tests or assignments, level of attention and facilitation required of the instructor, etc., can be included so that significant ones identified can prompt necessary course redesign.

## *4.7 Planning and Scheduling*

Decision trees can be used to determine course scheduling based on students' course preference and completion rates. Association rules can be applied to curriculum revisions and course offering frequency based on demand and impact courses have on student outcomes.

## *4.8 Enhancing Student Recruitment and Admission*

Classification of potential student inquiries and content or text analysis of questions frequently asked could help provide relevant information to enhance the admission website, recruitment information session and application packages being distributed. The pattern of admission webpage visits and the inquiries could suggest appropriate timing for information sessions and webinars. Statistical analyses of applicant characteristics and the use of clustering to determine their similarity may inform the recruiting department of the target audience (e.g., by location, by industry, by organizational size. etc.) and what may likely encourage them to apply. Association rules that relate student characteristics to performance would shed light on whether the admission criteria need adjustment, such as whether the existing educational or work experience requirement is necessary or sufficient.

## *4.9 Improving Student Support Services*

Classification of technical inquiries made to the helpdesk that involves a ticketing system and applying association rules to relate different query types to resolution success and time could provide useful information for improving the systems support, such as developing technical FAQs or visual illustrations for areas of concern. Similarly, classification of inquiries received by the student services advisors about course scheduling, course registration and changes, fee payment, program enrollment status, etc., offers information that can help improve the content of the student handbook such that policies, regulations, and processes can be clearly explained.

### *4.10 Connecting with Alumni*

Alumni relationships can be maintained through various activities. By using social network analysis as described earlier, alumni who are well connected with others can be identified. They can be invited to be the school's ambassador and to help in disseminating critical information and updates about the faculty.

## 5 What Are Some More Challenging Applications of EDM in the Educational Field

Though educational data mining has tried to improve and predict student performance, there are many other attributes of student psyche that are hard to study with the data available. Motivation, self-regulation, and metacognition are student attributes that one would like to study to know more about the way students learn. Winne and Baker (2013) describe the challenges that researchers face when using EDM for studying metacognition, motivation, and self-regulation. Based on previous success in identification of student behaviors, one can say that studying student behavior with EDM will ultimately help us identify the exact behaviors representing these three complex phenomena that lead to better learning. However, it is important to note that these three categories may be interlinked with other factors that affect student learning such as engagement. Knowing exactly when one process begins and another ends would lead to better student models. Another challenge is one that is common to all EDM techniques: collection of data that can be validly interpreted to represent these states, which involves design and implementation issues, as well as financial, technical, and human resource constraints.

## 6 Other Directions and Conclusion

Baepler and Murdoch (2010) look at the different kinds of information available from academic analytics, data mining, and classroom management systems and mention how these would be useful to faculty for course redesign and assessments. Learning analytics (LA) is a growing field. Siemens (2010, p. 1) defines learning analytics as "the use of intelligent data, learner-produced data, and analysis models to discover information and social connections for predicting and advising people's learning." There have been attempts to differentiate LA from EDM. Brooks (2013) proposed the distinction that EDM community research comes from intelligent tutoring systems, i.e., interaction between the student, domain material, and the system, while the learning analytics researchers focus on enterprise learning system like classroom management systems that accumulate data for all courses. Bienkowski, Feng, and Means (2012) presented a report analyzing the ways in which educational data mining and learning analytics can enhance teaching and

learning. Their suggestions included building intelligent tools that would lead to minimal instructor intervention and protect individual privacy. In recent years, privacy of big data has been a major debate (Pardo & Siemens, 2014).

Research in modeling students' metacognitive skills has further implications in honing business skills related to business problem solving that extend outside the formal learning environment. The development of predictive models of course learning has immediate applicability to applied environments and can greatly assist the creation of learning activities that are at the same time more quickly learned and more relevant to the business community.

The use of information is a growing concern, particularly as access issues come to the fore related to cybersecurity. This has consequences beyond data security, as privacy and confidentiality of student information will come under increasing scrutiny. According to Marshall (2014), commercial and academic codes of conduct in research and practice differ, causing ethics to be another area that must be considered while conducting research in EDM. Ethics is a huge factor related to privacy and misuse of information, especially in the online setting where the people conducting the study may never meet the participants. During collection of data, it is important to only collect the information needed. Temptation to collect additional information for unspecified reasons must be kept in check.

Gamification of the classroom by adding game elements in the learning environment has opened up new venues for use of EDM as learner behavior can be analyzed in this new setting. The game has intelligent agents whose actions should best support student learning. Games can also provide immediate feedback and opportunities for collaboration with other players, for mastery, and for leveling up. For example, Medulla (Fanfarelli & Vie, 2015) is a game to teach about the parts of the brain and their functions. Min et al. (2016) analyzed Crystal Island, a game-based environment for middle school microbiology, to predict dialogue acts for intelligent agents in the game. Models were created based on human wizards who observed the student's face, gaze, game screen, and voice, and using these models with data mining techniques of conditional random fields and long short-term memory networks, the intelligent virtual agent could give response to students similar to what the human wizard would. Thus, this side of the research aims at building components of games that are humanlike. Gamification will likely have tremendous application in business simulation and case studies. Virtual worlds, augmented reality, and multiplayer environments are gaining increasing adoption to simulate real business situations.

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# Emergent Versus Planned Assessment and Tuition Strategies for Online Postgraduate Teaching of Technology and Innovation Management at the Open University, UK

**Alison Bettley and Ivan Horrocks**

**Abstract** This chapter examines the development of the assessment and tuition strategy (ATS) for the online postgraduate teaching of technology and innovation management (TIM) at the Open University, UK. Both curriculum content and the ATS have changed significantly in the 25 years since the introduction of this taught programme. Drivers of change have been many and various including factors both internal and external to the institution. Some ATS changes have been prescribed or specifically designed, for example, to address new institutional policy, but others have evolved more gradually, through learning from experience and exploration. The chapter outlines the curriculum, identifies the significant changes made to the ATS together with their rationale, and evaluates the effectiveness of both the current ATS, as a whole, and the approach to its development. Evaluation draws on a variety of internal review activities as well as the benchmarks of good practice in the literature. The chapter concludes that the ATS has considerable strengths and that the combination of prescriptive and emergent approaches to development of the ATS, enabled by online learning tools, serves the programme well.

**Keywords** Technology management • Innovation management • Assessment strategy • Tuition strategy • Postgraduate distance learning

## 1 Introduction

Postgraduate Technology and Innovation Management (PG TIM) curriculum is part of a long tradition of the provision of taught postgraduate qualifications (PG certificate, PG diploma, MSc) by distance learning across a range of disciplines in the Faculty of Science, Technology, Engineering, and Computing (STEM) at the UK's Open University (OU). Over the past decade and a half, STEM postgraduate programmes have led the transition of the delivery of OU courses from print-based

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module materials supported by face-to-face tutorials and end of module assessment (EMA) delivered locally to a blended learning approach combining online module delivery with text-based teaching units and multimedia materials supported by online synchronous and asynchronous group and individual tuition. This chapter discusses the development of the assessment and tuition strategy for technology and innovation management (TIM) qualifications over more than two decades. The chapter's content follows the sequence:

- Outline of the institutional and curriculum context
- Digest of significant changes to the ATS, their rationale, and judgement of whether the change is predominantly prescriptive or emergent.
- Review of the ATS objectives
- Evaluative discussion of the ATS effectiveness
- Concluding remarks

## 2 PG TIM at the OU

The OU delivers a wide range of undergraduate (UG) and postgraduate (PG) curriculum through its supported modular distance learning model. Students are provided online with multimedia learning materials and receive support from a personal tutor who marks assignments and provides both individual and group tuition. Students can adopt a modular study intensity to fit with their work and personal circumstances; although modules run over a fixed period of time with fixed assessment deadlines, students can otherwise flex their study activity around their nonacademic commitments. Each module is produced by a core team of academics and support staff, responsible for module content and learning and assessment design. Tuition is provided by a team of associate lecturers (ALs) working under the guidance of the core module team and line managed by a staff tutor, who is responsible for AL recruitment, appraisal, and staff development. Tutor marking is monitored by an academic member of the module team to ensure consistency and provision of effective feedback. Student Support Teams of advisers provide administration services as well as being a point of contact for students requiring nonacademic or study support advice.

PG TIM curriculum was introduced in 1992, as the European Management of Technology Programme, delivering a specialist MBA in Technology Management. Curriculum development was part-funded under a European Commission initiative designed to address what the Commission believed to be significant shortcomings in technology management skills and expertise in EU countries when compared with elsewhere, in particular Japan and the USA (Industrial Research and Advisory Committee of the Commission of the European Communities (IRDAC), 1991). PG TIM curriculum also formed part of the University's Manufacturing Management and Technology programme (now discontinued). The curriculum has since developed continuously to ensure its relevance to an increasingly service-based econ-

omy; most recently core modules have been rewritten to give more emphasis to innovation management. Since 2004 an MSc, PG certificate, and PG diploma in Technology Management have been offered in addition to the MBA (see Figs. 1 and 2).

The range of electives, drawn from other PG curriculum in STEM and business faculties, provides the means for students to tailor qualifications to their interests. TIM modules (T847, T848, T849, T883, T889) are also options within other PG STEM qualifications (such as Engineering, Environmental Management, and Systems Thinking in Practice). Most modules are 30 credits (300 h of study) of 6-month duration and run twice a year so that students can gain a master's qualification in 3 years.

The student body is large and extremely diverse, drawn from the UK and Europe, and occasionally further afield. Taught modules attract up to approximately 300 students per annum. Students are typically mature professionals employed in a wide range of economic sectors, public and private, and small and large organisations, in technical and general management roles. They may be returning to study after a considerable gap and are often seeking to build on their practical experience rather than prior academic study. Students may therefore embark on their TIM studies without any previous experience of the discipline and in some instances without a UG degree. Study aims are almost always career development, through either PG qualifications or single modules.

The ATS has developed with the curriculum, as outlined in the next section.

## 3 Evolution of the Assessment and Tuition Strategy (ATS)

The TIM ATS has changed considerably since the curriculum's inception. Some changes have been prescriptively designed to align with new institutional assessment and tuition policies or to address developments in pedagogical technologies. Others have emerged through a more evolutionary and incremental path, from learning from trials of different approaches and from student or tutor experience. Patterns of successful practice have become established strategy, and learning from the experience in one area of the curriculum has informed further development of the wider ATS.

Table 1 lists the most significant changes made to the TIM ATS since the inception of the programme. Each is identified as 'prescriptive' or 'emergent' according to which approach was dominant. This 'classification' is based on well-established concepts from the literature on strategic management and strategy development. Prescriptive strategies are top-down and deliberate, based on explicit analysis of internal and external factors. Emergent strategies are by contrast more bottom-up, evolving as a result of multiple changes in response to environmental factors or based on learning from stakeholder feedback and experience (Mintzberg, Ahlstrand, & Lampel, 2008; Neugebauer, Figge, & Hahn, 2016; Rumelt, 2011). It is generally recognised that the more complex the context, the more weight should be given to

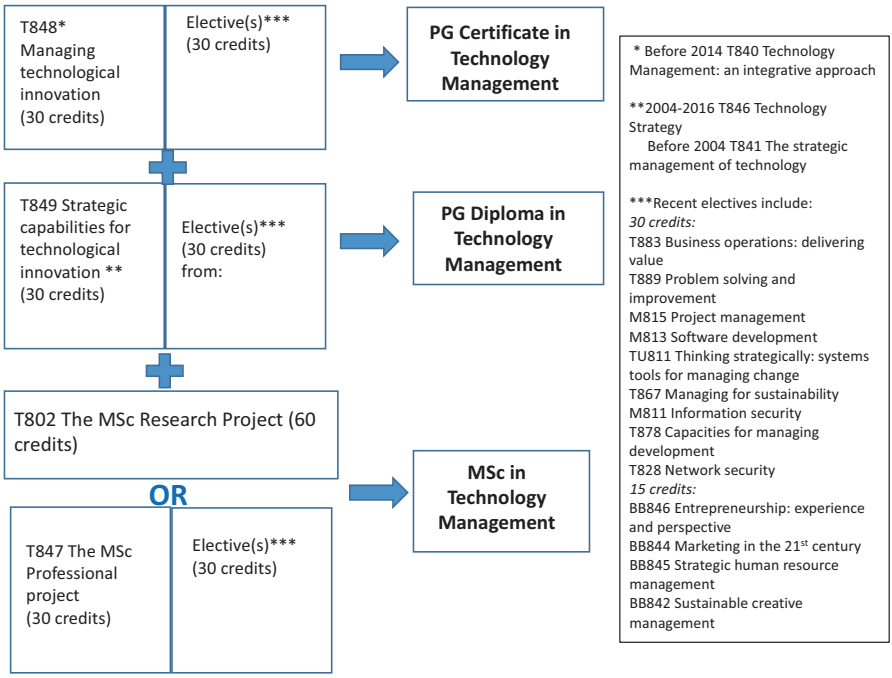


**Fig. 1** Structure of MSc Technology Management and nested qualifications

emergence (Neugebauer et al., 2016; Paarlberg & Bielefeld, 2009). 'P/E' indicates significant contribution from both approaches, with typically emergence occurring at the module level and prescription at programme or institutional level.

The mix of prescription and emergence evident in Table 1 can be considered appropriate for the TIM curriculum environment, a combination of relatively stable aspects, such as external quality assurance benchmarks, with many more complex and dynamic aspects. Examples of the latter include the diversity of the student body with respect to education background, workplace contexts, geographical location, and study objectives and pathways, variation of these factors from one module presentation to another, diversity of tutor backgrounds, the personalised nature of tutor-student interaction, and the multiple purposes of assessment and tuition (Price, Carroll, O'Donovan, & Rust, 2011). The next section reviews the TIM ATS objectives.

## *3.1 Objectives of the ATS*

Assessment in higher education typically serves a multitude of purposes (Quality Assurance Agency for Higher Education, 2006; Rust, 2002; Scottish Qualifications Authority, 2009; Yorke, 1998). For PG TIM the following can be identified:

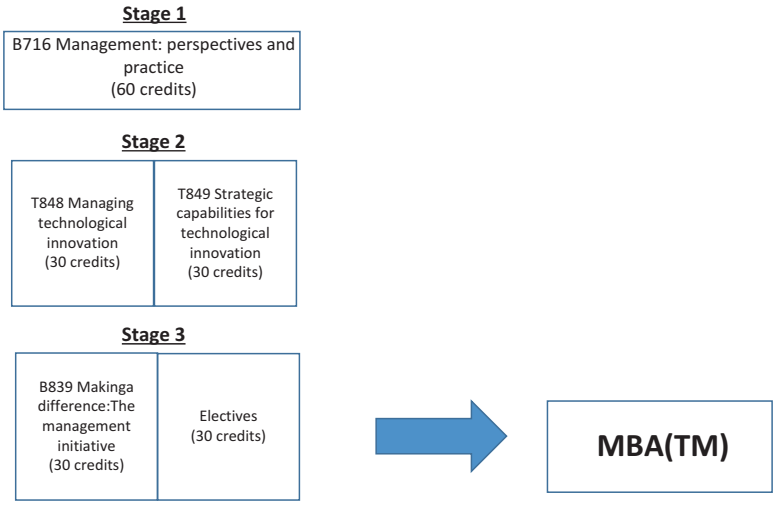


**Fig. 2** Structure of MBA (TM) qualification

1. Summative assessment (assessment *of* learning) for the award of credit/qualifications, in relation to the module and qualification learning outcomes with respect to skills and knowledge
2. Formative assessment (assessment *for* learning) – a long-established main objective of assessment in the OU context and an essential element of overall learning design, embracing:

    - Learning from feedback
    - Learning 'by doing', using authentic tasks
    - Identification of strengths and weaknesses
    - Feedforward – advice and guidance to support students in their future learning and assignment work
    - Motivation to study through student engagement with authentic tasks
    - Pacing of study
    - A means by which tutors can identify where students might need help
    - Lifelong learning – learning that will benefit the student beyond the aims of modules and qualifications
    - Benefits to employers through practice-related assessment tasks and demonstrable individual professional development

3. Provision of evidence that the programme is successful and that module content and its teaching are effective (e.g. for quality assurance and enhancement with respect to internal and external standards)
4. A contribution to institutional research outputs through capstone project modules

**Table 1** Significant changes to the TIM ATS

| Change | Rationale/driver | Prescriptive/emergent (P/E) |
|---|---|---|
| Reduced number of TMAs from 4 to 3 (from 2004) | To avoid 'over-assessment' but maintain appropriate pacing of study and to achieve consistency across programmes | P/E |
| Removal of compulsory residential school (from 2004) | The MBA(TM) qualification was transferred to the OU Business School with integration into the general MBA programme (to comply with accrediting body requirements) | P |
| Replacement of unseen examination by project-style assignment (in core modules from 2014) | Students increasingly were not achieving their full potential in the examination as evidenced by better student performance in a module (T889) using a more integrative assessment strategy without an examination. Project-type assessment is more 'authentic', more engaging for students, and a better vehicle for testing 'application of learning' outcomes. It also facilitates linkage between assignments and development of academic literacy skills | P/E |
| More practice-related assessment tasks (in electives T883/T889 from 2005/2007, in core modules from 2014) | This allows students to customise learning to their context and provides more authentic, motivating, and engaging assessment tasks. This aligns with other changes (see later) to emphasise real-world relevance of learning and replaces some of the 'application of learning' activities characteristic of now defunct residential schools | E |
| Tutors teach on several modules and have larger tutor groups | Changes to institutionally determined contractual arrangements have resulted in tutors with a broader understanding of the curriculum but less flexibility because of insufficient capacity to take on additional duties | P/E |
| Reduced weighting of the first assignment to 20% in core taught modules from 2014 | The three tutor-marked assignments (TMAs) are weighted 20/40/40%. The low-stakes first assignment recognises that some students have little prior experience of PG study and/or the TIM discipline | P |
| Introduction of 'professional' route to MSc, from 2012 | This change aims to increase the number of students progressing to MSc and provides more authentic project work that aligns better with student study objectives than the alternative 60 credit research project | P/E |

(continued)

**Table 1** (continued)

| Change | Rationale/driver | Prescriptive/emergent (P/E) |
|---|---|---|
| More progressive academic literacy skills development | A variety of steps have been taken over several years (from 2005) aiming to improve student performance and attainment especially in capstone project modules (see 1.5.2.2) | P/E |
| Larger proportion of study time allocated to assessment tasks (2007-) | High student attainment in one module (T889) with this characteristic led to the guiding principle for taught module design that at least one third of total study hours should be allocated to assessment-related activities | E |
| Closer alignment of tuition and assessment strategies | The strategy of more gradual development of academic literacy skills gives greater emphasis to feedback related to 'feedforward' skills development | P/E |
| Mix of 'cluster' and tutor-group online tutorials | The mix of tutorials open to all students and tutor-group-only events is aimed at efficient use of tuition hours, a richer tutorial experience for students, avoidance of duplication, and learning event choices for students | E |
| Single online discussion forum for each module with multiple threads including topical themes | Larger forums provide the critical mass necessary for effective peer-to-peer and tutor interaction. Discussion of topical themes has emerged as an effective enrichment of module content | E |
| Entirely online tuition with a predetermined schedule of online learning events from 2016 | All online tuition is a faculty policy for PG, driven by falling attendance at face-to-face learning events, cost reduction, and expectation that online events suit better our geographically diverse and time-poor students | P |
| Introduction of wikis for collaborative working from 2012 | New pedagogical tools provide additional opportunities for collaborative working, intrinsically difficult in distance learning. Experience in module T847 will be evaluated to inform future extension to other modules | P |

(continued)

**Table 1** (continued)

| Change | Rationale/driver | Prescriptive/emergent (P/E) |
|---|---|---|
| Reduced proportion of study time as directed learning | Modules are now designed to allow students more time to pursue their own areas of interest within the subject, evidence of which is rewarded in assessment. This aims to enhance student motivation, study authenticity, and the development of lifelong learning skills. Module materials signpost optional supplementary and support material through activities labelled 'extend your learning', with links to a wide variety of online resources such as YouTube videos and other real examples of technological innovation, debates, expert views, additional academic publications, and so on | P/E |

A single piece of assessment may address more than one objective, for example, OU TMAs are both summative and extensively formative.

Tuition objectives are closely related to assessment objectives and can be summarised as follows:

1. Determination of marks for summative assessment
2. Provision of formal formative feedback on assessment tasks to:
   - Develop subject knowledge and skills and academic literacy skills
   - Build student confidence and motivation to enhance student satisfaction and retention/progression
   - Explain course material as required
3. Monitoring student progress with follow-up of particular issues such as non-submission of assignments
4. Delivering online tutorials to develop subject and academic literacy knowledge and skills and to prepare students for assignment tasks
5. Facilitation of student learning more generally through the media of online forums, tutorials, and individual email contact

The next section evaluates how well the current ATS meets these objectives.

## *3.2 Evaluation of the ATS*

This evaluation considers external 'benchmarks' of good practice from relevant literature and draws on a variety of internal curriculum and assessment review activities: an institution-wide assessment project (Evans, Jordan, & Wolfenden, 2016;

The Open University, 2014b), a faculty wide assessment review project (Bettley, Walshe, & Lucas-Smith, 2010; Kantirou & Fisher, 2010), a programme workshop 'assessment for learning' evaluation, periodic programme reviews, and periodic and annual module reviews.

### 3.2.1 Summative Assessment

Modules other than capstone projects follow the same overall assessment structure: three TMAs, weighted 20/40/40%, making up the continuous assessment element, plus the 'extended' mini-project EMA. Continuous assessment and the EMA are equally weighted to determine the overall module score, and a pass grade must be achieved on both. Introduction of the new assessment strategy without an examination has improved both student attainment and student satisfaction, for example, in one module, a first attempt pass rate of approximately 50% has increased to above 80%.

Originally taught modules had four TMAs, but concerns about 'over-assessment' led to the reduction to three. It has been said that the real issue is not over-assessment as such, but the balance between summative and formative assessment (Price, Carroll, O'Donovan, & Rust, 2011). This is difficult to evaluate because in the OU model, summative and formative assessment are generally combined. Pacing of study is a significant function of the assessment structure, so retaining at least three TMAs is considered important. The lower stakes first assignment is designed to encourage submission and promote retention and allows time for students to adapt to a different level or subject of study. Modules achieve high retention rates – typically 85% of those starting successfully complete taught modules.

Relatively few (compared with other institutions) distinction grades are awarded for the MSc. This is a consequence of the relatively high hurdle of requiring a distinction grade in the capstone project modules. Although it is too early for definitive conclusions about grades, student performance in capstone modules shows improvement since the increased emphasis on academic literacy in earlier modules.

Monitoring of tutor marking indicates consistency of marking, and student appeals of marks are rare.

### 3.2.2 Formative Assessment

The focus on assessment for learning in our current ATS is consistent with the first of the OU's seven principles of assessment: 'The primary purpose of module assessment should be support of student learning and the development of self-regulated reflexive independent learners' (The Open University, 2014b). This aligns closely with recent pedagogical literature advocating much greater integration of assessment with overall learning design (Boud & Soler, 2016; Pereira, Flores, & Niklasson, 2016; Price, Carroll, O'Donovan, & Rust, 2011) and with placing emphasis on preparing students for life beyond formal study (Boud & Falchikov, 2006; Harlen,

2005; Maxwell, 2012; McDowell, Wakelin, Montgomery, & King, 2011). One instantiation of this thinking is Northumbria University's model of 'assessment for learning' consisting of six key elements (Bohemia, Harman, & McDowell, 2009): authenticity and complexity, sparing use of high stakes summative assessment, extensive opportunities for confidence-building activities before summative assessment, rich in formal feedback, rich in informal feedback, and develops students as independent learners who can direct and evaluate their own learning.

## Relevance and Application of Learning

Authentic assessments 'are based on tasks that require students to demonstrate practices, behaviours, and skills that are required of professional practitioners' (James & Casidy, 2016, p. 3). TIM assessment meets several authenticity criteria (Ashford-Rowe, Herrington, & Brown, 2014) especially with respect to its challenge, the application of the taught skills and knowledge to the workplace, and the encouragement of critical reflection.

Progress towards more authentic assessment has been made through replacement of the traditional 3-h unseen examination with a practice-related mini-project EMA (from ca 2011); TMA tasks that prepare for the EMA, requiring students to apply theoretical models, concepts, and techniques to self-chosen real-life organisational situations, typically related to their employed role; and the introduction of the professional route to the MSc using a 30-credit consultancy style project. Students are advised in the T848 and T849 assessment guide: '… you will be asked at several points in the module – within module activities, as well as the TMAs and EMA – to apply what you have learnt to an organisation of your choice. This is a great opportunity to add value to your employer organisation, to your own professional role or to any other relationship you have with a public, private or voluntary organisation' (Horrocks, 2016, p. 12).

Authenticity is not only academically advantageous in facilitating the learning of theoretical concepts, but it also engages and motivates students and is likely to have a positive impact on retention and progression (James & Casidy, 2016) as the following TIM student comments testify:

> The overlap of the assignment[s] with a real work situation has been a strong motivation to engage with the assignment[s]. [T883, 2005]

> TMA02 was especially useful … it has helped me plan for the future growth of the company. [T883, 2013]

> This module left us to our own devices, and encouraged us to draw on our broader and deeper knowledge and abilities. It was a worthy "capstone" module. [T847, 2013]

> The module materials definitely increased my knowledge of the topic and are very relevant to my work. I will be able to apply a lot of the new knowledge now. [T848, 2015]

Employers also benefit from authentic 'problem-solving' tasks, both directly and indirectly from the professional development of their employees. The 'slow convergence' of academic learning and professional development is cited as a particularly beneficial characteristic of online distance postgraduate study compared with fast-track master's courses because it enhances the student's capability to apply their learning to the workplace (Brooks & Roberts, 2016) and allows for application of learning to be treated as 'a skill in its own right' (Brooks & Roberts, 2016, p. 1704). The significant proportion of students sponsored by employers (currently approximately 30% down from more than 70% before the 2007–2008 economic crash) bears witness to the perceived value. Inevitably the degree of authenticity that can be achieved is limited, compared with study aims that are specific to a profession such as teaching or nursing (Chan & Gurnam, 2010), by the diversity of TIM students' professional roles. Nevertheless, exploration of further opportunities through consultation with students and other key stakeholders such as employers would be worthwhile.

### Integrated Skills Development and Lifelong Learning

The curriculum integrates the development of academic literacy skills from the first module of study through to the capstone project module as follows:

- The first TMA of both our compulsory taught modules focuses on information literacy skills to underpin development of good academic practice throughout the rest of the module and beyond.
- Development in conjunction with the library of a programme-specific comprehensive information literacy skills website to support students throughout their PG studies, signposted from module materials and by tutors in assignment feedback as appropriate.
- Each of the second and third TMAs contains a secondary question designed to help students prepare for the EMA and to provide opportunity for tutor feedback on this preparatory work.
- The EMA is designed to encourage student reflection on their earlier assignment work and its integration into a coherent whole.
- EMAs in taught modules act as preparation for capstone projects.
- ATS is consistent across all TIM modules, to maximise the learning that can be carried forward.
- The module materials include activities designated as preparation for assignment tasks.
- The TMAs in the capstone project dissertation serve as drafts of the final submission.

In the early years of the programme, most of the teaching and assessment of research and related academic skills had taken place within capstone modules. The current more integrated approach achieves the aim of improving both the numbers

of students progressing through to master's degrees and student performance in project modules.

Focus on the authenticity of assessment and skills development enables students to become genuinely independent learners capable of pursuing interests, professional or personal, independently of formal academic study (Hallett, 2013; Lea, 2004; Saltmarsh & Saltmarsh, 2008). The term 'sustainable assessment' has been coined (Boud, 2000; Boud & Falchikov, 2006) to indicate assessment tasks that, for example (Boud & Soler, 2016), help learners address the challenges they face in practice/professional settings, produce benefits to the learner that persist beyond fulfilment of the current study aims, and enable the learner to appreciate, articulate, and apply the criteria for good work in the field. The student comments above demonstrate significant alignment with these criteria.

Working collaboratively is an important aspect of authentic assessment and is seen as a weakness of traditional distance education, but new (Web 2.0) technologies provide the means to reverse this. User experience of these new tools is variable for many reasons, some associated with unfamiliar technology and others with the more generic concerns such as unfair division of labour and perceptions of reduced study flexibility (den Exter, Rowe, Boyd, & Lloyd, 2012; O'Neill, Scott, & Conboy, 2011; Pilkington & Sanders, 2014). As noted previously, wiki use is currently being actively explored for TIM curriculum.

## Feedback

High quality and timely feedback is crucial for any learning design (Shute, 2008) and is an essential and established element of the OU distance learning model. Tutors are required to comment on student work in detail and to produce separate summary comments highlighting strengths and weaknesses. Monitors appraise their feedback against criteria such as clarity, tone, accuracy in correcting errors or omissions, and relevance to future assignments (feedforward), consistent with established good practice (Li & De Luca, 2014; O'Donovan, Rust, & Price, 2016; Rae & Cochrane, 2008; Shute, 2008; Walker, 2009). Electronic submission, marking, and returning of assignments that facilitate timely feedback – within 10 days – are the university target. There is still nevertheless a tendency for tutors to focus on feedback on the assessment task and for students to see each assignment, and module, in isolation. It is known that modular structures generally tend to limit the extent of feedforward between modules (Jessop, El Hakim, & Gibbs, 2014; Rust, 2000). The various linkages between TIM assignments and modules (see above) help counteract these tendencies.

In spite of much evidence of good practice, a significant unknown is how well students engage with feedback and act upon it. This is an issue across the sector (Li & De Luca, 2014; Price, Handley, & Millar, 2011; Rae & Cochrane, 2008; Walker, 2009). The characteristics of effective feedback may be known, but 'best practice' in ensuring student engagement with it has not yet been established. Research sug-

gests the need for greater 'assessment literacy' among both students and tutors, underpinned by appropriate institutional policies and processes (O'Donovan et al., 2016; Price, Carroll, O'Donovan, & Rust, 2011; Walker, 2009).

It is tempting to suggest that use of social media by students can replace serendipitous face-to-face informal feedback typical of the conventional institution. However, in practice, it is necessary to design into the distance learning experience a range of informal feedback opportunities. The principal informal peer-to-peer and student-tutor interactions take place in online tutorial and forum activities and via individual tutor-student telephone and email communications. Also, a long-established practice is the inclusion throughout module learning materials of 'self-assessment questions' (SAQs) designed to build students' confidence in their understanding of course concepts.

### 3.2.3 Quality Assurance and Enhancement

Assessment and tuition issues are explicitly addressed in the university's teaching quality management regime which includes periodic and annual review of modules and qualifications. Trends in student performance and satisfaction are routinely explored. 'Real-time' measures of assessment and tuition are available via the tutor monitoring process and the module team's oversight and participation in student and tutor online forums. These inputs inform immediate, short- and long-term changes to module materials, assessment tasks, and so on, enabling continuous enhancement.

### 3.2.4 Research Outputs

Two research-related outputs are relevant. First, developing student research capabilities is an important master's learning outcome and supportive of lifelong learning objectives. Second, dissertations produced for capstone projects are themselves actual or potential research outputs. Some are retained as library resources. There are instances of students' capstone project work being developed into journal papers (see, e.g. Crotty & Horrocks (2017)) although this is unusual. Barriers include the considerable additional work for both staff and student, student perception of employer confidentiality issues, and the small proportion of students seeking academic achievement beyond their qualification.

### 3.2.5 Tuition

The OU tutor role is significantly different from most other HEIs because of its particular distance teaching model. Simpson (2012) defines the tutor role as comprising a 'spectrum of activities':

- Defining the course territory
- Explaining the course
- Assessment and feedback – formal and informal, formative and summative
- Developing skills and motivation
- Chasing student progress and record-keeping
- Exploring and enriching the course

TIM tutors spend the majority of their efforts on marking and providing feedback on assessment, including feedforward, and on preparing and supporting students to tackle assignments. They also run online tutorials, answer student queries both individually (by email or telephone) and in online forums and moderate forums, and follow up students who fail to submit assignments. There is comparatively little need for tutors to explain, explore, or enrich the course because of the extent to which this is built into module materials through, for example, extensive use of examples and cases. Nevertheless, tutors do contribute to these objectives through online tutorials and forum discussion. Library staff also contribute to tuition, especially associated with academic skills development, providing not just generic and module-related resources but also helpdesk and related enquirer services.

The monitoring process, carried out by an academic member of the module team, confirms that marking is consistent across tutor groups and that formal feedback communicates effectively to students the strengths and weaknesses of the work submitted. It is rare for tutors to be deemed lenient or severe in their marking. Monitors' feedback to tutors is typically associated with reinforcing strengths in constructive criticism, encouraging more feedforward, and ensuring the key feedback messages are not buried in a wealth of detail. Specific staff development is offered to tutors as appropriate.

The individual tutor-student dialogue in the OU context is very much focused around feedback on assessment, not least because student participation in tutorials and online forums is optional and therefore not a guaranteed vehicle for dialogue. Tutors are appointed on the basis of both their academic and practitioner experience because this dual capability enables assessment feedback to be relevant to the student's application of their learning. Mature part-time and perhaps especially distance learners typically adopt a very strategic approach to their studies, with many students aiming for the best outcome given the time available, rather than necessarily the best outcome they are capable of achieving without time constraints. Feedback can be effective in driving learning and keeping students engaged and on track (Li & De Luca, 2014; Price et al., 2011). Each AL typically tutors on more than one module, so marking periods often coincide, and meeting rapid feedback targets is challenging, a situation exacerbated by the increase in tutor group size from 15 to 20 from 2010. Motivation of students is undoubtedly a key tutor role (Simpson, 2012). This is achieved through prompt feedback, one-to-one communication by phone/email, and the monitoring of student progress or engagement with the course, so that timely and appropriate interventions can be made. Many of the more mechanical aspects of record-keeping

and progress-chasing are covered by Student Support Teams (SSTs), but tutors play a significant role in understanding the student's situation, advising students as to best use of limited time, offering interventions to address issues and acting as intermediary between the student and university systems where appropriate. The successful integration of SST and tutor interventions to ensure no overlaps or gaps is a work in progress.

The advent of relatively robust technologies for synchronous online meetings from the mid-2000s provided new opportunities for the tuition of our geographically widely distributed student body. Originally tutorials were entirely face to face and included a compulsory 5-day residential school. More recently we have used a blend of face-to-face events – such as tutorials, 'day schools', and weekend 'revision' schools, held in geographically central locations – and online events, with the precise mix flexed to suit the particular cohort. Now tuition is entirely online, with all tutorial events published well in advance of module start, the latter a feature of the new university tuition policy (The Open University, 2014a). Tutorials are a mix of those open to all students on the module – including 'masterclasses' dealing with key topics, seminar style – and those specific to a tutor group. This has evolved because there was often insufficient 'critical mass' to generate effective discussion in individual tutor groups and that provision of a wider choice of tutorial events facilitates higher levels of participation. An important additional benefit is that it gives students access to a wider peer group, from different backgrounds or sectors but who may be working with similar technology or innovation management issues. It also facilitates formation of informal study groups who organise themselves to meet online or, when geography permits, face-to-face. Recordings of online tutorials are available to extend at least some of the value of the events to non-participants. There are many studies in the literature demonstrating that learning outcomes are met equally effectively whatever the tuition regime, online or face to face (Cavanaugh & Jacquemin, 2015; Jennings & Ottewill, 1996; McCutcheon, Lohan, Traynor, & Martin, 2015; Richardson, 2009). However, the loss of all face-to-face tuition is seen by many staff and students as a retrograde step. Ways to build in opportunities for face-to-face interaction such as the reinstatement of optional residential schools are under discussion.

Online discussion forums meet a variety of needs. Both tutors and students actively participate to raise and answer queries, to share information about forthcoming tutorials, and to stimulate academic debate through raising topical issues or recent academic publications as points of discussion. This last has emerged as a popular thread providing unplanned but effective learning opportunities.

Tutors identify where students would benefit from further help, mainly through their marking of assignments and informal communications with students such as dealing with student-raised queries. Interventions available include signposting to additional resources and/or arranging 'special sessions' such as one-to-one telephone or online tutorials to provide specific help.

Student satisfaction with tuition is generally high, as evidenced by the end of module surveys – 90% ('satisfied' or 'very satisfied') is not unusual.

## 4 Conclusions and Implications

To date, the combination of planned and emergent development of the ATS has worked well. Many effective features of the ATS are very much prescribed by institutional policies and processes, but equally there are many successful aspects that have been emergent. The ATS is effectively an 'umbrella strategy' where 'the broad outlines are deliberate … while the details are allowed to emerge en route' (Mintzberg et al., 1998). Effective strategists mix emergent and prescriptive strategies 'to reflect the conditions at hand…to predict as well as…to react to unexpected events' (Mintzberg et al., 1998, p. 12) or, as Cunha et al. put it, to provide a 'combination of freedom and direction' (Cunha, Palma, & da Costa, 2006, p. 951). The term 'planned emergence' has been coined (Grant, 2003) to capture the need for synthesis between mechanistic (top-down) and more organic or bottom-up strategy processes in complex or turbulent environments, in order to provide flexibility and facilitate innovation (Dibrell, Craig, & Neubaum, 2014).

One of the greatest strengths of the TIM programme is the centrality of the assessment strategy to the overall learning design. This is well-aligned with university assessment policy and with established pedagogy, but probably owes at least as much in practice to emergence of our approach via learning from experience.

The high quality of assessment feedback is also a consequence of university policies and processes, reinforced by excellent tutors, in turn underpinned by the module team's engagement with recruitment and selection, timely and thorough monitoring of tutor work, and proactivity in supporting tutors, including through staff development activities and face-to-face module briefings. Continued tuition excellence depends on our continued ability to attract and retain excellent tutors and to provide appropriate staff development. The role of staff tutors who manage groups of tutors is crucial, and we depend considerably on prescriptive institutional policy in this respect.

But designing or prescribing approaches achieves only so much. There is much of value to be learned from the tutor and student experience, sensed via informal and formal feedback, and trials of new approaches. Exploration of how students engage with feedback, of ways to enhance assignment authenticity, and of additional opportunities for informal feedback are examples of how improved assessment and tuition strategy could be shaped. An overarching strategy of 'planned emergence' will ensure awareness that improvement opportunities are maintained and that there is sufficient flexibility to respond to them.

Online learning tools provide the means to implement 'planned emergence'. They allow student needs and preferences to be identified in real time, for example, by the monitoring of student use of online learning resources and facilities. They also support cost-effective provision of an appropriately flexible response such as provision of a range of optional online study resources from which students choose to suit their needs, or the configuration of tutorials and other tutor support according to the nature of the student cohort, or even flexibility of module start dates and assessment deadlines. There is thereby the potential for genuine 'personalization' of learning – to customise the learning experience for each and every student.

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# An Online MBA: Effort, Investment, and ROI

**Larry Berglund**

**Abstract** Every investment considers risks and rewards. Risks can be the funds required for a capital project or the amount of time required for a consulting assignment and the potential gains. Whether an organization or an individual, the process is similar. What are the costs and what are the returns?

When considering an MBA, as an individual, the capital investment (tuition fees) and the operating costs (materials, travel, technical tools) need to be estimated in relation to the potential rewards. The latter is more challenging to predict than the former in many cases. The intangible rewards such as increased knowledge, credibility, and expertise are an unknown commodity at the outset.

Where an individual is assessing an MBA program which must be self-financed, the risks for the individual are much greater and are relatively negligible for their employer.

The author's personal experience was one where as a mature MBA candidate, at 50-years of age, wondered how he could justify the investment – which at the time was 45% of his annual salary. He needed to identify potential job opportunities and the estimated level of income and consider lifestyle choices. The public entity he was working for offered no financial support, and the senior management position he held was plateauing.

Through market research, he felt that attaining an MBA would open more doors than remaining with his status quo having a business diploma. While he enjoyed the challenges of supply chain management, he also considered teaching and or consulting within this field.

Taking an MBA online reduced travel costs by 90%; the online format allowed him to accommodate the studies into his work and leisure time; the career opportunities he identified within the supply field all required an MBA.

Actual outcome: his return on investment provided a payback of less than 5 years. The study time was more than he expected, but the rewards also exceeded his expectations.

**Keywords** Risks • Rewards • Investment • Age • Payback

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## 1 Risks

Every investment considers risks and rewards. Risks can be the funds required for a capital project or the amount of time required for a consulting assignment and the potential gains. Whether an organization or an individual, the process is similar. Few public sector organizations at the time financially supported postgraduate programs for staff, which was the case for the individual in this perspective.

As a mature MBA candidate at 50 years of age, without an undergraduate degree, there were several risks to assess prior to considering enrollment. The candidate reflected and felt that his career at a senior management level in supply chain management had plateaued.

As an individual required to self-finance an MBA program, the capital investment (tuition fees) and the operating costs (materials, travel, technical tools) needed to be estimated in relation to the potential rewards. The latter is more challenging to predict than the former in many cases. Additional cost for materials and technical equipment was nominal.

To undertake an MBA program implied changes on a personal and professional level. While his peers and colleagues were reasonably comfortable in similar career roles, few had considered a postgraduate business degree. Most didn't seem to see advanced education to be a priority or thought it wouldn't lead to job promotions within their respective organizations. Many were also deterred by the financial investment.

Retirement plans could be considered within 10 years for himself; traveling sounded very appealing which also involved discretionary spending. Other lifestyle changes loomed such as enjoying more time for leisure activities with a grown family.

After reviewing various MBA programs offered in Canada, the USA, and Great Britain, tuition costs varied between 40% and 90% of his annual salary to complete a program. Would it be possible to recoup this investment without compromising his quality of life?

An online education format reduced travel time substantially and did not require spending vacation time attending classrooms with associated accommodation expenses; online actually enabled more time to be available to allow for part-time workshop facilitations which he had enjoyed doing for several years. Having to enroll in a traditional classroom format would have cost more in tuition, travel, and time and reduced the opportunity to continue part-time teaching. Teaching part time was important to continue to pay for the MBA studies. Online seemed like the best solution to meet budget limitations and address time constraints.

His final project in the MBA program was a paper on the risks and rewards of being a consultant – either on his own or as a part of a larger firm. The coaching advice encouraged him that consulting would be a viable option in his future.

## 2 Rewards

Rewards for completing an MBA program targeted enriched career path opportunities and an increased income. He also desired to have options when he chose to reduce his workload in the future.

The subject candidate had been involved for several years facilitating workshops primarily in supply chain diploma programs and private sector corporate training. He needed to ascertain whether an MBA would open other doors. His research focused on three key areas – teaching in undergraduate programs, providing consulting services, and attaining a director position in the field of supply chain management.

Teaching in undergraduate business programs required a postgraduate degree with an MBA being the most common requisite. Consulting service qualifications varied quite widely and considered work experience along with education. An undergraduate degree was usually a minimum requirement. Most senior managers or principals in business consulting organizations held recognized degrees. Supply chain director roles did not always require an MBA, but the degree was a differentiator in hiring selection criteria.

As stated, with a career path that had run out of rungs, an MBA seemed like a means of opening doors which would otherwise remain closed. Teaching in an undergraduate program sounded appealing, and the idea of being a consultant – either as a part of a larger organization or with his own shingle – was equally enticing.

Shortly after receiving his MBA, he was interviewed and was hired for a position at a local polytechnic university in their school of business. Initially this was with one supply chain management-related course which ran in the evenings. Again, this allowed him to concurrently work full time and enjoy another income stream. The problem faced for him at this university was there was very little chance of receiving a full course load where he could quit his current job and be a full-time instructor. He continued teaching part time for this university for 4 years, worked full time in supply chain management, and facilitated workshops.

Within 4 years of receiving the MBA, he was interviewed for a director position in a large public institution where the MBA was a preferred credential. This provided a significant salary increase. Due to the workload, he left his part-time teaching position with the local polytechnic university. Within a couple years, he left the large public institution and decided he did not want to continue to work full time. “Been there, done that.”

At the age of 60, after discussions with his family, he opted to provide consulting services under his own company name. This career shift worked well. There was less focus on income at this time as the lifestyle change was a great trade-off. He could work at what he enjoyed, helped many clients and nonprofit organizations with their supply chain operations, and enjoyed more leisure time off with family and friends. He continues to consult and teach.

## 3 The ROI

The published costs from the online institution allowed him to make a financial assessment prior to registration. The tuition fees over a 2.5-year period (considered full-time attendance) allowed for a budget with cash flows over a 3-year period. The tuition fees were recognized as tax deductions by Revenue Canada. Therefore, while the tuition fees were the equivalent of 45% of the candidate's annual salary, the investment could be spread over a 3-year time frame along with tax benefits.

As he gained more confidence during his studies, the candidate wanted to complete the MBA program earlier rather than later. The online program offered optional classroom courses on select weekend and weeklong formats. The candidate opted to spend the money to attend several of these sessions to accelerate his studies. The additional travel and accommodation costs were acceptable although these added an additional 7% to the investment.

Upon graduation, the teaching at the polytechnic university provided an additional 8% income per year.

During this period, he taught in the diploma program for a professional supply chain management association which set an MBA for their hiring criteria. He was then qualified to facilitate three more diploma workshops per year which equated to an additional 15% in revenue. The increased salary when joining the large public institution as a director was equivalent to another 38% income increase.

Summarily after his investment and associated costs for the optional courses, he could show a payback from his initial investment and costs within a 5-year window of graduation. The professional recognition while not a true ROI did contribute to a form of brand goodwill. While this market value is debatable, the degree did lead to new opportunities with virtually no advertising costs.

Currently as a supply chain consultant, he earns a satisfactory income from these assignments and projects. Based on his expertise and brand, he was contracted by a lawyer to teach online workshops and webinars and facilitate in-house client sessions on competitive bid laws and practices. These provide an incremental annual revenue stream as they continue into their fifth year of collaborations. A large research university contracted with him to develop and facilitate online supply chain-related courses which provided revenue for several semesters. As of this writing, he has gone full circle. He teaches supply chain management courses online for the alma mater which awarded him his MBA.

The ROI was seen to be well worth the investment and provided a good income. The degree allowed a transition into a lifestyle with more discretionary time, and he continues to be involved in the supply chain profession. Would all of this have been possible without the MBA? He honestly does not think so. The MBA led to a depth of knowledge that he shares with clients who appreciate his wide industry expertise complemented by the business degree. His investment continues to pay dividends in many ways.

# A Student's Perspective of Online Business Education: Self-Directed and Peer Learning in a Flexible Format Designed to Meet the Needs of Today's Busy Professional

**Terri Hinkley**

**Abstract** In today's volatile, uncertain, complex, and ambiguous (VUCA) world, busy professionals are looking for business education that balances two primary drivers: flexibility in managing the course workload and a robust curriculum designed to foster learning despite an online format. Unfortunately, many potential students worry that flexibility obtained via online programs comes at the expense of their learning experience.

This paper will explore the perceived duality of flexibility, through an asynchronous online format, versus the degree of learning that occurs in an online program. The asynchronous format of the author's online business program maximized flexibility and the ability to complete schoolwork when most convenient for her yet also fostered an environment of learning, both from the course work in collaboration with cohort colleagues and the ability to build strong peer learning networks. This format and structure resulted in an education that met the author's needs for flexibility as a busy professional but also resulted in learning that was as rich as would occur in any in-person business program.

Through this exploration, the benefits of the flexible structure will be demonstrated as will the valuable learning achieved with and through the learner, her peers, and instructors. From the author's perspective of both a student who completed an online program and an educator in two online programs, she can state with certainty that online education is not for the faint of heart but for those with commitment, perseverance, and the ability to be self-directed and disciplined; the learning achieved through an online business program is comparable to traditional in-person MBA programs, but with the added benefit of flexibility, which, in today's VUCA environment, is imperative for every leader.

**Keywords** Flexible • Asynchronous • Peer learning • Distance education • Cohort based

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## 1 Introduction

Online education has exploded in the recent years (Chumley-Jones, Dobbie, & Alford, 2002; Dutcher, Epps, & Cleaveland, 2015; Kupczynski, Mundy, Goswami, & Meling, 2012; Parenti, 2013; Safar, 2012; Topper, 2007; Ya Ni, 2013). Technological advances, increased globalization, increased reach of online programming, and shrinking budgets are some of the reasons for the increased growth of online education. In today's volatile, uncertain, complex, and ambiguous (VUCA) world, busy professionals are looking for business education that balances two primary drivers: flexibility in managing the course workload and a robust curriculum designed to foster learning despite an online format. Unfortunately, many potential students worry that flexibility obtained via online programs comes at the expense of their learning experience.

This paper will explore the perceived duality of flexibility, through an asynchronous online format, versus the degree of learning that occurs in an online program. The asynchronous format of the author's online business program maximized flexibility and the ability to complete schoolwork when most convenient for her yet also fostered an environment of learning, both from the course work in collaboration with cohort colleagues and the ability to build strong peer learning networks. This format and structure resulted in an education that met the author's needs for flexibility as a busy professional but also resulted in learning that was as rich as would occur in any in-person business program.

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## 2 The Increasing Attractiveness of Online Education

Online education increases the geographical reach of educational/training programs and allows for the learner to manage their time per their own schedule and other competing demands, both of which are key strengths to online programming. Educational institutions, attempting to deliver on both strengths, often structure online programs as asynchronous programs, without any requirement for live participation or interaction with peers and instructor(s) in class activities; students, therefore, have the flexibility to complete their school work at times most convenient to them, making these programs attractive to busy professionals and international or remotely located students alike (Bernard et al., 2016; Chumley-Jones et al., 2002; Dutcher et al., 2015; Kupczynski et al., 2012; Parenti, 2013; Safar, 2012; Topper, 2007; Ya Ni, 2013).

Potential students often worry, however, that online education completed in isolation negatively impacts their learning and their ability to build personal and professional networks with their fellow peers. Educational programs that do not incorporate means and methods by which students can interact with each other and instructors are limiting the learning that occurs within individuals. In the next section, the role of social interaction in the learning process will be explored.

## 3 The Role of Social Interaction in Learning

Historically, many scholars believed learning and development were individual and discrete activities (Holzman, 2004; Wertsch and Tulviste, 1996). Vygotsky, a Russian psychologist whose theory of learning as cultural development has gained increasing popularity in the United States over the last 30 years (Holzman, 2009; Wertsch and Tulviste, 1996), however, believed learning and development were collective activities and reflective of cultural-historic processes. His theory of learning was that individuals developed socially, with those more experienced, in an environment he called the zone of proximal development. The zpd is not an actual zone or a place; the zpd is the situation within which activity occurs (Holzman, 2009). Learning, in a zpd, is both intermental (between individuals) and intramental (within an individual), with intermental learning being primary and intramental being derivative or secondary (Wertsch and Tulviste, 1996). Learning is a social process, not a purely intellectual one, and, therefore, the social environment is a critical component of learning.

Vygotsky also viewed speech as a part of learning. "There are no longer two separate worlds, the private one of thinking and the social one of speaking. There is, instead, the dialectical unity, speaking/thinking, in which speaking completes thinking" (Holzman, 2013, p. 484). Therefore, speech is also a tool and result, where people are creating what is happening, rather than saying what is going on. It is the process by which humans create, with language, who they are becoming (Newman and Holzman, 1979).

Vygotsky further believed that writing was another mechanism by which learning occurred (Thompson, 2013). Per Thompson (2013), "Vygotsky (1986) argues that the process of composition involves social and cultural interaction leading to the translation from inner speech, or internalized thought, to outer speech in the form of writing" (p. 247). Vygotsky sees writing as a process of development in which learning occurs through inner speech, which is captured by the written word. In the next section, learning in online, asynchronous business education will be explored.

## 4 Learning in an Online, Asynchronous Business Program

Considering Vygtosky's theory of learning as socially constructed, online business programs must balance a synchronicity with opportunities for students to interact and learn with and from their peers and instructors. Means by which this was accomplished in the author's online business program included online discussion

boards, group assignments, and a cohort structure with a residential requirement. Each of these provided the means by which the author and her fellow students could interact, learn from each other, and build strong relationships.

## *4.1 Online Discussion Boards*

Through online discussion boards, students posted their interpretation and individual learnings from the weekly readings, after which they were required to engage in thoughtful, deep discussion with their fellow students. The instructor also played a role in the online discussion board but carefully managed their contributions to be complementary and not primary. Learning occurred through the process of considering the perspectives and experiences of other students in the context of the readings and through the process of writing, which further contributed to, and solidified, individual level learning. The discussion board assignments were an ongoing and significant component of the course grades, both because of their importance to learning but to also drive engagement and active participation.

## *4.2 Group Assignments*

While many students, the author included, dislike group assignments, they are a means by which learning occurs. Further, in today's VUCA work environment, teamwork is a critical component of organizational life. By utilizing group assignments in the author's business program, students learned through their peers as they completed the assignment, in a zone of proximal development, but we were also learning how to work with others, which contributed to our ability to successfully navigate our professional environments. In the author's business program, the students in her cohort came from a variety of professions and geographical locations. The learning that occurred about other professions and other cultures was deep and rich and significantly contributed to the author's individual learning about a world far beyond that which she had previously been exposed.

## *4.3 Cohort Structure and Residential Requirement*

Cohort intakes allow for students to enter and progress through the program together, thus increasing their ability to build personal and professional networks. The author joined a local study group who, despite not always being in the same section in each class, got together on a weekly basis to have coffee and discuss the teachings from each course. This peer network was invaluable to the author and she remained close friends with many of them following graduation. Additionally, the author's business

program required at least one residential, or in-person, course during the program. The residential program provided the opportunity for the author to meet many of her fellow students in person and continue to build strong personal and professional relationships with her fellow students.

## 5 Conclusion

Education and training is intended to expand knowledge and train the future workforce. The risks of ineffective education include an ill-prepared professional workforce that will have difficulty mastering their roles and individually; they will likely be frustrated by their inability to perform competently. Further, in today's volatile, uncertain, complex, and ambiguous (VUCA) environment, or today's knowledge era (Uhl-Bien, Marian, & McKelvey, 2014), organizations require individuals that can work in a fast-paced, ambiguous, and ever-changing environment (Bohórquez and Espinosa, 2015; Burnes, 2005; Chapman, 2014; Dooley, 1997; Ford, 2008; Lawrence, 2015; Rowe and Hogarth, 2005; Uhl-Bien et al., 2014). The ability to work with others in a fast-paced environment is critical. Well-designed online programs, like the one attended by the author, allow for flexibility for working professionals while also providing ample opportunity for interaction and peer learning and are positioned to offer the best of both worlds, an education that can be integrated into a professional's already busy life and a robust learning environment.

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# Perspective: Work-Study-Life Balance

**Ivo Kreyenbühl**

**Abstract** Engaging in a university management program is like running a marathon. It requires a high level of discipline, commitment, and mental strength from every student – regardless of being enrolled in a traditional campus or an online program. At times it is hard and painful, and you ask yourself why you are doing it; but once you have crossed the finish line, you are incredibly proud and feel like you can accomplish everything no matter how hard the challenge might be.

The main difference between campus and online programs is the higher level of flexibility online programs provide to its students and, with that, to their employers and families. With some exceptions, online students have the freedom to organize their study schedules themselves. This allows pursuing a professional occupation or, in some cases, even full-time employment. It also permits students with family commitments to continue a more-or-less normal family life.

Thanks to this increased flexibility, the author was able to remain fully employed at CSL Behring during the duration of the entire master program at the University of Liverpool. In addition, the author remained mobile for business travel and even more for an international long-term assignment that required relocation from Europe to the USA without interrupting the program. Studying in the late evening hours also allowed the author to spend as much time as possible with family and friends during daytime and weekends.

It was certainly not easy to bring work, family, and studies under one umbrella during the entire duration of the master program. However, studying online was found to be the perfect solution for the author to keep job, family, and study commitments in balance. This was obviously not a stand-alone achievement but required flexibility, comprehension, and support from all the actors including workplace and, more importantly, family and friends.

**Keywords** Campus vs. online programs • Discipline • Commitment • Work-life balance

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## 1 Introduction

There is no doubt that completing a university management program requires a high level of discipline, commitment, and determination from its students. Regardless of following a traditional campus or an online program, the journey is equally demanding. In both cases, students have to evaluate what program fits their educational needs, but in many cases, it is more than that. Accomplishing a university management program will, in any case, impact students' routine and time schedules and also conflict with time available to spend with family or friends, for hobbies, and potentially work. Bringing all these time commitments in balance is not an easy task and requires flexible solutions for students to be successful in meeting their work-study-life balance.

## 2 Why Online?

When evaluating the various management programs during several months in 2012, the author visited a variety of universities in Switzerland offering on-campus management programs. Most institutions offered generic MBA programs with focus on finance, marketing, or leadership. Only a few had programs specializing in logistics or supply chain which was the author's field of interest. The campuses of the small selection of potential programs were all located at least 1 h away from the author's hometown and required classroom attendance either on weekends or during several full weeks of the year.

Back in 2012, the author was husband and father of two little boys, ages 3 and 1. Staying away from wife and children every weekend during several years was not considered a suitable and family-friendly solution. Also, the author's employment required a certain level of business travel and would therefore conflict with the full-week classroom attendance model. Lastly, commuting from and to remote university campuses was not considered as a good time investment. As a result, the author's personal situation required an alternative solution to the traditional university campus programs, something that offered more flexibility not only for the author but also for his family and his employer.

Although online programs were not nameless to the author, they were not his first choice at that time mainly because of some people's comments about online programs not being as authentic as a traditional or hybrid university program. However, the more the author started researching on the topic of online learning, the more he was able to learn about the various online programs and the possibilities and flexibility they offered to their students. Most programs did not require fixed lecture schedules and classrooms, and course materials were accessible anytime and from everywhere. With no more logistical restrictions, the choice of suitable and qualified supply chain programs increased tremendously. The choice fell on the Master of Science program in Operations and Supply Chain Management at the University of

Liverpool, a business school accredited by the Association to Advance Collegiate Schools of Business (AACSB).

## 3 Flexibility Has a Price

The program started in November 2013 after successful admission and enrollment. Each module required a lot of academic reading and writing. Written assignments had to be completed twice a week, due by a specific deadline, and every week was graded with feedback from instructors about the work. Although highly academic, the program encouraged students to apply theory to real-life examples and to share those with other students of the virtual classroom. Through these exercises, the newly acquired knowledge was brought into a practical context, very often related to examples from an existing employer. Classmates and instructors would ask specific questions that required follow-up or more in-depth reading. At the end of every module, an assignment or project (individual or team) had to be performed and submitted.

Depending on the subject, the overall weekly workload averaged 15–20 h. In the beginning, this was higher until the right techniques and sources for research were found and applied. With more routine, it became easier to plan the respective workload. In order not to impact work or family commitments, the author chose to study in the late evening hours between eight and midnight, Monday through Friday. This modus operandi worked out well for the majority of the time, although, at times, weekends had to be used to finalize some work that could not be completed during the week. Scheduling of workload was a very important aspect for managing all the assignments of the online program in time, and self-discipline and schedule adherence became critical success factors. At times, certain assignments could not be accomplished in time due to business travel or other unplanned commitments. In these cases, students would contact instructors and ask for extensions that were typically granted.

The online program also offered students the opportunity to take breaks in between modules for personal reasons or simply to get some rest and tank energy after several intensive months of studying. In October 2014, the author's family grew to a five-person household with the arrival of an additional family member. For this special reason, the author made the decision to pause his studies and spend some time with his family and new arrival. Having the opportunity to spend these unique moments with his family was very important and appreciated by all.

Soon after, in summer 2015, the author was offered a Long-Term International Assignment within CSL Behring with relocation from Switzerland to the USA. This was an exciting new project for him and his family and required fast decisions and actions. After only 3 months, the entire household and family moved from Europe to the USA. Funnily, the only constant during this move was the university program since this was not impacted or interrupted by this transition. With all classes being

taught online, the author was able to have a seamless transition without any implications to his studies.

After completion of his master thesis project, the author finally graduated in December 2016. The feeling was almost like finishing a marathon after so much time of hard training. At times it was hard and painful, and the question why people do such things remains unanswered. However, once you have crossed the finish line, an incredibly feeling of pride goes through body and soul together with the belief that everything can be accomplished no matter how hard the challenge may be. This is probably the most important learning for every graduate to know and understand that big things can be achieved with the enough commitment and endurance. Of course, a graduation is not a solo performance but requires flexibility, comprehension, and support from all the entourage including workplace and, more importantly, family and friends.

## 4 Conclusion

The biggest advantage of online learning was found to be the high level of flexibility it offers to its students. Not only can classes be attended from everywhere in the world at any given time, studying online also eliminates the requirement for students (and instructors) to travel from and to campus locations. The elimination of logistical restrictions is even more beneficial for students who want to study and research in a specific field since the online campus is so much larger than onsite campuses and the choice of online programs is getting larger and larger.

However, online students have the freedom but also the responsibility to plan and organize their study schedules themselves. This doesn't make studying any easier; the work still has to be done. So much flexibility also requires a lot of self-discipline which is not everybody's strengths. Some students may require more structured programs with more extrinsic control mechanisms. For those who can work in a more self-controlled environment studying online on the other hand will allow pursuing a professional occupation or, in some cases, even full-time employment. It also permits students with other commitments to continuing a more-or-less normal life without renouncing to family, friends, sports, or other leisure activities.

Online programs can still develop in various aspects. As with campus training, good instructors make the difference between a good and a bad learning experience. Not all instructors are qualified or predestined for online teaching, and a more restrictive selection should be applied to grant the quality of teaching. Also, online technology has gone mobile in most aspects of life, but online learning platforms are hardly accessible through mobile applications. As a result, online libraries and classrooms should become easily accessible through mobile devices. The ability to access chats or forums from mobile devices anywhere, anytime, will provide even more flexibility for students and teachers.

# Perspective: But It's Online

**Dana Coble**

**Abstract** "She got her [business] degree online." Many say this in hushed voices, as if it should be a secret. Others, more brazen in their assessment, place the same emphasis on the word "online" as if it were something without value, a mail-order trinket that could be obtained as easily as adding it to the shopping cart and paying for shipping and handling.

Despite these negative sentiments, the online environment is logistically the only option for many. Common reasons are to pursue a business degree while working and/or managing family responsibilities, the latter frequently gender-biased. These reasons applied to the author as well. At the time, she wanted to continue to work and her travel schedule was sporadic. In addition, family health issues needed support and were her priority.

While flexibility might be the impetus, three other aspects are equally important: the learning experience, the knowledge acquired, and the recognition from third parties. If the degree does not enable the student to be both prepared and eligible to pursue further graduate studies or improve earning capability, the cost – both in time and money – is unfounded.

The author will outline current opinions of the validity of online business education and the importance of accreditation. Following, she will provide her perspective of business education quality based on her experiences. This will support her opinion that a common set of standards and evaluation mechanisms would be beneficial in assisting students in their assessment of programs and in providing confidence that the value of online education can be not only equal to traditional brick-and-mortar institutions, but preferred.

**Keywords** Online experiences • Standards for online business education • Evaluation mechanisms

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**Table 1** Quality of education ratings – Gallup Poll Oct 2013

| Question: From what you know, how would you rate the quality of education offered by each of the following – as generally excellent, good, only fair, or poor? | | | | | |
|---|---|---|---|---|---|
| | Excellent % | Good % | Only fair % | Poor % | No opinion % |
| Four-year colleges and universities | 16 | 52 | 22 | 8 | 2 |
| Community colleges | 13 | 51 | 27 | 6 | 3 |
| Internet-based college programs, in which the courses are conducted entirely online | 5 | 29 | 34 | 18 | 13 |

Source: Saad, Busteed, & Ogisi (2013)

## 1 The Perception

A report by the Pew Research Center (Taylor, Parker, Lenhart, & Patten, 2011) revealed only half of college presidents thought online courses provide the same value as classroom courses, while less than 30% of the public believed the same. A more recent Gallup survey (Table 1) did not show any significant improvement in public perception.

With respect to employers, the results are similar. While 80–90% of employers were likely to hire a graduate from a traditional degree program, that number dropped to less than 50% for online degree holders (Ramussen College, 2014; Society for Human Resource Management, 2010). These surveys also revealed that what remains important to hiring managers is their familiarity with the institution – indicating that traditional brick-and-mortar institutional degrees are considered more valuable regardless of how the degree is obtained. Such results suggest an unfounded bias against online education as a mode of learning.

## 2 The Value of Accreditation

The Oxford Dictionary defines accreditation as "the action or process of officially recognizing someone as having a particular status or being qualified to perform a particular activity," and with respect to education institutions specifically, the "official certification that a school or course has met standards set by external regulators" (Oxford Dictionaries, 2017).

With the myriad of options available, reliance on an independent reviewing body is understandable, but what are these "standards set by external regulators?" The answer appears to be "it depends." A simple Google search – an activity most would use in starting their assessment – lists dozens of international, national, and regional accreditation agencies, some that evaluate institutions, others that evaluate institutional programs, and each with different criteria for business education. This is confusing to anyone trying to make an informed decision in his/her educational pursuits. And just as there is a presence of "fake" colleges, there are also "fake" accreditation

agencies. Online lists of both recognized an unrecognized accreditation organizations vary – self-stating that they cannot keep up with the rapid growth. What is troubling is that a majority of agencies mentioned on these unrecognized lists include "distance," "online," "virtual," and/or "international" in their names (GetEducated.com, 2016; Outstanding Colleges, 2016; World Heritage Encyclopedia, 2016).

Hopefully, continued research will lead the potential student to the understanding that while online education spans geographical boundaries, recognized accreditation does not. It is regional accreditation that is fundamental. For students, financial aid is available only for regionally/provincially accredited schools, and most higher education institutions require it as a condition of acceptance for their postgraduate programs. The institutions themselves are eligible for government funding only with this type of accreditation, and as shown by employer preference noted earlier, companies rely on it when reviewing applications. It is more than a "nice to have" – it is a "need to have."

According to the Higher Learning Commission (2017), one of the six regional accreditation agencies in the United States, regional accreditation "evaluates multiple aspects of an institution ranging from its academic offerings, governance and administration, mission, finances, and resources." Provincial accreditation is the equivalent in Canada and "generally review[s] programs to ensure the quality of degrees offered, monitor the frequency and efficacy of institutional reviews, and/or set guidelines to audit existing programs" (Universities Canada, n.d.).

And these recognized accreditation agencies certify both brick-and-mortar and online institutions, but should the same standards apply? While there is value in curriculum consistency, student and faculty needs are different in the online environment. Student-faculty interaction, infrastructure, and supporting activities cannot be measured with the same stick, and onsite evaluation is impossible.

## 3 Education Quality

While accreditation is necessary, it does little to help the student in assessing "fit," that is, how well it is suited to his/her learning style and the robustness of the curriculum. A common criticism of the online environment relates to its isolation. Brick-and-mortar institutions facilitate interaction among and between students and faculty, and the exchange facilitates learning and creates valuable networks.

The author's experience with her postgraduate business degree program suggests this potential disadvantage can be mitigated. The platform and paced structure of the program enabled the cohort to interact frequently and with ease. And although interaction was frequent, impromptu feedback that occurs in a traditional classroom was replaced with researched responses and thought-out opinions. This enabled deeper exploration of business-related issues. In addition, the virtual environment allowed for a more diverse cohort than is possible at most brick-and-mortar institutions. Not only were the students of different ages and ethnicities, and in different

**Table 2** Benefits of diversity across three dimensions

| Individual | Institutional (public and private) | Societal |
|---|---|---|
| Enhanced openness to diversity and challenge | Greater cross-cultural competence to be successful in national and global markets | A more educated citizenry |
| Greater commitment to the understanding of other perspectives | Higher levels of creativity and innovation | Increased political engagement and democratic openness |
| Enhanced critical thinking ability | Greater organizational flexibility | Higher levels of service to community and civic organizations |
| Better able to function in increasingly diverse working environments | Better problem-solving abilities | Improved well-being and greater trust in society |
| | Attraction of the best talent pool | |

Sources: Council of Europe (2017), Kerby & Burns, (2012), and Milem (2003)

industries, they were also geographically dispersed. There is a wide body of evidence regarding the benefits of diversity, a few of which are listed in Table 2.

Professors and tutors were equally participatory – guiding discussions, providing feedback, and promptly responding to questions. In addition, and mirroring the professional experience of the author, face-to-face contact was not necessary to build long-term, valuable relationships: after several years, she remains in close contact with some faculty and several members of her cohort.

## 4 How to Choose?

So how does one choose? As is the case in most decisions, one gravitates to the known, the familiar, or what appears to be generally accepted. In consideration of the uncertainty in accreditation bodies and in the familiar (where she was educated previously), the author focused her search on Canadian institutions. While the business school affiliated to the university she selected was provincially accredited, well respected, and with a self-professed record of success in online learning, student reviews were mixed. Positive feedback referenced similar experiences as mentioned above, but others stated dissatisfaction with core content of various programs and unresponsive or unhelpful faculty. Also, there appeared to be no majority opinion, which added to the uncertainty in making the decision.

She considers luck, rather than research, was the bigger factor in selecting a program that not only met her needs but exceeded her expectations. This opinion is based on the above, as well as the author having enrolled in other online professional development courses after having completed her degree. These experiences were completely different: midway through one program, a certificate was offered for a fee, and in another course, interaction was less than sparse – it was nonexistent. Had the author been exposed to these courses prior to pursuing postgraduate studies, she would have sided with public opinion, agreed with the negative reviews, and waited until it was possible to attend a “legitimate” brick-and-mortar institution.

## 5 Concluding Remarks

Our society is increasingly reliant on the online environment to communicate both personally and professionally. Higher education institutions are striving to meet these needs; however, with the presence of a multitude of unrecognized accreditation agencies, and the different criteria of those that are recognized, it's no wonder the statistics indicate a majority are skeptical of online learning. To eliminate the confusion, the author suggests developing and applying a common set of standards and evaluation mechanisms specific to the online environment. This would assist students in choosing a quality online business education program that best suits their needs, as well as help educate and build public confidence.

Combined with the other advantages of online business education – such as accessibility, cost, and flexibility – the author believes it can contribute to making the online environment no longer an option primarily borne out of necessity, but one that is preferred.

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# Part II
# "How?": Building Knowledge and Skills

# Online Student Engagement and Success in Graduate Studies

**Kay Devine and Deborah C. Hurst**

**Abstract** The National Survey of Student Engagement (NSSE) examines university programs on four themes: academic challenge, learning with peers, experiences with faculty, and campus environment. We examine NSSE's commonly accepted indicators of student engagement on these four themes using Athabasca University Faculty of Business (AUFB) online graduate programs. Each theme is referred to in this chapter in light of these student engagement indicators and how they are operationalized within AUFB's graduate online environment which is designed to be a high-quality/high-touch system. We discuss online pedagogical elements and student engagement through the provision of academically challenging learning materials, small online discussion groups, unfettered access to professors, and an individualized student support system.

The AUFB example used in illustration of the NSSE engagement indicators shows how elements can work together to create enhanced student engagement and success. The chapter ends with the suggestion that effective graduate management education should provide the same degree of academic challenge, experience learning with peers, access to faculty, and campus experience to engage students to succeed at the level of degree earned regardless of mode of delivery.

**Keywords** Graduate student engagement • Online education • Academic challenge • Learning with peers • Experiences with faculty • Campus environment

## 1 Introduction

Scholars agree that developing a community of learning that supports a student's motivation to achieve and excel is difficult, yet paramount for success in a traditional classroom learning environment. In an online environment, where there is a separation of teacher and learner, and students are globally distributed, communicating primarily via text, that goal of student excellence and subsequent success becomes even more daunting. Despite the pedagogical and technological challenges

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posed by online learning, distance education programs have experienced rapid growth, resulting in multiple forms and providers internationally, who are spurred on by the desire to increase accessibility, as well as the advent of new technologies (Lee, 2017). While much of the research of online higher education reports positive outcomes, criticisms of universal access have also emerged (Fielding, 2016). Indeed, students and faculty are often dissatisfied with online interactions (Boyd, 2008). Additionally, one study indicated that dropout rates among distance learners as compared with on-campus learners are substantially higher, due in large part to students' dissatisfaction with the online learning environment (Levy, 2007). Consequently, student satisfaction with the learning environment is critical and likely influenced by the design of an online program.

The purpose of this chapter is to outline practices that the Athabasca University Faculty of Business (AUFB) employs to engage online graduate students in their Master of Business Administration (MBA) and Doctorate of Business Administration (DBA) programs in order to enhance satisfaction and elevate students' success in their educational aspirations through a high-quality/high-touch design approach. Achieving such student engagement is especially important in an online environment as "online students have fewer ways to be engaged with the institution and perhaps greater demands on their time and attention" (Meyer, 2014; p. 1). As will be discussed in this chapter, the AUFB high-quality/high-touch model is designed to promote student satisfaction, engagement, and subsequent success in their education.

## 2 Background

### *2.1 Student Engagement Defined*

The term "student engagement" evokes different connotations for educators, and, to date, there is no universally accepted definition or measure of the concept. According to Axelson and Flick (2011), historians of education attribute the 1980s' research on student involvement by Alexander Astin as the main precursor to today's interest in student engagement. Astin (1999) basically believed that the involvement of a student produces learning in direct proportion to that involvement and that involvement is akin to engagement. Further, he suggested that involvement is important to student achievement.

Building on the work of historian Astin (1999) and others, the National Survey of Student Engagement (NSSE) was created by Kuh (2009) and colleagues to "assess the extent to which students take part in empirically derived good educational practices" (Axelson & Flick, 2011; p. 40). Basically, engagement as represented in the NSSE refers to a student's quality of effort and involvement in their own learning and is an indicator of both student and institutional performance (Kuh, 2009).

The NSSE encompasses four themes: "(1) academic challenge, (2) learning with peers, (3) experiences with faculty, and (4) campus environment" (Indiana University School of Education, 2017). Theoretically, higher indicator levels for each of the student engagement themes should equate with higher levels of student involvement and subsequent learning and success. Practically, research has found that student engagement, as measured by the NSSE, has resulted in dependable and valid outcomes where the NSSE has been administered (see, e.g., Fiorini, Shepard, Liu, & Ouimet, 2014; Gonyea & Kuh, 2009; Pascarella, Seifert, & Blaich, 2010; Pike, 2013). One drawback in using the NSSE themes as evaluative tools for online graduate programs, however, is that they are primarily geared toward undergraduate, on-campus settings. Despite this, its basic themes and key indicators show promise for investigating student engagement in online learning and have been used in past research of student engagement in online learning (Robinson & Hullinger, 2008). Consequently, it seems that the indicators of student engagement as operationalized in the NSSE may also serve as valid descriptors of online graduate student engagement and how students spend their time.

Further, the notion of how students spend their time, as is measured by the NSSE, is a common element in most definitions of student engagement. As such, and for the purposes of this chapter, student engagement is defined as behaviors that enhance a student's level of involvement in a learning process; behaviors that achieve high levels of connectedness among students, instructors, and support staff who are acting together in an online environment; and behaviors that are guided by the four themes of the NSSE. Each of these themes will be discussed below in the context of how the AUFB operationalizes them in order to facilitate graduate student engagement in efforts to increase student satisfaction and successful educational goal achievement.

## *2.2 Student Engagement Practices*

The four themes of student engagement – academic challenge, learning with peers, experiences with faculty, and campus environment – as presented by the NSSE will be explored in terms of practices developed intending to support student success. These four themes and their engagement indicators are listed in Fig. 1.

### 2.2.1 Academic Challenge

The level of academic challenge, which refers to (1) higher-order learning, (2) reflective and integrative learning, (3) learning strategies, and (4) quantitative reasoning, is the first theme to be examined. At a minimum, AUFB graduate students are expected to complete appropriate degree-level readings, written assignments, discussions, and exams. For every course, a subject matter expert creates written lectures and supporting materials that mirror the required scholarly activity found in

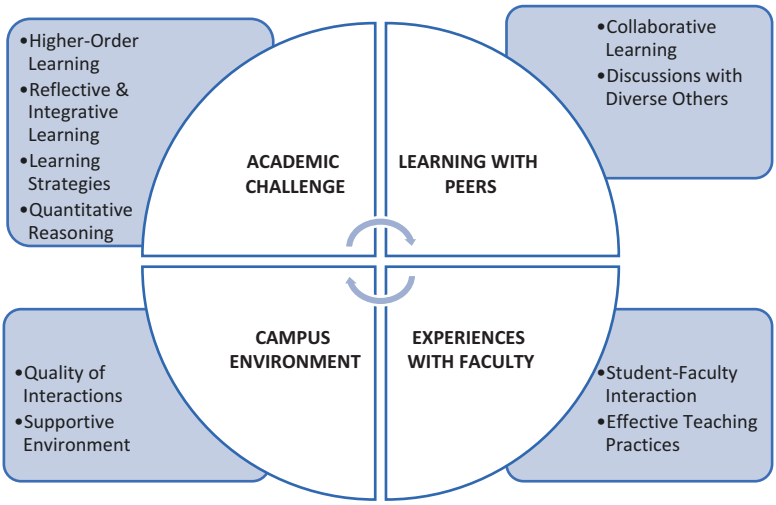


**Fig. 1** Themes and engagement indicators (Based on Indiana University School of Education, 2017)

classroom-based graduate programs, so that higher-order learning, as evidenced by course materials, is equivalent to that of a brick-and-mortar-based program. Students access course materials, i.e., course syllabus, lecture, seminar, discussion database, and readings, electronically in most cases, although some written texts are delivered via post prior to the start of a course when electronic versions are unavailable. Ultimately, however, despite the provision of challenging academic materials, questions of academic effectiveness of online learning as compared to face-to-face learning are typically raised, especially by those not familiar with online educational models. In response, past research has analyzed (a) students' outcomes, focused on grades, (b) student attitudes about learning, and (c) student satisfaction with online learning, with results supporting the notion that online student learning outcomes are similar to those in classroom settings (Robinson & Hullinger, 2008).

The AUFB electronic learning platform of choice for graduate students is IBM Notes© which all students and instructors download on their own devices. This platform provides the ability to create separate databases for each component of a course, e.g., syllabus with reading database, discussion database, Ask the Prof database, etc. These databases, sent to students electronically prior to a course, can be accessed at anytime, from any location, thus allowing students the flexibility to study at a time and location most suitable for them. While Internet availability is required initially to download databases, IBM Notes allows users to work offline in a database, e.g., while traveling or in remote locations and then submitting discussion responses or assignments once the Internet is again available. Granted, this system will not work for individuals with no access to the Internet, thus discriminating against some in marginalized populations, but so far, and especially as the Internet expands, all AUFB graduate students have had appropriate web accessibility and participate from most regions of the world.

All discussions occur asynchronously, with different topics introduced and pursued in a threaded manner. An advantage to the threaded, asynchronous discussions is that students have time to construct comments of value, and all comments can be accessed at a later time, should a student or instructor want to revisit an earlier discussion. Additionally, all students are expected to participate in the discussion, thus encouraging those who might be reluctant to speak in the classroom to contribute their ideas. The emphasis on interaction in the database by all students is supported by research that has found that there is a positive relationship between the frequency of interactions in a distance education course and student achievement, regardless of synchronicity (Bernard et al., 2009). As such, this is a critical element in the design of the programs.

For the instructor, there is an objective record of student performance. As well, the asynchronous nature of the discussion provides time for an instructor to carefully compose a response to students' questions, rather than having to respond immediately, on the spur of the moment in a classroom environment. This allows instructors to articulate comprehensive, well-reasoned responses and to perhaps introduce new materials or provide electronic links to research that expand challenge and learning.

In order to create a conducive and effective environment for discussion, another AUFB graduate study program feature is that prior to the start of a course, students are divided into diverse cohort groups of approximately ten individuals per discussion database, which are led by AUFB assigned professors. Students from different occupations, industries, and geographic locations come together in their small cohort study group and have an opportunity to gain a variety of perspectives due to this diversity. Each cohort group, after brief introductions to each other, then travels through a course together and is required to engage in discussions as spawned by the course readings, the instructor, or the other students. In addition to heightening the academic challenge for students, this participation requirement also encourages every student in the course to engage in active and collaborative learning, sharing a multitude of perspectives. Discrimination or perceived belittlement that might occur based on gender, age, race, appearance, or any physical attribute is lessened as electronic participation minimizes any differences other than at the level of ideas and the ability to express oneself in writing. Professors closely monitor database discussions and, should inappropriate behavior occur, are able to confront it in a private email to the offending party.

Academic challenge in this online environment can be further stimulated by an instructor who sets high expectations in terms of the level and extent of discussion and course deliverables. Students are encouraged to go beyond the required course readings, reporting back their discoveries to their online group. For example, doctoral level courses require students to lead weekly discussions, create salient discussion questions, and stimulate higher-order thinking of their peers. As such, every doctoral student is involved as a leader and gains experience in how to lead and facilitate online discussions and learning, thus adding new skills to their own personal and professional development.

While engaging with course materials, students are asked to apply various theories directly to their own work experiences, organizing their ideas and information into more complex interpretations. Because the AUFB online graduate students typically retain their full-time employment, the ability to apply an idea or concept to their workplace or proposed research can be instantaneous. Peer discussion, as facilitated by an instructor or other students, feeds into their reflective and integrative learning, thus directly challenging students academically. On the doctoral level, the synthesis and organizing of research ideas that will lead to new, original findings and their own dissertation work are developed through sharing written work early on in the program with their peers and professors, who discuss possibilities for how the research process might unfold.

Finally, AUFB has found that by imposing a weekly schedule for deliverables, and asking students to reflect on their own experiences, the potential frustrations that some distance learners have expressed, i.e., self-regulating their learning or time management, may be lessened (Sáiz, 2009). If a student does not post a weekly response in a discussion database, follow-up by the professor is immediate, thus preventing student drift.

In summary, the nature of online graduate studies allows a student to better capture ideas, with the ability to revisit concepts that are expressed throughout the educational journey. The existence of a diverse group of students, a capable professor, an appropriate learning platform, such as IBM Notes, and challenging course materials that allow for the acquisition, discussion, and application of key course content ensure that all students are challenged academically, thus supporting engagement. Students who are absent from discussions or not performing at an appropriate level can be individually contacted by their professor and hopefully assisted prior to the end of a course.

### 2.2.2 Learning with Peers

Learning with peers focuses on collaborative learning and discussions with diverse others. As such, at AUFB it includes class discussions, presentations, group projects, or conversations arranged by students outside of the formal course databases (e.g., instant messenger, Skype, Facebook groups, etc.). Graduate students in an online learning environment, similar to an onsite environment, initially learn alone as they complete their required readings and assigned papers for a course. However, unlike some courses in the onsite environment, AUFB courses require students to engage with their peers and their instructor in a discussion database that contains materials or questions designed to supplement and enhance basic course reading material. Database discussion participation is graded, based on the quality of each student's engagement, which motivates students to carefully think and reflect on what they contribute to the database. Peers learn from peers, with each student contributing his or her different worldview. Further, this discussion database participation is often mentioned by students as being one of the most important elements of their learning. Students are engaged in collaborative activities, with a diverse group

of peers and their instructor. They learn from reading and reflecting on the thoughts and experiences of their cohort peers. However, one downside of interacting with peers with the requirement of an acceptable level of participation is that it may be too demanding and time-consuming for students with different constraints or responsibilities, thus placing them at a disadvantage (Lee, 2017). Consequently, it is important to inform students prior to their entry into the program as to the demands of an online learning environment.

In a traditional classroom, a student may be able to attend and complete a graduate course without actually speaking in class. Notes are taken during lectures; exams and written papers are turned in, but, in some cases, no requirement exists for a student to collaborate with others or speak up in class. This "silence" may be further reinforced for students whose first language is not that of the language being used in the course or for those whose self-confidence may be low. Contrast these situations to an online learning environment where students are required to participate in online discussion databases as part of their final mark. Those students who feel a hesitancy to speak up in person, due to language barriers, reticence, or personal considerations, are able to contribute in a positive and meaningful way in an online discussion where they have the time to formulate their response and where they are being evaluated only on their thoughts, rather than on appearance or speaking ability. There is a "freedom" that occurs, in focusing on the written word. Conversely, students who may monopolize discussion in a traditional classroom setting no longer have sole possession of the stage from which to speak. There is room for all students on an electronic stage.

The element of engaging in discussion with diverse others is facilitated by random assignment to a different cohort group for each course in the MBA. As students move through the program, they come to know more students with each course, thus exposing them to ideas from all walks of life. Additionally, because online delivery of a program is available globally, students are not restricted by any geographical barriers. A student in Canada can be in a group with students in many parts of the world. Consequently, each cohort group allows for the mix of diverse backgrounds, thus enhancing diversity of opinions and discussions with diverse others.

Presentations and group projects can also be part of an online course, encouraging students to work together. Group projects are not always successful regardless of learning mode. Students need instructor intervention at times as well as various tools to help them. Requests to co-create team charter documents as a tool to govern team processes and behaviors can be used. In addition to process tools when working online, students also need technical tools. Various software applications can be used to permit students to collaborate from different locations, facilitating the completion of a group project. Presentation software also allows students to present their work to other students and faculty or to engage in a proposal or dissertation defense in the case of a doctoral student. Online presentations, however, should be more widely encouraged as research has indicated this is an area for improvement in online learning (Robinson & Hullinger, 2008), and these are skills students may need for the future given the rise in virtual teams in the workplace (Townsend, DeMarie, & Hendrickson, 1998). The AUFB DBA program uses Adobe Connect for

all oral proposal and dissertation defenses, which requires the student to present while all supervisory committee members are present at the same time, but in different locations. The MBA program, however, does not currently require every student to engage in an online presentation, which may be an area for improvement in the program.

Finally, in the DBA program, not all program components are online. Students meet annually for one onsite week in September in one location so that they have the opportunity to physically meet one another, share ideas, take part in workshops, and build trust. Starting in year 1, and continuing throughout a student's tenure in the program, various TGIF (thank God it's Friday) teleconferences following the on-site week are scheduled throughout the year in which all students are invited to participate and discuss topics ranging from what might be required in an assignment to how to overcome writer's block to motivational techniques. In year 2 of the program, every student is required to present a paper during the onsite week based on their research topic to other DBA students and professors, thus gaining presentation experience, as well as feedback on topic development. This onsite week also encourages the development of a research community and network of peers. Additionally, information webinars on topics such as research ethics, statistical techniques, library search techniques, grant proposals, etc. are periodically offered throughout the year by various departments within Athabasca University.

Taken together, all of these elements of learning with peers, i.e., collaborative learning and discussions with diverse others, contribute to professional skills development for each student. The requirements of engaging in online collaborative activities, whether in discussions, on projects, or in teams, may develop individual competences in skills such as communication, leadership, project management, conflict resolution, teamwork, analysis, critical thinking, and others in an online environment. As virtual or networked teams become increasingly prevalent in the twenty-first-century organization, individuals with skills in working online with others at a distance will become more valuable. "People are the core of virtual teams" (Lipnack & Stamps, 1999; p. 16).

In summary, learning with peers is imperative in an online graduate business course environment. Collaborative learning thrives, while geographic dispersion creates the sharing of insights from a diverse student body. Education in an online environment has no geographic or temporal boundaries, meaning students have maximum flexibility to engage when it works best for them.

### 2.2.3 Experiences with Faculty

Student-faculty interaction and effective teaching practices are the indicators which relate to the theme of experiences with faculty. Online courses create the ability to increase the frequency with which students are able to interact with faculty, compared to onsite offerings. While in a course, every faculty member checks into their student cohort databases numerous times throughout the week, responding to

student comments and adding stimulating questions or observations, thus promoting interaction. Additionally, interaction between students and faculty is not limited to a classroom lecture which occurs two or three times a week, but can be carried on virtually every hour and every day of the week. While faculty working in an on-site campus environment typically post office hours whereby individual students may interact with them one-on-one, these hours are likely restricted and sometimes not convenient for a student's schedule. More flexibility is often the norm in the online environment, as a student may pose a question or concern at anytime from any location, not needing to catch a professor on-site during office hours. AUFB practice is to respond to any question within 24 h, thus avoiding unnecessary frustrations and delays to a student's learning.

Additionally, with online graduate courses, students can interact with faculty members both one-on-one through email or as a member of a discussion group in an online database. Every graduate course that is offered includes a separate database which is designed to allow any student to ask a question about the course – basically an online office for the instructor without the restrictions of specific office hours. All students in a cohort have access to this database, thus allowing an instructor to communicate with everyone equally and efficiently.

Doctoral students further engage with faculty as they finish coursework and begin work on their dissertation research. Every student in the DBA has a supervisory committee made up of at least three individuals who possess a doctoral degree. Of those three committee members, one is a subject matter expert, one is usually a methods expert, and the third is a faculty member who contributes to the committee in support of the work of the student to provide further guidance and ideas. Every student must have an AUFB supervisor or co-supervisor, but the other committee members can be located at other universities, thus broadening the resource pool for potential supervisory committee members. Because supervisory committee members are at a distance, students are able to request a teleconference call whenever they feel they need the advice or assistance of their committee as a whole. Discussing research ideas with all committee members simultaneously ensures that everyone understands and agrees to a student's planned research agenda. Conversely, in an onsite doctoral program, rarely are students able to meet with all members of their committee simultaneously, prior to beginning and throughout their research.

Finally, graduate faculty members have the opportunity to get to know all of the students in the cohort(s) for which they are responsible. There are no large lecture sessions, with too many students to engage with individually. Each small cohort group comes alive, with students represented by their ideas, rather than by their student numbers.

In summary, experiences with faculty can be enhanced via online learning, as interaction cannot be avoided by student or professor, teaching practice is elevated, and both students and professors gain value through the level playing field an online environment creates.

### 2.2.4 Campus Environment

In online learning, a supportive campus environment may seem to be more elusive in that there is not a brick-and-mortar, physical place-based campus. However, an electronic campus environment may actually better serve students in that access to services is easily accomplished via email, text message, or a simple click on a link. The experiences of traditional campus support as indicated in the NSSE by the quality of interactions and a supportive environment can be achieved online via the quality of student relationships with their peers and faculty, as well as the support of staff who work professionally with students to ensure seamless connectivity and resolve any technical problems that may be encountered.

At AUFB, every graduate student has a specific, assigned student service staff member who works with them to answer questions, register for courses, pay fees, and provide guidance on course selection or during situations whereby a student may need atypical assistance, e.g., a crisis or unexpected event. Students get to know their student service representative and can engage with a specific person who knows their details and unique situation. Additionally, the ability of contacting only one person for help with registration, fee payment, course extension, withdrawal, etc. eliminates the needless shuffling of students from one physical office to another and what sometimes seems to be an endless wait in line. While administrative tasks are taken care of online, when students prefer to speak with someone rather than to complete tasks via the Internet, or if they have challenges they wish to discuss in person, student service representatives are able to phone them.

Additionally, AUFB provides technical support for students through a help desk which is staffed not only during office hours, but in the evening and on weekends when working students are more likely to run into technical difficulties with using IBM Notes©. The help desk personnel are accessed via phone, email, or instant messenger and are available to all graduate students and professors.

Library support is also provided online, offering an audiovisual online library tour and welcome video to introduce students to the available services offered. As an online university, AU has one of the largest database collections in North America as part of its library resources, along with a knowledgeable, experienced staff. Various webinars geared toward student needs are held throughout the year, covering topics from how to do a search to using reference software. Information sessions on the library's services are repeated throughout the year and are also recorded so that students are able to access them anytime. Finally, students are able to contact reference librarians if they need assistance with finding resources.

Other electronic student support services offered by the university include academic writing and ESL resources, assistance for students with disabilities, career advice and development, mental health resources, and an ombudsperson. The Office of Research Services provides information on research ethics and graduate student funding opportunities, coordinating both internal and external awards, including a specific internal award to fund statistical software that might be required for data analysis, e.g., SPSS or NVivo. Additionally, the university supports a Graduate Student Research Fund that provides funding to support students in both conducting and disseminating their research.

Finally, support is also provided by the MBA and DBA program directors, who are both full-time academics. Students are able to contact their program director with any questions, concerns, or ideas that they might want to share. In the DBA, a teleconference is arranged by the program director at the beginning of each course so that the students and professor are able to clarify expectations and become better acquainted with each other. These initial teleconferences set the stage for later conversations with doctoral students, once they complete their coursework. As AU, like other universities, has learned, the period between scheduled coursework and the defense of a dissertation creates different challenges for some students. Writer's block, loneliness, procrastination, inability to focus on research, and competing priorities such as work or family – all obstacles faced by doctoral students globally – may be magnified in an online environment as there is no physical structure or presence beckoning a student to finish. The AUFB doctoral business program attempts to ameliorate doctoral student drift with the requirement of an Annual Progress Report, attendance at the onsite week in September, teleconferences throughout the year, and encouragement of supervisory committee members to stay connected with their students. An electronic DBA Student Lounge database is also provided whereby students can gather for support or advice.

## 3 Conclusion

Throughout we have discussed the four themes of student engagement raised in the NSSE survey to understand university practices that support student engagement. These themes of academic challenge, learning with peers, experiences with faculty, and campus environment were discussed according to experiences of AUFB online graduate programs. An underlying message is that regardless of mode of delivery, points related to academic challenge, learning with peers, experience with faculty, and campus environment all factor into understanding student motivation and engagement. With respect to academic challenge, excellence at the appropriate degree level and learning outcomes must be achieved regardless of mode of delivery. Similarly, learning with peers in developing knowledge and soft skills in collaboration is critical. Interactions with faculty are expected to be impactful and learning preferences accommodated. The learning environment, regardless of mode, needs to facilitate the connections between learners to provide for the diversity of student needs directly.

We assert that students should expect that the degree of academic challenge, learning with peers, experiences with faculty, and experience of campus should at minimum be equivalent regardless of the university's mode of delivery. It is clear that online education and learning for graduate students is gaining traction globally and can be as effective as, if not more effective than classroom learning in engaging students, given the right design. The AUFB experience and program design rely on a high-quality/high-touch approach that seeks to guide students from entry into their graduate program through to completion. Where this was a new innovation in 1993

when the AUFB online MBA was first launched, it is no longer unique. Many other online degree programs also use this approach because it works. Students feel connected, have their specialized needs met, and have direct access to their colleagues and professors in academically rigorous programs. They experience graduate programs in small discussion cohorts led by accomplished professors, required degree-level reading and reflection, collaborative learning with peers, high levels of participation by professors and students, and attentive support services. Based on the institution's student surveys, feedback, and outcomes, this approach is described as helpful by students in fulfilling their educational goals. Internal AUFB statistics indicate that of those individuals who start the MBA program, 80 % graduate, while the DBA program has an attrition rate of only 12 % – both exemplary statistics for any graduate program in business, be it onsite or online. Student data are tracked ongoing through AU systems. AUFB has learned over time and continues to learn which practices engage students and ultimately lead to success. Importantly, the online model designed by AUFB incorporates technological and pedagogical elements that do not attempt to replicate what is done in the classroom, but rather are unique to what can be done in an online environment, and that lead to positive student engagement.

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# Enhancing Digital Intelligence Through Communities of Learning

**Madelaine K. Kineshanko and Kam Jugdev**

**Abstract** The purpose of this chapter is to explore how students described as "millennials" or "digital natives" approach online education and how social constructivist pedagogy can be incorporated mindfully into online business education programming to help these students refine and transfer their innate understanding of digital networking language and principles to business and professional communities of practice. Foundational literacies, competencies, and character qualities such as critical thinking, problem-solving, persistence, collaboration, and curiosity identified as being key to business success are discussed. Methods of incorporating authentic learning activities that develop tacit skills in conative and affective learning domains are also presented.

Online business education, designed using a social constructivist collaborative learning model such as the Community of Inquiry, has the potential to heighten inculcation of cultural norms and transferable knowledge of digital language and social practices to business environments. In particular, criteria for rethinking learning outcomes or goals, instructional design, learning activities, teacher and student roles, technological advancements and assessment are discussed.

**Keywords** Community of Inquiry • Digital intelligence • Digital learners • Digital native • Online business education

## 1 Introduction

Today's business environments are complex networks comprised of sophisticated technology that is intended to facilitate seamless interaction via synchronous, semi-synchronous, and asynchronous modalities among entities around the world. These environments demand graduates with high levels of digital literacy who are able to orchestrate and complete collaborative work with spatially and temporally separated teams. Students, especially graduate students, assume they will be active contributors

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to their education, which they expect to be able to access from anywhere, at any time, using their preferred technology.

Online business education designed using the Community of Inquiry (Garrison, Anderson, & Archer, 2000) framework can emulate complex digital networked business environments as well as model professional interaction patterns. At the same time, courses built on a social constructivist model can go a long way to meet students' expectations of active participation, collaborative knowledge construction with peers, and anywhere, anytime access. The Community of Inquiry framework (Garrison et al., 2000) has been researched and applied extensively to many diverse post-secondary education settings. The framework shares a number of similarities with the Community of Practice framework (Wenger, 1998), which is commonly encountered in business professional environments. The main premise of both frameworks is the effectiveness of collaborative construction of knowledge and understanding through participant interaction from novices to experts. "The challenge then is not re-purposing education, but making sure it meets that purpose more effectively" (Bates, 2015, p. 22).

The purpose of this chapter is to explore how academics and instructional designers can mindfully incorporate the social constructivist pedagogy of the Community of Inquiry into online business education programming. The chapter discusses how courses can be designed for tacit knowledge transfer to help digitally savvy students refine and apply their innate understanding of pragmatic digital networking language and principles to business and professional communities of practice. The chapter begins by introducing readers to digitally networked business environments, followed by the concepts of digital learners and digital intelligence. Then, the chapter discusses two communities of learning frameworks – the Community of Inquiry and the Community of Practice. Thereafter, the chapter discusses how academics and instructional designers can develop courses optimized for tacit knowledge transfer and help students develop digital intelligence skills that are readily transferable to work environments.

## 2 Digitally Networked Business Environments

The disruption to business practices since broadband Internet connectivity became commonly available in 2000 has been dramatic. The technological advantages that widespread access to broadband afford individuals, and businesses has transformed business practices from primarily place- and paper-based systems to interconnected complex digital networks that use sophisticated technology to conduct synchronous, semi-synchronous (Avrahami, Fussell, & Hudson, 2008), and asynchronous business interactions around the world.

Prior to the advent of these digital advancements, interactions with clients, suppliers, government agencies, and other businesses consisted of synchronous voice communication conducted primarily via telephone and asynchronous paper-based communications that were transmitted using postal systems, courier services, and fax. Customers either physically attended the business location or were visited in person by salespeople. Work teams usually consisted of members based in the same

geographic region that met in person. Geographically separated teams met via telephone-based conference calls or by traveling to meet in a mutually convenient location.

Widespread availability of high-speed Internet broadband networks and digital communication technologies has transformed most of these business practices. Synchronous person-to-person interaction can now take place remotely using Internet-based videoconferencing technologies such as FaceTime, Skype, or Google Hangouts; text, voice, and video semi-synchronous interactions are facilitated through multiple computer and personal device applications, and asynchronous communications are most commonly transmitted electronically. All parties to nearly all types of business interactions can communicate using their choice of device or medium; common geographic location is no longer required for teamwork.

These environments demand graduates who have the technical, professional, and cultural expertise necessary to orchestrate and complete collaborative work with spatially and temporally separated clients, agencies, and teams in a digital world.

## 3 Digital Learners and Digital Intelligence

Those born between 1980 and 1994 belong to the first generation to mature in a primarily digitally mediated era. Members of this group have a very limited perception of pre-Internet society and now represent the largest portion of students in post-secondary education (Echenique, 2014). Echenique's comprehensive review identified three widely used terms describing learners in the digital era – digital natives, net generation, and millennials. Other synonyms used to distinguish between pre- and post-Internet cohorts include digital visitors and digital residents (White & Le Cornu, 2011). Although the metaphor digital natives is popular, the concept is widely criticized for being simplistic, offensive, and narrowly based on age and place (Wikipedia, 2016). Typically paired with the term "digital immigrants," the term digital natives has been critiqued as being dichotomous (Bennett & Maton, 2010). This dichotomy is primarily noted as a *generational* difference between the older generation perceived to be technologically unskilled and the younger generation viewed of as technologically savvy. The term has also been accused of creating digital apartheid (Brown & Czerniewicz, 2010). Furthermore, Prensky's (2001) use of the term digital natives has generated misplaced concerns that educators are not keeping pace with the digital generation (Bennett, Maton, & Kervin, 2008).

The term digital native erroneously assumes that millennials are a homogeneous generation (Hargittai & Hinnant, 2008; Jones, Ramanau, Cross, & Healing, 2010). In fact, digital learning is multifaceted and in addition to age (Brown & Czerniewicz, 2010; Helsper & Eynon, 2010), personality (Correa, Hinsley, & De Zuniga, 2010), access, opportunity, as well as familiarity and use (Brown & Czerniewicz, 2010) should be considered. More specifically, advanced education and a resource-rich background (Echenique, 2014; Hargittai & Hinnant, 2008) contribute significantly

to differences in use of digital media. Digitality, then, can be thought of as a form of cultural capital, which in turn is a subset of social capital (Bourdieu, 1986). Since first discussing digital natives in his article, Prensky (2009) now uses the term digital wisdom. Hence, rather than focusing on the definition of "a digital native," we support the phrase "digital learner" and the concept of "digital intelligence" (Adams, 2004; Echenique, 2014).

"Today's learners, regardless of age, are on a continuum of technological access, skill use and comfort" (Echenique, 2014, p. 170). Digital learners use only a subset of technology beyond computers, phones, and email (Kennedy, Judd, Churchward, Gray, & Krause, 2008). Digital use may be based on cost, immediacy, and familiarity (Bullen, Morgan, & Qayyum, 2011). Furthermore, Margaryan, Littlejohn, and Vojt (2011, p. 429) indicate that "students' attitudes to learning appear to be influenced by the approaches adopted by their lecturers." Echenique (2014, p. 173) suggests that we "develop a comprehensive understanding of the issues, considering factors such as age, gender, education, culture, experience, institutional context, learning design, social inclusion and exclusion, subject discipline, and socio-economic background."

Technology has also had a profound effect on post-secondary academic institutions, especially in the extent and nature of distance and online education. Academics now commonly incorporate digital information and communication technologies in their courses and integrate mobile devices and social media (e.g., podcasts, blogs, Twitter, Facebook, and Instagram) (Rupp, 2016). The debate over the effectiveness of online versus place-based education has concluded that there is no significant difference in learning outcomes (Thomas, 1999); in fact, in many areas, online education has proven to be a more effective option.

The next section introduces the topic of communities of learning in relation to online education.

## 4 Communities of Learning

One of the trends in learning theories has been a move away "from an individual and cognitive perspective to knowledge as socially constructed" (Hemetsberger & Reinhardt, 2006, p. 189). Both the Community of Inquiry and Community of Practice frameworks are based on a social constructivist approach to learning. Constructivist approaches to education originated from the work of psychologists and educators such as Jerome Bruner (1987), Jean Piaget (Wadsworth, 1996), and Lev Vygotsky (1987). Cognitive learning theories typically emphasize a single reality, knowledge reproduction, abstract instruction, a predetermined sequence of instruction, and competitive knowledge construction (Jonassen, 1994). In contrast, constructivist learning emphasizes individual knowledge construction, authentic tasks set in a meaningful context, and real-world, experiential learning environments or case-based learning. Constructivist learning encourages thoughtful reflection incorporating knowledge through experience and shared knowledge construction.

According to Soffel (2016), the World Economic Forum identified the 16 critical twenty-first-century skills required in today's technology-driven workplace:

> To thrive in a rapidly evolving, technology-mediated world, students must not only possess strong skills in areas such as language arts, mathematics and science, but they must also be adept at skills such as critical thinking, problem-solving, persistence, collaboration and curiosity. (Bailey, Kaufman, & Subotić, 2015, p. 1)

Group interactions in both a Community of Inquiry and a Community of Practice are collaborative and similar in that members actively engage in purpose-based learning or working groups that require knowledge, application of curiosity, critical thinking, problem-solving, collaboration, and persistence. As Doolittle (1997, p. 85) states, "mental functioning is not merely absorbed or transmitted verbatim from teacher to student but actively constructed by the individual as the result of social experience."

## *4.1 The Community of Inquiry Framework*

The Community of Inquiry is a prevailing research-based framework based on social constructivist pedagogical principles. The perspective was developed specifically for online distance education and is comprised of three components identified as being crucial to nurturing deep and meaningful learning: social presence, cognitive presence, and teaching presence. Community of Inquiry pedagogy metrics include open communication, group cohesion, collaboration, problem exploration, integration and resolution, information exchange, connecting ideas, application of new ideas, organization, discourse facilitation, and focusing discussion, among others. The Community of Inquiry is one of the most enduring and influential online pedagogical frameworks and has been used and researched extensively in varying business education contexts with varying populations (Kineshanko, 2016).

Garrison et al. (2000) grounded the Community of Inquiry framework on Lipman's (1991) interpretation of a classroom community of inquiry, Dewey's (1933) concept of practical inquiry, and their own construct of teaching presence. In an analysis of classroom educational processes, Lipman (2003, p. 20) defined a community of inquiry as a classroom in which:

> Students listen to one another with respect, build on one another's ideas, challenge one another to supply reasons for otherwise unsupported opinions, assist each other in drawing inferences from what has been said, and seek to identify one another's assumptions.

Figure 1 depicts the Garrison et al. (2000) Community of Inquiry model. The three overlapping circles represent the social, cognitive, and teaching presences and their relationships to each other; the phrases in the intersecting areas identify processes that might occur within the framework. In the words of Garrison et al. (2000, p. 88), "The model of this Community of Inquiry assumes that learning occurs within the Community through the interaction of three core elements."


**Fig. 1** Community of Inquiry model (Garrison et al., 2000)

The Community of Inquiry model strengthens cognitive thinking (self-directed learning) strategies – especially reflection, metacognition, and discussion – skills and abilities that are critical for success in the digital work world. Garrison et al. (2000) maintain that Communities of Inquiry encourage cognitive independence and social interdependence simultaneously "It is the asynchronicity and connectivity properties of online learning that offer the potential for the unique integration of reflective and collaborative learning opportunities" (Garrison, 2002, p. 10). The Community of Inquiry model has much in common with the Community of Practice model (Friedman, 2005).

## *4.2 The Community of Practice Framework*

In the workplace learning field, Communities of Practice emerged out of situated learning theory (Fenwick, 2008). Situated learning is a workplace learning theory. In contrast to cognitive learning theories (Handley, Sturdy, Fincham, & Clark, 2006, p. 642), situated learning theory states that learning is "emergent, involving opportunities to *participate* in the *practices* of the community as well as the development of an identity which provides a sense of belonging and commitment." The socially constructed views of learning emphasize the tacit dimension of learning (Handley et al., 2006). Tacit knowledge of affective and conative capacities such as the ability

to value, appreciate, care, act, decide, or commit (or know-how) (Duguid, 2005) is shared through socialization (Granovetter, 1985).

Communities of Practice involve "groups of people who share a passion for something that they know how to do, and who interact regularly to learn how to do it better" (Wenger, 2004; p. 2). According to Wenger, Community of Practice members belong to a social learning system. They demonstrate this in how they *engage* with each other, their use of *imagination* to comprehend and reflect on discussions, and *align* undertakings to improve practices (Wenger, 1998). Sample activities toward practice-oriented learning include problem-solving, asking for information, seeking advice, recording experiences, and identifying knowledge gaps (Roberts, 2006). Communities of Practice also involve legitimate peripheral participation whereby new members become practitioners through gradual involvement.

The Community of Practice literature also addresses the concepts of power and trust within the communities. Power and trust are interrelated concepts. Since community members vary with respect to their formal and informal roles within the organization, issues of power can arise in how members engage with each other including between new and experienced Community of Practice members (Roberts, 2006). Trust is necessary for tacit knowledge exchange and "indicates an ability to share a high degree of mutual understanding, built upon a common appreciation of shared social and cultural context" (Roberts, 2006, p. 628).

Given that traditional course development focuses on cognitive learning over socially constructed learning (as nurtured in communities of learning), the next section addresses topics to help academics and instructional designers develop courses for tacit knowledge transfer.

## 5 Designing Courses for Tacit Knowledge Transfer

Content-focused courses that center primarily on cognitive skills such as remembering, understanding, and applying have been the norm in post-secondary education for many decades. It is very different in virtually every aspect, for both academics and instructional designers, to plan effective, engaging online business courses for digitally immersed students who:

> …are used to receiving information really fast. They like to parallel process and multi-task. They prefer their graphics before their text rather than the opposite. They prefer random access (like hypertext). They function best when networked. They thrive on instant gratification and frequent rewards. They prefer games to "serious" work. (Prensky, 2001, p. 2)

The topics of learning outcomes or goals, instructional design, learning activities, teacher and student roles, technological advancements, and assessment must be considered (Lombardi, 2007). We are not in any way suggesting that academic standards, rigor, or outcomes be compromised; we are, however, championing Vygotsky's (1896–1943) construct of a zone of proximal development as the foundation for learning structured in such a way that these types of learners in particular,

and all learners in general, see the relevance of and feel an impulse to engage in exploration of the content and processes (Doolittle, 1997). Vygotsky's zone of proximal development is based on his position that learning is constructed in an individual's mind as the result of social experience. The zone of proximal development is dynamic with learning or cognitive growth limited at the lower end "by that which he or she can accomplish independently, and on the upper end by that which he or she can accomplish with the help of a more knowledgeable other such as a peer, tutor, or teacher" (Vygotsky, 1987, p. 85).

## *5.1 Learning Outcomes*

Anderson, Krathwohl, and Bloom's (2001) revision to Bloom's taxonomy (Bloom, 1984) is widely used to develop curricula and evaluation material. Bloom's original taxonomy was an ordering of stages learners progress through when learning content in the cognitive domain. Bloom's taxonomy is also a popular starting point to develop learning outcomes. However, according to Lombardi (2007), courses designed with content transmission as the primary goal overlook three other key learning domains, namely, affective, psychomotor, and conative. In particular, tacit learning in the affective and conative domains requires the use of authentic content, problem-based activities, and collaborative group work with non-expert and expert participants on authentic projects that "culminate in the creation of a whole product" (p. 4).

Designing courses that intentionally incorporate activities intended to assist students in deepening tacit skills must involve using a framework that defines tacit learning as well as cognitive outcomes.

## *5.2 Instructional Design*

Rethinking instructional design for digital learners is key to achieving high levels of student engagement and strong learning outcomes. Lombardi (2007) identifies ten design elements:

1. Real-world relevance
2. Ill-defined problems
3. Sustained investigation
4. Multiple sources and perspectives
5. Collaboration
6. Reflection (metacognition)
7. Interdisciplinary perspective
8. Integrated assessment
9. Polished products
10. Multiple interpretations and outcomes.

**Table 1** Twenty-first-century skills

| Foundational literacies | Competencies | Character qualities |
|---|---|---|
| How students apply core skills to everyday tasks | How students approach complex challenges | How students approach their changing environment |
| Literacy | Critical thinking and problem-solving | Curiosity |
| Numeracy | Creativity | Initiative |
| Scientific literacy | Communication | Persistence or grit |
| ICT literacy | Collaboration | Adaptability |
| Financial literacy | | Leadership |
| Cultural and civic literacy | | Social and cultural awareness |

The commonly used instructional design ADDIE framework (Grafinger, 1988; Molenda, 2003) that consists of five stages including analysis, design, development, implementation, and evaluation addresses acquisition of the six skills considered as foundational literacies by Bailey et al. (2015) and which fall largely into the cognitive learning domain. Courses intended to inculcate the ten other requisite twenty-first-century skills in the competencies and character qualities categories shown in Table 1, and which fall into conative and affective learning domains, are best designed using a social constructive learning framework such as Garrison et al.'s (2000) Community of Inquiry.

Garrison et al. (2000) define specific indicators for each of the three presences in a community of inquiry. The indicators are detailed so researchers have a clear metric by which to identify occurrences of behaviors that indicate social, cognitive, or teaching presence in online discussions. Table 2 shows the indicators within each presence.

The course interface and user experience must be thoroughly thought through from the appearance; layout; functionality; access mode such as mobile, tethered, or untethered; size of content bites; overall duration; and integration of third-party applications such as social media, video, pictures, and audio. Fadel and Dyson (2010, p. 72) state "that interface design can increase the number of interactions and enhance the perceived social presence in e-learning environments."

Creating and sustaining social presence in online courses depend on the ease of communicating genuinely, openly, and with emotion. Interaction and communication modalities and methods must be considered, especially as all participants will be interacting with content, other students, teachers, and possibly external experts or organizations. Digital learners instinctively reach for a mobile device to communicate semi-synchronously by text or synchronously by voice and video. Communication in online courses is often constrained by the boundaries of the institutional learning management system (LMS). However, while some LMS such as Canvas have developed mobile applications that allow students to access a few of the features of the LMS on a handheld mobile device, most LMS still require access through personal computers for full functionality.

**Table 2** Community of Inquiry coding template

| Community of Inquiry coding template | | |
|---|---|---|
| Elements | Categories | Indicators (examples only) |
| Cognitive presence | Triggering event | Sense of puzzlement |
| | Exploration | Information exchange |
| | Integration | Connecting ideas |
| | Resolution | Applying new ideas |
| Social presence | Emotional expression | Emotions |
| | Open communication | Risk-free expression |
| | Group cohesion | Encouraging collaboration |
| Teaching presence | Instructional management | Defining and initiating discussion topics |
| | Building understanding | Sharing personal meaning |
| | Direct instruction | Focusing discussion |

Adapted from Garrison et al. (2000, p. 89)

Teachers can feel impatient and quick to judge students for not taking the time to read the online course material. Some may feel frustrated and think they are now "spoon-feeding" learners when they attribute student traits to generational differences. It is helpful to pause and reflect on what a digital learner is as covered in this chapter (as a concept that goes beyond age) that there is a range of digital intelligence and that concepts of designing courses for tacit knowledge transfer may assist in bridging these challenges.

The constraints of the traditional LMS frequently clash with the strong preferences of digital learners for instant, seamless communication. Course designers and academics must also be aware of this conflict and, if possible, choose the primary course platform accordingly or adapt content within the constraints of the LMS and/or adopt much more loosely structured learning networks (Siemens, 2005).

## *5.3 Learning Activities*

Learning activities must include authentic learning or learning by doing (Avrahami et al., 2008; Bailey et al., 2015; Lombardi, 2007). The formation of effective learning communities and development of social, teaching, and cognitive presences depend upon interactivity and engagement. "Continuous coaching and feedback can reinforce the power of learner-led discussions to foster more interdependent learners so they can conduct inquiries and model problem solving and collaborative learning" (Stein, Wanstreet, Slagle, Trinko, & Lutz, 2013, p. 83).

## 5.4 Teacher and Student Roles

Of the suggestions in this chapter, this one ranks high in importance for the formation of successful communities of learning yet may require the most effort for both teachers and students to implement. The traditional role of the teacher as the pedagogue dispensing knowledge to be consumed by students has no place in a social constructivist learning environment. Rather, as Bates (2015, p. 1) implores, teachers must adopt "facilitation of learning ('teaching') practice." Students too must acclimate themselves to a much more active role. The Community of Inquiry teaching presence signifies facilitation, as "a responsibility that may be shared among the teacher and some or all of the other participants or students" (Garrison et al., 2000, p. 90).

## 5.5 Technological Considerations

It is tempting to adopt technologies first and then form the learning around the technology. In fact, it should be the opposite – ideally, the technology should be chosen based on the learners and the learning outcomes. "Technology alone will not replace intuition, good judgment, problem-solving abilities, and a clear moral compass" (Prensky, 2009, n.p.). Lopes and Dion (2015, p.3) provide several best practice suggestions for implementing technology in education cautioning "new technologies should be implemented not for their own sake but with a specific goal or learning outcome in mind."

Anderson and Dron (2012) and Bates (2015) point out that old technologies do not disappear when new ones arrive, "but rather the repertoire of options available to distance education designers and learners has increased" (Anderson & Dron, 2012, p. 2). It is critical that technological considerations enhance, not inhibit or detract from the learning. Where and by what means learners will access the online classroom are determining factors. For example, even with the advances and developments related to mobile technology "ownership does not have a direct relationship to proficiency" (Teachonline.ca, 2016, n.p.).

## 5.6 Assessment

Assessment must be carefully considered and aligned with content, learning outcomes, and learning domains. "Evaluations of traditional, online, and blended approaches to higher education teaching indicate that the most commonly misaligned factor is assessment" (Reeves, 2006, p. 294).

Bates (2015) maintains assessment is the single most powerful determinant of student behavior in that learners focus on what will be assessed and how they can be

successful in that assessment. Terenzini (1989) recommends considering the following factors before planning assessment strategies: (1) What is the purpose of the assessment? (2) What is the scope of the assessment? (3) What is being assessed? Lombardi (2007) endorses the interweaving of assessment throughout the course in authentic ways similar to real-world evaluations including observations of student engagement, peer review, and personal reflections.

In this section, readers were introduced to a number of topics that should be considered in designing courses for tacit knowledge transfer. Online courses based on the Community of Inquiry framework have much in common with Communities of Practice that business students will experience in the workplace. There are many resources available to assist readers in developing and improving their online courses so that they place more of an emphasis on socially constructed knowledge as per the communities of learning and Vygotsky's zone of proximal development (Vygotsky, 1987).

## 6 Concluding Comments on Inculcating Digital Intelligence Skills

As mentioned in section "Digital Learners and Digital Intelligence" of this chapter, students born between 1980 and 1994 make up a large proportion of the current post-secondary student body. This net generation and its "digital native" or "millennial" members (Echenique, 2014) are, according to Prensky (2001, p. 2), "native speakers of the digital language of computers, video games and the Internet." These students possess an innate understanding of communicating in a hyper-connected, digital world but not necessarily "*the ethics*, *politics*, *sociology*, *languages and other things*" [emphasis by author] that Prensky (2001, p. 5) refers to as "Future Content." Successfully learning the explicit content of a course does not translate to an understanding of how to apply that knowledge in a professional or organizational setting. Duguid (2005, p. 111) states that the "accumulation of know *that* does not lead to knowing *how*" or as Ryle (1949, p. 41) concluded "we learn *how* by practice." Cultivation of tacit digital intelligence requires close interactions between novices and experts that provide opportunities to observe, practice, and model digital language and social practices in culturally representative environments. Vygotsky (1987) saw cognitive development as a form of enculturation where students internalize culture through interactions with others within their zones of proximal development. According to Adams (2004, p.49) "intelligence becomes a measure of enculturation, combining knowledge and the ways of knowing with the ability to interact effectively in a cultural or community setting." Online learning, designed upon a social constructivist collaborative learning model and with consideration to Vygotsky's zone of proximal development (Vygotsky, 1987), has the potential to heighten inculcation of cultural norms and transferability of digital language and social practice competencies to business environments.

"By acknowledging the existence of a new digital intelligence and all of the implications this acknowledgement may create for education and communication, we increase our ability to develop effective strategies to accommodate this new intellectual style" (Adams, 2004, p. 93). Similar to the debate in the digital learning literature including the critiques on the use of language such as "digital natives," the language (terminology or nomenclature) that business students and graduates use regarding digital learning is important both in terms of political correctness and in relation to group effectiveness. In addition to learning how to be effective learners in online communities, business graduates striving to be successful in the digital world will benefit by being mindful and aware of these points.

As discussed in this chapter, digital learning and intelligence is multifaceted and not simply based on age, personality, access, opportunity, familiarity, and use. Through online education, in addition to course knowledge, business students can also learn how to engage in learning conversations based on a community of inquiry. Since both Communities of Inquiry and Communities of Practice are socially constructed learning frameworks that share many similarities, students who have engaged in social constructivist Communities of Inquiry-based learning environments may more easily adapt to professional Communities of Practice. They will be able to draw from and transfer their skills and experiences acquired in online communities of inquiry as they engage in Communities of Practice.

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# Development of Personal Learning and Social Networks: Strategies for Knowledge Creation and Sharing in Online Learning Environments

**Natalie Solveig Mikhaylov**

**Abstract** In the chapter, the author will address the role of informal networks in transcultural knowledge creation and the strategies online learners employ to develop these networks. It is recognized that an increase of global social capital, development of a global mindset, and increase in transnational competences are some of the desired outcomes of business education, and these competences are relevant for international organizations. However, inadequate attention has been paid to how such developments occur in an online environment and what factors enhance or hinder the learning process. The chapter will open with a brief overview of the role social capital plays in the development of networks, followed by a discussion of different types of networks that can either promote or hinder knowledge creation in online education. It will then discuss the different strategies learners apply in development of networks, followed by an evaluation of these strategies' effectiveness. Then a model of an effective knowledge-sharing network will be presented and analyzed. Further, examples of different types of social and personal learning networks in which learners participate and which they develop will be provided, to illustrate knowledge-sharing routes and to pinpoint knowledge creation hubs in these networks. The chapter will argue that in contrast to the widespread opinion that online learners are disadvantaged in social capital development, they benefit from the interconnected learning space and can develop professional and social networks and collaborative knowledge more successfully than their peers in traditional learning environments.

In conclusion, recommendations for individual online learners will be presented regarding the best approaches for development of long-lasting, functional networks oriented on transcultural knowledge sharing. Recommendations for international higher educational institutions on how to promote networking among learners, as well as collaborative and cross-cultural knowledge creation, will be presented as well.

**Keywords** Collaborative knowledge creation • Social capital • Personal learning networks • Global mindset • Transnational competence

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## 1 Introduction

An increase of global social capital, development of a global mindset (Levy, Beechler, Taylor, & Boyacigiller, 2007), and an increase in transnational competences are some of the desired outcomes of business education (Jones, 2013), and these competences are relevant for international organizations (Gupta & Govindarajan, 2002; Nummela, Saarenketo, & Puumalainen, 2004). At the same time, an exponential increase in online educational opportunities, in a variety of formats, from massive online open courses (MOOCs) pioneered in 2008 by George Siemens and Stephen Downes to blended courses where traditional class instructions are enriched with some online tools, brought up questions of whether and how such competencies could be developed without face-to-face interactions among students and with instructors. While online education (OE) has a capability to bring in one virtual classroom students from different parts of the world, inadequate attention has been paid to how transnational competencies and global mindset developments occur in an online environment and what factors enhance or hinder the learning process. One of the fundamental assumptions of online education is an ability to create an instructional experience comparable in quality to "traditional" classrooms but without the constraints of time and space that are inherent in it (Sanchez & Khan, 2016). Yet even on a traditional college campus, the diversity of students and faculty does not necessarily result in enhanced transcultural competence development; therefore, the mere presence of classmates from diverse cultures would not be sufficient in OE as well. To develop such competencies, the students would have to use certain network building and learning strategies. It can be argued that the most functional strategies can be best applied specifically in the OE environment.

## 2 Social Capital and Development of Networks

While online learning removes numerous barriers to the educational access, and many students can benefit from courses delivered online, few are able or willing to complete the courses. For example, for MOOCs the dropout rate consistently stays close to 90% (Downes, 2008), and not all learners who complete a course can successfully pass it. However, the ones who tend to complete and benefit from OE are adult learners with professional experience currently in the workplace (Cusumano, 2013). These findings are not surprising, as Udacity, a provider of MOOCs and corporate training, co-founder, and Stanford professor Sebastian Thrun points out: "At the end of the day, the true value proposition of education is employment… If you focus on the single question of who knows best what students need in the workforce, it's the people already in the workforce" (Chafkin, 2013, p. 10).

One of the reasons that professional adults benefit more than novice learners from online learning environment is because it is consistent with principles of adult learning (Knowles, 1973). A study conducted in 2010 among management students in OE measured the learners' preferences using the Assessing the Learning Strategies

of Adults (ATLAS) instrument and found their inclinations to be consistent with the adult learning choices that online learners favor, namely, courses that require self-direction, have a variety of options and learning tools, allow for personalization, and involve a learning community (Arbaugh, Desai, Rau, & Sridhar, 2010).

In general, the main characteristic of OE is derived from the constructivist model of learning, or the idea that knowledge is constructed, and not transferred from one individual to another, as well as discovery learning (Vygotsky, 1978) and facilitated learning (Rogers, 1983). The constructivist approach to learning and knowledge creation, in turn, is based on social learning theory (Bandura, 1977), which is frequently applied as an explanation of learning processes in multicultural environments; an online learning community in an international educational institution is, by its very nature, multicultural and global, as it involves students from different cultural, professional, religious, and national backgrounds. Specifically, social learning theory (ibid) proposes that in cross-cultural situations, learners benefit from feedback from mentors (instructors in OE) as well as peers, provided that such feedback is delivered in a socially safe environment where moderate risk-taking is encouraged (Caligiuri & Tarique, 2012). In addition, intergroup contact theory (Allport, 1954) requires that the conditions of cooperation, equal status, and interaction be met for learning to take place, as well as an increase in mutual understanding, empathy, and perspective taking (Pettigrew & Tropp, 2008) – these conditions may be present in online learning environments, where faculty members may take the role of facilitators rather than teachers with privileged knowledge. However, while feedback and social interactions are necessary for knowledge creation and sharing, they alone are not sufficient. Besides these, a learner should possess sufficient social capital, and shared trust should exist among the learning community members to engage in networks and new knowledge creation (Inkpen & Tsang, 2005).

A learner prefers establishing connections with persons with higher or at least equal knowledge (Wang, 2013), yet, in a traditional classroom, it could be a challenging task to find such persons, as the level of knowledge is not always apparent to other learners. Instructors provide individual feedback to students, and students do not have access to work of others or instructors' assessment of it. In OE, all learners engage in discussions and share opinions and ideas, and therefore, their knowledge and the initial social capital levels of learners are apparent. Also, besides engagement in formal learning activities, students have access to informal networks, where the information and knowledge can be accessed and exchanged without any party intentionally searching for it, resulting in additional knowledge and social capital creation (Lin, 2008). Therefore, in contrast to traditional educational settings, OE allows for an exchange of knowledge and information from formal to informal networks and for bridging among different networks. Learners are also likely to have and use access to networks and sources outside the learning environment, including professional and social sharing sites, YouTube videos, news, discussion boards, and so on. They can incorporate their social, professional, educational, and other networks, as well as enrich them with other sources of knowledge and information available to them. However, not all networks are equally beneficial for knowledge development and sharing and for collaborative transcultural knowledge creation in online environments.

## 3 Different Network Types and Their Role in Knowledge Creation

It is recognized that looser networks of weak ties are more likely to result in knowledge sharing than a bonding network of strong, long-lasting connections (Granovetter, 1973). In knowledge creation, learners are likely to build personal learning networks (PLNs) (Couros, 2010) to utilize social capital (Bourdieu, 1986) or "resources embedded in one's social networks, resources that can be accessed or mobilized through ties in the network" (Lin, 2008, p. 51). Several theories of learning address knowledge created and shared in social interactions, for example, situated learning, which views learning as social construction occurring in communities (Lave & Wenger, 1991), and knowledge created in networks (Kayes, Kayes, & Yamazaki, 2005).

Putnam (1995) proposes two types of networks built on social capital utilization – closed binding networks that consist of close friends and family members and are used mostly for emotional support and bridging one, with looser and weaker ties of acquaintances based on professional identities and shared interests. The knowledge is more likely to be shared and created in the latter, as network members have access to more diverse information sources and thus the sharing would result in tangible pragmatic benefits for the members of such networks (Granovetter, 1973). However, these network categories were developed prior to the wide availability of information, discussion tools, and professional sharing networks. The connectivism theory of network learning (Siemens, 2014), called the learning theory for the twenty-first century, suggests that even more pragmatic ties are more appropriate to knowledge sharing and creation in the interconnected networked social reality, as these ties combine social and informational resources that operate in a chaotic environment and recognize rather than create patterns of meaning.

Downes (2008) suggested that network building is, in fact, learning and that knowledge should be understood as a pattern recognition rather than an acquisition of facts or understanding. Therefore, because social networks and online classes, in contrast to more formal traditional academic ones, are less structural and more fluid, learners tend to interact based on shared professional interests and values, not just academic ones; in addition, they invest into the network the social capital from other relationships and networks (Lin, 2008). Specifically, in management OE a student is expected to share professional and cultural knowledge developed through not only academic but also professional experiences, in different roles and locations. While the same could be true for a traditional MBA or graduate-level master course, it is unlikely that all students would participate equally and be able to share their knowledge and experiences. Nonacademic and nonprofessional factors might negatively influence the social capital of a student, for example, the country of origin, fluency in the language of instruction, accent, and other social factors, and thus limit the development of networks.

In contrast, in an online environment, such restraints are somewhat mitigated, and learners present their constructed identities as they are related to the subject and

topic. Increase in the demand and the changing mode of delivery and understanding of the goals of higher education have changed the traditional concepts of student identity (Naylor, Baik, & James, 2013), allowing learners build identity experiences from a variety of academic, lifestyle, professional, and cultural experiences (Kelly, Coates, & Naylor, 2016). However, when learners attempt to create networks based solely on cultural identity, be that national, regional, gender, or corporate culture, which is often the case in a traditional educational environment, the results are rarely conducive for knowledge creation or social capital development, regardless where these networks based on similarity, or with learners sharing a culture, or on novelty, or a desire of learners to connect with representatives of another culture (Mikhaylov & Fierro, 2015). The similar pattern can be found among expatriate employees from a common cultural background or of a national origin, who tend to create bonding networks (Adler & Kwon, 2002), which are not advantageous for producing and sharing of cultural knowledge.

Therefore, the types and the characteristics of a network a learner chooses to create affect not only the learning experiences but, ultimately, the learning outcomes. A learner could maintain separate networks built on his/her social, professional, political, or interest identities and not allow them to overlap. It could be pointed out that frequent advice given to young graduates is to create a professional identity that is not connected with their social one for networking and professional activities. While it might be a sound suggestion, it is unlikely to be realistic as many HR professionals require access to social network sites from candidates as a matter of policy. A similar approach would be to separate online presence and real-life activities; however, this tactic is also unlikely to be productive, principally for learners in formal education as most informational and educational resources are available only online, and that is particularly true for online students.

Young adults tend to have limited networking and professional experiences, and therefore they create situational networks; in other words, they connect and form ties with others based on opportunity rather than similarity of interests or expected benefits. Situational networks might be formed and maintained with classmates from primary school, neighbors, or distant relatives. Such networks are unlikely to be beneficial for a learner as they are bonding and lack diversity of resources and knowledge available for the members (Mikhaylov, Fierro, & Beaumont, 2016). Older and more experienced learners, on the other hand, are more likely to create multidimensional and loosely connected PLNs that incorporate multiple networks and social media presence, use problem-solving models of knowledge creation, and are more likely to participate in collaborative knowledge creation, including the transcultural one. However, few traditional college students engage in network-building activities, and most tend to use their social capital and connections primary for bonding purposes, emotional support, and entertainment (Mikhaylov, Beaumont, & Fierro, 2016). Figure 1 presents an example of ineffective knowledge sharing in a situational non-connected network.

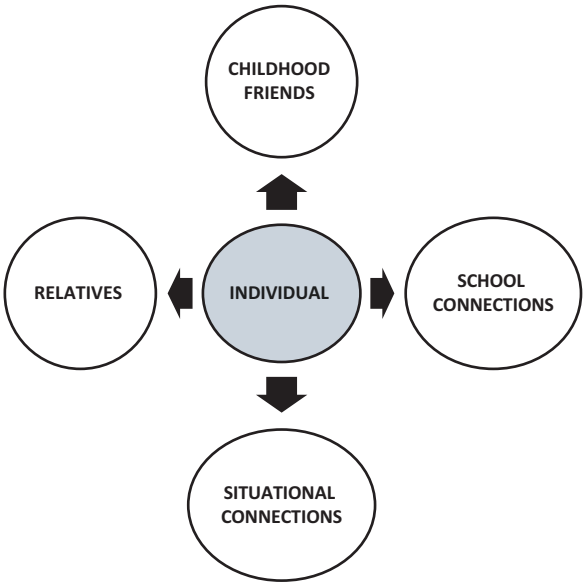


**Fig. 1** An example of ineffective knowledge sharing in a situational non-connected network

## 4 Effective Knowledge Sharing Network

In a connectivism approach to learning, knowledge is created when it is shared with a learning community, referred to as a node, which Siemens (2014) defines as "the clustering of similar areas of interest that allows for interaction, sharing, dialoguing, and thinking together." For a network to be classified as a learning community, it is required not only to share, but to create knowledge and be connected to other communities (Downes, 2008). Also, knowledge can be not only shared, but stored in a variety of digital forms. Therefore, a learner has to use social media tools to store and share information to create effective PLNs and, ultimately, nodes or connected learning communities.

Personal learning environments (PLEs) not only connect learning communities but also allow learners to share resources, participate in collaborative knowledge creation, and manage their sense-and-meaning-making process through social media, for example, social networking sites, such as LinkedIn and Facebook; blogging and microblogging, such as WordPress or Twitter; media sharing sites such as YouTube; and cloud computing office tools that enable sharing. In an online learning environment, social media tools can be incorporated in academic platforms, such as Blackboard or Moodle, or be used in addition to virtual classrooms. While PLE allows a learner to personalize information and knowledge and share it with others, an obvious requirement is an ability to use the social media for knowledge creation. However, most students tend to use social media either for entertainment, as sharing jokes, or for keeping in touch with their connections, for example, WhatsApp messaging; few and mostly older students use social media for professional, academic, or cultural knowledge creation (Mikhaylov, Beaumont, & Fierro, 2016).

Dabbagh and Kitsantas (2012) propose a three-stage pedagogical framework to application of social media to support self-regulated learning in PLEs. At the first stage, an instructor just encourages the students to use social media, such as wiki, blogs, and shared calendars, and social networking to store and organize information, to make personal planning, and to maintain a professional presence; then, at the second stage, the instructor asks the students to interact and collaborate, and finally, they progress to information aggregation and management. However, when such activities are presented as a class assignment, they can hardly be considered self-regulated learning, and young adult learners prefer to keep their academic and professional activities separate from social and entertaining ones. While students might believe that social networking sites in principle could be useful for course materials' sharing and discussion, in practice, only a small minority reports using it, and in general, time spent on social media, specifically on Facebook, negatively correlates with a grade point average (Tess, 2013). Learners need not only access to the information but also curiosity and ability to integrate and incorporate knowledge into their worldviews, including new cultural knowledge, to develop new worldviews (Mikhaylov, 2016).

Therefore, it is not sufficient to make sure that learners have access to social media and skills to use it. To create PLNs and PLEs, a learner must have an integrated approach to knowledge sharing; be proactive and opportunistic in maintaining, developing, and building networks; and seek to join existing networks and learning communities based on shared interests, values, competences, and needs (Mikhaylov, 2014b). The most effective strategy for developing learning communities and knowledge sharing networks is to apply current social capital and a cultural and professional identity to access existing networks. Then, when a learner finds an additional shared interest or a competence (academic, professional, cultural, or social) and through an introduction, or an active access, joins another network, where the process would be repeated. To continue the process, a new network can be developed and connected with the previously existing ones, and to share and store information, social media tools are incorporated. Through joining various complementary networks, knowledge is created, shared, and stored in digital format available to other learners (Mikhaylov & Fierro, 2015).

The process, as depicted in Fig. 2, starts with an individual joining a new network through an introduction or as a new connection or a member of a new network. At the same time, the individual accesses information on the Internet and joins a social media or a professional site. The new information is stored and results in new knowledge that can be shared or stored and in turn results in new knowledge. Based on the new networks joined and new interests and competences developed, a new network can be created, resulting in new competence, which can be shared, and ultimately, the result is an increase in social capital, knowledge creation, and access to more networks.

To accomplish this process, learners should be able to develop new identities, as well as adapt their knowledge creation and sharing behaviors to their current identities and personalities, including the preferred learning styles, which would influence the type of a PLE a learner would create. Besides, a learner would need to integrate

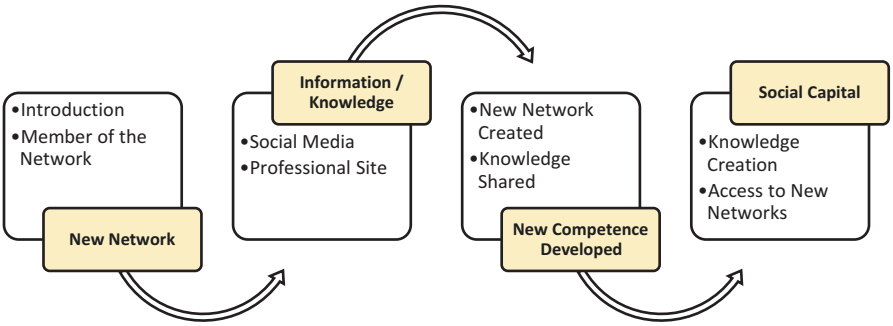


**Fig. 2** A process of knowledge creation in PLNs and PLEs

various social, professional, and cultural identities. Learners who do so successfully are more likely to be satisfied with their knowledge creation process and to feel belonging to a global community, as well as to maintain personal integrity, to project trustworthiness, and to develop global social capital (Mikhaylov, 2014a).

While creation of a new or an enhanced professional, social, or academic identity might seem a daunting task, according to the cultural identity perspective, personal identities can be multiple, fluid, and context specific (Hall, 1992), and, while it is possible and desirable to develop a new transnational role identity or revise an existing role identity (Kohonen, 2004), it is more feasible to do in a novel cultural or learning environment (Kraimer, Shaffer, Harrison, & Ren, 2012). It is recognized that developing and revising a role identity are conductive to personal and professional growth (Kohonen 2004, 2008; Makela & Suutari, 2009) and that involvement in a community or a network based on this identity increases the significance of new identity, specifically a transcultural and global one (Kohonen, 2008).

The process of participation in multiple PLNs based on fluid identities is illustrated in Fig. 3. A learner can develop multiple fluid identities, which can be applicable to situational knowledge development. Some of the most common ones are presented in Fig. 3. The circles represent other possible shallow identities that can be used for connection and leveraging of social capital. These identities are dynamic and overlapping and can be activated in the process of knowledge sharing and creation.

## 5 Online Learners

In contrast to the widespread opinion that online learners are disadvantaged in social capital development, they benefit from the interconnected learning space and can develop professional and social networks and collaborative knowledge more successfully than their peers in traditional learning environments. Online learners are ideally situated to accomplish both the building of the individualized PLEs, both through the tools available on the learning platforms and web-based, and creating new professional and cultural identities. They are unlikely to engage in binding

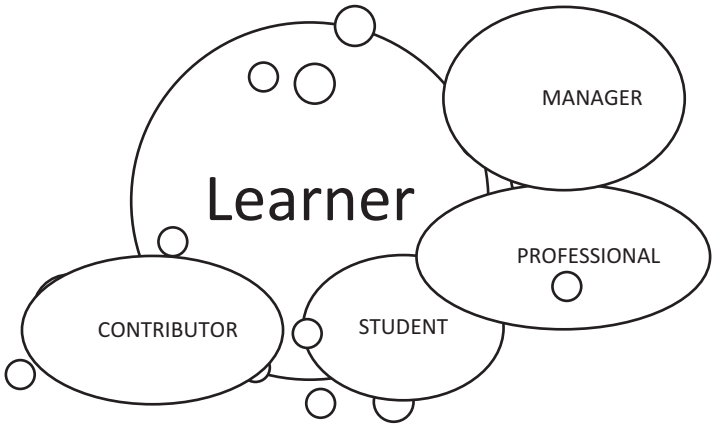


**Fig. 3** Example of multiple fluid contextual identities

networks' development as they would not have access to situational and binding networks in their learning environment, and they would be unlikely to join national or regional culture-oriented networks or limit their interactions to representatives of the same country, industry, or profession.

Online learners are likely to develop a new identity or enhance an existing professional one and engage in the consolidation of perspectives and knowledge across professional and cultural domains (Jeannet, 2000) and, eventually, develop a global mindset or an ability to influence individuals, institutions, and groups different from them (Gupta & Govindarajan, 2002). While some online learning institutions attempt to compensate for a lack of face-to-face contacts among students and between a student and an instructor, such contacts are a weak indicator of both student satisfaction and learning outcomes. In contrast, the course design is the strongest predictor of satisfaction, while intrinsic motivation of a student affects learning outcomes most positively (Eom & Ashill, 2016). It is possible that the course design conducive to self-directed learning and the development and application of PLEs result in higher satisfaction, and an intrinsic motivation to apply them results in higher learning outcomes.

In a traditional classroom, university students do not use social media, blogs, sharing website, and other digital tools available on the web to a large extent, so the idea of digital natives is mostly a myth (Margaryan, Littlejohn, & Vojt, 2011). In addition, general preferences for communication are to use less rich media for professional high-risk communication and for users with low self-esteem and high anxiety (Joinson, 2004). While limited research is available on how online students construct and evaluate their identity, students in online courses tend to perceive an instructor with non-native English accent as less likable and rate such an instructor lower than a native speaker, even though a non-native accent does not impact learning outcomes (Sanchez & Khan, 2016). By extension, we might conclude that learners with a non-native accent would be anxious to appear more knowledgeable and likable and hide their accents; thus they would prefer to communicate in writing. Based on the anecdotal

evidence in online courses, students prefer written communication even in synchronic sessions where both audio and video features are available.

Apparently, there is a preference for less rich communication media, the one that allows students to use a shallow identity and that does not specify origin, language skills, and other personal characteristics but focuses on professional and academic ones. Arguably, the same shallow identities would permit learners to engage in behavior that can be considered a high interpersonal risk, for example, a disagreement, or allow to establish a connection with a stranger. Media users tend to express stronger opinions, values, and emotions when engaged in a less rich media, for example, a discussion board; therefore, there could be opportunities for building an understanding of values. Additionally, creation of collaborative knowledge is less risky in a less rich media environment, such as an online classroom as opposed to a traditional one. Also, research demonstrated that in an online discussion, high levels of cognitive engagement and critical thinking are evident (Thomas, 2002). Besides, a low context of messages ensures the focus on the message, shared opinions, and new information, not social cues, and establishes a more egalitarian mode of the exchange (Ruberg, Moore, & Taylor, 1996) and thus promotes learning and knowledge creation.

Finally, one of the common concerns with online learning is the role of instructors and their involvement in discussions and facilitations. Buckley (2011) suggests that in contrast to motivating student participation in a discussion, the frequency of instructor's postings negatively affects the length of the threads and limits the amount of discussion for more advanced students. Thus, students are more likely to exchange in a discussion and continue when they are left to their own devices and when they discuss the issues that are of interest to them. The self-regulated learning, as well as principles of connectivism (Siemens, 2014) and adult learning (Knowles, 1973) in general, suggests that learners are most likely to engage in knowledge creation when the conditions of moderate risks, a pragmatic value of knowledge, and equal status are present. When such conditions are satisfied, learners not only create and share knowledge but increase their situational social capital, which is required for developing networks in future.

## 6 Conclusions and Recommendations

Therefore, it can be concluded that online learners are likely to benefit from the interconnected learning space, variety of media, and web tools available to them, self-directed learning, and peer-to-peer feedback, as well as from socially safe feedback, and they can develop professional and social networks more successfully than their peers in traditional learning environments. Online learners can create fluid and situational contextual professional and academic identities, interact with their classmates and faculty in a more egalitarian and lower contextual mode, and are more likely to express opinions and ideas freely; they are more likely to develop an ability to influence individuals and groups different from themselves and thus develop a global mindset and transcultural competence.

However, to achieve these outcomes, online learners need to focus on the best approaches for development of long-lasting, functional networks oriented on knowledge sharing. The first and the most important step is to focus on developing an intergraded professional identity that incorporates professional, cultural, and academic competences, as well as the learner's values and preferences. The specific situational identities can differ, as they are fluid. A learner should be actively engaged with a variety of social media tools and platforms through a variety of complementary networks. Sharing information and creating collaborative knowledge are most likely to happen in a loose network; therefore a learner should engage in both formal and informal networks; share contents, ideas, and opinions with other network members; and attempt to connect several networks, as well as enrich their connections by finding additional interests and competences in common with other network members.

Also, international higher educational institutions (IHEIs) can take steps to promote networking among learners, as well as collaborative and cross-cultural knowledge creation. The IHEIs could assist students in the development of social networks, both inside and outside of the academic environment, and create opportunities for the social interactions and allow the students and faculty to explore various social and academic identities and share professional, social, and academic networks. While the attention to course design and tools is essential, for successful building of PLEs and development of social capital and cultural competences, the learners should have more freedom and flexibility to support their professional and academic interests and to engage with fellow students on equal terms. Although more research is needed on the specific ways in which online students utilize their social capital and develop networks, and any conclusion can be only speculative at this point, it appears that online education is better suited for collaborative knowledge development in networks.

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# New Approaches to the Assessment of Learning: New Possibilities for Business Education

**Stephen Murgatroyd**

**Abstract** A key design challenge for any online course or program relates to the ways in which students will be able to assess their own learning (assessment for learning) and faculty are able to assess the students' learning (assessment of learning). Recent developments in both practice and technology are enabling new approaches to design and assessment, which in turn are leading to new credentials, new approaches to assessment in business programs and new ways of engaging potential employers in the assessment of students. These developments are described here and their implications are discussed.

**Keywords** Assessment • Adaptive assessment • Video-based assessment • Competency • Micro-credentials

## 1 Introduction

Current forms of assessment – periodic pen and paper tests administered at the faculty members' discretion – are being replaced by online, anytime, anywhere assessments using smart technologies. Hill and Barber (2014) suggest that we are entering into a new renaissance in assessment – a period of significant change in practice, driven by online assessment.

Such online assessments can be:

- Unique to the content and skills domain, refreshed daily using machine intelligence systems able to automatically generate relevant items and item banking (Gierl, Houston, Rich, & Boughton, 2015)
- Valid and reliable competency analysis based on standards for business skills and competency profiles

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- Multimedia-based assessments, where learners share video or audio (or other media) as the basis for both peer and instructor assessments, enabling collaborative assessment between the learner and their instructor
- Automated marking for all forms of assessment, including video, audio, essays, multiple choice and short-form writing, driven by machine and artificial intelligence
- Automated item generation in multiple languages
- Assessment of literacy through text analysis for all written forms of assessment
- Use of simulation (including 3D simulators) for assessment, like the way in which pilots are assessed for competency
- Using standard profiles to benchmark a specific student against all other students who have taken a test

This list is not exhaustive, but the point is clear: students can secure a much richer, deeper understanding of their knowledge, skills and competencies, and faculty members can have a much deeper understanding of how effective their teaching and learning design strategy by making more extensive use of emerging assessment technologies.

The potential for rethinking business education, driven by new thinking about competency and capability-based assessment, can already been seen. The University of Wisconsin, together with several other public and private universities in the United States, is now using capability-based assessments to offer flex degrees. These permit (a) students to progress in a program at their own pace, with assessment modules beginning at the start of each month; (b) students complete competency-based assessments based on a clear statement of requirements – no courses and no classes to attend; and (c) students receive concierge and mentoring support on an on-demand basis. A Bachelor of Science in Business Administration is available through this route, as are undergraduate certificate programs in business communications, project management and information sciences. At Western Governors University, it is also possible to obtain a competency-based MBA this way.

MOOC providers, such as edX and Coursera, are using new approaches to assessment, including peer assessment, to offer micro-credit and non-degrees which can be transferred into formal business education degree programs, including the MBA. For example, Arizona State University is partnering with the MOOC provider EdX (jointly owned by Harvard and Stanford) to offer almost all of its first year 100 level courses, including those required by business degree students, as on-demand MOOCs. Students who successfully complete MOOCs and pass a proctored examination will have credit awarded by Arizona State. The Malaysian public university system is also offering all of its first 2 years of undergraduate courses in this same way (Fadzil, Katif, & Minira, 2015).

The Open University, in partnership with others, is experimenting with the use of a combination of blockchain technology (Tapscott & Tapscott, 2016) and digital badges for accrediting learning by students using open education resources, including students in business education (Sharples & Domingue, 2016). These smart contracts plus progressive badge assessments enable learners to progress at their own pace using freely available learning materials on the open learn platform provided by the Open University.

In this chapter, a range of developments which are changing the nature of assessment are explored. The focus throughout is on understanding the developments that are occurring and demonstrating the implications these may have for business education, especially online education.

## 2 Understanding Assessment

If we are to understand the developments taking place in assessment and the opportunities they afford for rethinking online business education, we need to thoroughly understand assessment as a deliberate design process.

### *2.1 Designing an Assessment for Capabilities*

The process of assessment design, like that for instruction, requires a systematic approach. Such an approach involves these steps:

1. *Specifying knowledge, skills and capabilities*: For the program of studies and for each course within it, determining the knowledge, skills and capabilities, a successful learner needs to demonstrate reliably for that learning to be recognized and awarded credit. This requires:

   (a) Establishing learning outcomes and then designing appropriate assessments for each outcome
   (b) Agreeing these outcomes with colleagues who offer other courses or modules within the same program – reducing duplication, aligning assessment and building a program map of knowledge, capabilities and skills
   (c) Developing a shared understanding of what each course requires with each student so that there are "no surprises"

   This work requires a detailed and informed understanding of the strengths and weaknesses of students pursuing the program, understanding the ways in which instructional strategies enable the development of knowledge, skills and capabilities and a systematic approach to evidence gathering.
2. *Developing assessments for learning*: As a student progresses through a course and the program of studies, they require feedback which confirms that they are mastering the knowledge, skills and capabilities required. These "practice and feedback" opportunities, often called formative assessments, enable the student to move quickly in relation to knowledge and skills at which they are proficient and to spend more time on those they need to demonstrate significant improvement. These assessments also enable appropriate coaching and mentoring by the instructor or peers.

3. *Developing assessment of learning:* Designing appropriate, timely and authentic assessments which will have real consequences for student progress within the course and program, often called summative assessments. Such assessments need to be both thorough in terms of "signing off" the student as possessing the knowledge, capabilities and skills but also consistent with the formative assessments the student has completed.
4. *Documenting the assessments and sharing with others:* This is also a design challenge. What is to be recorded, not just on a transcript, but in the students' e-portfolio or record of performance and what is to be shared with peers, potential employers and other institutions? Given that many institutions have adopted e-portfolios or Higher Education Achievement Reports (over 90 universities and colleges in the UK use HEARs, capturing the work of over 500,000 students), how much information and materials (assignments, projects, presentations, videos, audio materials) should be captured and retained and by whom? How does the student "own" their record and how secure is the university or college's "official" part of that record? These are all questions that need to be addressed in the design of a "smart" assessment system.

These four domains of design constitute an assessment ecosystem which both the student and all who engage with them must fully understand and own. Given the growth of legal challenges to assessment (Lichtenberg et al., 2007; Kamvounias & Vernham, 2010) and the growing concerns with corruption in higher education (Daniel, 2016), it is also important that these design processes are rigorous and thorough.

## *2.2 Continuing Professional Education*

Once the learning outcomes for courses and programs have been established, the assessment regime within a program needs to be rigorous and fair. In large organizations offering online and distance learning, there may be many individuals engaged in reviewing and assessing students' work. In a course with 45,000 students, there is a need to ensure fair and equivalent marking across this range of markers and students. Analytics have been used for this work for some time, together with other processes for marker moderation (Beutel, Adie, & Lloyd, 2016) and the equalization of grades. The key is that students receive the same assessment of their knowledge, skills and capabilities no matter who the assessor is.

For business education, the key in this work is to align the knowledge, skills and competencies with the needs of a range of roles for the organizations in which graduates are likely to be employed. Many professional bodies (e.g. accountancy, administrative professionals, human resources, consulting, project management) have adopted capability or competency frameworks. One example is that from the Association for Operations Management (APICS). To become a certified supply chain manager, candidates must demonstrate competency in business foundational

knowledge and skills (workplace leadership, personal effectiveness and core skills), specified professional skills (operations management knowledge and technical competencies, supply chain management competencies) and materials management competencies (APICS, 2009). Many business schools also have advisory bodies which help them identify what emerging competencies and capabilities need to be designed into their programs.

## 3 New Developments in Assessment

The last section provided context for understanding the design and development process for effective assessment of business knowledge, skills and capabilities. This section will describe a range of developments which have occurred over the last 5 years which create opportunities to rethink assessment and to design richer and more authentic assessment processes. These can be used for either the assessments for learning or the assessment of learning.

### *3.1 Adaptive Assessment*

A feature of some learning management systems (LMS) including Desire2Learn, Moodle and Blackboard Learn, is known as "adaptive assessment". This enables learning materials to be automatically adjusted (sequenced differently, remedial materials brought forward and new materials added automatically) based on a learner's own self-assessment. For example, a student taking statistics might not fully understand how a correlation coefficient should be interpreted (as demonstrated by their assessment score). The LMS would then bring to their next learning session materials that would help them better understand just how coefficients are interpreted and give them more examples to work with. Thus, adaptive assessment enables differentiated instruction. In some advanced adaptive systems, the students' preference for learning materials – video, audio, text, simulation and games – may also affect the materials used for the next learning activity, with the intelligent system responded not just to specific learning requirements but also to learning preference.

All of the major LMS systems have adaptive learning engines embedded within them. These permit the easy creation of varied routes for students with different needs within a course. For example, a student who is struggling can be provided with a remediation route, and a student who is successful and learning quickly can find an accelerated route through the course. Using a combination of machine learning and artificial intelligence, modern LMS systems make the creation of these pathways quick and relatively easy, with the role of faculty one of confirmation rather than development of all of the needed materials and activities. We are likely to see a greater use of intelligent systems, especially now that Blackboard will connect to IBM Watson.

Imagine, then, a student struggling with key aspects of accounting. As students progress through the same course, each student will see and experience a different sequence of material and different learning challenges, yet all who complete the course will have mastered the same body of knowledge, same skills and capabilities. Their route to doing so will be personalized.

This also enables business courses to have a variety of routes through them. For example, the same course could have different cases, problems, activities, projects, learning materials from private sector, non-profits, public sector and military contexts. All students would have the same body of knowledge, competencies and skills, but their studies would have focused on their area of interest or commitment. This could be especially important for part-time students in work who are seeking a credential, such as an executive MBA.

## *3.2 Learner Progress Analytics*

Performance analytics generated from student assessments for learning (self-assessments) can also provide powerful information for the faculty member. Imagine an online class of 30 pursuing a specific module on supply chain management, with each competency involved in the course requiring the completion of an assessment of some kind. As students progress, the faculty member can see quickly who is mastering which construct, skill or capability and then design appropriate interventions. For those who are fast-tracking through the course, more challenging problems can be set, creating projects which require advanced use of the skills and capabilities they are developing. For student struggling with the material, additional support can be provided.

A variety of algorithms have been created which can, based on past behaviour in the same course by many cohorts of students, predict which students are likely to drop out and when. For an example, a student who postpones submission of a first assignment or does not complete any practice assessments in the first 2 weeks of a course is, in one specific course, more likely to drop out than a student who submits on time and is a frequent self-evaluator. In the UK, JISC is working with 50 universities establishing a national database of student behaviours to refine and improve the veracity of the algorithms used for this work (Sclater & Mullan, 2017). The key here is that knowing the consequences of their current behaviour can help a student change unsuccessful behaviours (Fritz, 2013).

## *3.3 The End of Average and the Bell Curve: Criterion-Referenced Grading*

Many faculty members have been required to mark students on a bell curve, assuming the distribution of capabilities and competencies is to be found on a “normal” curve. The major objective of such grading curves is to minimize the influence of

variation between different instructors of the same course, ensuring that the students in any given class are assessed relative to their peers. This also circumvents problems associated with utilizing multiple versions of an examination, a method often employed where test administration dates vary between class sections. Regardless of any difference in the level of difficulty, real or perceived, the grading curve is intended to ensure a balanced comparative distribution of academic results.

One aspect of the use of technology-based assessment is that such use of the bell curve can now be replaced by criterion-referenced grading. Rather than look at a specific cohort in a specific institution and seek to place all students in that cohort on a bell curve, it is now possible to develop assessment rubrics which look at all who take a test against a rubric for that competency, capability or body of knowledge and have a criterion for placing them in a specific performance category. This limits the potential abuse of the bell curve – covering poorly designed assessments – and ensures that a person awarded with a specific performance category has the capabilities associated with that category (e.g. Level 1, 2, 3 or 4). It also puts an end to the idea that skills and competencies have an "average" (Rose, 2016).

In a business education context, especially with so much data now available for competency assessments from professional bodies, the idea can be considered of aggregating all known data about the performance of students on a competency or capability assessment and then using criterion-referenced rubrics, informed by these data, to place a specific student on a capability framework. Charles Sturt University in Australia uses this method in its business school, as does Deakin University.

## *3.4 Competency and Capability Assessment and the Growth of Micro-Credit Programs*

Employers are increasingly less impressed by formal qualifications and more interested in what a given individual can do (Christie, 2014). What they are looking for is experience, competency and demonstrable skills. At least, this is the case for many leading employers, such as Alphabet/Google, who look for leadership capabilities, problem-solving and finding, humility, an ability to learn quickly and competencies as the basis for employment (Block, 2015). The more evidence a person can demonstrate their knowledge, capabilities and skills, the better.

For these reasons, standards-based assessment and recognition are growing quickly. For example, the use of digital badges to recognize skills is in wide use – one in five US colleges and universities use them (Fein, 2016). A digital badge uses a competency-framed assessment to provide recognition of abilities. Students can collect such badges as they develop the needed skills, perhaps as part of a course or as part of a work experience, internship or personal learning pursuit. A variety of institutions are using badges to recognize achievements and connect these badges to e-portfolios which they can share with potential employers. Continuing education programs, in particular, are making considerable use of badges linked to clear specifications of competencies and capabilities. Oregon State University, for example, offers over 40 badges ranging from technical skills to leadership and facilitation

skills. Some universities and colleges are connecting their award of badges to the learners LinkedIn profile. The badges are also issued by a variety of organizations, including employers and educational institutions.

In business education, micro-credentials are growing quickly. The Harvard-MIT MOOC provider EdX is offering micro-masters degrees. These are a series of four to five aligned MOOCs (e.g. in supply chain management, project management, entrepreneurship, leadership in global development) taken by anyone which, on completion, can be transferred into an accelerated MBA. They are also recognized by employers, such as Walmart, GE, IBM, Adobe, Volvo and the Carnegie Foundation. Udacity, another MOOC provider, is offering a similar program known as "nano-degrees" in some business fields (e.g. analytics for business), though the focus for Udacity is on technology-related fields. FutureLearn, the Open University (UK) MOOC platform, will offer full Masters of Professional Practice degrees, including one in Financial Planning, in partnership with Deakin University (Australia). Coursera, the largest MOOC provider, offers "specializations" in several business fields.

Another way in which business can see the value of the work of students is through business engagement in the assessment of student work, based on a competency-capability framework. This is how RIIPEN works with over 70 higher education institutions and close to 3,000 employers. Instructors design assessments linked to specific capabilities of interests to employers. The rubrics used for assessment are refined through a collaborative process. Once the student completes their assignment – often project work based on a placement or an applied research project – companies provide feedback to both the student and the instructor in addition to the assessment by the instructor. This is then captured and logged on the students' e-portfolio. Business schools, such as those at Berkeley, Suffolk (UK), McMaster, Boston, BCIT, UBC, Ryerson and many others, are using RIIPEN's platform to enable such assessment.

## *3.5 Peer-to-Peer Assessment for and of Learning*

Peer-to-peer assessment has been in use for some time (Topping, 1998). Students use a competency and capability framework to provide feedback to their peers, and peers value this feedback, which counts towards their final assessment for a course or program. For example, in a group assignment on an MBA program, each group member rates and gives feedback on each other group members' contribution to the final project which counts towards each student grade for participation in the online course. Many MOOC providers have used peer-to-peer assessment as a way of increasing student engagement and securing completions in massive online courses (Kulkarni et al., 2015), especially those with exceptionally large enrolments. It has been used in connection with over 100 MOOC courses on the Coursera platform alone.

The key elements of best practice in peer assessment involve these processes, according to Langan and Wheater (2003): "(a) keeping everybody in the picture

(e.g. about how the marks are allocated and why); (b) a simple assessment system (i.e. of high objectivity based on competency statements and clear rubrics); (c) sharing and sometimes negotiating assessment criteria with classes in advance (although this is not always possible); (d) having a moderation system by instructors (for example 10–20% of the assessments being second marked by tutors); (e) a complaints or review procedure so that peer awarded marks can be discussed/challenged; (f) allowing plenty of time for peer-assessment, whether in person or online; and (g), some form of feedback to students to confirm that peer marks are valid and similar to that of their tutors". These make clear that students are more than capable of assessing each other (Hughes, 2001).

### *3.6 Valid8 as a Competency-Driven Portfolio*

One specific kind of e-portfolio, developed by Vametric and now in use in Canada, is Valid8. Described as a "twenty-first-century ring binder" for knowledge, capability and skills, is a comprehensive, integrated e-portfolio system which uses video-based assessment to capture students demonstrating their abilities and competencies. It has become a highly regarded platform for the validation and accreditation of learning.

This is now being adopted by some Canadian banks (CIBC and the Royal Bank), colleges and universities. It incorporates a range of technologies to permit rapid review and assessment, including both hard and soft skills related to business and professional development. It provides a systematic, rigorous basis for rich and authentic assessment.

### *3.7 Replacing Faculty as Writers and Markers of Assessment Items with Machine and Artificial Intelligence*

As a faculty member, one of the challenging tasks each of us has to do is to create unique and new assessment items which fully reflect the competencies, knowledge and capabilities related to a course or area of study and have appropriate rubrics associated with them. This is demanding work. Now, with the support of machine and artificial intelligence, the faculty role is changing. The task now is to develop a model prototype of the ideal question or case study and the related rubric. New systems, such as the free-to-use/open-source platform TAO or the commercially available solution Varafy, enable a variety of different kinds of assessment items to be automatically generated (in multiple languages), delivered and administered and graded if required. Faculty's role is oversight and quality assurance, but sound robust systems are quickly emerging which make rigorous oversight of multiple offerings of an assessment possible (Gierl & Haladyna, 2013).

The significant implication of many of the developments outlined in this chapter is captured in this specific development: faculty members are design engineers for learning and mentors and coaches for the work of learners. They no longer must do everything. This is why IBM Watson and Pearson are partnering to create personalized learning solutions, including for business education at the college and university level, ending with personalized, capability and criterion reference-based assessments.

## *3.8 National Standards-Based Assessment*

Several jurisdictions, including England, Wales, Scotland and Australia, have a variety of trades, professions and disciplines, national standards and qualification frameworks. National Vocational Qualification (NVQ) assessments are based on the practical activity undertaken in the workplace and a portfolio of evidence showing the learner has meet occupational standards. A qualified assessor will observe an individual while they work and question them to test knowledge and understanding. NVQs are quality assured by qualified external verifiers who examine the work of assessors and review the e-portfolios of individual learners. The use of verified national assessment systems, such as those developed by Pearson or Valid8, is growing to ensure quality assessment. Recently it has been suggested that Canada needs such a system, already used for Canada's Red Seal certification, for all skills and competency-based programs (Lane & Griffiths, 2017) needed for effective business operations.

Nursing provides an interesting case study here. While each undergraduate nursing program assesses their own students, and awards their own credentials, entry to practice requires the completion of the computer-adaptive NCLEX-RN exam, administered by the National Council of State Boards of Nursing (NCSBN) – a US-based organization. Not all students who have completed a Bachelor of Nursing degree in Canada pass this national qualification at the first sitting, with failure rates amongst Canadian francophone students being especially high. As more of the health professions move to competency-based assessment against national and international standards, more such entry to practice assessments will be developed.

The same applies to some fields of business education. Individuals who earn an undergraduate or graduate degree are not automatically guaranteed admission to a professional body related to business. For example, Certified Management Consultants require both a relevant first degree and 3 years of consulting practice and the completion of a tailored peer assessment based on nine competencies. Similar processes exist for other business domains, including accounting and supply chain management. Certification in many business professions generally also requires a formalized commitment to continuing professional development (CPD), and many professional bodies, universities and colleges provide this through a combination of online, blended and workshop sessions.

## *3.9 Innovation in Prior Learning Assessment and Recognition (PLAR)*

PLAR permits students to have prior learning and prior work and related experience to be assessed "for credit" so that they can reduce the number of courses they are required to complete a university or college credential. One way to think about this work is that it enables a student a more flexible, rapid program completion based on the gaps in the students' knowledge and experience.

When PLAR became formalized in the 1970s, the basic premise was to compare what the students' prior learning and experience were with the specific course outlines they claimed credit for – a form of equivalency-based assessment. Now there are more options. Through LearningCounts.org, developed by the Council for Adult and Experiential Learning (US), students can leverage multiple approaches to PLA, including standardized exams, institutional challenge exams, existing evaluations of non-collegiate programs (including corporate and government training) and individualized portfolios. The free-to-use website LearningCounts.org provides information about these formats. The service goes further. LearningCounts.org provides independent academic assessment of e-portfolios which are then accepted by several colleges and universities across the United States.

Some colleges are using competency-based assessment of skills, for example, in accounting, rather than ask "is this learning equivalent to course X?" the question now becomes "what knowledge, competencies and capabilities can this student demonstrate and what does an assessment mean for their individualized program of study for a degree, certificate or diploma?". The Kentucky Technical Community College System (KTCCS) uses competency-based assessment to determine credit allocations and then is able to design a modular-based program for each student which takes account of this prior learning.

## *3.10 Learner Mobility, Assessment and Transnational Qualification Frameworks*

There are now great many international agreements, both educational and trade agreements, which seek to enable the mobility of learners and graduates of college and university programs. For example, the Canada-EU agreement contains a streamlined process for the mutual recognition of professional qualifications, which focuses on the development of mutual recognition agreements (MRAs) between professional bodies where the skills and competencies, especially as assessed through professional competency assessments and examinations, will form a key component for such MRAs.

Amongst the most comprehensive educational agreements is that created by the small states of the Commonwealth in their Transnational Qualification Framework

(TQF). This agreement, signed by some 31 countries, provides small states with more up-to-date procedures and guidelines and a referencing tool for alignment of qualifications in individual countries to an agreed international framework. The TQF functions as a translation device, making qualifications more readable, transferable and transparent, which, in turn, will help learners and workers move between countries or change jobs. The Erasmus, Tempus and Erasmus Mundus programs in the European Union are also aimed at high levels of interchange of learners within the EU (Ferdinande, Hosokawa, Yamada, & Nishimori, 2013).

What matters here is that the integrity of assessment across jurisdictions does not weaken these agreements – the real quality control relates to competency and capability assessment as well as to course design and the quality of instruction.

## 4 Unbundling and the Future of Online Business Education

"Unbundling" refers to the separation of the components of the learning and credentialing process. Who designs and develops courses will not be the same as the group which then delivers courses and programs. Who assesses learning and skills will be different from who delivers learning. Who provides credentials will differ from who assesses learning and skills. Learners will be able to "mix and match" the providers of content, the mentoring and coaching for mastery, and then undertake assessment in dedicated assessment centres to secure recognition by professional bodies, credit coordinating agencies, universities and colleges. Given that quality no longer relates to "residency" (in Canada, it is generally the case that 50% or more of a learners learning must take place at a given institution for that institution to provide degrees, diplomas or certificates), but to competencies and mastery, unbundling is the key to personalized learning routes and differentiation of providers.

Elements of this are already occurring:

- *Course Development Separate from Delivery*: MOOCs and open education resources make content freely available for learners to use to develop knowledge, skills and competencies. Most large online learning institutions (e.g. Open University (UK), Athabasca University, Thompson Rivers University, Western Governors University (US), Indira Gandhi University (India)) use course development teams which then may not teach the courses they have developed. MOOC providers are investing in instructional design and development to improve the efficacy and quality of the learning experience for learners, showcasing what difference design can make to the quality of learning. By doing so, they are showing faculty and students what a quality course can look like.
- *Delivery Separate from Course Development*: The development of an adjunct faculty, peer support and tutoring and other systems of support provides for models in which a standard course is delivered in multiple sites to a very large number of learners (the largest MOOC in 2015 had some 440,000 learners) by qualified individuals who did not develop that course. This is how all the dedicated online

distance learning institutions have achieved scale and how programs and courses could follow suit. MOOCs have shown how scale can be achieved.

- *Assessment Separate from Delivery*: The MOOC developments in Malaysia are important in terms of this component of unbundling. In Malaysia, the 20 public universities have developed a set of MOOCs (64 so far with more to come) which are fully integrated into their on-campus program offerings. Anyone can take a MOOC and then asked to be assessed on admission to the University they have chosen for their program studies. Malaysia is the first country in the world to implement a nationwide strategy that integrates MOOCs with on-campus classes. Some professions (e.g. accounting) and other occupations (e.g. supply chain managers in the USA) already undertake assessment independent of the learning providers and assessment processes of institutions. The growth of competency-based certification is now being accelerated by the development of micro-credentials, nano-degrees, badges and other forms of skill and competency recognition. Skills assessment centres in Australia cover a range of different professions and trades. Western Governors University is based on this construct of outcome-based assessment of learning – it is how they award degrees.
- *Certification Separate from Assessment*: Some qualifications use credit coordination as the basis for the award of a degree or diploma. Athabasca University's Bachelor of General Studies is one such degree, but other similar prior learning and competency-based qualifications are available around the world. There are emerging collaborative programs between a variety of institutions – up to five collaborating partners – where the learner completes their competency journey and then chooses which institution is the primary provider of their qualification.

A key component of unbundling is the effective use of peer coaching and assessment. A typical MOOCs' use of peer assessment involves (a) the use of common rubrics; (b) the random distribution of learners work to peer raters and assessors; (c) written feedback and comments on each work assessed – what is often called "coaching through the script"; and (d) peer ratings and an indication of how this rating "sits" (average or median) with all ratings provided to all learners. Some have suggested a range of modifications to this work (Suen, 2013), including a Calibrated Peer Review™ system. While it is currently the case that those MOOCs which make the most extensive use of peer review and assessment have the lowest completion rates (Suen, 2013), the extensive use of these methods is triggering interesting developments of peer-based coaching and mentoring and peer assessment in post-secondary education generally (Lawrence & Zollinger, 2015).

The emergence of unbundling is not due entirely to MOOCs – it has been taking place for many years. But MOOCs are accelerating the process of unbundling and are showcasing the power of scale. Given that many universities and colleges are struggling financially, including dedicated distance teaching institutions, getting to scale is an attractive proposition if revenue can be attached to the large learner numbers. Micro-credentials and assessment seem to provide a route to leverage MOOCs for institutional development.

One observation rarely made with respect to unbundling is that these developments accelerate innovation for each "bundle" of activity – design, development, deployment, delivery, assessment and credentials. Rather than having to create a comprehensive system level innovation, breakthroughs and disruption can occur at the level of one or more components of this system. While unbundling is at an early stage with some significant developments occurring, especially in emerging nations, it is the underlying trend being observed by many who have been engaged in online learning for some time (Craig & Williams, 2015).

## 5 Conclusion

Hill and Barber's (2014) suggestion that we are entering a period of renaissance in assessment seems to be supported by the range of developments reported here. As the ways in which assessments are conducted continue to change, we can expect to see significant and further "unbundling" of assessment from the delivery of courses. This will particularly occur in professions, like medicine, which are shifting from time-based credentials to competency-based credentials, but will also be seen in business education, especially, that closely tied to specific professional competencies. Indeed, the underlying theme of this chapter is that it is assessment, especially rich online assessments (including video, peer-to-peer and anytime/anywhere assessments), that will provide the backbone for the next phase of work in ensuring the relevance and value of business education.

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# Implementation of a Next-Generation Course Architecture for Blended Learning

**Rodney Beard**

**Abstract** A learning architecture for class management and student learning is described that incorporates a mix of online technology, mobile technology, and face-to-face learning. The architecture was implemented for four classes in Agribusiness Management in the Oklahoma State University program at International College Beijing, China Agricultural University in 2016. The architecture involves a combination of Internet technologies in a blended learning environment. Students work both online at home and in class to interact with next-generation learning management systems such as Piazza and Nb and to complete exercises using Jupyter interactive notebooks which allow a mix of verbal and numeric exercises to be completed by students in a single interactive document. Mobile technology is incorporated by linking classroom materials using QR codes so that students can directly access class materials using their phones. Class activity involved a mix of more traditional class delivery using lectures and mini-lectures where appropriate and computer labs where students engaged with both online materials in the classroom with instructor support. A number of these lab sessions were taught using methods borrowed from just-in-time teaching. The use of online anonymous discussions on Piazza and Nb lowered the participation threshold for students. In addition, Piazza's support for equation typesetting allowed students to easily ask quantitative questions online. File management for the courses employed the Git version control system so that class materials were simply dropped into a local directory on the instructor's laptop which synced with all the online learning systems. The method was used for teaching a range of subjects in Agribusiness; however, it can be employed in both blended and fully online learning environments. The paper will also discuss some challenges of using technology in teaching in a country like China in which the IT infrastructure is still being developed.

**Keywords** Blended learning • Online learning • Business education • Mobile technology • Interactive notebooks

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## 1 Introduction

In this paper I report on and describe my experience in implementing a learning architecture for class management and student learning in a series of classes delivered at International College Beijing at China Agricultural University, People's Republic of China, during the fall semester of 2016 and the spring semester of 2017. China Agricultural University dates back to 1905; later parts of it were incorporated into Peking University and Tsinghua University before being split off in the form of Beijing Agricultural University and Beijing University of Agricultural Engineering; these were then later merged to form the current China Agricultural University, which is China's leading institution for agricultural higher education. International College Beijing is a liberal arts-based college within the University that has been running English language international degree programs since the 1990s with a number of foreign university partners. The courses that I was asked to deliver consisted of the fourth year of a joint program with Oklahoma State University. Normally students would transition from International College Beijing to Oklahoma State University's campus at Stillwater Oklahoma after their junior (second year) of undergraduate studies. However, a number of students for a variety of reasons had elected to remain in China to complete their degrees. Four courses were required by these students during the fall semester 2016: Agricultural Marketing and Price Analysis, Agricultural Finance, Farm and Agribusiness Management, and Agricultural Law. In the spring semester 2017 courses, an advanced course on Agribusiness Management, a course on Commodity Futures Markets, and a course on International Agricultural Trade and Development were delivered. The administrative structure of ICB is organized around programs and not departments, and each program has adopted its own IT solutions for learning management and course administration; instructors have however a large degree of autonomy to work within the institutional constraints of the college and the university.

ICB had adopted Moodle as its learning management system (LMS) of choice, but Moodle did not support a number of essential features that were needed for the particular courses that were to be delivered. So, for example, two courses: Agricultural Marketing and Price Analysis and Agricultural Finance involved a relatively quantitative subject matter that was likely to generate student questions related to mathematical content. Moodle does not support mathematical typesetting so its usefulness for dealing with student questions of a mathematical nature is somewhat limited. Using it would have led to an exchange of generic messages along the lines of "Please come and see me in my office to discuss in detail." As one of my objectives in delivering the courses was to employ a blended learning approach, a need for an effective online communication tool that supported mathematical typesetting was essential. At the same time, there was a requirement that whatever tool was selected would not have any cost implications for the college or be disruptive to college or university systems. I was therefore actively searching for nondisruptive IT solutions. The irony in this statement should be immediately apparent given the current business fad for disruption theory and a perceived desirability of disruptive technologies.

However, disruption also has a cost, and this can be a barrier to the adoption of such technologies and thereby prevent innovation. In researching possible learning management systems, I found only one that met the requirements of the courses that were to be delivered. That LMS was Piazza (piazza.com). Piazza would play a key role in the learning architecture that I envisioned for course delivery. Agricultural Law presented a different problem to the more quantitative courses. Law is an essentially text-based subject with court practice based on a mix of text and oral practice. As such it presented particular challenges for a blended learning mode of delivery.

A system designed by the Haystack group within MIT CSAIL (Computer Science and Artificial Intelligence Lab), Nb seemed well suited for text-based courses so I decided to evaluate it during the law class with a view to using it in other courses as well. No one system seemed to do everything needed. The third system that I wished to use was Jupyter notebooks (http://jupyter.org/) as the basis for lab-based computer classes as in previous teaching I had found that these had some advantages over the use of spreadsheets for class exercises in economics and business courses. To get all these systems working as seamlessly as possible, I connected one to the other using hyperlinks. The result was to be a course or learning architecture or instructional architecture that could be employed in both fully online and blended learning modes. Clark (1998a, 1998b, 2000) distinguished between information objects and information or learning objects later she built on the learning object concepts to introduce the idea of instructional architecture. It is in this sense that I am employing the term architecture in the title. The resultant architecture should also support the always on learning style of todays students (Baird and Fisher, 2005). This chapter also contributes to the nascent literature on the implementation of new and novel teaching approaches in Chinese classrooms (see Jun, 2012 and Zhao, 2008 for another example).

The paper is organized as follows, the next section describes options for different learning management systems and why the particular solution was chosen, Sect. 3 discusses pedagogical strategies that influenced the choice of technology solutions and my thinking about an approach to teaching in a blended learning environment. Section 4 describes how the course architecture was integrated into my course preparation and course management workflow. Section 5 discusses how the technology was used in actual teaching of classes in Agribusiness and Agricultural Economics, and Sect. 6 concludes.

## 2 Learning Management Systems

A variety of learning management systems can be used which one to choose will depend on institutional constraints (recall the principle of zero disruption mentioned earlier), the subject matter of the course and what mode of material needs to be supported, how much interactivity is required, whether or not some form of automated grading and assessment is required, how easy it is to link to external resources, and

how easy it is to update course materials. Some systems such as Moodle for example assume the user will upload pdf's or PowerPoint slides directly to Moodle. This solution did not suit the workflow I had in mind for my course because it was a barrier to workflow automation. So one requirement for any learning management system that I had was that it was easy to link to external weblinks. While this is possible in Moodle to do it the way I wanted to with the landing page that I wanted required setting up a webpage within Moodle and some simple HTML programming; in other words, Moodle did not immediately meet my requirements for a LMS and provide me with the desired solution out of the box. I used Moodle mainly for one course Agricultural Law, but I found it was more a hindrance than help for the most part. For other courses, a redirect message for students was posted in Moodle (the college's default LMS), and they were asked to register with Piazza. Piazza is actually capable of being integrated within Moodle; however, this would have required action on the part of the college system administrator who would have had to reconfigure Moodle to allow Piazza to be added. This would have violated the principle of zero disruption and created a barrier to pedagogical innovation. The likely outcome would have been that the systems administrator simply said no, unless pushed to act by more senior administration who would have had to approve the project. In the absence of a strong case for why the change was necessary, the project would have been a nonstarter. A strong case could have been made if there was sufficient critical mass among students and instructors to push for the innovation. Fortunately, it is possible for individual instructors to register with Piazza and provide students with a link to self-register. This effectively places the decision to use Piazza in the hands of the individual instructor thereby reducing the costs of adoption. Adopting Piazza does not disrupt normal university procedures or processes, thereby satisfying the principle of zero disruption.

Piazza has a number of interesting pedagogical features, one of which is that Q&A facility (discussion board) allows students to post anonymously. There are various levels of anonymity that the instructor can set. So, for example, the instructor can determine that students have the choice to post anonymously so that other students cannot see their identity or even that students can remain anonymous to the instructor. The theory is that the ability to post anonymously lowers student inhibitions about posting and asking questions. This was of particular concern given differences in the learning culture in China, where it can be difficult to get students to participate in classroom discussions for fear of embarrassment. As the courses progressed, I found that students increasingly made use of this facility, although initially, unfamiliarity led them to post under their own names.

Another advantage of Piazza, in particular for quantitative-oriented courses, is that it allows students to typeset mathematical formulas and properly format computer code. This increases the readability of their questions and enhances communication. Using this facility meant that dealing with questions with quantitative or computer code content could now be done online rather than during the prescribed office hours, which often results in long queues at the office door in the case of more quantitative classes. Piazza effectively eliminates such queues. The typesetting system used by Piazza is LaTeX based but has a menu-driven system similar to the MS

Word equation editor. One can either use the menu-driven system or directly type LaTeX into any messages. This has advantages beyond just communication because the same LaTeX-based typesetting method is also used within Markdown which is increasingly becoming a standard typesetting system for web-based documents, so, for example, Jupyter uses this. Learning this system is therefore increasingly a desirable learning goal in and of itself.

Another benefit of Piazza is that a phone app is available; this means that it can play a role in situations where mobile technology is desirable. This increases student access to the instructor but also allows you to access resources in a blended learning setting while moving through a classroom. The latter is useful when fielding student questions in the classroom/computer lab. Not everything is kept in memory and the ability to check classroom resources without having to access the computer is an advantage in some settings.

## 3 Pedagogical Strategies

The pedagogical approach taken was influenced by a number of existing approaches to teaching as well as a number of years of experience teaching in face-to-face, online, and blended learning modes. The key concept was to use technology to enable a more interactive learning environment for students. One option that has been suggested in recent years has been the flipped classroom. The potential for using technology to introduce a flipped classroom was clear; however, the evidence in support of flipped classroom's in the published literature is rather flimsy; most of literature on flipped classroom's falls under gray literature and has not been peer-reviewed. There are a few exceptions to this; for example, Arnold-Garza (2014) assesses the use of flipped classroom teaching in library teaching and finds weak support for the method. Gilboy et al. (2015) also find support for the flipped classroom in a class on nutrition. However, Zuber (2016) reviews the literature on the flipped classroom and finds the method relies on inconsistent theoretical frameworks and inconclusive evidence and Pienta (2016) is critical of its use. Jacot et al. (2014) discuss whether it is just a fad or the future of training and while optimistic about it's future report no conclusive support for the approach. Knight and Wood (2005) report positive learning effects from interactive and cooperative learning in lieu of lectures. Strayer (2012) consider the effectiveness of teaching in inverted classrooms. This should be contrasted with research into two related methods: just-in-time teaching and the Moore or Texas method of teaching mathematics. Just-in-time teaching has generated a developed literature on the efficacy of the method. So, for example, Bailey and Forbes (2005), Higdon and Topaz (2009), Howard (2004), Marrs and Novak (2004), and Novak, Patterson, Gavrin, Christian, and Forinash (1999) as well as Formica, Easly, and Spraker (2010) discuss just-in-time teaching. Mostly just-in-time teaching seems to be viewed positively by the literature, in contrast to the flipped classroom concept which appears to have received mixed reviews. Gross et al. (2015) for example attribute positive outcomes for the flipped classroom to

increased pre-class preparedness of students rather than the flipped classroom per se. The Moore or Texas method in mathematics is also well established and has generated a small literature, so, for example, Cohen (1982), Foster, Barnett, Van Houten, and Sheneman (1995), and Chalice (1995) describe the use of the Moore method. The aim of the teaching approach I was aiming for was a hybrid blend of just-in-time teaching and the Moore method, without using the closed classroom approach typical of the traditional Moore method. The closed classroom approach would have negated the advantages of technology in the classroom. In addition, the basic teaching philosophy employed was to follow principles of reproducible research for student work (Claerbout, 1992, Gentleman, 2005, Laine et al. 2007, Stodden 2012). The use of Jupyter notebooks and extensive use of API's (Application Programming Interfaces) supported this goal. Jupyter notebooks are interactive notebooks that allow one to mix computer code, text and graphics including images in a single programming environment. They are based on and extend Knuth's (1984) concept of literate programming, in which computer programs are viewed as integral with literature. This concept is becoming increasingly influential in the sciences and is changing the way researchers work (Lithiaote, 2012, Shum and Cook, 1994). The approach to teaching was also influenced by the view that the subject matter was inherently computational in nature and was to be viewed through what Karp (2011) has referred to as the "computational lens". Combining these different approaches together was supported and enabled by the software used in the classroom.

In order to create efficiencies in workflow and to be able to track changes in teaching materials, the Git version control system was used to manage teaching materials. Git is a version control system used by software developers. Github is a social coding platform that uses Git as its version control system and enables software developers to collaborate on projects.

## 4 Putting It All Together: Architecture and Workflow

In the fall semester of 2016, I needed to set up a working system for blended learning relatively quickly that would be compatible with a possibly dated Internet and intranet infrastructure that was potentially subject to a number of firewall restrictions that I would not be fully aware of until the system was in place and teaching began. Students would access the system largely using their own computer equipment and possibly mobile devices, the configuration of which was largely unknown. At the same time, the university had its own Moodle-based learning management system in place and political expediency suggested, at least initially, making use of this where possible and integrating the system I envisioned as much as possible with existing infrastructure in order to disrupt systems and processes as little as possible. The system I initially set up is depicted in Fig. 1 and consisted of the universities' Moodle-based learning management system (LMS) which I proposed to use as a jumping-off point to other resources. My intention was to place resource links and syllabi on Piazza but no lecture slides or other class resources. Piazza was to act as

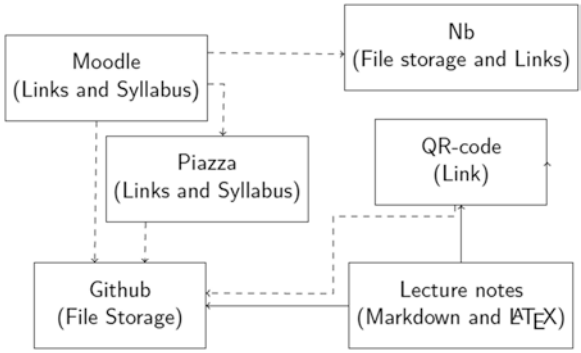


**Fig. 1** Learning system architecture and workflow initial configuration

an aggregator for other materials and a means of communication through its Q&A bulletin board system with students. All teaching materials were to be stored on Github and pushed whenever necessary from my local machine (laptop) to the remote repository on my Github account. I also wanted to experiment with Nb (developed by MIT), the most appropriate course for that appeared to be a class on law, where the ability of Nb to allow collective annotation of pdf files would provide students with a tool whereby they could discuss legal texts and cases that they needed to read for the course. As it turned out, students needed incentives to make use of the system, and even though they were introduced to it and completed a class exercise using Nb, they were hesitant make use of the system in the first semester. On arrival and before teaching started, the cultural and social importance of QR codes and their widespread use quickly became apparent, and so I decided to try and make use of them in class. I used QR codes in the course syllabus to point them to the Piazza sign-on page, and a link to this page was also placed on Moodle, to capture students who were looking for course materials through the existing university infrastructure. QR codes were also placed on the title page of lecture slides so that students could directly scan lecture notes from Github onto their phones (dashed line in Fig. 1 depicts this). This initially proved very popular, but because so many redundancies were built into the system in case of technological failure, it largely proved to be a novelty.

Initially Piazza was only used for the more quantitative classes, and the law class was based on Nb; on reflection this decision was a mistake, and I should have used Piazza for all courses because it is far more user friendly than Moodle. In the end I ended up using Piazza as the default communication tool anyway simply because it was more convenient than Moodle. Student usage of Piazza for a sample course is depicted in Fig. 2.

The course ran from mid-September until the end of December and the usage pattern reflects this. The class was small, and this is reflected in the scale of the $y$-axis. Usage was however highly concentrated on one particular student.

Student participation for this course is shown in Table 1.

What is noticeable is that one particular student dominated contributions and that others tend to passively monitor discussions. It is possible that cultural factors are at work here. So, for example, such passivity is frequently observed in face-to-face

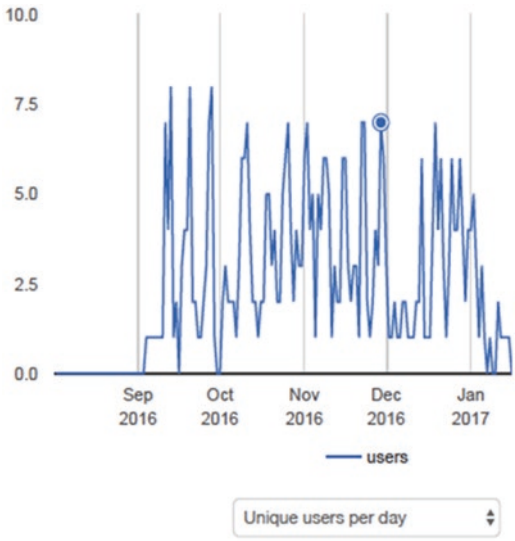


**Fig. 2** Student usage patterns unique users per day

**Table 1** Student participation

| Student | Days online | Posts viewed | Contributions |
|---|---|---|---|
| 1 | 65 | 25 | 13 |
| 2 | 13 | 9 | 1 |
| 3 | 34 | 8 | 3 |
| 4 | 39 | 21 | 0 |
| 5 | 32 | 20 | 0 |
| 6 | 80 | 25 | 7 |
| 7 | 59 | 23 | 2 |

classes with Chinese students. These results are representative of other courses although it was not always the same student dominating contributions. To broaden student participation, the course architecture was modified and some changes made for the spring semester. In the spring semester, the architecture of the various platforms and the way they interacted were changed to encourage greater participation; this was reinforced by changing assessment methods to provide greater incentives to participate in the online environment and to bring about closer integration of the online environment with classroom activities.

The online learning architecture was modified to include an agile project management software tool, Trello for managing student assignments and to link Piazza and Nb more closely (see Fig. 3).

Lecture notes were uploaded to Nb and backed up on Github. Piazza was used as a point of entry. Trello was generally accessed independently although initially a sign-up link was posted on Nb. Tasks (Assignments) were assigned to students on Trello directly and students generally submitted completed work on Trello. Figure 4 depicts an example Trello board for an Agribusiness course.

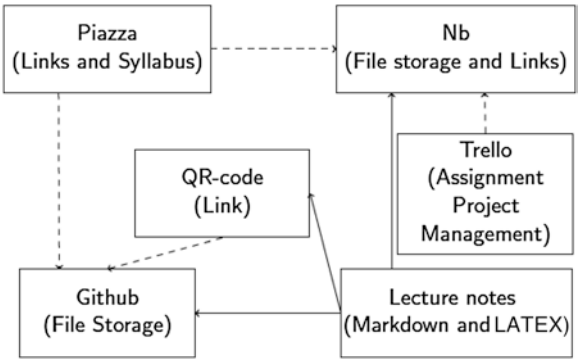


**Fig. 3** Final learning architecture employed in 2017

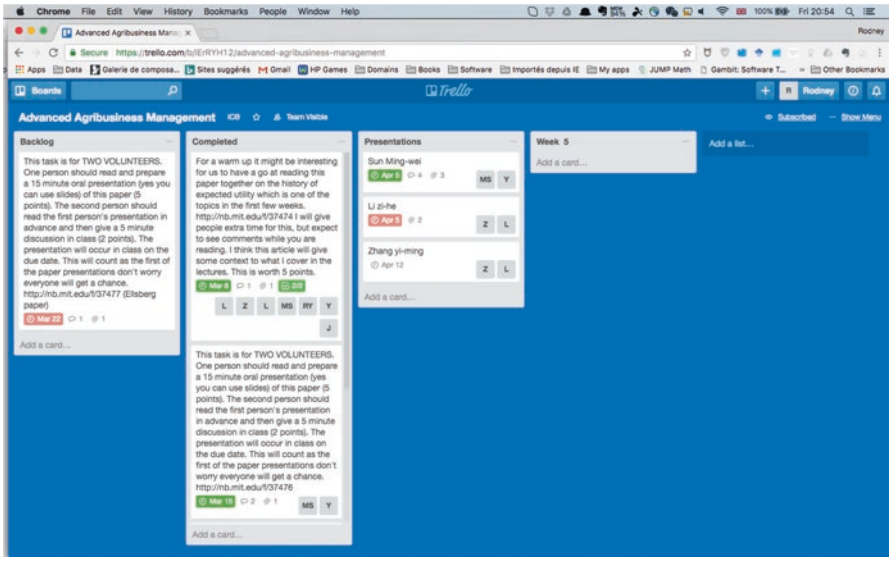


**Fig. 4** Trello board for assignment management

Trello is based on Agile project management and uses virtual boards with task cards to track project progress. Feedback from students about the system ranged from initial surprise to positive, with some students stating that they intended to encourage others to use the system. In the fall semester, students had used a system called DropittoMe a Dropbox app to submit work online. Dropbox is generally not accessible in China, but DropittoMe can be linked to Microsoft OneDrive. This however had to be actively refreshed unlike Dropbox which proved to be somewhat inconvenient. In addition, the lack of some form of project management tracking meant that students were tempted to delay submission of work despite being given clear deadlines. For this reason, it seemed more explicit project management was needed and a way of breaking projects into smaller tasks, which is why Trello was used. Students were assigned tasks on Trello such as to comment

and discuss lecture notes posted on Nb. This proved very popular and eventually students began to initiate discussion concerning unclear points on their own. An example of an Nb discussion is depicted in Fig. 5.

Nb allows students to highlight passages in readings or the lecture notes and to open a chat session where unclear points can be discussed among each other or with an instructor. The discussion is anonymous except to the instructor. During the courses both lecture notes and additional readings were posted to Nb; in some cases students read papers online that were to be presented in class later and were able to ask clarifying questions of the instructor by highlighting passages they did not understand. This proved extremely useful with difficult texts and gave the students confidence to tackle more difficult material. A further advantage was that when working with nonnative English speakers, it enables greater feedback between the student and instructor. Nonnative speakers also tend to be stronger with written rather than spoken language, and enabling a written form of real-time interaction has advantages in facilitating their engagement with material. They tend to be more forthcoming in this form than they would be in a face-to-face situation.

In addition, to lecture-based classes, face-to-face computer labs were used in which the system was employed for tasks/exercises. A common task was the completion of an exercise with Jupyter notebooks (www.jupyter.org). Jupyter notebooks are interactive notebooks capable of processing text, data, images, and mathematics (see Fig. 6 for an example). They support the use of programming languages such as Python and R. These notebooks were pre-loaded to Github and hyperlinked to Piazza or Trello. Students were required to download them and run them locally on their own machines. This required that they locally install Python (the Anaconda system was used), students were able to complete this without assistance despite no

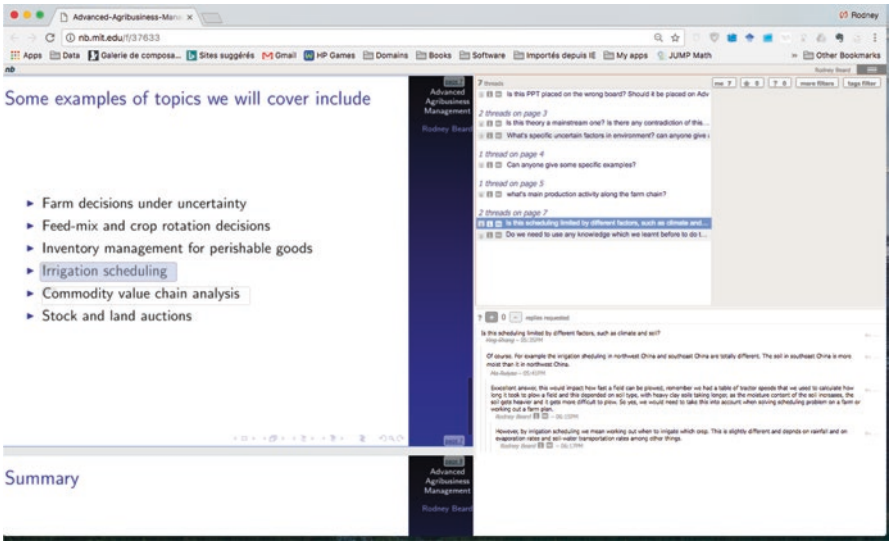


**Fig. 5** Nb discussion of lecture notes with chat window at *right*

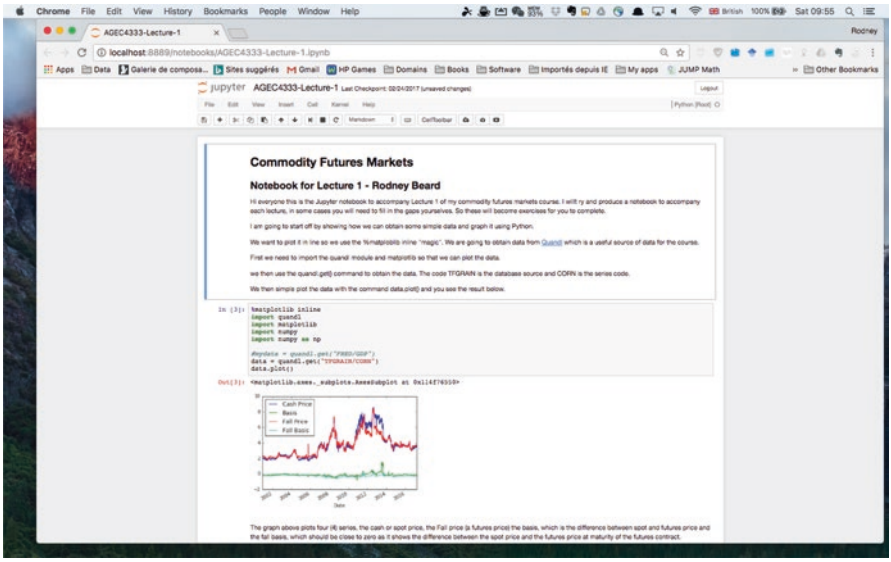


**Fig. 6** Example Jupyter notebook running in Chrome web browser

background with Python or programming. Initially, I experimented with setting up a Jupyter server to run these in the cloud but connectivity issues quickly showed that this was not viable. Possibly with further experimentation and support, it might have been possible to overcome these by enhancing performance on the virtual private server I was using. The use of these notebooks had advantages when teaching in a multilingual setting. Typically, the system language on students' computers was not English and these were all configured somewhat differently. Using Jupyter provided a common English language platform for all students which made it easy to troubleshoot student problems. In addition, because it combined both word processing and computational abilities in a single platform, there was no need for constant switching between applications for students to complete classwork.

While using Jupyter was not part of the learning architecture that was developed, the original intention had been to combine a Jupyter server with the system. This proved to be too ambitious and so I resorted to using it with local installations on student computers which for the most part worked extremely well. After a semester of working with Jupyter and writing basic Python code students had acquired skills comparable to an intermediate Excel user. That is, they were able to solve tasks using Jupyter similar to those that an intermediate level Excel user would be capable of doing. More advanced students had progressed to completing tasks that would be comparable in difficulty to that of an advanced Excel user writing Visual Basic Macros. Ideally, one would want to test experimentally, which of the two approaches is easier to learn. The impression is that using Jupyter led to more rapid learning and progression to more difficult tasks after the initial familiarization phase had been completed.

## 5 Application Examples from Agribusiness Teaching

To illustrate how the system is used in practice, I will present some examples from teaching practice. One course taught with the system was an agricultural marketing course, Agricultural Marketing differs somewhat form Business Marketing in having a greater focus on pricing, Agricultural Marketing textbooks therefore tend to cover pricing models drawn from economics. The first substantial chapter from James Vercammen's textbook on Agricultural Marketing, for example, covers spatial price equilibrium models that typically are solved using quadratic programming (a mathematical optimization technique). Such models present challenges to student understanding if taught in a standard lecture delivery format followed by assessment or if taught in online mode through readings and study guide alone. Two things are lacking in such a mode of delivery: (i) interaction between student and instructor to discuss points where the student's understanding is unclear and (ii) practical exercises to reinforce learning. The latter could be set as homework, but if the student lacks understanding, that is unlikely to be successful. One option is to add a lab class to reinforce theoretical material through practical exercises. Such lab classes could be done using only pencil and paper, but this would constrain exercises set to very simple problems. A second approach would be to make use of some form of spreadsheet modeling software such as Microsoft Excel. To solve quadratic programming problems requires access to a nonlinear programming solver. At the time I taught this class, Microsoft had apparently disabled access to this in the MS Excel solver package, so I needed to look for an alternative. It has since been reinstated. However, using MS Excel presented a second problem. In multilingual teaching situations when one is not using a standardized desktop, a lot of installed software defaults to the system language on installation; if the students' computers are in French, Excel will be in French; if they are in Chinese, Excel will be in Chinese. This can limit the ability of the instructor to assist students with problems they are having. To avoid these two problems, lack of availability of appropriate plug-ins and language compatibility issues, I used Jupyter notebooks as they are always in English no matter what the system language of the computer, although one can write in them in other languages if need be; they provide a fully functional higher-level programming language in the form of Python with access to numerous modules for computational work including mathematical programming; they are based on principles of literate programming that allows one to write text when needed. The Pandas module provides calculation facilities comparable to Microsoft Excel.

Students had questions concerning the computer code they were writing for solving the exercises and also the mathematics underlying spatial price equilibrium models. Instead of coming to my office to ask questions about the exercises they were working on, they were able to use Piazza to ask the question using Piazza's Q&A facility. Figure 7 depicts the equation typesetting facility in Piazza's Q&A facility that allows students to typeset equations using a menu or alternatively to type a LaTeX-formatted equation directly. This facility is a huge enhancement to communication on technical matters which would otherwise require a face-to-face

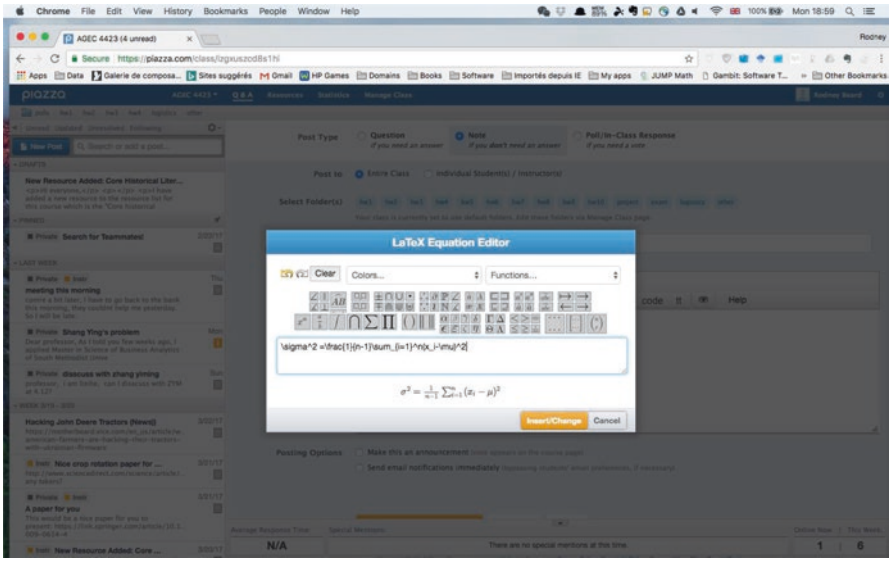


**Fig. 7** LaTeX formula input in Piazza's Q&A facility

meeting. Other systems as far as I am aware do not have the ability to typeset mathematical equations making Piazza unique in this regard. In addition to mathematical typesetting ability, Piazza's Q&A facility allows properly formatting computer code (see Fig. 8).

Snippets of computer code can be inserted into messages. As an example a student was having trouble to get their Python code running for a spatial pricing problem but was able to send a copy of a section of the code to me through Piazza that I was able to quickly check for errors.

To confirm things I asked for a copy of the complete notebook they were working on but it turned out my conjecture was indeed correct. The ability to send well-formatted computer code without having to necessarily download an attachment leads to an efficiency gain. It would even be better if the code could be run directly within Piazza, but we are not there yet. Until then a portable lightweight format for working is important for when students and instructors are spatially separated. The JSON format used by Jupyter notebooks is relatively compact as it is really just a text file and is easily transferred by e-mail or by other means. Figure 9 depicts an example class notebook for a finance class questions are written in markdown and answer cells are left blank for students to complete. New cells may be added by students in either markdown or computer code format for completing calculations.

The example illustrates that formatted equations may be easily inserted into markdown cells. The syntax for equation typesetting is identical to the syntax used by Piazza for equation typesetting in Piazza's Q&A facility. This has the advantage of reinforcing student learning on how to typeset equations. The Markdown system used by Jupyter is increasingly becoming a web standard for formatting text documents so

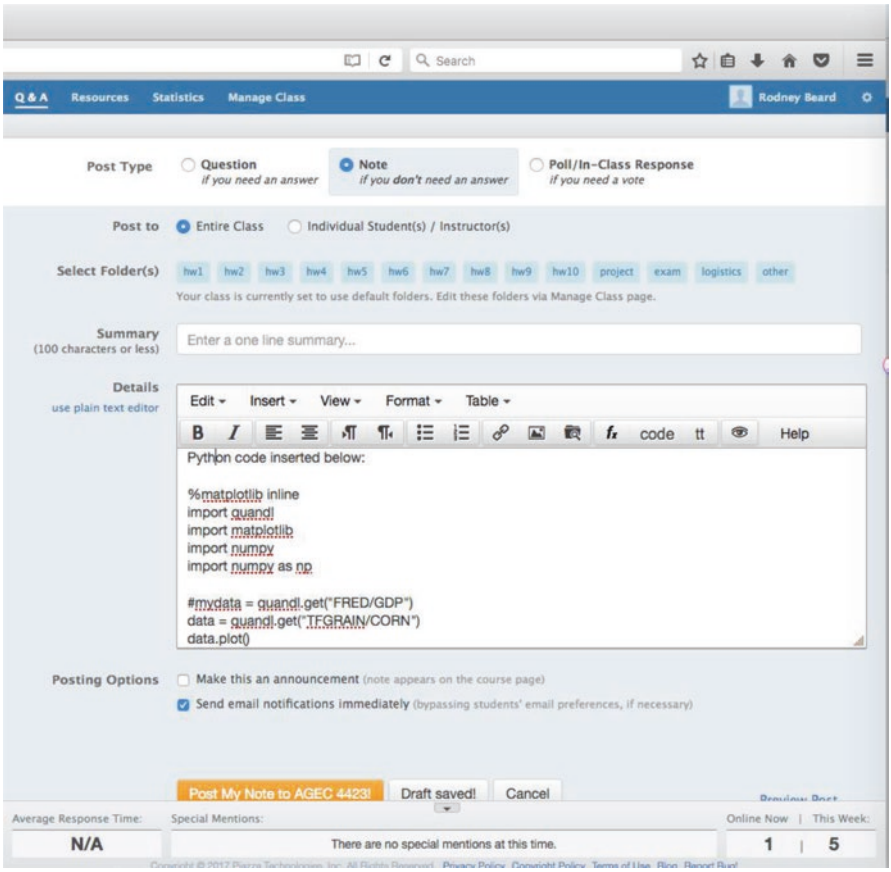


**Fig. 8** Screenshot of Piazza with formatted computer code

it seems desirable for students to gain some exposure to this as part of their studies as they are likely to encounter it on a number of different platforms; the popular writing package Scrivener, for example, also makes use of Markdown, so this is not something confined to technical disciplines alone.

In farm management, we were able to use the Pandas module for budgeting exercises and Python's SciPy module for solving linear and nonlinear programming problems for whole farm planning exercises. Pandas provides facilities similar to a spreadsheet for manipulating data and doing basic calculations with data as well as graphing and where needed symbolic mathematics; as such it subsumes the abilities of a spreadsheet for analysis but far surpasses the uses of spreadsheets in terms of analytical power. It provides a single system for both typesetting of text and for analytical work that may be either numerical or symbolically based.

A number of alternatives to Jupyter notebooks exist or are in development; the original notebook idea is due to Mathematica, but the high cost of Mathematica has slowed its adoption, the R programming language has recently released a notebook

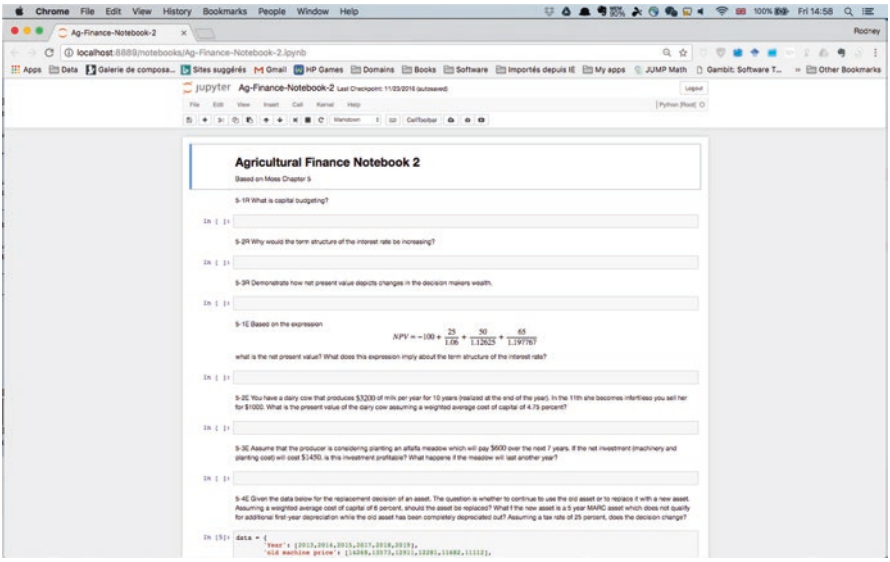


**Fig. 9** Example Jupyter notebook for a finance class

version that is still being developed but is functional, SAGE Mathematics also has a notebook system, and currently of the free versions, Jupyter appears to have the most well-developed system.

The courses taught were senior undergraduate courses; however, the same or a similar approach could be used to teach masters' level or MBA students, in particular; Nb is very promising as a technology for online teaching of MBA classes as it closely links discussion with readings; for more technical classes, Jupyter can be run in the cloud and could be used as an interactive cloud-based teaching tool for classes at all levels. This was the original intention behind my own early experiments with setting up and running a Jupyter server on a virtual private server.

## 6 Conclusion

I have considered the implementation of a learning architecture for blended learning classes. While some difficulties were encountered with student uptake of new technology for the most part, these have to do with students learning new ways of doing things rather than fundamental cultural or infrastructural problems. The cloud format of the approach had both advantages and disadvantages. An advantage being that the system was accessible from anywhere at anytime (Piazza and Trello phone apps supported this). A disadvantage was that Piazza seemed to struggle with some browsers at times. Although mostly this appeared to be an issue of laptops system resources being overloaded (trying to do too much). Also there was some evidence that some Chinese browsers were not supported.

Overall, combining different platforms with different strengths together proved superior to adopting a single platform that did not meet all needs. Initial experiences led to Moodle being dropped as it served little purpose except as an initial point of entry for new students. Increased use of Nb appears to have been a considerable improvement with all students responding to this positively. The use of both Piazza and Nb complement each other, and in the absence of a single platform allowing both mathematical typesetting and annotation of pdf files with real-time chat, combining the two makes sense. Further development of the system is possible; currently I am exploring methods for remotely controlling the system via cellphone using applications such as Splashtop and possibly Airserver for projecting individual student work and interacting with their machines. Discussions with colleagues raise potential ethical issues with some of these approaches that would need to be addressed. Use of server-side processing of Jupyter notebooks would allow the use of a cloud-based data and word-processing environment that was largely independent of local computer lab infrastructure or student computer hardware, the quality of which can be variable.

While much was achieved with this approach in a short period of time and a number of barriers were overcome, there is still considerable room for enhancing the system both in the classroom and through the use of newer online learning technologies that are being continually developed. So, for example, the approach used does not draw on programmed learning methods which are proving popular in commercial training settings, and it would be desirable to have an option for this available. This is however left for a future project.

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# On the Relevance of Digital Learning Cultures Within Online Business Education

**Kristina Lahl, Lana Plumanns, René Vossen, and Sabina Jeschke**

**Abstract** Advancing digitisation on the job requires a rethinking and redevelopment towards a new business education that is able to address the challenges of increasing complexity. Business qualification measures have to do justice to an increasingly flexible and interconnected life and work environment that is linked to the application of new technologies. Thus, the industry of the future, including large, medium and small enterprises, must apply new ways and strategies in order to enable their employees to embrace and adequately deal with the new digital chances and challenges. In this, the important question for research and practice concerning business education is not whether digital formats should be integrated into qualification measures but indeed how they must be applied.

An important factor for success is the development and support of new digital learning cultures that promote the integration of digital media as intuitive and self-explanatory devices, thus reducing uncertainty or scepticism. In this way, the opportunities that digital qualification measures offer with regard to individual and lifelong learning, agility, topicality, democratic knowledge transfer, accessibility and cooperation can be effectively exploited by employees, managers and organisations. The development and use of innovative digital learning tools and formats is a requirement; however, it is not a sole guarantee for success.

This chapter aims to reflect on the relevance of the development of a fitting digital learning culture within different types of organisations. The varying parameters that are decisive for success are scrutinised: Teachers, students, media and corporate structures each have different requirements, aspirations and contributions towards digitalisation and desired education processes regarding content, goals and methods. Focussing on the manufacturing sector, a concept for developing jointly performed digital learning cultures is outlined in this chapter. It strives to combine and enhance communication, values, didactics, learning contents as well as individual and corporate goals within organisations as livid networks in a digitalised environment.

**Keywords** Digital learning culture • Manufacturing sector • Organisational structures and processes • Learning environment • Concept development

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## 1 Introduction

Although associated in common parlance, learning is not only schooling but much more (Fischer, 2009). Especially with regard to current trends such as all-embracing digitalisation, globalisation and demographic change, lifelong learning is a concept that has to be addressed and internalised by learning institutions as well as enterprises of all sizes and branches. Innovation as an essential drive for successful businesses has always been reliant on new perspectives that can only emerge from learning ever new things. Today, the rapidly growing rate in which technology reshapes our world and culture is increasingly demanding for comprehensive models of lifelong learning in social- as well as in work-related contexts. Encompassing digital learning cultures that support learners and teachers in a given environment and within given structures are essential in order to achieve effective and safe application of new technologies.

The developing of digital learning cultures that address the challenges and benefits of a fully digitalised society and economy is often associated with the application of new media. Yet, it is not only the sole use of new technology and digital media that determine the challenges to come with regard to developing learning cultures. New media includes devices that enable diverse groups to work together in a fashion that had not been possible before. Teaching across languages, cultures and various group sizes of learners, equal opportunities for different social backgrounds as well as overall accessibility finally become tangible through digital media. However, these achievements have to be incorporated into values, norms and beliefs of educational systems and need to be addressed in an appropriate way (Goodfellow & Lamy, 2009).

So far, the most innovative and promising approaches to establishing digital learning cultures are not supported by official criteria, norms and structures regarding pedagogic and didactic traditions and values (Kukulska-Hulme, 2010). While this affects schools and universities as traditional learning environments, it is also true for institutions and enterprises in which lifelong learning takes up an increasingly important role but is often reliant on outdated conditions and presumptions. In redefining digital learning environments, it is essential to not only change the way teaching interacts with digital media but also reshape the surroundings in which contexts, methods, media and learning in its entirety are embedded.

This chapter aims to give a comprehensive overview regarding the relevant aspects for the development of digital learning cultures within businesses and enterprises that are on the threshold towards a fully digitised company. In scrutinising different parameters, the theoretical basis for analysing different types of learning cultures and interdependencies of different configurations of parameters is offered. Furthermore, an approach for individual designs of digital learning cultures suitable for given corporate structures and conditions is outlined.

## 2 Learning Cultures

In general, learning culture is defined as the entirety of all learning formats and styles that are typical for a certain time frame, including the anthropological, psychological, societal and pedagogical alignments that are at the base of these educational designs (Weinert, 1997). In this context, different scales of consideration, such as individuals and social surroundings, are co-dependent: "Cultures are produced, changed and reproduced by individuals, just as individuals are produced, changed and reproduced by cultures" (Hodkinson, Biesta, & James, 2007). Various studies have examined learning cultures with regard to their fundamental change in the course of a growing relevance and use of digital media. As early as 2001, studies anticipated a new culture of individual and organisational learning, within which lifelong learning, knowledge and experience transfer as well as extensive cooperation will become a given (Reinmann-Rothmeier, 2001). With the realisation that a new learning culture is on the horizon came the demand for an integration of institutional and organisational conditions into the reshaping of learning processes (Severing, 2003).

Empirical studies have so far mainly concentrated on the effect the use of digital media has on learning success (Herzig, 2014; Schulz-Zander, 2005). A comprehensive study regarding the different elements constituting the existing and advancing new learning culture has yet to be conducted: These elements are comprised of the participating stakeholders, i.e. the learners and the teachers, but also other actors of the surroundings, educational structures and system requirements as well as different media, whereas Hodkinson et al. name eight different dimensions with regard to understanding learning cultures (Hodkinson et al., 2007), i.e. the positions, dispositions and actions of the (1) students and (2) tutors; (3) the location and resources of the learning site; (4) the syllabus, assessment and qualification specifications; (5) the interrelationships between students and teachers and time frames; (6) the management and procedures, including funding, inspection and regulations; (7) the wider academic cultures and contexts; as well as (8) the social and cultural values such as class, gender, ethnicity, etc. (Hodkinson et al., 2007). This chapter will focus on the aggregated dimensions, learners, teachers, media as well as educational structures and processes. A thorough analysis of the dimensions in their diverging characteristics and interdependencies is essential in order to identify and evaluate the individual learning culture within organisations with regard to their qualification measures and professional development processes in lifelong learning intentions. For this purpose, this chapter will focus on the different elements of learning cultures and how they change within the work environment regarding advancing digitalisation; demographic change; increasing complexity, for instance, in human machine interaction; and growing importance of collaborative and lifelong learning.

One of these elements that have been scrutinised in detail by research are digital media and their frequent use in learning setups. There is an abundance of empirical studies concerned with the effect digital media have on learning in general and on the development of different competences within various learning environments

(Herzig, 2014). Connected with these effects are the empirical findings on the impact digital media have on learning cultures and cultural change. Digital media support didactic concepts in which the student rather than the teacher is at the centre of focus, which also triggers overall transitions in entire learning environments (Schulz-Zander, 2005).

The transition from the old, analogous into a new, digital learning culture is triggered mainly by technological innovations and processes of individualisation (Meier & Seufert, 2012). Yet, from a perspective of learning theories and didactics, it is also inevitably linked with the change from a cognitivist towards a constructivist conception of teaching and learning (Mürner & Polexe, 2014). With an emphasis on the media used, this transition is also referred to as a change from e-learning 1.0 – concentrated on the teaching process – to e-learning 2.0 – concentrated on the process of learning as an interlinked and social approach that makes use of collaboration and communication (Ehlers, 2009). The emancipation of the learner is contingent upon the information flood which is accessible through digital media and can only be managed by the ability of the learner to select and evaluate the excessive stream of data. The rising importance of learning communities and the numerous possibilities regarding global knowledge networks in virtual environments also boosts opportunities for collaborative learning and the importance of metacompetences regarding social behaviour.

Yet the development and use of innovative digital media is not a sole guarantee for a successful digital learning culture (Tezci, 2009). Instead of a mere conversion of linear learning concepts into digital tools, there rather have to be additional innovative designs of learning and teaching processes that enable digital media to fully unlock their potential (Herzig, 2014; Tillmann, 2015). Critical studies are tackling the framework conditions that are essential in order to apply digital media adequately and expediently in teachings and trainings. Especially the vast availability of information in differing quality requires new strategies in the selection, assessment and mastering of knowledge (Reinmann-Rothmeier, 2001). In this context, the teachers acquire a key position and they have to be explicitly trained regarding dealing with digital media (Pietraß, 2005). The selection, training and integration of teachers into organisational structures of enterprises and institutions are core requirements for the establishment of a successful digital learning culture.

While the teacher is thus still an essential entity in learning environments, the growing importance of collaboration and co-producing within learning environments attaches an increasingly higher priority on the requirements, acts and involvement of the learner him- or herself. In order to establish a learning culture in which individuals can apply, enlarge, reproduce and relay their knowledge, it is important to scrutinise their prerequisites with regard to learning. This includes the settings in which students are involved, in order to allow them to be "self-sustaining given adequate time, freedom and resources" (Greenhow, Robelia, & Hughes, 2009).

Last but not least, besides the learner, teacher and media, it is also important to shed light on the structures and learning processes that are part of the overall

learning environment, such as the corporate culture, underlying strategies, management decisions, hierarchies, etc. The management usually decides on fundamental questions regarding who and how will be trained; the tasks connected with this process are the identification of (1) the groups or individuals who require training, (2) the number of individuals who need to be trained, (3) training location, (4) duration of the training, (5) what types of training are required, (6) who should train the groups or individuals and (7) who should finance the training (van der Heiden, Pohl, Bin Mansor, & van Genderen, 2015). These processes and structures have to be compatible with the requirements of learners, teachers and media, which is why the underlying management strategies and corporate culture cannot be dissociated from other parameters of learning cultures.

## *2.1 Teachers in Digital Learning Cultures*

Ertmer and Ottenbreit-Leftwich (2010) stress the importance of culture on the development of teachers and their efficiency in applying new media and technology in their teachings. Norms, values and shared beliefs in work contexts are essential factors in the adoption of innovative teaching methods (Ertmer & Ottenbreit-Leftwich, 2010). As the use of new technology in teaching may destabilise established learning routines regarding, for instance, norms of time and space (Somekh, 2008), it is of utmost importance that the surrounding culture supports these changes. They offer a comprehensive list of how pre- and in-service teacher education and professional development can support adequate and successful use of new technology and thus transitions from an analogous to a digital learning culture. In this, they mainly concentrate on affecting knowledge, self-efficacy, pedagogical belief as well as culture change (Ertmer & Ottenbreit-Leftwich, 2010).

The growing digitisation in every context of modern life, including work and education environments, has changed the challenges and tasks teachers and educators have to tackle. In analogous learning environments, necessary skills used to be comprised of the knowledge of the subject, different teaching methods and strategies, work materials, the learners and their specific abilities in certain contexts, etc. Now, digitisation has increased the need for technology skills in teachers as well (van Eck, 2006; Heuer, 2001). These skills include not only the knowledge of different technological education tools as well as their use and application in different contexts but also most importantly the skill to enable students to use these tools expediently, responsibly, creatively, purposefully and autonomously. In order to achieve this, digital learning cultures are to provide teachers with the necessary means to acquire these skills. In this regard, professional development programmes, professional learning communities, room for trial and error experiments as well as access to knowledgeable peers and innovative educational models should support educators in business contexts (Ertmer & Ottenbreit-Leftwich, 2010).

## 2.2 Learners in Digital Learning Cultures

Yet, as important as teachers and the role, skills, methods, pedagogies and didactics of educators remain, the focus shifts increasingly towards the learner him- or herself. Former concepts of learning have put the emphasis on the teacher and his or her active part in transferring knowledge to a rather passive and receiving or reproducing student. Now, fuelled by the web 2.0 and its collaborative opportunities, the learner is at the core of learning arrangements, where he/she "actively participates in the construction of knowledge, either as an individual or collaboratively to support deep, rather than surface learning" (Lai, 2011).

With the change to e-learning 2.0, essential parameters in education are altered, transforming the challenges and roles of students and learners (van Eck, 2006). Learning as a lifelong process brings about new requirements in learners that assume more responsibility in investing time and choosing different tasks and methods, self-evaluation, thus defining criteria and plans for broadening their competences as well as for developing social skills for feedback processes as in social recommendation mechanisms, peer review and peer assist methods (Ehlers, 2009).

Apart from the immediate knowledge a certain subject in a specific field requires, learners have to acquire meta-skills, which can be divided into three subcategories: "Learning and innovation (creativity, critical thinking, problem solving, communication, collaboration); Information, Media and Technology (information, media and ICT literacies); and finally, Life and Career (this includes flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility)" (Kukulska-Hulme, 2010). This is especially the case within the environment of an enterprise, e.g. of the production sector, where further education is not only a way to increase knowledge-based skills but must be applied in a practical context within an ever-changing and dynamic environment in which teamwork, knowledge transfer, innovation and flexibility are required on an everyday basis. Within this context, it is both necessary to install learning environments, strategies and media that support these meta-skills and at the same time to determine the level of these competencies already existent within different groups of individuals in order to identify the suiting learning settings.

van der Heiden et al. (2015) name different stakeholders and individuals that have to be trained in business environments, such as decision makers and planers, opinion leaders, managers, professionals, engineers and technicians, researchers, teachers, students and the general public (van der Heiden et al., 2015). Each group of individual professionals requires different content, approaches and media that have to be chosen in accordance with the specific contexts and learning environments of the business. Also, mixing of different learner types regarding interdisciplinary and international background, roles and functions within the business

promises gainful opportunities for synergies, yet also risks of misunderstandings and frustrations. In order to deal with these challenges, balanced concepts for joint trainings that support reciprocal and cooperative learning are necessary.

## *2.3 Media in Digital Learning Cultures*

Whereas the potential of digital media in education is widely accepted with regard to "enhanced diversity of provision and equity of access to higher education, alongside the increased efficiency of delivery and personalization of learning processes" (Henderson, Selwyn, & Aston, 2015), its immediate benefits in real-life learning environments are much more controversial. Mainly because effective media use relies on many different parameters, for example, different forms of representation. While the use of certain technologies can achieve good results in one context, it may not be appropriate in another, where teachers and learners have different requirements regarding, for example, their age, stage, foreknowledge, status, etc.

Digital media used in educational contexts have to be incorporated into didactic settings and adjusted according to different parameters, "such as the characteristics of the target group, the specification of learning content and aims, didactic method, didactic transformation and structuring of learning offers, characteristics and functions of media chosen, as well as auxiliary material" (Ehlers, 2009). Especially computer games have managed to escape their niche in the entertainment sector and have slowly worked their way into curricula as game-based learning. This, however, still poses didactic challenges.

Game-based learning can enhance learning and supports exploratory behaviour as well as control over a subject or knowledge. To achieve this, the different components of an educational game, identified by Kilii as person, task and artefact (Kilii, 2005), have to be matched. If tasks or artefacts are too complex, they may lead to anxiety; if their complexity is too low, boredom and distraction can be the outcome. Thus, the challenges of the game have to be matched to the user's experience and skill levels. Similarly, usability is a very important factor that influences the learner's experience and thus learning progresses. Rather like a cybernetic control loop, game-based learning generates learning effects if active experimentation, reflective observation and schemata construction can enhance each other via the implementation of clear goals, feedback structure, focused attention through usability and skill development. Ideas that are directed at problem solving and thus learning progress are generated (Kilii, 2005). Yet, as in all cybernetic systems, the different items within the loop have to be balanced continually in order to reinforce the flow. A continuous analysis and monitoring of the different prerequisites and development of the learners, tasks and the artefacts has to be conducted, represented either in the role of a teacher or within the system via collaboration, feedback and a vibrant change culture.

### *2.4 Corporate Structures in Digital Learning Cultures*

Teachers, learners and media are embedded within a wider educational setting that interacts with the different actors and their strivings. Whereas this is the case for traditional, formal learning contexts in which different didactic concepts, budget, equipment, teaching philosophies, etc. influence the learning environment, it also applies to corporations and enterprises: Just like every subject in school or every discipline in academic contexts has a distinct "set of tools and resources[,] approaches to teaching and learning[,] curriculum practices[,] cultural values, expectations and aims" (Hennessy, Ruthven, & Brindley, 2005), every market sector and, within narrower limits, also every company has their own culture that affects how business education is conducted and embedded in the system.

Ahmed, Loh, and Zairi (1999) define three different parameters that are essential for establishing continuous learning environment in organisations and that have aggregation and cross-level effects: the individual, group and organisational characteristics. Individual factors include, amongst others, intrinsic and extrinsic motivation, different life stages of actors, skills and creativity. A culture of open sharing of information, support for risk-taking behaviour and tolerance of failure enhances learning effects within corporate settings. Important factors of group characteristics are defined as group diversity, participative structures, leadership and size of project teams. While these can hinder learning effects, e.g. in the case of autocratic leadership, they can further lifelong learning if carefully adjusted with regard to the needs and requirements of the corporation and market. Last but not least, organisation characteristics such as communication channels, the availability of time and funds, underlying strategies, etc. are important with regard to establishing a resilient digital learning culture (Ahmed et al., 1999). Differentiated quality assessment, in which different interests of different stakeholders are taken into account (Ehlers, 2009), i.e. no simple checking and controlling, but feedback, reflection and recommendation mechanisms, supports lifelong learning in companies.

## 3 Method for the Survey to Examine the Existing Learning Culture in a Company

Companies are characterised by constantly altering (external) parameters, which lead to shrinking product life cycles as well as an increasing individualisation. Because employees adapt to these parameters, these parameters influence the company – and hence its learning culture. Dynamic capabilities of the company figure into managing this culture and involve having the potential to anticipate altered circumstances (Teece, 2012).

An adaptive learning culture becomes increasingly important as a result of demographic change and shortage of skilled workers. Adaption and update of a learning culture is therefore becoming an essential aspect of preventing future problems.

These problems could consist of elimination of knowledge by the separation of employees or outdated learning (Döring & Freiling, 2008).

Digital learning cultures, unlike a traditional one, have the opportunity to react faster and more flexible to a changing environment. Additional, digital learning cultures support a self-regulated learning and promote employees to become creative and more independent. New ideas and innovations are the results and generate competitive advantages. Concepts that can be applied at this point and generate the appropriate learning method with regard to learners, teachers, media and structures are thus highly promising and also verifiable with the aid of analytical tools. Problem areas can be detected and future problems are prevented early. The company can react to knowledge gaps and introduce the appropriate countermeasures, and an implementation of additional modern media extends the spectrum of digital learning (Ehlers, 2009; Kukulska-Hulme, 2010).

To review all the above-mentioned relevant factors learners, teachers, media and structures, and to put the learning culture into context, the use of an apparatus is necessary. The purpose of this is to conceive the learning culture itself and to analyse the effects of individual components of the participants on the learning culture.

The purpose of the concept/apparatus is to measure and to determine the process of learning between the learning culture in a company and the individual components. It is a questionnaire, which is developed based on various scientific sources.

In a first step, a typecast of participants of the study is implemented to, if necessary, identify possible varieties, e.g. of the results of production SME or big companies. Thus, factors like the company size, past personal experiences in usage of media, current position resp. occupation and constraint concerning usage of media (e.g., Simulator sickness) are gathered. This contributes to identifying the role of the study participants and the concerned parties. This first step serves therefore as data capture as well as the assignment of the roles of the participant.

After the collection of person-specific features, the evaluation criteria for the learning culture are gathered. For the recognition of the learning culture, a type of Competing Values Framework is used. This model/construct, dated back to Cameron and Quinn (2005), is one of the widespread instruments to the recognition of a company's culture and refined to learning in this study. This construct was chosen, because it should be noted that there is not one promising culture in a company but rather different characteristics of the factors that can lead to success. There are other factors that play a role here such as ever-changing tasks and challenges, which are brought into the company from the outside. This is where the dynamic capabilities concept takes effect, because the company must respond to the shift of the market or alteration within the company.

The questions and indicators to be answered in the assessment of learning culture will be developed by qualified psychologists, linguists, directors as well as employees of the companies that participate in the pretests. The statements/questions are answered by all participants with a view to the perceived learning culture in the company. The rating scale is deliberately chosen to use a 5-ary rating from "does not apply at all" to "fully applies".

**Table 1** Overview of (possible) constructs, topics and individual benefits

| Captured construct | Scales | Individual benefits |
|---|---|---|
| Measurement of learning promotion (German: Lernförderlichkeitsinventar) – LFI (Frieling, Bernard, Bigalk, & Müller, 2001) | | |
| Objective characteristics of the workplace and tasks | Independence/autonomy | Acquisition of the objective characteristics of the tasks |
| | Participation | |
| | Variability/monotonicity | |
| | Complexity | |
| | Cooperation | |
| | Feedback | |
| | Time pressure | |
| Learning climate questionnaire – LCQ (Bartram, Foster, Lindley, Brown, & Nixon, 1993) | | |
| Didactic climate in the company | Management relations and style | Contrasting of the didactic climate from the point of view of the individual and from a group is possible |
| | Autonomy and responsibility | |
| | Team style | Separate recording because of many items |
| | Opportunities to develop | |
| | Guidelines on how to do the job | |
| | Contentedness | |
| Learning transfer system inventory – TSI (Holton, Bates, & Rouna, 2000) | | |
| Transfer restrictions | Stage: compilation of the conditions of a certain training | Good to use as screening instrument, e.g. for identification of problem areas |
| | a.o. Positive and negative personal experiences | |
| | Personal transfer restrictions | |
| | Assistance of colleagues/supervisor and sanctions | |
| | Design of the transfer and possibilities of application | |
| | Stage: training conditions in general | |
| | Effort in transfer and performance and earning expectations | |
| | Resistance/openness to change | |
| | Self-efficacy and performance coaching | |

The development of the questions/statements, rather the refining, will be based on different scientific constructs. Table 1 presents a spreadsheet that serves as an overview of (possible) constructs together with their topics and individual benefits (Erpenbeck, 2005).

After the survey of the company's learning culture is completed, each participant answers questions in which he is asked which competence each participant in the specific process/occupation has to have, as well as which competences other employees of the company already exhibit. With the aid of a variance analysis, it is

possible to draw interferences from these parameters about the actual predominant learning culture and the desired (future) learning culture. This target actual comparison constitutes a promising potential for the future adaptions and hence the success of the company. Furthermore, additional interviews can be used to deepen the gathered knowledge. Strategic fields of action are reduced later through individualised recommendations later on and represent another goal of the tool.

## *3.1 Concept Tool*

Next to the assessment of the learning culture, a digitised learning tool is developed to work out the appropriate learning methods/media (M) within the company depending on the competences of the learner (L), the teacher (T) and the respective process that is to learn (P). All questions and items to identify the appropriate method are combined into a calculation matrix, which shows the compatibility of individual elements. Both charts (L/T, respect. M/P) are combined in a next step to show possible combinations and thus the corresponding learning culture (Fig. 1).

The use of the questionnaires is limited to the subjects in the charts which are media and processes, but can be appropriately readjusted. By asking about identic topics, it is possible to make comparison between the teachers (L) and the learners (S) as shown in Table 2.

Before asking questions regarding the media and the process (Table 3), it should be specified which group size of which age range will participate, what time is planned, if there is feedback and which topics should be digitalised.

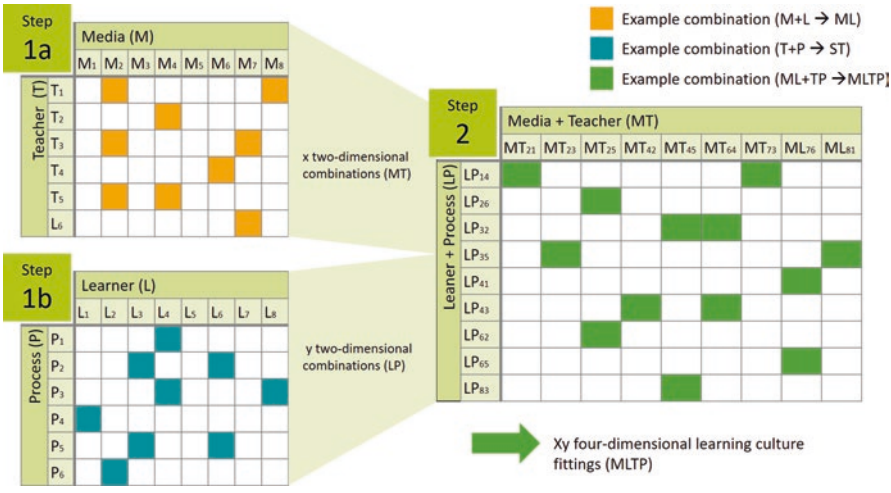


**Fig. 1** Example of the calculation matrix, own source

**Table 2** Comparison between the teachers (T) and the learners (L)

| Questions for chart I – teaching (T) | Questions for chart II – learners (L) |
|---|---|
| "Media Mx is provided" (several media like books, movies, brochures, instruction sheets, technical drawings/illustrations) | "Media Mx for the process Px is provided" (several media like books, movies, brochures, instruction sheets, technical drawings/illustrations) |
| "The learner is being encouraged using media Mx" | "I am encouraged to use media Mx for learning about process Px" |
| "Media Mx is useful for the learner" | "Media Mx helps me to understand the process Px" |
| "The use of media Mx results in an upskilling of the learner" | "Media Mx results in an upskilling for process Px" |
| "I am able to guide the learner in the process of learning with media Mx" | "I am guided while learning about process Px" |
| "The employees/learner are able to constantly learn new things with the use of media Mx" | "Media Mx makes me constantly learn new things about/for process Px" |
| "The learner are able to learn self-organised with the use of media Mx" | "I am able to learn self-organised to understand process Px" |
| "Media Mx is used for processes of importance in working life" | "Process Px is of importance in working life" |
| "Learner are able to test processes with media Mx beforehand" | "I am able to test process Px using media Mx beforehand" |
| "Learner are being prepared for process Px by using media Mx" | "I am prepared for process Px using media Mx" |
| "Media Mx shows employees learning-deficits" | "Media Mx shows me learning deficits for process Px" |

**Table 3** Comparison between the media (M) and the process (P)

| Questions for chart I – media (M) | Questions for chart II – process (P) |
|---|---|
| "The Media Mx suits process Px" | "The Media Mx suits process Px" |
| Feedback | Feedback |
| "The media Mx suits the group size" | "The group size suits the process Px" |
| "The planned time is adequate for media Mx" | "The planned time is adequate for process Px" |
| "The media Mx suits the age range" | "The age range can participate in process Px" |
| "The digitalised topics suit the media Mx" | "The digitalised topics help to learn about process Px" |

## 4 Conclusion

To examine and grasp the learning culture of a company, it is necessary to generate a unitary questionnaire that assesses the holistic learning culture and takes up connections and interactions. Parameters like social support, development opportunities, rewards as well as communication play an important role and affect the learning culture, and thus also the transfer of new knowledge what is assessed in the first part of the tool. Furthermore, it is necessary to develop appropriate methods and

instruments to identify learners, tutors, processes and media and quantify interactions to enhance the learning culture and represents the second part of the tool. Recommendation for the enhancement of the learning culture will complete the developed tool. The usage of digital media to encourage learning creates added value. Items to measure the learning support, social environment, dynamic capacities and technical acceptance are necessary to define relevant learning culture characteristics and – characteristics range. To seize the learning culture in its whole range, it is appropriate to combine these instruments and assess the learning culture as a whole. This chapter aims to give an overview regarding the relevant aspects for the development of digital learning cultures within businesses that are on the threshold towards a digitised company and should encourage business to assess those components while and before getting digitised.

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# The Use of Explainer Videos as a Learning Tool: An Internal and External View

**Andreas Krämer and Sandra Böhrs**

**Abstract** Both in private and the business sector, there is a significant increase in the use of videos. Companies take advantage of videos not only as a source of information but also as learning tools. Explainer videos effectively convey complex facts to a target group within a very short time. Characterizing elements are storytelling and a multisensory experience. Explainer videos are usually 1–3 min long. Rather than going into detail, they focus on the most relevant facts. The visualization includes animated illustrations, graphics, photos, and text. This article explores the future potential of explainer videos as a learning tool based on empirical research, academic and practical literature, and experience. Among other sources, findings are based on two empirical studies (representative for the German and US population, 18+ years): the first study focuses on the market potential for online courses in B2C and B2B market segments and the second investigates the effectiveness and efficiency of different explainer video formats (experimental online survey).

While the first study reveals a growing use and further market potential for online courses and investigates the specific requirement in different market segments, the results of the second study confirm that in all test groups, a significant improvement in the knowledge level of subjects was achieved after presenting the explainer videos during the interview. However, it is also necessary to take into account the time required to achieve this effect. Here, strong differences occur across the tested video formats.

Overall, business education explainer videos offer a broad area of application, ranging from independent elements of communication (e.g., for a short presentation of products or services) to embedded videos as core elements of online courses.

**Keywords** E-learning • Explainer video • Corporate learning • Visual education • Business • Education

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## 1 Growing Demand for Online Courses and Explainer Videos

In recent years, the use of video has been growing steadily. Indicators for this are the strong growth of e-learning applications such as online courses, as well as an increase of the overall use of videos, for example, on YouTube or video integration in online journals. Among the instruments of e-learning, online courses are regarded as a subsector with a particularly strong growth potential (Zhang & Nunamaker, 2003). The vision of the democratization of knowledge might come true soon. According to Fozdar (2015), open and distance learning (ODL) can be the solution for overcoming the gap between those who have access to an education including subjects like science and technology and those who do not. According to Androulla Vassiliou – former European Commissioner for Education, Culture, Multilingualism and Youth – "the online and open education world is changing how education is resourced, delivered and taken up. Over the next 10 years, e-learning is projected to grow fifteen-fold, accounting for 30% of all educational provision" (European Commission, 2014). Here, online courses are a major area. A typical online course includes digital lectures with interactive elements such as discussions in forums and multiple choice questions. Enrollment to the course is usually free or very cheap. Courses are often financed by venture capital firms, nonprofit organizations, profit-oriented companies, and universities (Holdaway, 2015). In addition to the academic field, e-learning currently plays a significant role in other areas. It offers the prospect of a substantial scalability that is not limited to the classical university environment (teacher in a classroom). In turn, the scalability includes the opportunity to offer online courses on various topics to a broad range of the population at a relatively low price or even for free. During the last 3 years "… MOOCs (Massive Open Online Courses) have largely moved from pedagogy to promotion and are now more used to advance institutional reputation than any serious drive to reinvent the institution" (Stewart, Khare, & Schatz, 2015).

Studies suggest that learning success can be improved if teachers use a mixture of media. Videos play a crucial role since video is by far one of the most powerful and expressive non-textual forms of media that captures and conveys information (Hampapur & Jain, 1998). According to a meta-analysis of Mayer (1997), students who received a coordinated presentation of explanations in a verbal and visual format (multiple representation group) generated a median of over 75% more creative solutions on problem-solving transfer tests than students who received verbal explanations only (single representation group). At the same time, companies are using e-learning programs to take advantage of the possibilities of digitization to achieve economies of scale in the transfer of knowledge among employees. Here, videos play an important role (Derouin, Fritzsche, & Salas, 2005). Furthermore, the development of the video hosting platform YouTube shows the growing interest in the video format. The average upload of videos per minute on YouTube boosted from 8 h in 2007 to 300 h in 2014 (Statista, 2015). In recent years, YouTube has become the most popular free video-sharing website for user-created content or

user-generated content (Shifman, 2011), mainly driven by its perceived usefulness and ease of use (Lee & Lehto, 2013). Apart from YouTube as the most popular and well-known video hosting site, there are other platforms that are widely used, e.g., Vimeo, Wistia, Sprout Video, and many more.

Companies take advantage of videos not only as a source of information but also as learning tools. In this context, explainer videos are playing an increasingly crucial role. This video style effectively conveys complex facts to a target group within a very short time. Characterizing elements are storytelling and a multisensory experience. Explainer videos are usually 1–3 min long. Rather than going into detail, they focus on the most relevant facts. Today, an increasing number of users create explainer videos using free of charge tools (Forbes, 2014). According to Graham (2015), video and presentation platforms are often applied while producing advertisement, e-learning courses, and explainer videos. Hence, not only are business-to-business (B2B) segments making use of explainer videos but also the business-to-consumer (B2C) and consumer-to-consumer (C2C) markets.

## 2 Market Potential for Online Courses and Usage of Explainer Videos (External View)

This paper explores the future potential of explainer videos as a learning tool and specifically the relevance of explainer videos as part of an online course. The first study focuses on the market potential for online courses in B2C and B2B market segments; the second investigates the effectiveness and efficiency of different explainer video formats (experimental online survey). Both studies were financed by simpleshow, a media company (founded in 2008) specialized in the production of explainer videos in the business sector. With an accumulated production volume of approximately 8,000 videos, simpleshow has a leading position in the worldwide market. The complete results of the studies (Böhrs & Krämer, 2015, 2016) are available on the company's webpage.

### *2.1 Research Approach: Focus on B2C and B2B Segments*

The general objective of the study is to explore the future prospects of online courses using a quantitative and representative survey and to measure the acceptance of innovative online courses (concept testing). Within the global market of e-learning, Western Europe (16%) and North America (53%) are key markets (Docebo, 2014). Therefore, Germany and the USA were selected as focus regions. In addition to the B2C perspective, a B2B sample (contacts of simpleshow) has been included in the study. In particular, it is assumed that the affinity to online courses and explanatory videos is above average in the B2B segment. The

questionnaire was designed in two languages, covering topics as recent experience with e-learning in general as well as online courses, in particular, future perspectives for online courses and the evaluation of innovative online course formats (with embedded explainer videos).

In order to answer the research questions, an empirical study was developed and carried out.

The online survey – representing three different groups ($n$ = 1,176) – was conducted in July 2015. According to the purpose of the study, the designed surveys are divided into different parts: the core element of the survey was a concept test with a special focus on a new innovative format of online courses (see Giannakos, Chorianopoulos, Ronchetti, Szegedi, & Teasley, 2014). The test was carried out in a two-stage approach: in the first stage, the simpleshow video format was presented. It included a short explanatory video (3 min), which presented complicated content in very condensed and compressed form. After displaying an exemplary video in this format during the interview, in the subsequent step the actual concept test was carried out. During this concept test, the basic structure of an innovative online course was presented (explainer video as an essential input; a speaker leading through the topics; changing forms of presentation; final test; total length of about 30 min). With regard to the concept, the intention to use, the willingness to pay for the simpleshow format, and the willingness to recommend have been recorded (Fig. 1). To ensure the validity of the concept test results, Schoormans, Ortt, and de Bont (1995) suggest that consumers who are invited to participate in a concept test should possess a degree of product knowledge.

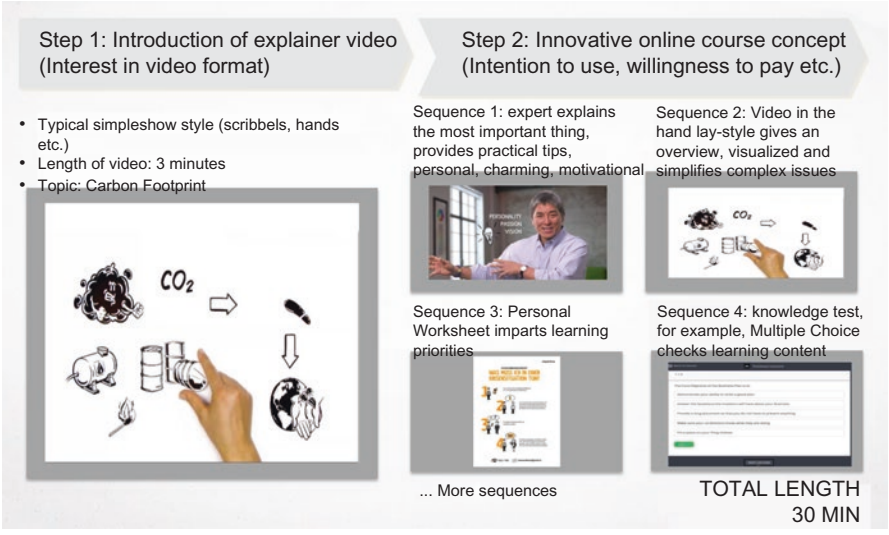


**Fig. 1** Concept test: Explainer video and new online course concept

## 2.2 *Research Findings: Market Study for B2C and B2B Segments*

Overall, the level of involvement is lower in the B2C segments (45% in the USA, 38% in Germany) than in the B2B segment: 83% of B2B respondents already experienced e-learning. Differences are significant, when performing a chi-square test ($p = 0.001$). Recent experience with e-learning is strongly correlated with age: all sample groups have shown lower level of involvement if respondents are seniors (60+ years).

### 2.2.1 Digital Learning Applications

Respondents who confirmed e-learning experience were asked to indicate which digital learning applications were used. Here, the usage of online references (e.g., Wikipedia) ranks number 1 (see Table 1). While blended learning plays a minor role in Germany, its relevance increases in the US B2C and B2B segments. Since the term "online course" is not clearly defined, the following definition has been used in the study: users of YouTube training videos, online trainings, or learning applications. Overall, 75% of the B2B contacts completed at least one online course in the past, followed by the B2C segment in the USA (34%) and the B2C segment in Germany (29%). At the same time, about one third of all users of online courses did not complete one or more online courses. When asked for the reasons (open question), it turned out that length ("course was too long," 38% of responses) and style and pedagogy (32% of responses) were the main factors. Among all respondents, students showed the highest dropout rate.

Online courses cover a broad range of topics. Here, business and professional topics play a dominant role (especially in the B2B segment). The relevance of language courses strongly differs between the B2C segments in the USA (13%) and Germany (45%). Similarly, the length of the courses shows a wide range. B2B respondents prefer rather short online courses (51% up to 1 h). Between 15% (B2B

**Table 1** Digital learning applications according to sample group

| Used digital learning applications* | B2C (Germany) (%) | B2C (USA) (%) | B2B (International) (%) |
|---|---|---|---|
| Online references | 77 | 67 | 89 |
| Computer training | 50 | 53 | 60 |
| Learning forums | 21 | 32 | 40 |
| YouTube training video (=online course) | 56 | 52 | 83 |
| Online training (=online course) | 56 | 65 | 82 |
| Learning apps (=online course) | 25 | 18 | 39 |
| Game-based apps | 15 | 15 | 29 |
| Blended learning | 15 | 33 | 44 |

*Question: Which digital learning applications did you use? (multiple responses)

contacts) and 22% (B2C, Germany) of respondents paid for the last online course taken. The median price is approximately USD 90 in the B2C segments and is significantly higher in the B2B segment (median: USD 550).

### 2.2.2 Degree of Customer Satisfaction with Online Courses

The degree of customer satisfaction with online courses reaches 48% (top 2) in Germany and is significantly lower in the USA (29%), while the highest level is recorded in the B2B segment (45%, differences are significant, $p < 0.001$). Therefore, it can be assumed that there is considerable room for improvement in customer experience. Concerning potential drivers, the length of a course does not significantly influence customer satisfaction ($p = 0.055$) nor do the number of courses booked ($p = 0.340$) and the topic of the course ($p = 0.340$). The customer satisfaction level is below average for business topics and is above average for languages and leisure topics. However, the satisfaction level significantly depends on age groups ($p = 0.001$). Furthermore, there are indications that the style of the video and its format are relevant factors as well. Pictures, video sequences, and text pages appear significantly more frequently in those courses that were rated "satisfying" by their customers. Respondents up to 30 years old are less euphoric about their last online course (top-2: 29%, low-2: 30%).

Since many possibilities for the distribution of online courses exist (Holdaway, 2015), further questions focused on the awareness and use of the most important marketing and distribution platforms. It was found that the market for online courses is strongly fragmented: Khan Academy reaches 24% in terms of awareness (recognition). All other online platforms rank lower.

Most respondents see online courses as a good option/opportunity to get further training in interesting subject areas. The evaluation of statements concerning online courses is especially positive within the B2B segment, as well as the group of respondents with usage of online courses in the past.

Overall, approximately one quarter of the respondents has used online courses in the past and at the same time indicates a usage in the future. Within the B2B segment, the corresponding share of this subgroup is 64%. Typically, those interviewees have a relatively high degree of customer satisfaction (49% top 2) and intensively book online courses. More than 80% of respondents in this group are employed, and 58% are willing to pay for online courses.

### 2.2.3 Evaluation of Innovative Online Course Formats

As presented in Fig. 1, one part of the online survey was used for a concept test concerning innovative online course formats. Simpleshow's video format plays a crucial role in this concept, and it was assumed that this format is not generally known in the B2C segments. Therefore, a video example was shown in the first step of the concept test. Approximately 50% of all respondents in Germany and the USA rate the presented

video as interesting (% top 2 agreement) – as expected corresponding results for the B2B segment were more favorable (82% top 2). This share increases to 67% in the group of respondents with the general intention to book online courses in the future. During the second step, the structure of an innovative online course format was described. Twenty-five percent of respondents in Germany and 30% of respondents in the USA indicate a high probability to book an online course as presented in the concept test (50% in the group of respondents with intention to book online courses in the future). The evaluation of the online course concept is significantly driven by the assessment of the simpleshow video format, which was shown before. Respondents with a very good evaluation of the video indicated 67% probability to use the online course.

Based on overall research and findings, explainer videos have the potential to play a crucial role when creating learning tools as online courses, from the perspective of designers as well as potential users.

## 3 Effectiveness and Efficiency of Explainer Videos as a Learning Tool (Internal View)

### *3.1 Research Approach: Experimental Online Design*

The general objective of the second study is to explore the consumer acceptance and expectations for explainer videos. One key element of the study is to analyze the effectiveness (learning effect) and efficiency (input/output ratio learning effect pro time of consumed video) of the explainer video as a format to improve the knowledge base of the user. Germany and the USA were selected as regions for the study. Considering there is a broad variety of different explainer video formats in these markets, this study not only investigates the effect on general knowledge when using an explainer video to transfer information to the consumer but also focuses on differences related to the video format.

In order to answer the research questions, an empirical study was developed and carried out. It provided insights to regional differences and therefore focuses on the key markets such as Germany and the USA. In addition to the cost-effectiveness of an online research study, this survey tool also has further substantive advantages for an experimental design. This is particularly true when different types of information such as videos and graphics will be presented during the interview (Krämer, 2016). Since the assessment of innovative formats of online courses is relevant for the study, online market research becomes particularly favorable. The online survey – representing two different sample groups (Germany and USA; total $n$ = 2.012) – was conducted in August 2016 and focused on B2C segments.

Per the purpose of the study, the online interview is divided into three parts: The first section deals with previous experience in the areas of e-learning in general and explainer videos specifically (number of videos, subjects, degree of satisfaction, and future intension to use). The second section relates to the learning effect achieved by explainer vid-

eos. Based on an experimental design, five different video formats are tested. In the third part of the interview, future customer expectations toward main characteristics of explainer videos are analyzed. For the experiment, a popular topic was selected, for which one video was already available (US presidential election). The company Explainity released a video on YouTube on March 21, 2016. By early October 2016, the video had more than 50,000 views. It explains that every 4 years the presidential election takes place in the USA and shows the process in which a new president is elected. Based on this reference video, four alternative videos were produced that contained the same information. The following formats were used: mysimpleshow, simpleshow classic, colored video, and whiteboard animation (Fig. 2). Each video was produced by a different simpleshow team with accordingly uniform specifications. These five different videos were shown to test groups. Each test group received only one randomly chosen video; following this procedure five different treatment groups for each regional sample group were created.

To measure the effect of explainer videos on the level of knowledge about the presidential election, the interviewees were asked to answer a series of questions about the video, followed by a typical pretest-posttest procedure (Zhang, Zhou, Briggs, & Nunamaker, 2006): pretest, during the online survey, subjects took a test, which included questions concerning the US presidential election. Those questions were derived from the reference video (Explainity). The test (multiple choice, ten questions) was repeated at the end of the interview.

## 3.2 *Research Findings: Usage and Efficiency of Explainer Videos*

Respondents who confirmed an e-learning experience in the past were asked to indicate the digital learning applications they used. Here, the usage of online references (e.g., Wikipedia) ranks number 1, while YouTube ranks second. Compared to the results in 2015, the usage of YouTube faces a particularly strong increase.

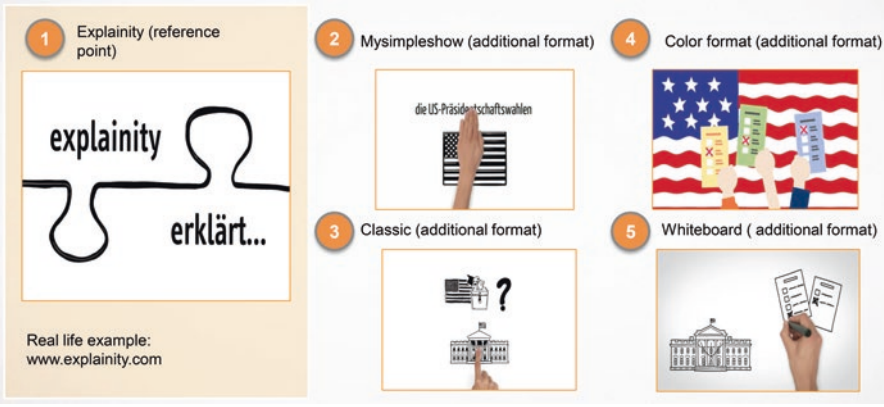


**Fig. 2** Experimental design: five explainer videos about the US presidential election

### 3.2.1 Digital Learning Applications

While 71% of respondents in Germany indicate that they have already watched explainer videos, the corresponding share for the USA is much lower (47%). It can be observed that video usage is depending on age. The use of explainer videos is broadly diversified: product videos are most commonly used (55% of respondents with e-learning experience in Germany, respectively 57% in the USA), followed by videos on health issues (44% of respondents with experience in Germany, respectively 37% in the USA).

### 3.2.2 Importance and Usage of Explainer Videos

The strong trend toward the use of YouTube videos is also explained in the empirical results. Overall, a strong preference to use video over text information can be detracted from the statement evaluations. The agreement to the statement "I often watch videos, for example on YouTube" is much larger (61%, top 2) than the rejection (21% low 2). One out of two respondents expressed the opinion that he or she can remember video content better than text content. While the structure of responses in Germany and the USA is relatively similar, there are highly considerable differences concerning two statements: this applies to the statements "If an explainer video is too long, I stop watching" and "If I'm searching for information, I often watch a video about the topic" (Table 2).

### 3.2.3 Pre- and Post-knowledge Test

The evaluation of the effectiveness and efficiency of explainer videos has a subjective and objective component. In the following, the subjective perspective will be investigated first. After the video was presented to the test group, respondents were

**Table 2** Statements concerning the consumption of videos (% top 2 agreement)

| Evaluation of statements based on a rating scale[a] | Germany | USA |
|---|---|---|
| I often watch videos, for example, on YouTube | 59% (2.52)* | 64% (2.35)* |
| I can remember videos better than text content | 52% (2.55) | 47% (2.63) |
| If an explainer video is too long, I stop watching | 52% (2.59)** | 57% (2.39)** |
| I prefer watching videos to reading text | 43% (2.74)* | 38% (2.85)* |
| If I'm searching for information, I often watch a video about the topic | 39% (2.99)** | 49% (2.67)** |
| I tend not to watch videos to the end | 31% (3.10) | 31% (3.09) |
| I prefer to read texts to watching a video | 29% (2.99) | 28% (2.99) |
| I often watch videos on my smartphone, because I can't read texts as well on it | 23% (3.58)* | 18% (3.72)* |
| I have already created videos myself and have uploaded them on the Internet | 15% (4.20)* | 16% (4.02)* |

[a]Question: To what degree do you agree with the following statements? (scale from 1 = I fully agree to 5 = I fully disagree)
Mean values in (). *indicates $p < 0.10$; **indicates $p < 0.001$

**Table 3** Results of the knowledge test (videos explaining the US presidential election)

| Mean values (standard deviation)[a] | Explainity | Mysimpleshow | Classic format | Color format | Whiteboard |
|---|---|---|---|---|---|
| Knowledge level before video (Ø points) | 3.49 | 3.26 | 2.99 | 3.32 | 3.25 |
| Knowledge level after video (Ø points) | 4.77 | 4.88 | 4.67 | 4.55 | 4.86 |
| Difference (Ø points) | 1.28 | 1.63 | 1.68 | 1.23 | 1.61 |
| Significance (reference: Explainity) | – | $p = 0.17$ | $p = 0.07$ | $p = 0.85$ | $p = 0.17$ |

[a]Question: We will now ask you some questions about the topic US presidential election presidency. Comparison of average scores (knowledge test) before and after the video. Mean values are shown

asked to evaluate the explainer video in relation to nine single dimensions and give a summarizing assessment ("overall I liked the video"). Overall, all video formats achieve a good rating level (subjective evaluation). Almost four out of five respondents indicate that they liked the video that was shown to them. Results for Germany were higher (80%) than for the USA (73%). Table 3 reveals that the improvement of the respondents' knowledge differs across the video formats tested in the experiment (objective evaluation). Compared to the original format (Explainity), three out of four alternative videos achieve better results than the original video (reference), while the result for the Color format is worse than for Explainity. In absolute terms the Classic format shows the best results. Here, the average improvement of respondents' knowledge amounts to 1.68 points, exceeding Explainity's results ($M = 1.28$) significantly ($p = 0.07$).

The share of test subjects who have watched the video completely ranges from 24% (Whiteboard) to 66% (Classic format). At the same time, the Classic format achieves the highest share of respondents who improved their personal score. Overall, the learning effect increases with the time the respondents spend watching the video. While in the case that the video was watched for less than 1 min and the knowledge effect is close to zero, the biggest improvement was gained when the video was watched more than 3 min.

### 3.2.4 Input/Output Ratios

The results so far confirm that in all test groups, a significant improvement in the knowledge level of subjects was achieved when presenting the explainer videos during the interview. However, it is also necessary to take into account the time required to achieve this effect (Krämer and Böhrs, 2017a). As Table 4 shows, the Classic

**Table 4** Knowledge improvement related to time spent to watch the video

| Mean parameters | Explainity | Mysimpleshow | Classic format | Color format | Whiteboard |
|---|---|---|---|---|---|
| Difference in knowledge level (average points) | 1.28 | 1.63 | 1.68 | 1.23 | 1.61 |
| Time spend to watch the video (average sec.) | 277 | 192 | 161 | 177 | 198 |
| Efficiency index[a] | 100 | 184 | 226 | 150 | 176 |

[a]Index = 100 for reference video (Explainity)

format not only gains the strongest knowledge improvement but also achieves this with minimal time effort. The ratio between input (time spent to watch the video) and output (improvement of knowledge level) is particularly favorable in this case. In other words: the efficiency of the knowledge transfer is particularly high.

## 4 Discussion

Results from the first study show that the use of online courses has become popular among the population and is not only a subject for academic training. Free of charge offers do not necessarily have a high quality. This also applies to online courses. On the one hand, the number of users of online courses is increasing. On the other hand, a relatively low degree of customer satisfaction suggests that there is considerable room for improvement. Correspondingly, dropout rates are high. For 2014, Stanford University reported a completion rate of just 5–10% (Walsh, 2015). This is consistent with the results of our study, showing an above-average proportion of incomplete courses among the group of students. For other target groups, this is also true. Studies focused on the business environment also underline that employees only weakly participate in online courses (IBIS Capital, 2013). A lack of incentives, failure to understand the content material, having no one to turn to for help, and having other priorities to fulfill are the main reasons for dropping out, as Hew and Cheung (2014) point out. The authors conclude, "the quality of MOOC education and MOOC business models are some unresolved issues." Other studies showed that course completers tend to be more interested in the course content, whereas non-completers tend to be more interested in MOOCs as a type of learning experience (Wang & Baker, 2015).

With regard to the requirements of the potential benefits to the design of online courses, it becomes evident that a special subsegment, in particular, expects a strong reduction in the length of online courses. This may be explained by two factors. On the one hand, shorter courses provide more options to fit the course in the time schedule. On the other hand, such courses are compressed in terms of content and detail. Here, videos can play a crucial role. Since video content is easy to understand and learners often retain more by watching a video than by reading a document

(Abeer & Miri, 2014), the video format is one option to compress content in order to reduce the length of an online course. Further examining the possibilities of use and the learning efficiency of explanatory videos helps identify a rule of thumb: shorter videos are more engaging than longer videos. Video creators should strive to make the content as concise as possible to achieve the highest engagement. The longer the video is, the higher the dropout rates (Hornung, 2014). However, this relationship is not linear. Usually higher dropout rates arise when thresholds exceeded 2–3 min and 10 min, respectively (Ruedlinger, 2012).

Results from the second study reveal a high acceptance for explainer videos from the perspective of potential users. A relatively high degree of customer satisfaction and a high intention to use explainer videos generate a substantial growth potential in this market segment. Explainer videos fit particularly well into the changing structure of media consumption in which visual aspects play an increasingly important role. Therefore, it is not surprising that the intention to use it in the future is firstly very much dependent on age and secondly on the recent usage of explainer videos. In addition, new fields of application arise, for example, as elements in e-mail marketing (Hampel, Hammon, & Hippner, 2013) or as essential parts of an online course (Krämer & Böhrs, 2017b).

From the authors' point of view, a particularly far-reaching result from the second study is that consumers show particularly satisfactory positive knowledge effects using explainer videos when they have a low degree of involvement on the topic and a low level of subjective knowledge: the weaker the respondents' interest (expressed by the subject's knowledge), and the lower the objective knowledge, the stronger the effect on knowledge improvement was. This is a crucial point for the marketing and sale of explainer videos. In many cases, these videos are used especially in areas where either the knowledge base is at a very low level or the involvement of consumers is rather low. Based on these results, it is expected that the knowledge improvements in other areas could be even more substantial than in the test (the majority of respondents were very interested in the topic). Furthermore, in case the interest is low, potential users of explainer videos only have a limited willingness to spend a longer time watching the video. This emphasizes the crucial role of a short video time.

## 5 Closing Remarks and Outlook

Explainer videos as a means of explaining complex facts have not yet been intensively studied, but in practice they are gaining importance, whether it is to explain products or services to potential customers (B2B), to provide consumers with information via video (B2C), or an element within an online course. Empirical findings provide clear evidence that explainer videos not only improve the knowledge level of the users but also increase consumers' involvement and activation potential. These effects are presumably dependent on the topic and should be further investigated.

Results from this paper suggest that further research is needed to investigate the full educational potentials that explainer videos provide to all subject areas.

This paper investigates the possibilities for companies to use explainer videos for business education. In times of advancing digitization and perceived product similarities (Krämer, Tachilzik, & Bongaerts, 2017), dependencies between customer experience and employees' satisfaction intensify. In some cases, the employees become the main competitive advantage of the companies. This requires a different form of cooperation, care, creativity, and empathy in the management of the workforce, the use of the collective knowledge base of a company, and the promotion of a "learning organization" (Ahmed & Rafiq, 2003).

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# Social Media Usage in Higher Education in Online Business Programs

**Gracia Castillo and Abubaker Haddud**

**Abstract** The impact of social media usage on students' performance continues to evolve, and it is important to explore the best practices to gain the most benefits. This chapter covers the benefits of social media use in higher education by providing an overview of the emergence of Web 2.0, its main tools and processes, how each of these tools can be used in higher education, and an academic snapshot of social media and students. Also, the chapter provides an evaluation of a current approach through reporting the findings of a study conducted to explore the impact of social media usage on students' engagement and performance. Quantitative research was conducted through the application of an online survey to collect primary data from 96 students studying at six higher education institutions, namely, Central American Technological University (UNITEC), Honduras; University of the Valley of Mexico (UVM), Mexico; Latin American University of Costa Rica (ULATINA), Costa Rica; Inter-American University of Panama (UIP), Panama; CIBERTEC, Peru; and University of the Americas (UDLA), Chile, who were enrolled in an international business program in one of four online business courses [entrepreneurship, marketing, social corporate responsibility, and consumer behavior]. The study revealed that the use of social media tools can help online students become more engaged and interact more effectively with peers and instructors.

**Keywords** Social media • Social networking • Higher education • Online business programs • Student interaction and engagement

## 1 The Emergence of Web 2.0 and Social Networking

In 2004, the concept of "Web 2.0" began with a conference brainstorming session between O'Reilly and MediaLive International. The term was an outcome of a discussion about what is known at that time the dot-com crash. Dale Dougherty, Web

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pioneer, and O'Reilly VP, noted that the Internet was more important than ever bringing in new applications and that the companies that survived the mentioned "crash" have some things in common. Both agreed that the dot-com crash marked a new turning point for the Web and a call to an action such as "Web 2.0" may make sense (O'Reilly, 2005). "Web 2.0 or Social Media is affecting the way people communicate, make decisions, socialise, learn, entertain themselves, interact with each other or even do their shopping" (Constantinides & Fountain, 2008, p. 232). Web 2.0 is defined as the philosophy of mutually maximizing collective intelligence and added value for each participant by formalized and dynamic information sharing and creation (Schroth & Janner, 2007).

## *1.1 Web 2.0 Tools and Processes*

The concept of Web 2.0 is demonstrated by a number of Web-based services and applications (sometimes referred to as "collaboration tools," and these include blogs, wikis, social networking, tagging and social bookmarking, RSS and syndication, audio blogging and podcasting, and multimedia sharing services). Many of these applications are relatively mature and have been in use for a number of years now. New features and capabilities are being added on a regular basis (Andersen, 2007). They are seen to hold considerable potential for addressing the needs of today's diverse students, enhancing their learning experiences through customization, personalization, and rich opportunities for networking and collaboration (Bryant, 2006). Social media resources can be divided into three distinct categories. While one category emphasizes content sharing and organizing sites like Delicious, Digg, Flickr, YouTube, and RSS readers, the second category encompasses content creation and editing Websites such as Blogger, Google Docs, and WordPress. The third category includes social networking sites (SNS) like Facebook, Ning, MySpace, Twitter, and Orkut that serve as online communities that enable users to connect with old or new friends and share ideas and resources (Rutherford, 2010).

### 1.1.1 Blogs

The blog, or Weblog, is perhaps the oldest of these applications (Tredinnick, 2006). The term Weblog, or blog, was coined by Jorn Barger in 1997 and refers to a simple Webpage consisting of brief paragraphs of opinion, information, personal diary entries, or links, called posts, arranged chronologically with the most recent first, in the style of an online journal (Andersen, 2007). Blogs can be written by one person or a group of contributors. Entries contain commentaries and links to other Websites, and images as well as a search facility may also be included (Boulos, Maramba, & Wheeler, 2006). Blogs have a variety of formats and might include the user expressing their opinion about a topic or documenting activities. Blogs are interactive in the sense that other users could provide comments on the information posted by the

blog author (Ajjan & Hartshorne, 2008). Blogs have been widely used for educational purposes include searching, tracking, interpreting, and evaluating blogs (Alexander, 2006). Specifically, bogging can be applied in higher education to achieve the following benefits (Grosseck, 2009):

- Use blogs for real-world writing experiences.
- Pull class blogs together into one area for easy tracking.
- Quickly give feedback to students and students to each other.
- Students use peer networks to develop their own knowledge.
- Update new information such as homework and assignments.
- Using comments in blogs can encourage students to help each other with their writing and get responses to a question without getting the same answer 20 times, etc.

### 1.1.2 Wikis

A wiki is a simple yet powerful Web-based collaborative-authoring (or content-management) system for creating and editing content. It lets anyone add a new article or revise an existing article through a Web browser (Murugesan, 2007). The most well-known wiki implementation is Wikipedia. Wikipedia allows users to modify encyclopedic entries by creating a reviewer and editing structure (Ajjan & Hartshorne, 2008). Wikis are useful in educational settings in that they support individualized learning, allowing for more socially defined search structures and promote collaboration through group editing and peer review (Alexander, 2006). Wikis can specifically be used in higher education as follows (Grosseck, 2009):

- Used for student projects and for collaborating on ideas and organizing documents and resources from individuals and groups of students
- Used as a presentation tool (as e-portfolios), as a group research project for a specific idea, and as a collaborative handout for students, in writing student-created books and journaling, used to manage school and classroom documents
- Used to create and maintain a classroom FAQ, as a classroom discussion and debate area, a as a place to aggregate Web resources, and for supporting committees, working parties, university projects, etc.

### 1.1.3 Social Networking

Social networks allow users to create personal profiles and establish a variety of networks that connect him/her with family, friends, and other colleagues (Ajjan & Hartshorne, 2008). Informal social networking has existed since the inception of the Web, but sites dedicated to social networking have been expanding exponentially since 2003. These sites collect data about members and then store this information as user profiles (Barsky & Purdon, 2006). While the increase in the use of these sites has generated concerns among parents, school officials, and government officials

about the potential risks posting personal information on these sites, it is evident they have a series of positive pedagogical implications (Ajjan & Hartshorne, 2008). Social networking can specifically be used in higher education as event support and continuation, team and community support, aggregation of social media applications, personal learning environments, etc. (Ajjan & Hartshorne, 2008).

### 1.1.4 Tagging and Social Bookmarking

Social bookmarking is the process by which users bookmark interesting pages and assign tags to each. Users can then share their tagged bookmarks. Social bookmarking is a great way of capturing contextual knowledge (Murugesan, 2007). Social bookmarking sites allow users to store, describe, and share numerous Web addresses with others. Users can explore bookmark collections of others by subscribing to their bookmark pages (Ajjan & Hartshorne, 2008). In 2003, Joshua Schachter launched del.icio.us – the first social bookmarking service. Inspired by del.icio.us, many kinds of social bookmarking systems have been established recently. The simplicity they offer for creating bookmarks and adding annotations was one of the reasons for their high popularity (Yanbe, Jatowt, Nakamura, & Tanaka, 2007). Tagging and social bookmarking can be used to facilitate collaborative information discovery in higher education as follows (Grosseck, 2009):

- Create a set of resources that can be accessed on any computer connected to the Internet; conduct research and share that research with peers.
- Track author and book updates and groups of students doing a classroom project sharing their bookmarks; rate and review bookmarks to help with students decide on usefulness of resources; set up a group tag in order to share educational resources.
- Share one del.icio.us account between a number of different subject-specific educators in order to share resources with each other, etc.

### 1.1.5 RSS and Syndication

Really simple syndication (RSS) is a service that rapidly disseminates awareness of new information. Searchers can use RSS to be alerted to relevant news headlines, blog postings, podcasts from radio, tables of contents of published electronic journals, and updates on results from a previous search (McLean, Richards, & Wardman, 2007). RSS and syndication can be utilized in higher education as follows (Grosseck, 2009):

- Professional development, time saving; updated information in teaching area information coming from constraining sources; sharing work with other educators.
- RSS feeds can potentially replace traditional email lists, reducing email overload.

- RSS feeds can be used to keep course-specific Webpages up-to-date and provide details about news and events etc.

### 1.1.6 Podcasting

A digital recording, or podcast, is produced and then played on a digital media player. The digital recording is commonly in the form of an audio file, but it may also include video. The downloaded digital media files can be played on a range of devices (Sandars & Schroter, 2007). Podcasting is a popular form of audio recording that has an associated RSS feed for subscribing to new audio recordings. Students could record themselves reflecting or reporting on their progress in an assignment or project, or they could record an interview with an expert in the field, etc. (Cochrane & Bateman, 2010).

### 1.1.7 Multimedia Sharing

Visual media can be uploaded and stored on a Website, such as Flickr (www.flickr.com) for photographs and YouTube (www.youtube.com) for videos. These media can then be shared with others (Sandars & Schroter, 2007). Multimedia sharing is identified as one of the main characteristics of social Web technology. This multimedia-oriented feature has enabled people to store and share their own produced pictures, videos, audio, and other multimedia files in social Web space. In addition, it allows people to search, tag, and comment on shared media (Panahi, Watson, & Partridge, 2012). Multimedia/video sharing can be used in higher education in a form of video professional development on own terms, create an own subject-specific videos with students, use video sharing sites to find videos on current issues, etc. (Grosseck, 2009).

### 1.1.8 Photo Sharing

Image sharing sites are designed to facilitate asynchronous public sharing of images. Users can utilize these to source and share image resources. Flickr (http://flickr.com) provides a large repository of publicly shared photos (and more recently videos) that people can use or share (Bower, 2015). Photo sharing can be utilized in higher education as follows (Grosseck, 2009):

- Share, comment, and add notes to photos or images to be used in the classroom.
- Inspire writing and creativity; create a presentation using the photos.
- Use tags to find photos of areas and events around the world for use in the classroom.

- Post student presentations to an authentic audience and get feedback from around the world; share professional development materials and have it available anywhere, anytime, to anyone; post presentations of special events.

## *1.2 Four Social Networking Sites*

### 1.2.1 Facebook

Facebook was created in February 2004 by Mark Zuckerberg at Harvard University. While its membership was originally limited to Ivy League college students, membership was later (since 11 September 2006) extended to anyone worldwide with a valid email address (Bosch, 2009). Facebook has come to dominate college students' personal lives and has become invaluable tools for maintaining interpersonal relationships, exchanging information, and providing entertainment value (Camus et al., 2016). Facebook has become an important site for the informal, cultural learning of "being" a student, with online interactions and experiences allowing roles to be learned, values understood, and identities shaped. Facebook should therefore be seen as an increasingly important element of students' meaning-making activities, especially where they reconstruct past events and thereby confer meaning onto the overarching university experience (Selwyn, 2009).

Facebook's networking and social communication capabilities can benefit both the instructor and the student by tapping into a greater number of learning styles, providing an alternative to the traditional lecture format, creating an online classroom community, and increasing teacher-student and student-student interaction (Munoz & Towner, 2009). Facebook allows users to create private groups restricting access to permitted users only. This feature can be used to create virtual classrooms, and only students enrolled in these classes can be invited to join and keep the undertaken activities within these group spaces private.

### 1.2.2 Twitter

Twitter is a social networking site that is often termed a microblogging service (Tess, 2013). Twitter helps engage learners using a media application in which they are interested. It enables educators to curb the traditionalist comprehension-based model and encourages critical thinking, synthesis, and evaluation throughout the learning process. Twitter allows learners and educators to interact via "Tweets" via smartphones, laptops, or any device with Internet access (Rockinson-Szapkiw & Szapkiw, 2011). Twitter may allow students to learn in informal settings, have more control over their learning as it can create communities of inquiry, have an avenue to share ideas and communicate with peers and teachers, and receive an immediate feedback and documentation of learning activities over time (Forgie et al., 2013). The integration of Twitter as a communication tool encouraged participation from

some students who otherwise may not be active participants in class and provided then with opportunities to communicate virtually at any time (Junco, Heiberger, & Loken, 2011). While many may perceive 140 characters restrictive in the amount and type of information that can be shared (Lovejoy, Waters, & Saxton, 2012), this can be seen as a way of fostering concise communicate.

### 1.2.3 Google+

Google+ was launched in June 2011 as a free social networking site based on the concept of "Circles." Circles allow members to group people they follow on Google+ into categories thereby providing the means to target comments to specific audiences. Hangout, the name for the videoconferencing feature of Google+, was initiated in August 2011, and the ability to create video posts directly on Google+ was added in January 2012. All three features, Circles, Hangout, and video posts, can be used to form a discussion platform and collaborative space for an online course (Strudler & Grove, 2013). Google+ can improve students' collaboration through Circles, conducting research for projects with "sparks" improving the student-instructor relationship by using social media, and support blended e-learning with the Hangout functionality (Erkollar & Oberer, 2013).

### 1.2.4 YouTube

YouTube, originating in 2005, is a Website that invites people to create and upload their own videos and to view, share, and comment on others' contributions (Sherer & Shea, 2011). Various organizations such as businesses, television broadcasters, universities, political parties, and nongovernmental organizations have set up YouTube channels in order to deliver their message to a wider audience (Clifton & Mann, 2011). YouTube has emerged as a major host of online video content and is now the third most popular Website behind Google and Facebook. The use of video in education can be an effective way of engaging students and supporting their understanding (Tan & Pearce, 2012). YouTube has also been shown as a tool that can help students participate in the educational process and learn effectively, by preparing and recording an individual report for submission to the class or through collaboration with other students to complete a project (McNeill, Rice, & Wright, 2016).

## 2 Social Media and Students: An Academic Snapshot

Social media are popular for education, not least because young adults, who attend courses at university, are familiar with these systems and most of them use it frequently (Erkollar & Oberer, 2013). Newer forms of social media differ from older,

traditional broadcast media in that they enable peer-to-peer messages, as opposed to unidirectional transmission of one-to-many media content (DeAndrea, Ellison, LaRose, Steinfield, & Fiore, 2012). Social media is a twenty-first-century term used to broadly define a variety of networked tools or technologies that emphasize the social aspects of the Internet as a channel for communication, collaboration, and creative expression and is often interchangeable with the terms Web 2.0 and social software. In higher education, institutions are still primarily relying on traditional platforms such as course and learning management systems (LMS) that do not capitalize on the pedagogical affordances of social media (Dabbagh & Reo, 2011). Social media usage within higher education can benefit the students in different ways, for example, greater student engagement, greater student interest, and students taking more control of their education and more responsibility for their education (Blankenship, 2011). The following three sections present how social media usage promotes student engagement, delivered quality, and improved student interactions.

## *2.1 Social Media and Collaboration Tools for Student Engagement*

Student engagement is defined as the time and effort students invest in educational activities that are empirically linked to desired college outcomes (Kuh et al., 2006). Engagement may include investment in the academic experience of college, interaction with peer students, interaction with faculty, and involvement in cocurricular activities (Junco et al., 2011). Student engagement with lectures, participation in seminars, and deep immersion in a subject matter have declined in recent years (Cole, 2009). At the same time, education has been undergoing a paradigm shift moving away from teaching-as-instruction toward student-centered learning, and as a consequence, curricula have been increasingly designed around learning outcomes rather than content (Lin & Hsieh, 2001). Using social media to support educational endeavors leverages the benefits of in-person learning communities with the benefits of using technology to support student engagement (Rutherford, 2010). Higher education administrators, faculty, and staff have an opportunity to help students use Facebook in ways that are beneficial to their engagement and, by extension, to their overall academic experience (Junco, 2011). Furthermore, student learning is positively impacted by learning communities, and there is a positive relationship between academic uses of technology and the occurrences of active and collaborative learning and the frequency of student-faculty interactions. Both of these benefits directly promote and enhance student engagement (Rutherford, 2010). Beltran-Cruz and Cruz (2013) demonstrated that instructors that communicate with students through course-based social networks increase student engagement in these online environments enhancing educational learning outcomes by using Facebook as a specific social platform.

## 2.2 Social Media and Enhancing Quality in Online Education

The growing popularity of social media applications indicates that by providing additional avenues and purposes for communications among students and faculty, social communications can become a contributor to successful learning. Interaction has long been recognized as a key indicator of quality in online courses (Roblyer, McDaniel, Webb, Herman, & Witty, 2010). The use of social media tools can provide personalized learning environments that can increase the quality and quantity of participation in online courses. Wakefield, Warren, and Alsobrook (2011) show that there is a relationship between social presence, perceived learning, interaction in the classroom, and course satisfaction with social media implementation in online classrooms. This can lead to fostering communication which in turn complements perceptions of engagement and perceptions of quality of education (Welch & Bonnan-White, 2012). Quality in education is reflected through engagement and participation of students in the online classroom. When students are highly involved and communicative within the environment provided, it leads to more interest in the topics of study, and more discussion is fostered and accomplished. Gonzalez, Leidner, Riemenschneider, and Koch (2013) explain that when higher education environments are not engaged in social media for communication with students, they are not using these outlets to their full potential. Social media plays an important role in the way educators approach students to encourage participation and engagement. Evans (2013) states that there is a positive relationship between social media tools usage, such as Twitter, and the way that students actively participate in shaping their experience and vice versa.

## 2.3 Online Platforms and Social Media to Improve Interaction

Increasing student engagement is positively related to student utilization of social media tools, for example, Facebook, Twitter, and other social interactive tools or microblogs. Such tools can create stimulating environments for online classrooms to encourage interactions between students and with faculty with the increment of these types of interactions providing a basis for increased student engagement (Welch & Bonnan-White, 2012). Such social media tools can help learners interact with peers in a way that can help them make sense of the subject matter they are studying and provide an efficient way to maintain communication and social connectivity (Veletsianos & Navarrete, 2012). The interactions between students in an online education system support active participation which is an important element in making the learning experience a success (Tarantino, McDonough, & Hua, 2013). Increased interest in online education made institutions address the key challenge this mode of instruction faces which is to develop and incorporate a social presence for students to keep the sense of human contact that is sometimes lost in online settings for education (Mathieson & Leafman, 2014). Obtaining this from current

LMS seems far-fetched since often these learning platforms are restrictive and lack flexibility. Mathieson and Leafman (2014) emphasize that it is important to tackle this issue to establish a relationship between students' perception of social presence and students' satisfaction with the course.

## 3 Current Approach

In 2015, the authors of this chapter have conducted a research study to explore the impact of social media tool usage on student performance enrolled in online business courses in a number of higher education institutes. A quantitative methodology was selected through the use of an online survey to collect the primary data for this study. Data was collected from 96 students studying at six higher education institutions, namely, Central American Technological University (UNITEC), Honduras; University of the Valley of Mexico (UVM), Mexico; Latin American University of Costa Rica (ULATINA), Costa Rica; Inter-American University of Panama (UIP), Panama; CIBERTEC, Peru; and University of the Americas (UDLA), Chile, who were enrolled in an international business program in one of four online business courses [entrepreneurship, marketing, social corporate responsibility, and consumer behavior]. The survey included 12 questions and was administrated through the use of Qualtrics survey software. Table 1 illustrates each of the 12 questions, the available answers, and the participants' responses for each response option.

## 4 Key Findings

The surveyed students reported that the interaction levels with their instructors on the used LMS [Blackboard] were relatively high. Whereas, the interaction level with peers using the same medium was relatively low. This is, perhaps, because of the nature of online classes' setup where the delivery of materials is more instructor led and directed. About two-thirds of the surveyed students stated that they used social networks to interact with peers and/or instructors for academic purposes outside the classroom online learning management system (Blackboard). This percentage remains low compared to the widespread and use of social media in general. Among Facebook, Twitter, YouTube, and Google+, the majority of students reported using the Facebook more often. This was an interesting findings where Twitter and YouTube had zeros responses. However, the majority of surveyed students stated that they used social media tools to communicate with instructors and this has facilitated the interaction process in the online courses. The majority of students agreed that the use of social media improved their interaction in the online learning process.

From these findings, social media tools can be used as effective tools in helping students engage and interact more efficiently with peers and instructors when taking

**Table 1** Survey questions with participants' answers

| | Question | Possible answers with participants' response percentages | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Age | 18 years or less (5%) | 19–21 years (44%) | 22–24 years old (33%) | 25 years or more (18%) | | |
| 2 | Course I am part of | Entrepreneurship (57%) | Marketing (14%) | Corporate social responsibility (10%) | Consumer behavior (19%) | | |
| 3 | Institution in which you study | Central American Technological University (UNITEC) – Honduras (5%) | University of the Valley of Mexico (UVM) – Mexico (63%) | Latin American University of Costa Rica (ULATINA) – Costa Rica (5%) | Inter-American University of Panama (UIP) – Panama (8%) | CIBERTEC – Peru (5%) | University of the Americas (UDLA) – Chile (16%) |
| 4 | How would you rate your experience taking an online course? | Very dissatisfied (15%) | Unsatisfied (21%) | Neutral (28%) | Satisfied (29%) | Very satisfied (7%) | |
| 5 | How would you rate the interaction with your peers that you experienced with the online classroom collaboration tools (Blackboard)? | Remarkably strong (5%) | Strong (11%) | Competent (36%) | Needs improvement (29%) | Need to improve significantly (18%) | |

(continued)

**Table 1** (continued)

| | Question | Possible answers with participants' response percentages | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | How would you rate the interaction with your instructor who experimented with the online classroom collaboration tools (Blackboard)? | Remarkably strong (17%) | Strong (31%) | Competent (26%) | Needs improvement (14%) | Need to improve significantly (13%) | |
| 7 | Have you used social networks to interact with your peers and/or instructor for academic purposes outside the classroom online? | Yes (64%) | | | No (36%) | | |
| 8 | Which social networks did you use? | Facebook (82%) | Twitter (0%) | YouTube (0%) | Google+ (3%) | Other (15%) | |
| 9 | How would you rate interaction with your peers within the social network you used? | Remarkably strong (15%) | Strong (41%) | Competent (31%) | Needs improvement (11%) | Need to improve significantly (2%) | |

| | Question | Possible answers with participants' response percentages | | | | | |
|---|---|---|---|---|---|---|---|
| 10 | How would you rate the interaction with your instructor within the social network you used? | Remarkably strong (16%) | Strong (28%) | Competent (21%) | Needs improvement (11%) | Need to improve significantly (23%) | |
| 11 | Do you consider that the use of social networks helped your participation in the online course? | Yes (87%) | No (13%) | | | | |
| 12 | How would you rate your commitment to the subject taught in the online class? | Remarkably strong (25%) | Strong (33%) | Competent (20%) | Needs improvement (14%) | Need to improve significantly (8%) | |

online courses. Higher education institutions may put more effort in officially promoting the use of these tools and help students capture the benefits from engaging and interacting on these mediums. This can be done by developing some course materials, requiring the completion of certain assignment, or creating some discussion forums on different social networking tools. This study was limited to students taking undergraduate online business courses, and further studies may expand to explore other courses, levels, and institutions. Also, this study was limited to higher education institutions based in six South American countries. Duplicating the study to include students from different geographical areas is recommended. Another recommended research may include attempting to measure the impact social media tools usage has on student engagement, interaction, and performance in general.

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# A Practitioner Perspective: Pushing the Limits of Online Learning

**Gyula Julius Dobos**

**Abstract** *Pushing the limits of online learning* is making a case for hybrid learning by comparing the high productivity in real-time online team learning versus traditional classroom-based learning, from the perspective of a high-level undergraduate collaborative project series that utilizes both systems. The main focus is on identifying the methods and tools that make individual and team learning more effective in a hybrid system, as opposed to traditional education taking place only on ground or by exclusively using a virtual classroom as a more efficient platform in education. Online learning platforms can form productivity-enhancing opportunities, which supplement but don't fully replace on-campus meetings. A hybrid approach, which provides both an excellent utilization of resources and a practical, personal learning experience via human interactions, can best support the development of the invaluable soft skills essential in the world of business and entrepreneurship today.

**Keywords** Online business education • Collaborative environment • Project-based learning • Soft-skill development for business • Hybrid education platform

## 1 Introduction and Background

As a film and music business professional and business owner in Europe, in the United States and online for over two decades, I have witnessed the power of hands-on experience-based learning in a wide range of professional environments since the early 1990s. I have also seen the growing importance of soft skills and watched business communication and interpersonal skills igniting and breaking businesses. After all, what are the professional skills worth if a professional can't get a career job or if a business owner can't get (or keep) a client to sell the talents, ideas, products, and services to? While the popular platforms both for business education and for conducting business have gone through a major shift during the past decade, I continue to experience an ever-growing need for a mix of trade-specific skills and soft skills that are essential for employees, employers, entrepreneurs, and

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freelancers alike in today's digital media businesses. Using technology is supposed to make operations easier, but it can also disconnect us, becoming a layer that makes it harder for a provider-client relationship to form and thrive. The same can be said about online business education: technology can enable better learning, but it can also diminish the teaching effectiveness in some of the most practical skills in business.

In the Western culture, business is based on market balance and involves competition within specialized fields. Therefore, professional education at the dawn of the twenty-first century has to be practical – especially in highly competitive and long-established fields, like media production, in which professionals might represent several generations and their diverse approaches to business – all in the same field and within the same economy. A virtual reality start-up might be doing business with an IT services vendor, and their way of conducting business, communication, business strategies, etc., may be similar. However, they both may need to work with an import-shipping company, a business that may be operated in a more traditional business culture. Today's business professional may need to work well with the "old school" and the "new school" businesses alike.

Business education must be practical not only in a sense of building professional skills and experience but also in armoring graduates with soft skills, which they must possess in order to join the workforce or develop their own ventures. The author brought this philosophy from the music- and film production industries, when he joined higher education as a Distinguished Lecturer at Cogswell College of Silicon Valley in 2012. Education had already been transitioning from the on-campus model to online platforms, and the goal was to use a mix of benefits from both.

The first challenge lied in the fact that, while new platforms and tools were plentiful, content specifically created for supporting these new platforms was insufficient and generic. Technologies evolve rapidly, but teaching methods take time to be introduced, tested, and embraced. Education is trying to keep up with the pace of change in technology, but quick adaptations of new tools often lack the development of new methods and content to accompany such new tools. Not finding existing programs that were suitable for conversion into the real-life-driven, practical approach the author wanted to use, he created a new, professional program concept along with Cogswell Faculty Anthony Dias; the program is now known as MediaWorks. This interdisciplinary, collaborative, hands-on program aims at putting students through a real-life business experience during their junior and senior years. Within the educational framework, actual business is being conducted between fully involved parties: corporate clients and teams of undergraduate college students. The specialized teams consist of students from various disciplines, such as digital audio production, arts and animation, digital media management, and business administration. Two directors, who are also faculty members, are leading the work. MediaWorks is a highly practical learning experience; students produce complex media projects for established companies and organizations with actual needs, working under the pressure of high client expectations and tight deadlines. The experience involves on-campus and online meetings, collaboration between

individuals and teams, in-person and remote project planning and project management, and plenty of hands-on work. Recently the focus has been expanded with business development, analysis of service effectiveness, formulation of business strategies, and presentations. All of these tasks are carried out by students. Going beyond an internship or a one-off industry-academia collaborative project with an end date, the program has been continuously running with great success for 4 years and has been responsible for collaborations between Fortune 500 companies, international brands, and an increasing number of students. The conclusions discussed here are based on the analysis of various methods and platforms used by the directors, the experience of students, instructors, and clients of the past 4 years.

## 2 Offline Versus Online Productivity

What is the goal of online learning form the students' perspective? Virtual location? Convenience? Freedom with their schedule? What *should* be the goal of this relatively new platform?

Whether we're teaching entrepreneurship, business administration, or media production, online learning should not be seen as a replacement for the in-person classroom experience but rather as a way to enhance the experience of learning, as well as putting students through the experience and challenges of the way real-life business is conducted in the twenty-first century: both online and offline. This is often referred to as the hybrid learning system: a combination of online and on-ground sessions during a course or program. Another desired outcome of online learning is to create a classroom-like experience, however, not a static kind, where information, ideas, and questions travel in a single direction at a given time between two collectives (teachers to students or students to teachers), rather, where the collective experience and information flow in every direction between every member of a group or several groups in real time, creating a true collaborative learning environment.

The MediaWorks project was created to fill the gaps between the traditional method of learning and today's professional business practices. The long list of such gaps include trade-specific and soft skills development, on-campus and real-time online collaboration for business and media production, and online team-building and project management. More importantly, the program aims to create a bridge between simulation work and conducting business with real-life clients that have actual service or product needs. Without this bridge, graduates often face the sudden need to apply business skills in the professional field right after graduation – which is not a realistic expectation given the lack of opportunity to develop those skills, not to mention the time it takes to acclimatize to today's business culture, in which those skills are expected to be used from the first week on the job (and some even at the job interview). Starting this acclimatization years before graduation requires a hybrid approach in most fields. During the first 4 years of the program's operation, MediaWorks students have served as a control group and focus group in one,

providing invaluable feedback and opportunities for comparative analysis of the various online and offline methods used.

Student teams and instructors learn to use a wide range of ever-changing platforms and services for collaboration, communication, and project management *while* they are focusing on the production or business tasks at hand, as opposed to learning the communication tools themselves first, before using them for the actual work. The "learning by doing" method not only generates highly practical habits for the student user, it effectively doubles the number of tools students familiarize themselves with within the same amount of time, since no dedicated time is spent on tool-learning.

Online learning is often associated with prerecorded instruction videos, learn-at-your-pace convenience, and limited individual feedback to students. While these passive models might be cost-effective and convenient to students and institutions alike, their effectiveness, as exclusive methods, are low relative to active online learning: real-time discussion and idea sharing (through platforms like Slack), video conferencing (Zoom), real-time written collaboration (Google apps), and file sharing services help to raise the effectiveness and efficiency of building concepts and proposals, production, intra- and inter-team communications, and faculty-student and student-client communications far beyond the basic functions of a standard portal of a learning management system (LMS). For example, during the research and client interview phases of their TEDxSanFrancisco audiovisual project, MediaWorks' Visual and Audio Team members worked together to generate concepts and propose solutions to the client, led by the two directors and a project manager student. The role of directors was that of facilitators, guiding the process of information exchange and concepting. The conversations and brainstorming took place on-site, with the project manager using Google Docs for shared documenting, and the directors using the Canvas LMS for defining expectations and for course management. However, going into production, the team structure changed: the Visual Team enlisted concept artists and animators, led by the project manager, and the Audio Team was further broken down into several sub-teams, each containing a sound designer and a composer. The directors became creative leaders, reviewers, and "client representatives." As the structure changed, so did the methods of communication: the Visual and Audio teams kept using Google Docs, but added Slack, as their choice for real-time, two-way updates available outside of class meetings. File exchange took place over an FTP connection to a cloud server, where the various teams created their own file hierarchy, as well as through an improvised Facebook Group within the Audio Team – both accessible at anytime from anywhere. While this might sound complicated, it was quite the opposite: each team using their *preferred* way of communication for the given tasks, as opposed to being forced to use a set of tools, greatly enhanced individual involvement and team productivity. Directors were also able to manage their teams remotely between class meetings and make immediate decisions when critical updates occurred on weekends and late nights.

Based on the MediaWorks model and the combined advantages of real-time online and real-time offline methods, the many facets of business learning can be grouped into the following three categories:

1. Aspects that can be taught online effectively
2. Aspects that involve practical work performed by students and may be enhanced by the online platform for higher efficiency and effectiveness
3. Aspects that are inherently limited by the nature of online learning and require a hybrid approach for its in-person meeting component

Let us examine each.

## *2.1 Learning Aspects Suitable for the Online Platform*

The need for proper and effective written communication in business cannot be disputed, yet, graduates' average functional English literacy does not meet the expectation of today's competitive and often formal business environment. This is one of the areas where participants should benefit from using an online platform, i.e., writing proposals, business plans, etc. While online platforms, helper scripts and flexible templates can certainly help to develop business writing and composition skills by providing an efficient feedback mechanism, it should be noted that the use of spell-check and phrasing correction functions of software can develop a reliance on such automated help. Employees might be required to create a proposal or memo at a jobsite or in a meeting room, where correction software (or a computer, for that matter) might not be available; situations of this type can get new employees who are overly reliant on such software into trouble quickly. In online learning platforms, disabling grammar-correction scripts, phrasing-recommendation functions, and the ability to paste text from other software can ensure that students properly develop unaided business writing skills.

Project planning can be greatly enhanced by the use of online platforms. Students have the option at their fingertips to access information about the project; view notes from other project team members, clients, and project managers; access and cross-reference multiple schedules and desired deliverables; and work collaboratively in real time to establish a plan that takes each subject expert's input into consideration. They can do all this and more, without having to walk across the classroom to obtain pieces of information one by one in person as they used to do in the classrooms; the online process is not only more efficient but also invaluable in the development of analytical and planning skills. Today, students can effectively create complex plans that involve dozens of parties from diverse fields, complex tasks that might have given them a headache 20 years ago.

Students tend to analyze others' work with better focus and more accuracy online. Comparisons between students critiquing each other's work online and in-person also revealed that they are more comfortable with, therefore more accurate

when analyzing another student's work in the absence of that work's creator. Such unbiased analysis is a must-have skill in business, and the online platform encourages students to critique and even self-critique work more objectively online in real time. It is worth noting, however, that on a more advanced level, the process of constructively critiquing work in the presence of the creator of the work should be also practiced by students, acting both as providers and receivers of critique.

MediaWorks students have been observed to perform critical thinking and analysis quicker and more objectively online, typically from the comfort of their home, when such analysis was performed individually, relative to similar individual work analysis done in classes. However, the directors did not encounter a significant difference between the effectiveness of collaborative analysis performed by student teams online and in person. This seems to be due to most individuals' ability to better focus on analysis tasks when working alone in an environment with less distraction; in a team scenario, the advantage of several team member's diverse views is canceled out by the difference between team members' varied personalities and approaches. The conclusion seems to be that students perform critical thinking and analysis most effectively when they are working individually online but subsequently discuss their findings collectively in person.

While students with extrovert personalities or higher self-confidence may enjoy sharing their critical thinking and creative thinking processes, experimenting with ideas on the spot in front of a class is not an exciting proposal for everyone. The online platform has a clear advantage for the type of students who prefer to think their ideas over and over before sharing them with a group of peers or with clients. Others thrive in the on-site collaborative environment. A wide range of projects have shown that the creativity of the more inward-turning students often gets compromised, and some ideas and solutions don't even surface when the online learning platform, as an optional brainstorming space, is removed. For the highly introvert students, the on-site practice might be severely detrimental, especially in larger teams. Moreover, not providing the online platform for these students' ideas to surface may be a loss for the team as well, for which the same students would provide a valuable contribution online. In a sense, the online platform gives students who tend to find solutions when removed from a high-pressure offline situation an even chance at creative thinking and expression. Taking this even farther, providing the online platform can help project managers and instructors to realize the intellectual power that the "inward-facing deep thinker"-type of students can provide to their project. Similarly, the online platform may be a benefit for instructors to teach students with a more introvert personality and help develop their critical and creative thinking skills in their preferred environment.

In business learning, students may be required to multitask: gather, process, and provide information at the same time, while also taking notes, memorizing facts, and employing critical thinking and reasoning. Over 20 projects involving 12 different student teams (of 10–20 students each) have shown an advantage of online learning over in-class learning in the memorization of factual information. As an in-person session typically takes place in a faster-paced environment with more potential distraction, it's no surprise that students take advantage of the online

learning model by separating tasks and sequencing them in their preferred order. While in-person sessions might not be avoided in real-life business, the clear separation of tasks between offline and online sessions in a course will enhance the quality of learning outcomes.

For example, MediaWorks students meeting with an instructor, project manager, or client in an on-ground class might be exposed to both statistical and big-picture information (like metrics and branding guidelines) and be required to analyze and interpret findings and formulate a plan while taking notes at the same time. Should they need to revisit their thinking or the information their business plan is based on later, they would have to rely on their notes taken in the same class session when they were preoccupied with performing multiple other tasks, too. However, when the same set of tasks are performed using an online platform, students tend to focus on each task separately, for example, they might be taking notes real time, memorize information subsequently, and evaluate their findings in yet another step, before formulating a plan. This more deeply memorized information will then become readily accessible for students in the future while they are performing the subsequent tasks; this often eliminates the need to refer back to notes, rethink a previously established intent or business plan, and so on. Only by changing the platform, the quality of note taking, memorization, analysis, and any other single-focus task can be improved. This is not unlike the difference between keeping information on one's hard drive and in their computer's RAM; it is more effective to "paste," for example, numerical information from RAM without interrupting the workflow than to start a lengthy search on a hard drive for such data when it is needed.

Probably the most obvious benefits of a hybrid learning system are team learning and multidisciplinary collaborations. Various online platforms allow students to synchronize their work and progress with other parties that are involved in the project, without having to coordinate on-site meetings – which are often not possible and would limit the learning outcomes of students in every group. Online collaboration tools such as Slack allow most younger and tech-savvy students to experience learning as part work, part fun, given their interest in the tool themselves. It's not hard to imagine how a notification about some new information or action taken by another team member appearing on a student's smartphone can prompt an immediate reaction or response, similar to a Facebook post or other social networking events. Whether being connected 24/7 is a benefit or curse for the human psyche is debatable, but it certainly allows educators to run projects in a way they replicate the real-life business experience most accurately. This, in turn, prepares graduates for a smooth postgraduation transition into a professional lifestyle, which is much different from the student life they get used to while taking traditional classes.

When students are working together online, sharing their research with each other, summarizing their collective findings, and brainstorming as a team rather than a class, project after project the student team as a collective becomes more effective online than in a classroom. Feedback from students reveals that this is due to their activities taking place on their own terms. While this might sound scary at first, students actually tend to get more involved in the work and develop a stronger sense of ownership of projects, when they choose the time and place to work on

them, as opposed to feeling like they are forced to work together at a given time (class) and place (classroom). Of course, students who are prone to getting sidetracked easily or have low interest in the subject will not do well and might contribute to the team's efforts less than they would in a traditional class on campus. A hybrid approach (the combination of on-ground and online classes) can make practical learning more efficient and productive for most while keeping each student team member motivated and accountable for their contribution.

Real-time editing of written documents, preparing proposals as a group by brainstorming, and drawing ideas on a shared screen are examples of tasks that can be accomplished offline but are much less efficient or collaborative due to physical limitations, like shared space and time, and due to the lack of synchronized document updates between participants' document copies. In a way, online platforms that bring together many contributors real time, such as Google Docs, enable students to experience the *process* that other students use and the difference in the *ways* contributors think about similar problems; these platforms essentially enable students to study a diverse set of *approaches* in a familiar situation – without much input from an instructor. This is powerful!

## *2.2 Practical Learning Enhanced by the Online Platform: The Hybrid Learning Approach*

Online platforms enable students to work with the class, and possibly with the instructors, more frequently and in smaller increments, than traditional once or twice a week in-class meetings. In an online LMS, information and assignments can be set up in advance, to become available for students between scheduled classes. This can facilitate more in-depth learning and more frequent self-critique and cross feedback between class members and potentially the instructor (via email, LMS messaging, discussion groups, and forums). Providing information or mini-assignments between class meetings can also mimic the often spontaneous nature of real-life business practice, where information may arrive late, and appear at a random frequency, but must be dealt with rapidly.

While instructors' in-class demonstration of practical skills has a stronger advantage for students due to the first-hand experience, online video demonstrations are actually very helpful in developing the most important skill for the next generation of workforce: the ability to adapt. Tutorials delivered online may feel less convincing for students, which forces them to figure out some less obvious elements and "make it work," typically by investing more time into practice and less time into memorization. This essentially allows them to experiment more, make more mistakes, and learn more from their mistakes, to their own advantage. Managing the learning process on their own or with limited external help and turning the challenge into success may also enhance their level of confidence. Both of these outcomes greatly help the development of their ability to adapt to new tools, situations,

and methods, as long as a feedback mechanism, such as an assignment, an evaluation, a test, etc., is in place. While this is true for most skills required in entrepreneurship, business administration, and project management, it is not "safe" in areas where learning or demonstrating proficiency of a skill has important physical aspects or practice requirements. An example is business presentation: the use of facial expressions, tone, body language, and nonverbal communication are skills that business students should practice in real-life class sessions. Future technologies like augmented reality will be likely promoted as tools that eliminate the need for in-person practice via virtual meetings and AR presentations at the student's home, but the best way to practice human interaction will always be real-time same-space human interaction, due to aspects that may also influence a real-life meeting or presentation but are not feasible to be virtualized (such as the scent of the presenter's cologne or perfume, voice projection, sweating, etc.).

As discussed earlier, unexpected receipt of information in business may require rapid response skills. Being able to properly react to such information, whether it's in the form of questions or instructions, is an essential skill in today's accelerated business culture and should be developed in business-focused courses. In one of author's real-world exercises, he unexpectedly brought in the representative of Corning, Inc., a Fortune 300 client to a class meeting. Students had only prepared by researching the client's business online but were not prepared for an in-person meeting. They were expected to ask questions that would prompt answers practically relevant for the development of a business proposal for the same client. One of the students commented after the meeting: "Professor Dobos, this was a really thrilling exercise... but, would you mind to let us know the next time we'll have a meeting like this in advance? My legs were shaking while I was asking my questions." This example should serve a reminder that for all of us there was a first time for everything that we think of as a routine task today and the most challenging element might have not been our professional preparedness, rather our comfort level or our ability to do our best in a given situation. At the same time, business tasks that require fast thinking, decision-making on the spot, fast critical analysis, creative problem-solving are not abilities that students develop during the first week on the job. And, there is no better way to start to practice for these scenarios than by putting students to the tests in a familiar environment. It is essential to give students the chance at some point to go through "live" experiences in real-life situations, like the above client meeting example, as opposed to only interacting with others via a video call from a comfortably familiar environment, like their home. Even the meeting room on campus and a field trip to a corporation's office are such properly less-than-comfortable environments. It is one of the main reasons not to preserve, nor replace, rather expand the traditional on-ground education model with online learning.

On the other hand, as today more business is conducted online than ever before in history, and the pace of this change is accelerating, it is just as essential for business students to be familiar with the practice and etiquette of doing business online, which is obviously best studied and practiced online.

While oral communication skills are included in the hybrid learning approach category, current online platforms don't seem to provide a significant advantage over traditional communication scenarios; the same technology that makes it easy for us to connect the screens of dozens of students online in real time can also make it challenging to provide the focused and effective learning experience of traditional classes. Video conference apps and online LMS video chat features easily replicate the way business video conferences are held every day in the twenty-first century, but these conferences are quite two dimensional; the focus is typically shared between one and six participant screens and capped by the size of our monitors and screen resolutions. It's simply not practical to put 30 tiny faces on one monitor and enable everyone's microphone at the same time for much increased noise floor.

When conducting an online call between the MediaWorks student team and a client, each student is required to be physically present on campus, in the same room, to allow conversations to start in organic ways, often "on the side" between team members and within small improvised groups. In these situations, a pair of microphones are set up in the meeting space, and a wide-angle camera is positioned to show the entire room full of students for the connected parties (typically the client) in the video conference. Even with this setup, the speaking student must move closer to the camera in order for the client to see a student's facial expressions in synch with his or her voice in detail. In reality, our ability to focus on a speaker while perceiving and interacting with the environment (like side conversations) and to turn our head to change our field of view is a human advantage we take for granted but is much limited in today's video chats. This is where augmented reality can come to the rescue, a technology that, when enabled for project meetings, will provide us with the flexibility in participation by providing us with the detailed and the big picture views alike.

In other scenarios, online platforms may enhance the quality of student work by allowing students to learn from more sources than just the instructor: from each other. As a matter of fact, students in group projects might even learn about the point of views, professional fields, and methods of team members in different subject areas as well. In case of MediaWorks, students in different programs regularly seek feedback from each other; in this process, Business Administration students may be learning file organization from the Audio Production students, who may be taking media project management ideas from Arts & Animation team members. This idea of experiencing the work approaches of team members from other disciplines, learning about their challenges and from their mistakes, can give students an invaluable experience and surface-level familiarity with connected fields – a collaboration that would much less likely to exist between departments and programs at an institution with physically separated buildings or more campuses. An additional benefit of such collaborations is networking; it's more likely that alumni of the same institution will hire one another or start a business with a team member with previous good work experience – that is, if they get connected through cross-disciplinary projects.

## *2.3 Learning Aspects Not Suitable for the Online Platform*

Skills and experiences that require the on-ground component of the hybrid methods mentioned above would not be delivered with the same effectiveness exclusively online. Surprisingly, the learning components that failed when the MediaWorks directors added online-only students to on-ground or hybrid production teams were all soft skills-heavy exercises and assignments, as opposed to professional skills. Online students may have improved their knowledge of specialized software over the semester, but they did not show an improvement in business communication skills, reasoning, and presentation skills. Without in-person meetings, online students were not able to "tune into" the professional *work atmosphere* created by directors on-site; therefore, they did not get onto the "same page" with the rest of the production team either. While this might sound like an unfair expectation from students who did not spend time with the class in the same physical space, it should be noted that they were provided the same tools, project information, and resources as all other students and they participated in weekly group progress reports and planning meetings via video calls as well. Online students finished the semester with a lack of practice in group exercises and were generally less satisfied with their experience and the learning outcomes than on-ground students.

Online students' work efficiency didn't seem to improve either. Despite of the project providing a demanding under-pressure "live" work scenario, online students' time management practices were not measurably effected by the course, which is generally described by on-ground students as one of the highest-impact professional growth experiences throughout their studies. Despite of receiving the same course content, equally high level of expectations and deadlines (dictated by clients) as their on-ground classmates, online students reported a magnitude lower level of pressure to excel throughout the proposal, bidding, planning, production, and delivery phases of the project. Their level of accountability was somewhat lower as well, compared to on-ground students with similar GPAs.

An interesting example for the advantage of in-class practice and in-person instructor support comes from a branding project, in which students remotely recorded 1-min videos of themselves, pitching their idea to an active client. Among the several submitted videos, an exceptionally good idea emerged, but it was presented in an unconvincing, rather unprofessional manner, despite of directors' tips for effective remote pitching. The presenting student's superior idea was, not surprisingly, rejected by the client. Had the student captured her pitch on campus with the available professional video equipment and with the real-time guidance of a director or a more experienced student, the presented concept would have been likely chosen for the benefit of the student and the project.

Another example is the atmosphere that formed in class while students were working on an audiovisual marketing communication piece for Panasonic. In this project, individual small teams within MediaWorks were *competing* for the client's final choice and approval. Given the high-profile client, the pressure and excitement resulting from a healthy level of competition and "trade secrecy" between the teams

could be felt in the air in each class meeting and influenced the approaches students took to win the client's approval.

In another instance, directors chose to introduce a project in a rather impactful way, in order to build a sense of personal responsibility and accountability for each student. Directors invited a C-level representative of a large public transportation industry client, AC Transit, to class. The representative disclosed that the outcome of media deliverables expected from students would influence the public opinion on the company's multimillion dollar project and the student-produced film would also accompany the groundbreaking ceremony, to be visited by the US Transportation Secretary as well.

The director's plan paid off: students worked under a healthy pressure with total accountability, passion, and a deep sense of ownership. Comparing the AC Transit project experience with the results of similar projects introduced less impactfully (e.g., published online as assignments), it became clear that the real-time, same-space launch event ensured a higher level of authenticity and students' sense of higher stakes.

These are all valuable experiences, however, not the kinds that could be achieved remotely.

The disadvantage of the online platform also became evident when final client presentations were prepared by online students, but the lack of real-time, same-place practice resulted in a less coordinated performance. Online students' *individual presentations* were equally well developed and delivered on-site to similar presentations given by on-ground students. However, the *team presentations* that included a mix of online students and on-ground students created the impression that independent students with independent approaches were given the same script and were assigned into one group just a few minutes before presentation. The audience saw prepared individuals, but did not get the sense that the presenters belonged to the same production team.

## 3 Natural Selection Online

The ease of tracking individual students' productivity in larger collaborative projects allows instructors to isolate and identify a student's strengths and weaknesses. The online platform may provide the opportunity for instructors to prevent, counteract, or improve such deficiencies in skills or abilities rapidly by addressing an individual student's needs via a direct connection with the student. The privacy of an online class may also allow instructors or advisors to help struggling students in the manner they find the most effective, based on the student's personality, learning style, and the assignment and course specifics. Online business leaning can provide a life-changing experience to students who don't thrive in the class environment due to their personality or less developed social skills. Sometimes it's the quiet students who have the best questions or comments, and in a virtual classroom, they tend to prefer the use of an audio-only connection, chat features, and discussion boards. By

focusing more on content and results, and less on personalities, the online platform may be the most democratic solution yet in practical project-based learning.

## 4 Conclusion: The Hybrid Approach

The many outcomes of business studies can be categorized into two broad groups: *knowledge + skill-based outcomes* and *experience-based outcomes*. Education in the twentieth century used to focus on the former – this worked just fine for most learners, as generally no experience was expected from fresh graduates on the first day on their new job. This was especially true for undergraduate students. In the past two decades, however, technology provided a new platform for conducting business: online businesses were born, and the business culture changed. Education's answer to this rapid change was the expansion of course content or curricula, and these changes in academia took place relatively fast as well. The problem was that only the course content changed, the approach was carried over from the previous millennium.

Thanks to new technologies and the competition between Internet providers, fast and affordable Internet access soon became a reality for learners in the Western Hemisphere – so it made sense to move entire courses online. This new trend was primarily fueled by institutions' desire to provide flexibility and convenience to students and educators while increasing operation efficiency and gaining access to a brand new market. It is important to acknowledge that online education recognized the new online business models of the real world and delivered the expected outcomes of the first group*: relevant knowledge + skill-based outcomes*. However, the changes that came from the widespread use of the Internet by businesses and consumers alike affected more than just online stores and net start-ups: by 2010, it became the way most companies hired, trained, and many even operated. This brought about an even more significant change: that of the business culture. While academia's focus was still on the delivery of new *information*, while striving to stay up to date, its *methods* were still grounded in what used to work well in the largely offline business culture of the 1990s; there was no synchronization between the changing *way* of business and the new platform in education. In other words, education was teaching current information with yesterday's methods. One of the high-impact consequences of the shift in business culture is the fact that today more and more businesses expect fresh graduates to have prior practical experience in a related field – and internships aren't even always enough to satisfy their expectations. Twenty years ago, employers' primarily focus was on fresh graduates' degrees and academic performance. A decade later employers started asking interviewees about their skills and relevant experiences obtained during their education. Today, interview questions are centered around extracurricular experience, and graduates have much increased chances of getting hired when they provide proof of such experience, along with professional references. This is where our second group of outcomes, the *experience-based learning outcomes* comes into play.

Developing the skills essential in real-life business, and running simulation scenarios while online students are gaining their experience in front of their home computers, isn't a new concept anymore, but it is still an imperfect, or rather, incomplete one. Currently, it is not the (actually, often existing but underutilized) technology that holds back students from gaining the practical experience that their future employers seek, rather the sluggish focus-shift from an information-centered to a practice-center approach in education. And while the online platform can enable students to do more than ever, it doesn't help to obtain the human connections and experiences that are still the engines of businesses today.

Taking all the strengths, weaknesses, opportunities, and threats into account, the conclusion can be drawn that online platforms can complement the on-ground business education extremely well and should be incorporated into today's business education. However, practical business learning cannot fully, without significant compromises, take place online. A hybrid approach that includes a series of both classroom and online sessions per course or a mix of on-ground and online courses in a curriculum may be the most effective and practical approaches today.

Course contents are traditionally centered around one subject area and may involve practical work. Educators are aware that adaptability is one of the most, if not the most, important skills for a graduate to develop due to the accelerated changes of our times, yet most traditional academic models favor teaching in a one- or two-dimensional context (i.e., one-way or two-way teacher-student communication), in a student's chosen core discipline, only accompanied by mandated general education classes. Online business learning can put students into both professional- and soft skill-building scenarios, as courses can be organized and taught by several specialized instructors in a shared schedule with more scheduling freedom and greater efficiency than in traditional on-site classes. However, in order for students to fully prepare for a professional career in business, a real-time, same-space component is essential to fill in the gaps in experiences that a well-rounded graduate in business should be armed with today.

"Soft-skills-driven, project-based, collaborative, and practical" is the future of education, and hybrid is the platform that will take us there.

# Part III
# "So What?": Outcomes and Impacts

# Exploring the Factors Affecting Student Academic Performance in Online Programs: A Literature Review

**Fotios Misopoulos, Maria Argyropoulou, and Dionisia Tzavara**

**Abstract** Online education has been receiving an increasing interest, and there are several studies focusing on student satisfaction with fully online or blended learning models. This paper has been written with a view to explore the recent developments and literature in the field of online courses and e-learning education, in general, focusing on pertinent published research. Aiming at an understanding of the factors that have an impact on student performance in the online education, a literature review of the pertinent publications has been conducted. Sixty papers have been carefully reviewed to provide a synthesis of previous and recent findings. To our understanding, this is the first systematic review focusing on student performance in the online setting, and this work will help teachers and institutions develop an understanding of what drives academic performance of online students so that they can create the appropriate e-environment for e-teaching and e-learning.

**Keywords** E-learning • Online education • Student outcomes • Student satisfaction • Student performance

## 1 Introduction

Online education has been receiving an increasing interest as it has become the most popular distance-learning method due to its flexibility and availability (Al-Azawei & Lundqist, 2015). Students have the choice to attend courses from a great number of programs offered by many universities, as long as they have access to the Internet, interacting with the educational material via different technological platforms (Kattoua, Al-Lozi, & Alrowwad, 2016). Consequently, e-learning adoption is

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increasing as the opportunity attracts the interest of many students who can receive a degree from institutions across the globe without having to leave their country or even the convenience of their home.

The advances of IT are rendering the e-learning education even more attractive, and universities are investing in courses or even entire programs that can be offered online to improve students' experience. The e-learning market has a steady growth but failures exist (Wu, Tennyson, & Hsia, 2010); despite the steady increase of the e-learning market, universities are faced with a high percentage of failures in the completion of their courses and degrees. Previous studies have focused on the technological environment, the e-learning advantages and disadvantages, and the critical success factors for successful online learning (Kattoua et al., 2016). Recent research in the field of e-learning is focusing on the reasons of high attrition rates and the factors affecting student performance.

The purpose of this study is to provide a review of the literature pertinent to the factors affecting student performance when taking online courses and to explore how satisfaction and performance are related from a holistic viewpoint. This review can contribute to this lacuna of knowledge initiating future studies on academic performance in the online setting. Moreover, the findings can provide some useful insight for the reduction of attrition helping institutions reduce the risk of failure.

## 2 Methodology

Research on e-learning, student performance, and its antecedents is at the primary stage. Also, often the question of student performance in e-learning environments is part of research focusing on a wider area of issues pertaining to e-learning. For this, the pertinent literature was extracted using all available databases (Scopus, Science Direct, Emerald, Google Scholar) to collect as many studies as possible. The desk research allowed for multiple options such as author(s), affiliation, topic, and year of publication. The search criteria for this review included the following keywords: student performance and e-learning and/or online learning and student satisfaction in the title and abstract.

The first attempt provided an outcome of 403 papers. The abstracts were reviewed to confirm the usage of student performance and its drivers with an emphasis on the e-learning paradigm. The review of the abstracts revealed that some of the studies were not really contributing to the scope of our research as they were either missing the emphasis on the e-learning paradigm or the content proved irrelevant to this paper's aims and objectives. This resulted in 170 articles. A more careful examination of the articles revealed several interesting methodological approaches exploring different concepts and relationships between various constructs such as student performance and academic success, predictors of student satisfaction and performance, factors contributing to academic success/achievement, and individual characteristics and traits and their impact on performance. These papers were further categorized using specific research criteria:

- Critical factors affecting student outcomes
- Comparisons of learning outcomes/academic performance between on-campus and online students
- Student satisfaction and the correlation between student satisfaction and performance
- Drivers of student satisfaction and antecedents of performance

This helped the thematic analysis that followed which pinpointed the emergence of three themes: (a) comparison of performance between online and on-campus students, (b) factors affecting student performance, and (c) factors affecting student satisfaction (see Fig. 1).

The narrowing down produced a short list of 60 papers. Table 1 presents the publishing outlet and frequency of publications. It is worth noting that there are numerous journals, each one offering a single paper only, which attests to the scarcity of research findings in this domain.

Figure 1 illustrates the percentage of themes emerging from the reviewed literature. The majority of studies explored student satisfaction with a focus on its predictors and on its correlation with student outcomes and performance.

A total of 16 publications aimed at comparing student performance between online and on-campus students. Eighteen publications studied factors affecting students' performance. Twenty-six publications focused on student satisfaction, with 92% online and 8% blended.

Finally, Fig. 2 presents the distribution by year of publication.

A closer look shows that the most productive year is 2013 and that there is an increasing trend in the published research, but not at the pace that we expected. We are of the opinion that this trend has not followed the rapid growth of online courses as a result of IT advances and student shift in e-learning education.

## 3 Student Performance Online Compared to Traditional On-Campus Delivery

The literature uses different ways to capture student outcomes and performance: grades, student retention, student progression and attrition, and perception of learning (student own perception as well as tutor/lecturer perception). For the purpose of this review, performance is understood as grades (module grades, final exam grades, midterm and assignment grades, etc.). The review of the literature revealed a number of studies which used student performance as their key construct, but for the purpose of this paper, the focus remained on studies with an online delivery element – either entirely delivered online or delivered in some hybrid or blended form combining face-to-face and online elements.

When we focus on programs which have an online element of delivery, there is a bulk of literature that focuses on comparing student outcomes between online (fully or in part) and traditional face-to-face delivery. The majority of studies are leading

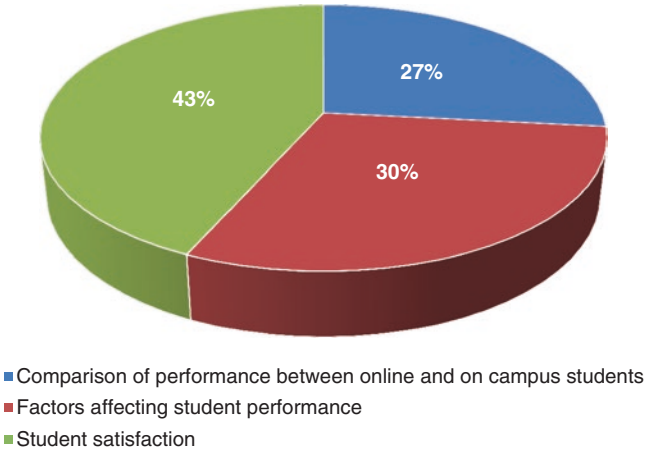


**Fig. 1** Percentage of themes emerging from the reviewed literature

to the conclusion that there are no significant differences in student performance between online and traditional face-to-face delivery. It was 16 years ago when Piccoli, Ahmad, and Ives (2001) concluded that there weren't any differences in student performance when comparing the traditional to the virtual environment. Friday, Friday-Stroud, Green, and Hill (2006) also found no significant difference in course grades between online and traditional face-to-face students. Daymont and Blau (2008) compared students' average quiz grades and final grades (comprising of average quiz marks and course participation marks) across online and traditional delivery, and they found no significant differences between the two modes of delivery, when they controlled for class (senior/junior), major, and GPA.

Similarly, Lam (2009) found no significant differences in students' final exam grades between online and face-to-face delivery. Figlio, Rush, and Yin (2010) found that the traditional face-to-face students achieved modestly better but not significantly better outcomes when they compared students' midterm and final grades between a hybrid and a traditional face-to-face course. Ary and Brune (2011) compared average coursework, test, midterm, and final exam grades and found that the mode of delivery had little impact on students' performance. Bowen, Chingos, Lack, and Nygren (2012) found no significant differences in performance on tests and final exams between traditional face-to-face and hybrid students. Driscoll, Jicha, Hunt, Tichavsky, and Thompson (2012) compared exam and assignment grades across online and traditional campus and found no significant differences in student performance between the two modes of delivery. Another comparison of student performance between hybrid and traditional campus delivery which found no significant differences in performance between the two modes of delivery was that by Haughton and Kelly (2015). Wilson and Allen (2014) also compared student performance between online and traditional face-to-face delivery, and they found that online students did not perform worse than traditional face-to-face students. Realizing the importance of the technology advances on virtual environments, Li,

**Table 1** Publishing outlets and frequency of publications

| Journal | No. of publications |
|---|---|
| *Academy of Educational Leadership Journal* | 1 |
| *British Journal of Educational Technology* | 2 |
| *Computers & Education* | 3 |
| *Decision Sciences Journal of Innovative Education* | 1 |
| *Distance Education* | 1 |
| *EURASIA Journal of Mathematics, Science & Technology Education* | 1 |
| *European Journal of Contemporary Education* | 1 |
| *Insights to a Changing World Journal* | 1 |
| *International Journal for the Scholarship of Teaching and Learning* | 1 |
| *International Journal of Business and Management* | 1 |
| *International Journal of Educational Leadership Preparation* | 1 |
| *International Journal of Emerging Technologies in Learning* | 1 |
| *International Journal of Global Business* | 1 |
| *International Journal of Global Management Studies* | 1 |
| *International Journal of Mathematical Education in Science and Technology* | 1 |
| *International Journal of Stress Management* | 1 |
| *International Journal on E-Learning* | 1 |
| *International Review of Research in Open and Distance Learning* | 3 |
| *Internet and Higher Education* | 1 |
| *Journal of Asynchronous Learning Networks* | 1 |
| *Journal of Behavioral and Applied Management* | 2 |
| *Journal of Computer Assisted Learning* | 1 |
| *Journal of Economic Education* | 1 |
| *Journal of Economics and Economic Education Research* | 1 |
| *Journal of Education for Business* | 5 |
| *Journal of Education for Library and Information Science* | 1 |
| *Journal of Educational Computing Research* | 2 |
| *Journal of Educational Research* | 1 |
| *Journal of Instructional Pedagogies* | 1 |
| *Journal of Management and Business Research* | 1 |
| *Journal of Policy Analysis and Management* | 1 |
| *Learning and Individual Differences* | 1 |
| *MERLOT Journal of Online Learning and Teaching* | 1 |
| *MIS Quarterly* | 1 |
| *National Bureau of Economic Research Working Paper* | 1 |
| *Open Praxis* | 1 |
| *Paradigm* | 1 |
| *Personality and Individual Differences* | 1 |
| *Proceedings of the 15th European Conference on e-Learning ECEL* | 1 |
| *Research in Higher Education* | 1 |
| *Student College Journal* | 1 |

(continued)

**Table 1** (continued)

| Journal | No. of publications |
|---|---|
| *Teaching Sociology* | 1 |
| *Technology, Pedagogy and Education* | 1 |
| *The Canadian Journal of Higher Education* | 1 |
| *The International Review of Research in Open and Distance Learning* | 1 |
| *The Quarterly Review of Distance Education* | 1 |
| *TOJET: The Turkish Online Journal of Educational Technology* | 1 |
| *Turkish Online Journal of Distance Education* | 1 |
| *Universal Journal of Educational Research* | 1 |

Qi, Wang, and Wang (2014, p. 49) conducted a study to compare two groups of undergraduate students, and they confirmed "no significant difference between students' engagements in traditional classroom and e-learning." They noted, however, that e-learning could support higher-level learning when considering aspects of innovative thinking and critical thinking (p. 51). Stöhr, Demazière, and Adawi (2016) used student performance data, captured by home assignment grades, from a traditional face-to-face course which was gradually enhanced with online learning elements for each year it was offered, and their findings supported previous research indicating no statistically significant difference in the students' average performance across the two different learning paradigms.

We found a small number of studies which indicate that one or the other mode of delivery supports better student performance. Bennett, Padgham, McCarthy, and Carter (2007) used final average grades to compare student performance between online and traditional face-to-face delivery of one microeconomics and one macroeconomics course. They found that, when they looked across the sample, there were no significant differences in student grades between the two modes of delivery. However, when they separated microeconomics from macroeconomics students, they found that microeconomics students performed better face to face than online, while the reverse was true for macroeconomics students. They argued that online may not be an equally appropriate mode of delivery as face to face for the microeconomics course, which was more technical compared to the macroeconomics course. Similarly, Anstine and Skidmore (2005) compared student average exam grades between online and traditional face-to-face students on a managerial economics and a statistics course. They also found that a simple uncontrolled comparison revealed no significant differences in performance between the two modes of delivery. But controlling for prior performance and self-selection of the mode of delivery revealed higher performance of the traditional students compared to the online students, which was attributed to the higher performance of the traditional statistics students, as the differences in performance of the managerial economics course students were not statistically significant between the two modes of delivery. Dendir (2016) compared online and traditional students' quiz and exam grades and found that online students performed better even after accounting for self-selection of the mode of delivery. Al-Qahtani and Higgins (2013) found no significant difference of

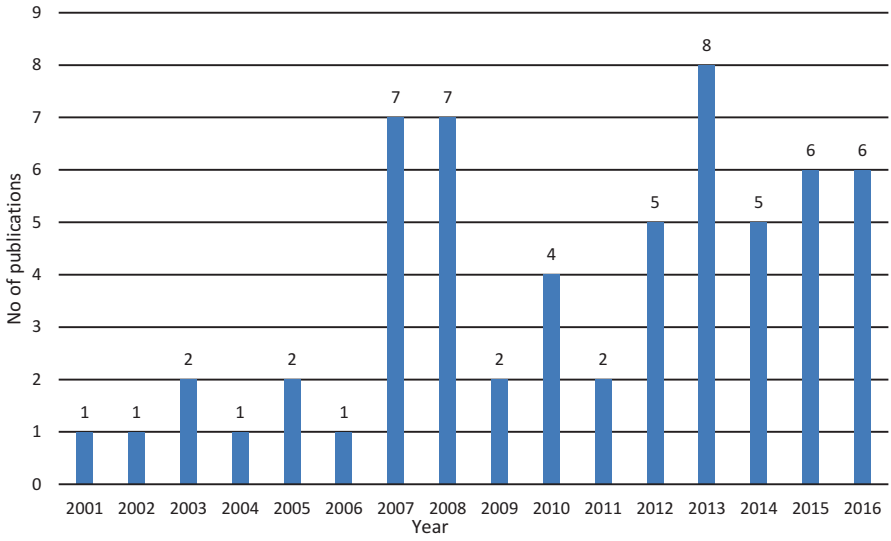


**Fig. 2** Distribution of reviewed papers by publication year

performance between online and traditional face-to-face delivery when they compared students' test scores but found that blended learning students performed significantly better compared to both online and face-to-face students.

A key finding in the literature comparing student performance between online and traditional face-to-face delivery is differences in the setting of the various studies. By online, the literature often refers to hybrid or blended models of delivery, with varied extents of online elements, and only in a small number of studies, the online delivery is 100% online. Also, there are differences in relation to the characteristics of the online delivery model. In Ary and Brune (2011), the online environment included face-to-face elements, for example, an optional face-to-face preexamination session. Bowen et al. (2012) did not describe in detail the hybrid delivery model which they used for their comparison. In Figlio et al. (2010), the online elements of the hybrid model that they used for this comparison were the lectures which the online students watched on the Internet rather than attended in class on campus, while all other elements between the two modes of delivery seemed to be identical. Haughton and Kelly's (2015) hybrid delivery model involved students watching online study materials prior to attending a weekly face-to-face class. Stöhr et al. (2016) used a model where a traditional face-to face course was gradually enhanced with online learning elements to the point where there were very few face-to-face elements.

Lam's (2009) online delivery model was almost 100% online, with the exception of the final examination which students had to take in class. Both Dendir (2016) and Anstine and Skidmore (2005) described fully online delivery models. Interestingly in Daymont and Blau (2008), the online model that they described was 100% online but in this case, it was what they called the traditional model

that was a hybrid model, since it involved some elements of online delivery (quizzes and discussions were done in Blackboard). Similarly, in Driscoll et al. (2012), what they called as face-to-face course was actually a hybrid course, with elements of online delivery (such as assessment, email correspondence, and distribution of readings online). Al-Qahtani and Higgins (2013) compared an online learning model with traditional face to face and with blended learning. But in this study, it is not clear whether the tests were taken online or in the classroom and whether students across the three modes of delivery were tested in the same way (online or on campus). Wilson and Allen (2014), Bennett et al. (2007), and Piccoli et al. (2001) did not specify whether their online models were fully online or with face-to-face elements. In Piccoli et al. (2001), the nature of the course (management information systems) made the lines between traditional and online delivery less distinct.

Another finding of our review is that some studies did a simple comparison of performance between the campus and online learning paradigm, whereas in other cases, the studies used control variables. Ary and Brune (2011), Bowen et al. (2012), Dendir (2016), Bennett et al. (2007), and Stöhr et al. (2016) compared students' performance between online and face-to-face delivery in isolation of other factors, for example, student characteristics, previous performance or self-selection, or otherwise of the mode of delivery. Figlio et al. (2010) accounted for self-selection of the mode of delivery, and they looked at four groups of students. online volunteer, campus volunteer, online non-volunteer, and campus non-volunteer, and so did Haughton and Kelly (2015) who compared performance across the two modes controlling for selection bias. Lam (2009), Friday et al. (2006), and Daymont and Blau (2008) also looked at the effect of gender on student performance. Both Lam (2009) and Friday et al. (2006) found that female students performed better in the online class, while for male students, there were no significant differences between the two modes of delivery. Piccoli et al. (2001) identified gender as a control variable. Driscoll et al. (2012) also controlled for age, gender, prior achievement (captured by GPA), year in school, and prior experience with online learning and found that with the exception of prior achievement, the other control variables had no significant effect on performance across modes of delivery. Wilson and Allen (2014) also found that online students tended to be female but did not comment on differences in their performance between the two modes of delivery. Al-Qahtani and Higgins (2013) looked at prior performance, through the use of a pretest, but they found no significant differences in pretest performance. Lam (2009) and Wilson and Allen (2014) also looked at students' prior performance (captured by GPA) and found that prior performance was a driver of performance across both modes of delivery. Anstine and Skidmore (2005) also looked at prior performance and self-selection of the mode of delivery, and they found that both factors were explanatory factors of performance.

## 4 A Review on the Factors Affecting Student Performance

Moving away from the comparison of student performance between online and traditional delivery, whether we refer to the term of student performance or to the broader domain of academic success, this concept has attracted the attention of researchers and institutions as their dependent construct. Understanding the factors that can affect student performance has always been a priority for the educational institutions, students, and teachers according to Duggal and Mehta (2015), but findings remain inconclusive as the concept is viewed as a multidimensional construct. The literature looking at student performance in a traditional face-to-face environment explores factors such as psychological and environmental determinants (Al-Mutairi, 2011), personal characteristics (Chamorro-Premuzic, Furnham, & Lewis, 2008) and the big five personality traits framework (Costa & McCrae, 1992; Busato, Prins, Elshout, & Hamaker, 1998), personality traits and ability and IQ (O'Connor & Paunonen, 2007), demographic factors (McCoy, 2005), socioeconomic factors (Mushtaq & Khan, 2012), and student approach to learning (Chamorro-Premuzic, Furnham, & Lewis, 2007). The literature, however, focusing on online courses reports less "traditional" factors which might be explained by the modern approaches to teaching, due to the rapid growth of Internet technology that changed all aspects of our lives, including education.

In a hybrid learning environment, Cavanaugh, Hargis, and Mayberry (2016) looked at correlating final course grades with student course participation. The authors found a parabolic relationship between grades and number of logins and grades and login session length, associating intermediate session length and number of logins with higher grades. Measuring instructors' perception, Dennen, Darabi, and Smith (2007) argued that student performance is positively influenced by instructors who focus on the course content being proactive with meeting students' expectations and reactive by sending pertinent feedback on assignments in a timely manner. In a blended learning model, Umek, Aristovnik, Tomaževic, and Keržic (2015) looked at the extent to which the proportion of the online elements incorporated into the course affected student performance, and they found that the higher the percentage of the course that used online elements, the better students performed in the course. In another blended learning environment, AlJeraisy, Mohammad, Fayyoumi, and Alrashideh (2015) found that the introduction of online discussion boards had a positive impact on student grades.

Ferguson and DeFelice (2010) looked at the length of the course as a factor driving performance of online students. They compared a full-semester course with an intensive course, and interestingly, they found that online students who took the intensive course performed significantly better than the online students who took the full-semester course. Gallien and Oomen-Early (2008) looked at the effect of different types of feedback on students' academic performance. More specifically, they compared performance between two groups of students, one where students received personalized feedback and a second group where student feedback was collective, and they found that online students who receive personalized feedback

performed significantly better than those who received collective feedback. Du and Wu (2014) examined the effect of human interaction on student performance in a blended learning course. They found that after controlling for prior performance, captured by GPA, students' grade in mathematics, gender, and students' status (whether transfer students or freshmen), greater human interaction did not have an impact on student performance.

## 5 Student Satisfaction and Performance

Before embarking on discussing the links between student satisfaction and student performance, we find it useful to briefly discuss student satisfaction in the online paradigm.

### *5.1 What Is Driving Student Satisfaction in Online Courses?*

Academic institutions across the globe are eager to provide the necessary conditions for ensuring the best learning experience possible to their students while students are satisfied when their actual experience meets or exceeds their expectations. As Noel-Levitz's study (cited in Wickersham & McGee, 2008, p. 74) based on online learning posits, the key to assessing students' satisfaction is to ascertain what is important to them.

Sun, Tsai, Finger, Chen, and Yeh (2008) developed a framework for evaluating perceived learners' satisfaction of online environments. The model consisted of six dimensions (learners, instructors, courses, technology, design, and environment) incorporating a total of 13 variables. This captured the majority of the factors identified in the literature, regardless of the mode of delivery (fully online, blended, or distance learning). Sun et al. (2008) found that the factors having a positive effect on perceived student satisfaction were students' computer anxiety (Bray, Aoki, & Dlugosh, 2008; Ke & Kwak, 2013), the instructor's attitude toward e-learning (Gray & DiLoreto, 2016; Ladyshewsky, 2013), e-learning course flexibility (Arbaugh & Rau, 2007; Eom, 2009; Gilbert, Morton, & Rowley, 2007; Gray & DiLoreto, 2016; Teo & Wong, 2013; Topal, 2016), e-learning course quality (Beqiri & Chase, 2010; Callaway, 2012; Calli, Balcikanli, & Calli, 2013; Teo & Wong, 2013; Wickersham & McGee, 2008), perceived usefulness (Calli et al., 2013; Liaw, 2008; Teo & Wong, 2013), perceived ease of use (Calli et al., 2013; Teo & Wong, 2013), and diversity in assessments (Chen & Yao, 2016; Topal, 2016).

Recent studies have concluded that the dimensions of interaction (student-instructor, student-content, and student-student) contribute positively to student's satisfaction (Burnett, Bonnici, Miksa, & Kim, 2007; Eom, 2009; Gilbert et al., 2007; Kuo, Walker, Belland, & Schroder, 2014; Martín-Rodríguez, 2015; Pinto & Anderson, 2013; Richardson & Swan, 2003; Topal, 2016). Surprisingly though,

there are many contradictory findings concerning the effect of the student-student interaction on student satisfaction. The work of AlHamad, Al Qawasmi, and AlHamad (2014) suggested that the online discussions are greatly benefiting learners, and Wickersham and McGee (2008) opined that discussion forums provide the opportunity for active student engagement. In Cole, Shelley, and Swartz (2014), lack of interaction was considered the most significant dissatisfaction factor. On the contrary, in Kuo et al. (2014) the student-student interaction was not a significant factor of student satisfaction, while the other two dimensions of interaction were highly rated as important.

Contradictory results were found in studies that included gender as a predictor of student satisfaction. While Cole et al. (2014) found no differences among female and male students, González-Gómez, Guardiola, Rodríguez, and Alonso (2012) claimed that females were more satisfied with their online course than males. On the other hand, the research of Beqiri, Chase, and Bishka (2010) and Lu and Chiou (2010) revealed that male students were more satisfied than female students.

## *5.2 Linking Student Performance with Student Satisfaction*

The recent literature that we found exploring the links between student satisfaction and performance is not vast, and the majority of this research is on the links between student satisfaction and performance, with most focusing on traditional campus delivery (Cotton, Dollard, & de Jonge, 2002; Garyson, 2004; Karemera, Reuben, & Sillah, 2003; Najafabadi, Najafabadi, & Farid-Roahani, 2012; Zeitun, Abdulqader, & Alshare, 2013). These studies are positing that performance measured by student grades has a cause-and-effect impact on students' evaluation of their course and instructor, but regarding the direction of the relationship between satisfaction and performance, there is no consensus as to which predicts the other, and the ensuing causality has been debated for long in the literature.

To our knowledge, the literature exploring student performance online which considers student satisfaction variables as the main predictors of performance is scarce. The literature argues that increased satisfaction will have a positive impact on the e-learning process which in turn will affect academic performance (Martín-Rodríguez, Fernández-Molina, Montero-Alonso, & González-Gómez, 2015). This is based on the premise that satisfied students will perform better, a condition for successful e-learning. Realizing the importance of satisfaction variables on academic success, Sembring (2015, p. 267) used the service quality framework dimensions (Servqual), as proposed by Parasuraman, Zeithaml, and Berry (1988), to measure satisfaction and test the impact of satisfaction on persistence, academic performance, retention, and career advancement, in an online setting. The 169 survey responses and the ensuing SEM analysis attested that "career advancement, retention, academic performance as well as persistence, were all positively affected by satisfaction" (p. 267).

## 6 Summary and Conclusions

The increased popularity of online learning, whether this is fully online or some form of hybrid learning, has made it imperative for universities to try and understand the factors that influence student performance. Understanding the factors affecting student performance will help universities manage the rate of attrition of students in online course and increase student retention. Our review shows that the literature is progressively focusing on more and more aspects relating to student performance. Starting from a comparison of student performance between online and traditional face-to-face learning, it is evident in the literature that while there seems to be a lot of evidence suggesting that there are no significant differences between online and traditional student performance, there is also evidence to show that this is not a universal finding. It seems that factors such as the technical difficulty of the course, self-selection of the mode of delivery, and gender may be rendering online students more or less successful compared to traditional face-to-face study. Certainly these findings suggest that further research is required to support or challenge existing findings and to shed more light on the effect of these factors on online student performance compared to student performance in traditional classes.

Similarly, to better understand how online student performance compares to face-to-face student performance, the comparison would have to be between similar settings. Our review reveals that there are significant differences in what is perceived as online mode of delivery and there are some examples in the literature where even what is perceived as traditional face to face is actually a hybrid mode of delivery, including some online learning elements. Also, to be in a position to compare like to like, further research is required on controlling the effect of other elements on student performance, to be able to isolate the effect of the mode of delivery on student performance.

Interestingly, moving away from the comparison of student performance between online and traditional face to face, and looking at other factors affecting student performance, there seems to be a difference between the factors that interest the research focusing on the traditional face-to-face delivery and that focusing on online learning. Looking at the traditional face-to face delivery, research on factors affecting student performance is focusing on socioeconomic, psychological, and environmental determinants; personal characteristics, demographic factors, personality traits and ability, and IQ; and student approach to learning. On the other hand, the literature exploring factors affecting online student performance focuses on less "traditional" drivers, such as the type of feedback, the length of the course of study, the use of discussion boards, and the proportion of online delivery elements incorporated to the delivery model. This striking difference calls for further research, firstly to discover the relevance of more "traditional" drivers to the online delivery mode and, secondly, to uncover other factors that may affect online student performance.

Turning our attention to student satisfaction, our review reveals that there is a recent interest on exploring the links and the cause-and-effect relationship between

online student satisfaction and performance, but the literature is still scarce. The traditional face-to-face delivery seems to suggest that there is a cause-and-effect relationship that needs to be explored for online learning as well. The fact that satisfaction is driven by a number of factors that have been identified as drivers of performance as well suggests that there is fruitful ground to exploring the different cause-and-effect relationship between satisfaction and performance as well as the mediators, as these have been identified in the reviewed papers.

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# A Renaissance in Skills: The Future Place of Online Learning for Skills for Business

**Stephen Murgatroyd**

**Abstract** The skills agenda dominates the thinking of many governments faced with economic and social challenges related to the changing nature of work. A new agenda for skills development and lifelong skill renewal is emerging from governments around the world. Online learning and assessments of capabilities and skills are now playing a growing role in skills and competency development and technical and vocational education. In the coming years, online learning for the skills business needs to be competitive and will expand and grow. This chapter explores the challenges associated with this work and the opportunities it affords.

**Keywords** Business and technical skills • Online learning • Online assessment • Modular and stackable learning • Apprenticeship

## 1 Introduction

The nature of work is changing. Robotics, artificial intelligence, three-dimensional printing, new approaches to business processes, and globalization are all having a significant impact on the nature of work. That this is the case is reflected in two other aspects of work: the nature of employment and the design of organizations.

Canadian workers are increasingly not in a lifetime employment or in an employee relationship with an organization. They are contractual, contingent workers – engaged in short-term (sometimes renewable) contracts for specific tasks and roles for a specific time. In fact, Canada has the seventh largest contingent workforce in the world, behind New Zealand and the United States (Manpower Group, 2016). Over 40% of the Canadian workforce are contingent (Ricci, 2015), and this number is rising quickly. In Britain, over 900,000 persons (2.8% of the workforce) are contingent workers on what is known as "zero-hour" contracts – their contracts do not guarantee any work in a specific period: they are standby workers (Financial Times, 2016).

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Organizations are also changing. A growing number use contingent workers on an "on-demand" basis for their business. The most obvious example is *Uber* – a brokerage which connects those seeking a ride with those offering a ride. Uber is not the only kind of matching service between providers and users. *Rent a Coder* is another, which matches programmers with those needing new software components for their system, or *TaskRabbit* which matches all sorts of trades with those seeking such skills. Universities and colleges also use "Uber" like workers – sessional staff, adjunct faculty, and part-time contractual employees. The "uberization" of domains of employment is taking place quickly.

These developments have significant impact on the nature of work. Four of five positions lost in US manufacturing since 2000 were lost to automation and technology (Lehmacher, 2015). A team at Oxford University has suggested that up to 47% of existing jobs in the United States will be lost to computerization and emerging technologies (Frey and Osborne, 2013) by 2030 and later suggested that 35% of UK jobs could be lost for the same reasons in the same time frame (Deloitte London Futures, 2014). Whether the number is as high as these researchers suggest or not is questionable; what is not disputed is the idea that the skills required to sustain employment are changing and will continue to do so.

Business needs a skilled workforce to be competitive and productive (World Economic Forum, 2016b). Business education, defined here in terms of providing to business the knowledge, skills, and capabilities needed for competitiveness and effective performance, needs to respond to the growing challenges of the skills gaps and the transformation of work. To do this, education for business needs to change.

## 2 The Skills Gaps

These changing workforce requirements are leading some employers and politicians to suggest that there is a significant gap between the skills employers seek and those available to them in the workforce. But the skills gap is in fact more complex than being a gap between what employers seeks and what employees offer. It is a "wicked" problem with several different layers. We can capture the elements of this complexity in the following list of six skills gaps:

### *2.1 Gap 1: The Basic Gap – The Gap Between What Employers Are Seeking and What They Can Find*

This is the gap everyone talks about – "we can't find workers with the skills we need." According to the Conference Board of Canada's Ontario Employer Skills Survey (2013), a significant percentage of employers are currently seeking employees with trades training. Survey data from the Ontario Chamber of Commerce (2013) reveals that 30% of businesses in Ontario have had difficulty filling a job

opening over the last 12–18 months, because they could not find someone with the right qualifications. This shortage is most prominent in those sectors that rely most on skilled trades – transportation, infrastructure, manufacturing, and engineering – and the situation may be deteriorating; between 2013 and 2016, there was a 9% increase to the number of employers having a hard time trying to recruit the right person for a position (Ontario Chamber of Commerce, 2016; Sullivan, 2016); several new strategies are emerging which may help alleviate this pressure. These Ontario data are typical of data from provinces across Canada, the United States, and many other jurisdictions.

## *2.2 Gap 2: The Expectations Gap*

This is the gap between what employees expect in the workplace and what employers offer. This is a complex gap, most often related to the very different expectations for the nature of work held by millennials and those held by an older generation (Dill, 2015; PriceWaterhouseCooper, 2015). But it can also be related to the difference between how an individual was trained in a way of working and how that work is undertaken in the organization they now work for – different methods, technologies, and business processes.

## *2.3 Gap 3: The Productivity Gap – The Skills We Need to Develop to Significantly Improve Productivity*

The skills needed to practice adaptive and agile management, lean manufacturing, and efficient and effective service need improvement. Leadership, communication, and strategic human resource management are all skills which need strengthening. Skills Canada reports that 40% of new jobs created in the next decade will be in the skilled trades. However, currently only 26% of young people aged 13–24 are considering a career in these areas (Spence, 2012). Once on the job, they also need investment in their skills to significantly improve Canada's productivity, which is significantly lower than in many other jurisdictions around the world (Statistics Canada, 2016).

## *2.4 Gap 4: The Leverage Gap – The Underutilization of Skills in the Workforce*

Once employees are in the workplace, do we fully leverage the skills they have? This is fundamentally a problem about the way we design work and how human resource management functions in the workplace, but it also reflects our lack of

focus on employees as people with needs for learning and development. We might also ask if we are underutilizing the apprentices within the workplace – for training, productivity improvement, and the development of their collaborative skills.

## 2.5 *Gap 5: The Futures' Gap – The Gap Between Current Skill Sets and the Skills We Need to Become Competitive in the Fourth Industrial Revolution*

The World Economic Forum suggests that the Fourth Industrial Revolution is now underway and that it requires different skills from the last IT-driven revolution, and we are not developing these skills well (World Economic Forum, 2016a). In addition to "hard" technical skills required for a trade or occupation, the emerging industries require creativity, collaboration, emotional intelligence, judgment, and adaptive capacity. These "soft" skills are, according to the World Economic Forum, critical for new enterprises and for the reinvention of existing industry sectors. New trades are emerging all the time – e.g., mechatronics, nanomedic, and recombinant farmer. We need learning systems which are quickly adaptable to emerging skill needs. In this context, it is worth noting that four out of five positions lost in manufacturing in North America since 2000 have been lost to automation (Cocco, 2016).

## 2.6 *Gap 6: The Skills We Need to Build a More Innovative and Sustainable Economy*

Canada's ability to innovate is declining, not growing according to the most recent Global Competitiveness Report (World Economic Forum, 2016a). We need the skills to problem-find, develop new products and services, and get them to market faster than our competitors. There are a variety of profiles of this skill set, such as those suggested by the Conference Board in their innovation skills profile (Conference Board, 2015), but the key is to build the adaptive capacity of firms and organizations and to develop a problem-solving, growth-oriented mindset for all employees. This represents a major challenge for those offering business education, business skills development, and apprenticeship.

To respond to these six skills gaps, there are several actions that need to be taken, and all will involve each of the educational providers, regulators, unions, the federal and provincial government, employers, unions, and individual learners starting to think differently about skills and their acquisition. There needs to be stronger collaboration and coordination of effort, currently fragmented and undertaken in many different siloes, aimed at rethinking all forms of business-related learning and accelerating skills acquisition.

## 3 New Approaches to Skills Development and Assessment

Given these challenges, made worse by rapidly changing demographics which are reducing the number of individuals in the workforce in the developed world, new approaches to training, skills development, and apprenticeship are needed. Innovation in the way in which skills are mastered and such learning is assessed has become an imperative. Five specific innovations can be seen to be occurring, all of them aided by the developments in technology. In this section we will explore the nature of these developments and their implications.

### *3.1 The Modularization of Learning*

Rather than offering long courses – between 12 and 15 weeks long – many institutions are now offering shorter modules of 2 or 3 weeks' duration, focused on a specific capability or skill. For example, the college system in Kentucky has recast all its courses into modules and then made these available to start on demand, 365 days of the year through online learning. By doing so, they have made micro-modules available which can be accumulated to be equal to a transferable credit course. This mechanism – three or more modules taken together are equivalent to a three-credit university course – is known as a stackable group of modules. Modular, stackable courses are becoming a significant feature of a variety of programs.

For example, the Red Seal certification for cooks and chefs in Canada, which enables a Red Seal-certified chef to work anywhere in Canada, is being reengineered as a set of competency modules. Individuals who have been working in the industry for some time can complete an assessment of their skills – essentially a form of prior learning assessment – and then just complete those skill modules they need to secure their certification (BC Campus, 2014). Similar developments are occurring in business education through the development of flexible degree programs based on competency assessments, not courses or class time, at the University of Wisconsin, Western Governors University, Capella University, and many others (Brower, 2014).

Moving to a modular approach to programs for skills enables more modules to be online, blended, or project based. Rather than attending class, apprentices and learners focused on skills and competencies can acquire these skills through mobile learning, online learning, or a combination of online and in-class work.

### *3.2 A Shift to Competency Not Content or Time in Class*

A great many courses in colleges, technical institutes, and universities are focused on a specific content domain taught over time in class. Students are expected to master a body of knowledge and related skills and attend a certain number of classes

to master the knowledge and skills they require to be able to complete formal, summative assessments. The new approach is to base learning on the mastery of a competence, capability, or skill, no matter how the student secures this knowledge. Time in class is secondary to mastery and competence.

For example, to master statistics, students would need to demonstrate their ability to apply statistical knowledge and skill in specific situations through problem-based work and examples. Knowledge is tested through the ability to apply knowledge. In this approach, specific capabilities and competencies have to be specified and delineated. There is then a need to devise appropriate methods for assessing these capabilities and skills independently of class time and activities. Students can use a range of online and peer-to-peer resources to secure the knowledge and skills they need.

By focusing on specific capabilities and skills, it becomes possible to rethink apprenticeship and skills-based learning. For example, the Canadian Medical Association has determined that it will move from time-served and content-based learning and assessment of potential doctors to a competency, milestone-based approach to certification. In this they are following the United States, Australia, and the Netherlands. For each block of learning – e.g., pediatrics, family medicine, and psychiatry – specific competencies have to be demonstrated and "signed off" by an assessor before the learner may proceed.

Some other fields – especially business – have also adopted this approach. For example, several universities now offer a range of competency-based flex degrees. No lessons, lectures, or specific readings are required – learners are assessed based on whether they can demonstrate a competency. The University of Wisconsin, Capella University, and Southern University of New Hampshire all offer competency-based flexible degrees at the undergraduate and graduate level in business.

## *3.3 E-Portfolios and Blockchain Technologies*

To trace and track learning, competencies, and demonstrable capabilities, e-portfolios are emerging as a mechanism for capturing just what students can do. Educational institutions can use the individual student's e-portfolio to record progress, transcripts, and assignments and share feedback. In addition, the student can use their portfolio to capture video, audio, or other digital versions of their work. Employers can also add feedback from internships, placements, or special projects. The e-portfolio becomes a rich source of understanding just what a specific learner can do.

One example of how this can be helpful comes from the work of Riipen. This company partners with skills providers so as to engage employers in assessing student work. For example, a student in a skills-based course at a college has their skills-based assignment assessed both by the educational institution and a range of employers who work in sectors which require the skills being assessed. The results are recorded on the individual students' Riipen e-portfolio. This enables potential

employers to explore the catalog of students by skill but also students to connect to potential employers seeking the skills they are developing.

Some developments are taking this work further. Blockchain technology, used extensively in the financial service sector, is used to track every activity undertaken by a learner in their interaction with a learning management system or related digital resource. The Open University (UK) Knowledge Management Institute is piloting the use of Blockchain and e-portfolios together with its learning analytics resources so as to better provide traceability of student behavior. Since a Blockchain is a publicly shared, immutable ledger, it provides an opportunity to revolutionize skills-based learning. This is what the OU team says about this work (Open University, 2016):

> Blockchain based ePortfolios can address these challenges through the development of an open decentralized, peer-to-peer platform, in which control of and responsibility for this information flow is radically disintermediated, away from educational institutions to students and teachers. This will be achieved by using Blockchain-based distributed ledgers, a technology that enables the secure and resilient management of distributed data in combination with data analytics techniques that add scale and flexibility to the way levels of qualifications are defined and granted.

## *3.4 Micro-credit and Skills-Based Badges*

A variety of providers of learning – educational institutions, MOOC providers, employers, trade unions, and others – are now offering forms of credit and certification. Included in these "micro-credit" forms of recognition are these:

- *Badges*: Launched in 2011 using an open architecture and standards, badges have been slowly gathering pace since. They are based on an agreed competency specification and process of assessment. Once a person masters a competency and has been assessed and successful, a badge showing their mastery is placed in their portable e-portfolio. Learners can make their portfolio available for review by prospective or current employers or educational providers. While some are trying to commercialize this development, most are seeking to leverage these developments to advance competency based learning and credentials. More than 14,000 independent organizations are already issuing badges to document formal and informal learning and workplace training, providing more ways for learners and workers to get verifiable recognition that can lead to increased access to opportunities for further education and career success. The McArthur Foundation is supporting a network of such organizations – the Badge Alliance – to leverage and accelerate these developments. Badges are now being offered through MOOCs by George Washington University and others.
- *Specializations*: *Coursera* began specializations in 2014 and now has over 160 specializations. They consist of a group of related courses designed to help learners deepen expertise in a subject with business skills at the heart of these developments. According to *Coursera*, 1.5 million *Coursera* learners have signed up

for courses that are part of specialization. To earn a Specialization, learners need to achieve a verified certificate in every course that is part of a specialization. The final step is a capstone project – a project that demonstrates the knowledge acquired during the specialization. The cost of a specialization lies in the range of $150–600US. An example would be the Business Analytics from the University of Pennsylvania, which comprises of four courses and a capstone project. Udacity also offers nano-degrees in business, which can be customized to a firm's needs or to the professional development needs of the learner (Lemoine and Richardson, 2015).

- *Nanodegrees*: *Udacity* began offering nano-degrees in partnership with companies and major employers in June 2014. Partnering with companies such as Google, AT&T, Tata and others to create custom MOOCs which meet the competency and skill needs of these employers. All of the nanodegrees are in ICT at this time, but there is nothing preventing these being offered in a range of other subjects. Some of these nanodegrees come with job guarantees.
- *XSeries MOOC*: Launched by MIT through edX in 2013, each XSeries will cover content equivalent to two to four traditional residential courses and take between 6 months and 2 years to complete. In a break from previous offerings, the XSeries sequences are composed of shorter, more targeted modules without one-to-one residential course equivalents. These programs will offer certificates of achievement but not academic credit. Many have been developed for specific industrial needs (e.g. supply chain management), but are not linked to particular companies.
- *HBX Core*: This is the Harvard Business School offering a credential of readiness (CORE). Irrespective of the background of the learner, all will take three modules: Business Analytics, Economics for Managers, and Financial Accounting. The aim is to enable basic competency across these three components of business practice. HBX Core takes 10 weeks of study, costs $1,800 US ($3,600 if credit is required – eight university credits are available). A similar approach is being taken by Athabasca University (AU) with its leadership and management development courses (LMD). A student who completes three of these successfully may transfer them to the MBA degree, equivalent to a single elective. The cost of this AU elective compatible LMD program is $3,324 Can ($2,514 US).

No doubt there will be other developments of company-based accreditation in partnership with training providers. Many of these new credentials are both earned through online learning or competency assessment and are recorded in e-portfolios.

## *3.5 New Approaches to Assessment*

Old forms of assessment – periodic pen and paper tests administered at the faculty members' discretion – are being replaced by online, anytime, anywhere, and on-demand assessments using smart technologies.

Such online assessments can be:

- Unique to the content and skills domain, refreshed daily using machine intelligence systems able to automatically generate relevant items and item banking (Gierl, Houston, Rich, & Boughton, 2015).
- Valid and reliable competency analysis based on standards for business skills and competency profiles.
- Multimedia- based assessments, where learners share video or audio (or other media) as the basis for both peer and instructor assessment, enabling collaborative assessment between the learner and their instructor.
- Automated marking for all forms of assessment, including video, audio, essays, multiple choice, and short-form writing.
- Assessment of literacy through text analysis for all written forms of assessment.
- Use of simulation (including 3D simulators) for assessment, similar to the way in which pilots are assessed for competency.
- Using standard profiles to benchmark a specific student against all other students who have taken a test.

This list is not exhaustive, but the point is clear: students can secure a much richer, deeper understanding of their knowledge, skills, and competencies, and faculty members can have a much deeper understanding of how effective their teaching and learning design strategy is.

### 3.5.1 Adaptive Assessment

A feature of some LMS systems, including Desire2Learn, Moodle, and Blackboard Learn, is known as "adaptive assessment." This enables learning materials to be automatically adjusted (sequenced differently, remedial materials brought forward and new materials added automatically) based on a learner's own self-assessment. For example, a student taking statistics might not fully understand how a correlation coefficient should be interpreted (as seen on their assessment score). The LMS would then bring to their next learning session materials that would help them better understand just how coefficients are interpreted and give them more examples to work with. Thus, adaptive assessment enables differentiated instruction.

How this is done differs between LMS systems, but both Desire2Learn's LeaP and the core of Blackboard have automated a great deal of the necessary work to make differentiated instructional support available to the learner. Machine-learning engines embedded in the LMS enable mapping of content, identification of learning resources and assessments, and the ordering of learning. Now that Blackboard is connected to IBM Watson, we can expect this work to become even easier.

### 3.5.2 Learner Progress Analytics

Performance analytics generated from student assessments for learning (self-assessments) can also provide powerful information for the faculty member. Imagine an online class of 30 pursuing a specific module on statistics, with each competency involved in the course requiring the completion of an assessment of some kind. As students' progress, the faculty member can see quickly who is mastering which construct, skill, or capability and then design appropriate interventions for those who are fast-tracking through (e.g., setting more challenging problems for them to solve or creating projects which require advanced use of the skills and capabilities they are developing) and providing additional support to those who are struggling.

### 3.5.3 The End of Average and the Bell Curve

Many faculty members have been required to mark students on a bell curve, assuming that the distribution of capabilities and competencies is to be found on a "normal" curve. The major objective of such grading curves is to minimize the influence of variation between different instructors of the same course, ensuring that the students in any given class are assessed relative to their peers. This also circumvents problems associated with utilizing multiple versions of a particular examination, a method often employed where test administration dates vary between class sections. Regardless of any difference in the level of difficulty, real or perceived, the grading curve seeks to ensure a balanced distribution of academic results.

One aspect of the use of technology-based assessment is that such use of the bell curve can now be replaced by criterion-referenced grading. Rather than looking at a specific cohort at a specific institution and seeking to place all in that cohort on a bell curve, it is now possible to develop assessment rubrics which look at all who take a test against a rubric for that competency, capability, or body of knowledge and have a criterion for placing them in a specific performance category. This ends the abuse of the bell curve – covering poorly designed assessments – and ensures that a person awarded a specific performance category has the capabilities associated with that category (e.g., level 1, 2, 3, or 4). It also puts an end to the idea that skills and competencies have an "average" (Rose, 2016).

### 3.5.4 Competency and Capability Assessment

Employers are increasingly less impressed by formal qualifications and more interested in what a given individual can do. What they are looking for is experience, competency, and demonstrable skills. At least, this is the case for many leading employers, such as Alphabet/Google who look for leadership capabilities, problem-solving and finding, humility, an ability to learn quickly, and competencies as the basis for employment. The more evidence a person can show of their knowledge, capabilities, and skills, the better.

For these reasons, standards-based assessment and recognition are growing quickly. For example, the use of digital badges to recognize skills is in wide use. A digital badge uses a competency-framed assessment to provide recognition of abilities. Students can collect such badges as they develop the needed skills, perhaps as part of a course or as part of a work experience, internship, or personal learning pursuit. For example, students at the Del Lago Academy (a science and engineering high school, San Diego, California) are acquiring badges for their skills in biochemistry and engineering and storing them in personal e-portfolios which they can use when applying to universities and colleges or for employment. The badges are issued by a variety of organizations, including employers and educational institutions.

### 3.5.5 Valid8 as a Competency Driven Portfolio

One specific kind of portfolio, developed by Vametric and now in use in Canada, is Valid8. This is a powerful e-portfolio and learning management system which enables students, faculty, and others to capture evidence of learning and capability, connect learning outcomes to learning intentions, and provide an easy-to-use, reliable method for validation and accreditation of learning. This is now being adopted by some Canadian banks (CIBC and the Royal Bank), colleges, and universities. It incorporates a range of technologies to permit rapid review and assessment.

## 4 Implications for Skills Training and Business Education

Many learners are engaged in skills training, professional development, and capability development. Yet many of the programs they are pursuing are "stuck" in a format and mode of delivery which takes little account of the five developments just listed. Apprenticeship, for example, seems most resistant to significant change. Yet some jurisdictions have moved to adopt e-apprenticeship as part of their approach to accelerating the mastery of skills and increasing completion rates. The Province of Manitoba (Canada) experimented with the E-Apprenticeship Alternative Delivery Development Initiative (EADDI) which used e-learning to deliver apprentice learning resources to learners in remote northern communities (Vogt, 2013). Similar developments in both British Columbia and Nova Scotia are reported by Hartwig (2007). Others are rethinking business education and skills for business in terms of modular, short courses which can be transferred into degrees at a later date, one example being Athabasca University's willingness to recognize three modules taken as part of a professional leadership and management development program as equivalent to an elective in Athabasca's MBA.

More recently, the integration of virtual reality (VR) into business education, apprenticeship, and skills programs is moving quickly. Northern College (Ontario, Canada) is using VR in its mining programs to give students an experience of spe-

cific challenges in mining, and authentic and rich simulation is now part of many business education courses. Video-based learning has been used extensively for skills development in a range of programs, but VR and gaming/simulation technologies are now enabling significant skills development in safe environments – both in an educational setting, at work, or at home.

As technology becomes more sophisticated, enabling complex simulations and environments to be created more efficiently and at a lower cost, we can expect to see the more widespread use of just-in-time, modular, stackable learning for business and technical skills linked to competency assessments as the basis for accredited learning. Indeed, the future should focus more on how we assess and accredit competencies and capabilities and worry less about how the learner mastered these abilities. Authentic, rich online and simulation-driven assessment will be the hallmark of the emerging new work on business education and skills development.

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# Building Adaptive Capacity in Online Graduate Management Education

**Deborah Hurst, Ana Azevedo, and Pamela Hawranik**

**Abstract** Increasingly, employers state that university graduates are not "work ready" meaning graduates do not possess the combined academic disciplinary knowledge and professional skills needed in the workplace. Such include strong communication, collaboration, conflict resolution, continuous learning and creative problem-solving. Though educators attempt to address these concerns, questions remain. Building on ideas from Griffin and Heskath (*Australian Journal of Psychology*, *55*(2), 65–73, 2003) and Pulakos et al. (*Journal of Applied Psychology, 85*(4), 612–624, 2000), this paper proposes the construct of adaptive capacity as a key capability that may help to address this perceived knowledge/skills gap. Using one online educator's example, we explain how adaptive capacity can be developed within the context of an online MBA program directly mirroring skills needed increasingly in workplaces today. The authors begin this chapter with pertinent literature and summarized key findings regarding what employers perceive as skills gaps among graduate students and suggest techniques around building adaptive capacity that might assist higher education institutions in developing future work-ready graduates. The authors then propose key learning processes and outcomes synergistically combined to increase graduate students' adaptive capacity. Key processes and outcomes to dimensions of adaptive performance, the main dependent variable that can be predicted from adaptive capacity, are noted. This paper advances the concept of "adaptive capacity" as the key and enduring competency construct composed of a set of skills that needs to be developed within the context of online graduate business education programs. As such, the authors suggest that instead of a continued focus on the lack of current work-ready graduates, educators and employers alike need to instead privilege the adaptive capacity building and producing of "future work-ready graduates," meaning graduates ready for both current and future work. This paper concludes with a discussion of key implications for management educators.

**Keywords** Adaptive capacity • Graduate business education • Work-ready graduates and future work-ready graduates

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## 1 Introduction

Graduate student enrollment in Canada has burgeoned over the past several decades. Enrollment in master's programs has more than tripled (Canadian Association of Graduate Studies (CAGS), 2016). Multiple factors have been identified as influencing this dramatic growth in graduate students. There have been significant increases in the number of graduate programs, growing diversity of graduate career opportunities, emphasis on the creation of new knowledge to provide a competitive advantage in the global economy, and industry and government-driven research agenda with increases in research support (Rose, 2012). Further, approximately 70% of master's and doctoral graduates are employed outside the postsecondary sector. Thus, creating another reason for graduate education to shift its paradigm of education to one that helps prepare students for employment regardless of sector (Rose, 2012).

A number of studies have been conducted, in Canada and elsewhere, purporting that graduate education must change to meet the shifting needs of the twenty-first century (CAGS, 2012; EUA, 2005; Gold & Dore, 2001; Leitch, 2006; Walker, Golde, Jones, Bueschel, & Hutchings, 2008). The reports point out that graduate programs lack connection to larger social contexts and that academics hold a weak understanding of professional life outside the university (Porter & Phelps, 2014). Employers have indicated that university graduates are not ready for work. Work ready describes a graduate who possesses combined academic disciplinary knowledge and professional skills that enable them to handle a myriad of workplace issues. The Porter and Phelps (2014) study reports and many employers describe (Berr, 2016; Brown, 2016; Docherty, 2014; King, 2015; Thorne, 2015) a gap in the type of skills needed, namely, the inability to work in teams, inadequate communication skills, poor conflict resolution abilities, and lack of problem-solving skills.

To consider graduate education as having a responsibility for workplace readiness represents a culture shift for many. Educators that do attempt to address these concerns have questions about how to meaningfully prepare students for work readiness. To complicate the issues further, workplace demands are rapidly evolving, coupled with a globalized world of growing volatility, uncertainty, complexity, and ambiguity (the "VUCA world") describing general conditions and situations that are volatile, uncertain, complex, and ambiguous (Bennett & Lemoine, 2014). Such creates even greater pressures for producing work-ready leaders and employees. The challenges are very serious and unpredictable. Thus, how can educators move forward to better prepare students with the needed knowledge and skills applicable in any mode or for any work location?

Our paper advances the concept of "adaptive capacity" as the key capability needing development to help address this knowledge/skills challenge gap. Though an important consideration for all graduate programs regardless of delivery mode, we discuss the concept with examples from an online MBA program believing that online delivery adds another important layer of skill by virtue of delivery mode, not always possible in place-based programs. We suggest that such graduates combine

their disciplinary or technical knowledge with the key capability of adaptive capacity helping them succeed in continuous learning, upgrading, re-skilling or simply adapting to a new project or environment. Building on ideas explored by Griffin and Heskath (2003) and Polakos et al. (2000, 2002), we pull examples from Athabasca University Faculty of Business's (AUFB) online MBA who endeavor to develop adaptive capacity in their "future work-ready" graduates. We end this paper with implications for educators, business, and suggestions for further research.

## 2 Background to Issue

The accelerating nature of change whether it be environmental, technological, a result of merged/acquired organizations, global pressures, or the changing nature of work has all led to the need for adaptive skill as enduring features (Griffin & Hesketh, 2003) of social and work life. This implies that individuals must develop capabilities for today's changing workplace but also be prepared for changes required in future work by developing an ability to learn, adapt, flex, and change as part of their skill set (Azevedo & Hurst, 2017).

This chapter is concerned with professional skills including both "academic" and "transferable" skills. The Canadian Association for Graduate Studies describes these skills as "behaviors that can be learned, improved with practice, that require reflection, and that benefit from ongoing improvement" (CAGS, 2008, p. 3). Terms such as competencies and skill are often used interchangeably, even though the former is conceived more broadly to include knowledge, skills and abilities (KSAs), as well as learned behaviors (Azevedo, Apfelthaler, & Hurst, 2012).

The Canadian Association for Graduate Studies (2008) positions professional skills development as a critical part of graduate education programs. CAGS emphasizes that universities are *obliged* to support the professional development of graduate students and "they are responsible for providing graduate students with the best possible preparation for their future roles whether within academia or in other sectors…" and must be willing to "provide resources for the development of the necessary… skills" (CAGS, 2008, p. 4). Professional skill building in their view combines technical knowledge with how to delegate and coordinate work with others, deal with limited resources, set and reach goals, and prepare and negotiate budgets and projects. Further, professional skills development includes understanding, explaining, and applying complex ideas across different contexts. Individuals should also be able to critically assess, think creatively, and transfer knowledge objects. Finally, professional skills include the ability to make sound judgments across complex situations, based on ethical principles. Success on these four levels of professional skill developed during graduate business education better prepare graduates personally and professionally to behave with integrity, good judgment, and demonstrate skill (CAGS, 2012).

Expectations of graduate programs, as described in the CAGS (2008), report above, correspond with employer expectations. Employers are looking for a combination of technical knowledge in addition to soft professional skills such as written and oral communications, teaming, problem-solving, and entrepreneurial thinking (Brown, 2016). And yet, despite educator's greater emphasis placed on building professional skills as demonstrated through the work of educators such as the University of Saskatchewan (2016) and York University (2016), educators overall do not appear to be doing enough (Lawrence, 2012). Employers continue to claim that graduates are not work ready (Thorne, 2015).

King (2015) suggests that higher education has failed to adapt to rapid technological and industry demands and have thus failed to meet the needs of both students and industry. Skills are still lacking in analysis, problem-solving, collaboration, teamwork, business-context communication, flexibility, agility, and adaptability. Finding graduates that hold the needed disciplinary knowledge along with practical experience and professional skills continues to be challenging. Doyle (2017a, 2017b) in a series of practitioner blog posts provides further support for King's (2015) claims. The research by Azevedo et al. (2012) confirms this. These authors show that critical/analytical thinking, communication and presentation skills, teamwork and relationship building, self and time management, leadership, and ability to see the big picture are the core competencies needed for successful work performance of graduates, according to employers and graduates across four European countries.

The lack of graduate skill is not only a problem perceived among Canadian employers and educators. Berr (2016) states that 90% of new graduates in the USA believe themselves well prepared for employment, whereas only half of their hiring managers shared that opinion. Thorne (2015) notes that workplace readiness of graduates in the UK also goes beyond specific discipline knowledge and qualification. In his view, it is more about "the right sort of attitude on top of academic qualifications" (Thorne, 2015, p. 9) and that there is no definitive readiness measure. Work readiness more often depends upon an individual's response to situations they find themselves within, the ability to keep an open mind, and an ongoing readiness to learn. Docherty (2014) agrees that specific discipline-based degree programs are no longer sufficient to identify suitable workplace candidates. Employers must consider other aspects of the candidate's ability such as if they are agile, if their skills learned in educational programs are transferable, and whether or not a candidate is likely to develop an understanding of how workplaces function.

Brown (2016) notes that Canadian employers want to hire people with "soft or essential skills." These findings are consistent with those stated above revealing that employers around the world share concern with finding graduates who possess broad intellectual skills around critical thinking, problem-solving, interpersonal skills such as communication and teamwork, and personal skills such as acceptance of diversity, work ethic, and professionalism (Casner-Lotto and Brenner, 2016; Peter D. Hart Research Associates, Inc., 2006).

## 3 Online Professional Skills Development

Among needed skills graduates must acquire an ability to work in a rapidly changing world facilitated by distance and online communication technology. Employees must work effectively with others in both face-to-face and distributed space. A question that Athabasca University has explored is whether professional skills can be taught and developed when students are enrolled in an online university (Anderson, 2008). There seem to be assumptions around an individual's ability to connect meaningfully with others at the core of this challenge. Tix and Johnson (2016), in the Chronicle of Higher Education, emphasize that it is "how" learning is structured that enables meaningful connections to one another and learning objects. They point out that emotion aids learning regardless of the platform or modality through which a course or workshop is offered. It is important to focus on how learning environments and objects are created and the degree that they are able to inspire and create new insights or "awe" in learners. Meaningful learning occurs when students are asked to record their observations, learn about others' perspectives, observe other students demonstrating skill in context, experiment with phenomena, and work through complex questions (Tix & Johnson, 2016). The key is to create an experience where learning phenomena require students to critique, create, and engage and in doing so evoke emotional connection and insight. Others like Brown (2016) suggest that the development of learning objects and testing can be tracked by collecting baseline data on skill levels as students enter programs and then subsequently as they graduate. Assessments can include learning outcomes for both discipline knowledge and professional skills (Brown, 2016) to provide more fulsome tracking student progress.

Professional skills requirements, however, are no more static than graduate degree programs. Skills deemed critical yesterday and today are likely very different from those required in the next 2, 5 or 10 years. Another consideration for an educational institution that intends to offer professional skills development is whether it should be incorporated into the academic courses and/or maintained as separate learning experiences. Many of the universities in Canada offer professional skills initiatives. A recent survey of CAGS membership was conducted with 60 of the 65 member institutions indicating that they offer professional development programs (PDP) (Lypka, 2017). These PDPs tend to be offered as "stand-alone" workshops for multidisciplinary audiences. The topics and the skills that are being taught are not part of the context of the student's discipline. Integrating and linking the knowledge and skills within the student's academic and disciplinary context would enhance their knowledge and their abilities for potential employment, in the opinion of the authors. Similarly, research on employability or "work readiness" suggests that the "embedding approach" (i.e., embedding skills development within the higher education curriculum) is more effective than stand-alone approaches (Cranmer, 2006).

Thus, a critical question in our view is not about what professional skills are needed but how we as educators can move forward to better prepare students

regardless of ever-changing skills required to produce future work-ready graduates. Our paper advances the concept of "adaptive capacity" as the key and enduring competency construct composed of a set of skills that needs to be developed within the context of online graduate business education programs.

## 4 Adaptive Capacity

There are many different definitions and measures of adaptive behavior in the literature. Griffin and Heskath (2003) provide us with the concepts of behavioral adaptability, cognitive flexibility, trait flexibility, and self-efficacy for understanding adaptive behavior. They provide predictor measures to consider the individuals level of adaptability drawing from the work of other authors to understand an individual's ability to adapt. For example, an individual's positive experiences of past successes best predict future successes (Owens & Schoenfeldt, 1979), so behavioral adaptability develops from the familiarity with change-related activities that are increasingly likely to be repeated in the future (Chan & Schmitt, 2000) as well as the increased likelihood of engagement in such challenges given confidence gained (Dawis & Lofquist, 1976). Engagement with culturally diverse groups and ideas encourages new thinking and interpretations of ideas and increases one's comfort level with diverse opinions. Cognitive flexibility describes an individual's ability to adapt dynamically and strategically to the changing nature of tasks and situations. Griffin and Hesketh (2003) believe that cognitive flexibility is a significant predictor of adaptable performance.

Trait flexibility is related to the enduring attributes of personality (Chan, 2000), suggesting that an individual stays open to new experiences, is sensitive to the needs of others, is curious, and is flexible in finding solutions (McCrae & Costa, 1997). Furthermore, Griffin and Heskath (2003) believe that self-efficacy is essential to adaptability as a motivational construct. In their view individuals build confidence and the belief that they can succeed in the future based on past successes (Parker, 1998). Thus, adaptability is most likely to develop when individuals have increasing experience and familiarity with change-related activities making future performance less stressful (Chan & Schnitt, 2000), increasing the individual's likelihood of greater engagement (Dawis & Lofquist, 1976), allowing expertise to develop from experiences that are complex and changing (Chan, 2000), and increasing the relevance of new understanding and good feelings from completing a task well. For an individual to develop skill and self-efficacy, they need to build confidence in their performance – the belief that if they try again using what they have previously learned, they will succeed (Parker, 1998).

The measures of behavioral adaptability, trait flexibility, cognitive flexibility, and self-efficacy, as described by Griffin and Heskath (2003) above, focus on how we might predict adaptive performance. When we review the nature of the typical professional skills employers' state that graduates lack, we see the ability to deal with and adapt to crisis, creatively solve problems, cope with uncertainty, learn new

tasks, and demonstrate interpersonal adaptability, confidence, and emotional intelligence. If individuals are adaptive, they are thought to be able to demonstrate skill on these dimensions while performing their work. When we think of the main outcome measure under discussion, "adaptive performance," we can examine employer's criticisms by drawing from the work of Pulakos, Arad, Donovan, and Plamondon (2000), who define adaptive performance on eight outcome dimensions.

Pulakos et al. (2000) provide us with a definition of adaptive performance useful across job, occupation, or roles. They studied adaptive performance according to eight different dimensions including (a) handling emergencies or crisis situations; (b) handling work stress; (c) solving problems creatively; (d) dealing with uncertain and unpredictable work situations; (e) learning work tasks, technologies, and procedures; (f) demonstrating interpersonal adaptability; (g) demonstrating cultural adaptability; and (h) demonstrating physically oriented adaptability.

Though overall levels of adaptive performance seemed warranted in their research, the dimensions proposed came out as low to moderate criticality for present jobs. They suggested further study on jobs with accelerating changes due to technology, globalization, and job requirements is needed. We suspect that with the increasing dependence on knowledge workers across a number of different occupations (e.g., management, technical, and professional occupations), future jobs will require higher levels of adaptive performance, due to workers' complex and constantly evolving job requirements (Apte, Karmarkar, & Nath, 2008; Beckstead & Gellatly, 2009; Davenport, 2013). In a subsequent study, Pulakos et al. (2002) extended their research to examine usefulness of their eight adaptability dimensions using other predictor and criterion measures to predict adaptive job performance. They asked respondents to comment on past experience in adapting, interest in adaptive situations, task-specific self-efficacy to adapt, and measures such as openness, emotional stability, achievement motivation, and cognitive ability. Though results supported their multidimensional construct for adaptability, not all of the predictors were found to significantly predict adaptive performance (Pulakos et al., 2000).

Griffin and Heskath (2003) incorporates Pulakos et al. (2000, 2002), adaptive performance taxonomy to categorize and understand adaptive performance. Griffin and Heskath (2003) propose that the eight dimensions of adaptive performance developed can be collapsed into three categories such as the "reactive factor (consisting of items related to interpersonal, physical and cultural adaptability, as well as new learning) … proactive factor (measures of novel problem-solving and handling crises)… [and the] tolerance factor (containing items related to coping with stress and uncertainty)…" (Griffin & Heskath, 2003, p. 66).

Drawing from Griffin and Hesketh (2003) and Pulakos et al. (2000, 2002), we introduce our skills construct referred to as "adaptive capacity." Our definition of adaptive capacity consists of a combination of knowledge; skills and abilities (or competency) that we believe can explain and predict adaptive performance outcomes. We propose that our construct of adaptive capacity is a more comprehensive tool for understanding graduate's capabilities demonstrated on specific learning outcomes and developed within an online graduate management program. Our

thoughts in combining ideas from authors noted above to build adaptive capacity and future work-ready graduates by way of our online MBA program are illustrated in the following "adaptive capacity conceptual framework."

## 5 Adaptive Capacity: Construct Elaboration

We propose that the reactive, proactive, and tolerance adaptive performance dimensions can be successfully predicted from the construct of adaptive capacity (Griffin & Heskath, 2003). In addition, adaptive capacity can be developed from key learning processes and MBA program-learning outcomes. In Table 1, we describe these learning processes and MBA learning outcomes that promote adaptive capacity, our predictor of adaptive performance.

## 6 How AUFB Builds Adaptive Capacity

In this section, we draw examples from Athabasca University Faculty of Business's (AUFB) approach to highlight adaptive capacity development within an online MBA program. AUFB's distributed learning environment was specifically designed to create learning processes and outcomes in support of adaptive capacity development. Adaptive capacity develops through a synergistic combination of four specific learning processes, i.e., knowledge contextualization, encouragement of creativity and interpersonal growth, and actively linking new knowledge/theory to practice as well as key program-learning outcomes (i.e., critical/analytical thinking, leadership, problem-solving, written and oral communication, and ethical reasoning).

### *6.1 Reactive Dimension and Knowledge Contextualization*

The first aspect of promoting adaptive capacity is the consideration of knowledge contextualization. Students in the online MBA are required to learn how to examine the context they are in and where, when, and how knowledge applies across industries, situations, and disciplines. We describe knowledge contextualization here from a reactive frame, i.e., we consider how it can impact the reactive dimension of adaptive performance (Griffin & Heskath, 2003).

When contextualizing knowledge, students are required to use the content under study in their various courses to actively achieve learning outcomes by connecting ideas presented to develop a deeper understanding of the academic discipline. Students learn new techniques, such as doing financial or supply chain analyses, or engaging in human resources planning within different constrained environments with differing points of view. In learning different tasks, technologies, and

**Table 1** Developing adaptive capacity

| Adaptive performance – original dimensions (Pulakos et al. 2000) | Adaptive performance – revised dimensions (Griffin & Heskath, 2003) | Adaptive capacity development – key learning processes and learning outcomes |
|---|---|---|
| Overall adaptive performance: eight dimensions | Overall adaptive performance: three dimensions | AUFB MBA program promotes the development of adaptive capacity through the synergistic combinations of specific learning processes (i.e., knowledge contextualization, encouragement of creativity and interpersonal growth, and actively linking theory/knowledge to practice) and key learning outcomes (i.e., critical and analytical thinking, leadership, problem-solving, written and oral communication, ethical reasoning) |
| Learning of new tasks, technology, and procedures | Reactive adaptability, inclusive of learning and interpersonal, cultural, and physical adaptability | Knowledge contextualization. Prepare to examine context, where, when, and how discipline knowledge applies |
| Interpersonal adaptability | | Learning outcomes: critical and analytical thinking (inclusive of application of learning to current problems and consideration of diverse perspectives) and leadership (inclusive of self-reflection and teaming – i.e., learning/working with others) |
| Cultural adaptability | | |
| Physically oriented adaptability | | |
| Handling of emergencies and crises | Proactive adaptability, inclusive of handling crises, and emergencies and novel problem-solving | Encouragement of creativity and interpersonal growth. Prepare proactively for any challenges. Develop the ability to work together and effectively complete work regardless of face-to-face or distributed space |
| Problem-solving | | Learning outcomes: problem-solving (inclusive of creative thinking and consideration of diverse perspectives) and written and oral communication (inclusive of self-reflection and teaming – i.e., collaborating in projects and presentations) |
| Ability to cope with stress | Tolerance, inclusive of the ability to cope with stress, work with uncertainty, and unpredictability | Actively linking theory/knowledge to practice. Prepare to go beyond previous perspectives and build new tolerance and insight individually as well as within teams. Learning outcomes: ethical reasoning (inclusive of ability to cope with uncertainty and ambiguity and consideration of competing demands) and leadership (inclusive of ethics and social responsibility, resilience, and self-reflection) |
| Work with uncertainty and unpredictability | | |

procedures, discipline-specific knowledge is assessed. Students also grapple with applications within different contexts through peer discussions where they engage critically, solve intricate problems, and communicate in ways and on issues perhaps not normally considered.

Within knowledge contexts, students examine where, when, and how discipline knowledge applies. In such discussions and exercises, learning outcomes that support the development of critical and analytical thinking are employed. Specific examples are found in the core courses which include but are not limited to the expectation that students apply and discuss the different merits of current technology in use or under consideration for management of different types of operations or to solve weekly applied problems, complete spreadsheets, and/or build graphs of econometric data to support organization member discussion and decision-making. Other tools used in the courses include think tanks, case analysis, and weekly discussion topics based on current business events.

Critical and analytical thought is advanced when exposed to diverse perspectives and work environments. Within peer learning discussions, students bring forward ideas from their different industries and types of work organizations and across profit/nonprofit settings and geography. This diversity is deliberately incorporated into discussions to expand the ability to engage in critical and analytical thought both individually and at team levels. Students are encouraged to apply diverse insights in discussion of organizational processes whether they are operational, financial, strategic, or human resource based. Student groups develop team charters to engage in team building aspects around effective communication, collaboration, participation, and commitment. Such pushes students into challenging learning conversations where they must establish consensus agreement among online peers on how they will work together.

Other tools used in courses include simulations, self-reflection and exercises for individual and team leadership development, a second learning outcome that supports adaptive capacity. In the change management course, students engage individually and as teams in both learning about concepts and with decision-making in simulated environments. As a result, they subsequently discover the impact of their own as well as team decisions and learn about, as well as how, to engage in effective change management. The use of a variety of experiences and tools contributes to the development of leadership skills as well as disciplinary knowledge.

Various courses assess learning outcomes on marking rubrics. Program outcomes are assessed as overall achievement of the outcomes noted. As students contextualize discipline knowledge, they also engage and learn within a distributed space via communication technology that increasingly mirrors organizational complexities and new structures of work. Disciplinary knowledge develops along with the ability to adapt to change quickly. Graduates (as discussed above) are expected to collaborate, learn, absorb, adapt, create, and solve problems with others in distributed space. Given the cognitive development and skills practice employed, adaptability practiced, they will be much better positioned as work and future ready as a result.

## *6.2 Proactive Dimension: Creativity and Interpersonal Growth*

The second aspect of adaptive capacity is creativity and interpersonal growth and how this impacts the proactive dimension of adaptive performance. The encouragement of creativity and interpersonal development builds student knowledge and skill and the proactive ability to respond to any challenges. We examine students' ability to work with others, handle interpersonal challenges within teams and work together to solve problems, and complete work in face-to-face and/or distributed space.

Interpersonal skill can combine elements as noted above when working with others that can be considered as both reactive and proactive adaptability; however, in this section, we focus on the proactive elements related to creative and interpersonal skills development specifically found in problem-solving. The program-learning outcome of problem-solving is achieved through consideration of diverse perspectives among students and faculty within the online forums. The course rubric for assessing problem-solving assesses typical aspects of problem identification and analysis of the issues as discussed earlier in the earlier reactive dimension. The rubric includes generation and evaluation of alternative solutions through the practiced skill of creative thinking. Processes for generating creative ideas to achieve this overall program-learning outcome are found in different formats and within different courses.

Many MBA courses require students to frame and analyze problems either individually or in groups. For example, in financial and managerial accounting, students must think through problems and financial information needs from different stakeholder points of view. Similarly, in human resources management, problems in work flow or performance management must often be framed from different points of view prior to analysis. Arriving at solutions, once this framing and multi-view analysis takes place, requires skills in creativity. In negotiations and conflict management, creative thinking exercises are used to develop new ways of examining problems to arrive at consensus decisions or win-win-win solutions. Creativity workshops are provided in the leadership development course to encourage deeper personal reflection in problem-solving.

Written and oral communication is another MBA learning outcome to consider for development of adaptive capacity and the proactive dimension of adaptive performance. For oral communications, students are expected to develop audience awareness – such as using professional language, grammar, and clear and succinct responses; displaying vocal qualities and creating enthusiasm and expressive and suitable volume, pace, and enunciation; and using nonverbal/physical delivery that is appropriate such as confidence, poise, eye contact, posture, movement, attire, and appropriate transitions. The use of appropriate media, content, and organization of communications is also considered in the rubric.

Excellence in providing presentations and communications in written form with paper/report preparation are also measured learning outcomes. Where all MBA courses assess written communications, several also assess both oral and written

communications such as those offered in blended format through individual and team presentations. In each case, effective spoken/written communications and creative problem-solving, the student develops both disciplinary knowledge and skills that expand their repertoire and behaviorally increase their flexibility to adapt by way of having this additional capability. The synergistic combination of these learning processes regarding creativity and interpersonal growth and the above learning outcomes thus strengthen students' adaptive capacity.

## *6.3 Tolerance Dimension: Actively Linking Theory/Knowledge to Practice*

Within AUFB's MBA, students are expected to immediately apply their learning to effectively internalize the knowledge and promote further adaptive capacity. In discussion with other students who work across various industries, they learn new ways of considering knowledge under study from various students and industry perspectives and how it is interpreted. This pushes the boundaries to build new insight, solve problems, and collaboratively cocreate knowledge. Participation in collaborative peer learning requires students to interpret and wrestle with understanding potentially contradictory perspectives of other students. Interpersonal skills are further developed especially with respect to coping with change, uncertainty, and ambiguity, which all contribute to an ability to adapt to new situations, expand thinking for greater flexibility, as well as come up with new and novel approaches to problem-solving.

When handling unexpected events that occur, such as with work stress and/or interpersonal conflict, students are able to build on their ability to cope and, by virtue of successes, enhance their confidence. Building confidence in future success based on past performance is learned through challenges presented to students as part of their program learning. Aspects of tolerance adaptive capacity related to building an individual's confidence in their acquired knowledge and skill is in our view related to growing ability to handle uncertainty and ambiguity while still making sound ethical decisions. Program-learning outcomes associated with ethical reasoning and leadership development are important considerations here. We have mentioned that in actively linking theory/knowledge to practice, students go beyond previous learning as they engage with other student perspectives. At times, such perspectives can be unpredictable, contradictory, and challenging to core values and beliefs. How one then works with others to understand and cope with ambiguity and uncertainty presenting as conflict not only challenges the ability to come up with creative solutions but also to find the skill and knowledge that come from truly seeking to understand the "other" perspectives and learn from them in a meaningful way.

Ethical reasoning skill is a key MBA program-learning outcome. Students examine ethical situations and dilemmas; gather information from various and, at many times, competing points of view; and work through the challenges to come up with

solutions and interpretations. Examples of ethical issues and discussions designed to address this core-learning outcome occur throughout the MBA program in various contexts and situations. Some are disciplinary specific as well as personal requiring students to challenge their own assumptions and those of others as well as come up with solutions that are sound and ethical.

Students wrestle with the intricate connections between ethical reasoning and leadership. For example, a leader of operations may discuss challenges, solutions, and implementations that need to occur in an organization; however, implementing the solution in a socially responsible manner may not be the most cost-effective. A marketing manager analyzes the business environment that the organization operates within as well as the consumer needs, which hold opposing views. Financial managers consider financial analysis and investment recommendations, whereas stakeholder desires may be in conflict in their decision-making. Students engage in decision-making across all management disciplines; they use ethical frameworks to assess situations and work together collaboratively to explore ethical issues. Ethical reasoning is explored in depth through application of ideas in assignments and exercises, student's ethical reasoning and skill building practiced, and program-learning outcomes achieved.

The tolerance dimension of adaptive performance is inclusive of building resilience as students learn to more flexibly deal with work stress, uncertainties, lack of predictability, handling competing demands, deciphering what is an appropriate and ethical response, and planning for challenges in balancing competing personal demands of study/work/life. To understand resilience as an important element of adaptive capacity and overall leadership development, much emphasis is put on the student's ability to self-reflect. Students are encouraged to continuously reflect on the disciplinary knowledge they are gaining, as well as on their own leadership skills development and that of others. Self-reflection is core to a few dimensions of adaptive performance already discussed such as demonstrating interpersonal adaptability, demonstrating cultural adaptability, and working in teams. Similarly, development of resilience and ultimately adaptive capacity as discussed in this paper depends on the degree of introspection found in self-reflection (Azevedo, Hurst, & Dwyer, 2015).

## 7 Conclusion

We have discussed learning outcomes linked synergistically to learning processes that promote combinations of learning in context, creativity, and interpersonal development and connecting theory to practice. While learning outcomes appear to be increasingly focused on forms of adaptive capacity and adaptive performance development at both individual and team levels, there is much further work to be done (Chen, Thomas, & Wallace, 2005). Where knowledge and skill can be shown to enable individual adaptive performance, it is unclear what impact such development has on a team's adaptability. Further empirical study on learning outcomes and

educational design to enable development of adaptive capacity is needed. Learning outcomes designed to enhance key learning processes of knowledge contextualization, creativity, interpersonal growth, and linking theory to practice would all support the development of adaptive capacity.

There are implications for management educators who seek to build adaptive capacity online. As discussed adaptive performance outcomes and individual attributes that are thought to predict such outcomes. Coupled with this are examples of "adaptive capacity" embedded in the AUFB's MBA program-learning outcomes. Such are connecting theory to practice immediately building skill and new capability to enhance a student's workplace. We discussed aspects of different program-learning outcomes inclusive of a combination of skills development aligned with disciplinary knowledge requiring online MBA students to engage with other students to learn both individually and vicariously through observing learning peers. We then considered a synergistic combination of five specific program-learning outcomes (i.e., critical and analytical thinking, leadership, problem-solving, written and oral communication, and ethical reasoning) and learning processes of knowledge contextualization, encouraging creativity and interpersonal development, and actively linking new knowledge/theory to practice to illustrate the development of students' adaptive capacity within this online MBA.

As noted at the outset, employers claim that universities are not producing work-ready graduates. We suggest that there is an opportunity for further investigation into this issue and how employers and educators can work together to more meaningfully co-alleviate the issues. In our view, educators need to improve their focus on aligning discipline- and skill-based knowledge with adaptive capacity. At the same time, employers in participation with educators could design ongoing learning opportunities within their organizations and teams to bring skills developed in university programs into sharper focus as well as provide the foundation for continuous workplace learning in response to changing realities.

We end our chapter by suggesting that instead of a focus on current work-ready graduates, educators and employers need to privilege the concept of adaptive capacity and produce "future work-ready graduates," meaning graduates ready for both current and future work. Such graduates will have a combined academic disciplinary knowledge and professional skills enabling them to handle a myriad of workplace issues. Future work-ready adaptive grads and the ability to continuously adapt to evolving demands of the workplace, within a globalized world of growing volatility, uncertainty, complexity, and ambiguity, are essential.

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# Professional Accreditation: An Investigation into the Case of Online

**Iain Reid, Murray Dalziel, Alan Southern, and Maria Argyropoulou**

**Abstract** The purpose of this article is to examine the application of professional accredited postgraduate programmes in the fields of business, management, operations and supply chain management. The approach adopted here is a reflective one, looking at the recent trends in postgraduate education and focusing in particular on the professional accreditation process, such as programme design, learning goals, mode of delivery of e-learning model and the criteria of assessment. The aim of the research is to discover the real-time dynamic of professional accreditation, from both objective and subjective perspectives with a particular focus on two major accreditation bodies: the Association to Advance Collegiate Schools of Business (AACSB) and Chartered Institute of Purchasing and Supply (CIPS). The article also highlights the dynamic character of professional bodies and on whether an e-learning format is being considered as an obstacle by institutions with their accreditation agenda. The paper also presents a second case study on the uptake and delivery of specialised degree programmes offered across a selection of UK universities accredited by CIPS.

**Keywords** Professional accreditation • E-learning • Online • Supply chain • AACSB

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## 1 Introduction

Higher educational institutions (HEIs) in the UK have been severely criticised in the past for offering out-of-date education and poor teaching standards and not delivering employable graduates. Furthermore, practitioners often talk about the need to systemise training functions or maximise their investment in education, while many organisations seek to develop the employability of the workforce and remain competitive in the marketplace (Dillich, 2000). Universities themselves are also facing challenges to internationalisation, particularly through franchising overseas (Hitt, 1998) to be increasingly competitive and to find new ways of reaching new students and wider participation, particularly through innovations such as e-learning or online learning (Moreira, 2016). In this paper, we describe the contribution of e-learning to discovery-based learning theories (Bicknell-Holmes & Hoffman, 2000). Additionally, Moisey (2004) explained that education through online resources opens up opportunities for many people who for economic, physical, family or other reasons would find it impossible to become full-time residential students. Universities see, in meeting these needs, an opportunity to expand and deliver their existing programmes to underserved populations as well as on an international scale. A 2004 survey of commonwealth universities recorded that 54% of respondents expected off-campus online learning to play a major role in their institution over the next 5 years, an increase from 36% 2 years earlier (Garrett & Jokivirta, 2004). Furthermore, Massive Open Online Courses (MOOCS) was established in the early 2000s with the aim to expand open access to online learning to a wider audience (Pasha, Abidi, & Ali, 2016).

The purpose of this article is to examine the uptake and challenges of professional accredited management programmes focusing on recent trends in postgraduate education. Increasingly, the e-learning environment is being used in management education as an addition to the more traditional face-to-face physical lecture room (Landry, Griffeth, & Hartmann, 2006). These online and virtual environments are particularly useful when dealing with part-time or distance learning students or organising group work activities or assignments, and some authors argue pertinently in the case of management that e-learning has contributed in discovery-based learning theories (Bicknell-Holmes & Hoffman, 2000). This view has become embedded within HEIs as the current Online Learning Task Force has noted (White, Warren, Faughnan, & Manton, 2010). Often web-based, e-learning covers many different approaches that have in common the use of information and communication technologies and the use of computer and Internet-based technologies or systems in the delivery of a broad range of learning opportunities designed to enhance knowledge, skills and performance. In addition to the learning provision, e-learning is able to make knowledge available to users or learners and can do so in an asynchronous manner, disregarding time restrictions or the need for geographic proximity (Greasley, Bennett, & Greasley, 2004). Others have noted how e-learning has helped to counter increasing competition. HEIs have recognised the value of e-learning as an instructional tool and are developing, or have developed, online learning programmes (Allen & Seaman, 2008; Larreamendy-Joerns & Leinhardt, 2006).

## 2 Literature Review

### *2.1 The Need to Go Online*

Some academics have suggested that e-learning has advantages over traditional face-to-face education (Piccoli, Ahmad, & Ives, 2001), although there are concerns that include time spent online, labour-intensive study methods and costs incurred in running e-learning environments. We might add that the costly high failure rates of e-learning implementations discussed by Arbaugh and Duray (2002) and the factors contributing to the success or failure of attempts to achieve accreditation (Kuo, Chen, Hwang, & Chen, 2015) deserve additional attention from educationalists and learning technologists. To add, there is a market demand for the skills and knowledge for engaging with e-learning as well as for own professional development. While this might often be the reason behind the online provision by HEIs for academic programme, it is not a necessity. HEIs are acknowledging new technologies such as their virtual learning environment (VLE) in supporting the more traditional methods of face-to-face learning.

Online programmes further attract an international student population that may well have experience in the field, but still require the broader theoretical understanding of management thinking to be found in the provision from HEIs. The following section of the article will introduce the discussion on online education through the delivery in an e-learning format and the mechanisms for student engagement (Khan, Everington, Kelm, Reid, & Watkins, 2016). The relevance of this is related to how this mode of delivery can satisfy the requirement for the attractiveness of an online programme. In this sense, the fact that there are different modes of study including wholly online provision is one response, a provision that satisfies a clear demand from students who enter a virtual classroom with a varied level of experience, different organisations (e.g. from a multinational to a small entrepreneurial start-up) as well as diverse national cultures. We would suggest therefore that there is a scope to provide this form of management education and there is a need to understand the pedagogy behind this.

### *2.2 Designing an E-Learning Environment*

The key difference therefore between traditional on-campus deliveries is the deliberate involvement of students in learning, experience and understanding of the subject matter that recognises their value to the field and brings this into the learning environment of online. In a traditional format, this may happen, but generally, such an approach will be incorporated by chance rather than by design. For example, in the online classroom, the mode of communication is asynchronous, again deliberate and necessary given the requirement to enable students to fit the demands of their learning into their work schedule. This is deliberate as it encourages practitioners to engage in postgraduate education in a manner they would struggle to do otherwise.

Furthermore, the asynchronous mode caters for an international community of academic staff and students who may be working in several different time zones. In simple terms, what we see at play is a particular type of learning that seeks to draw from Student 'X' aspects of particular subject matter that would help student 'Y' learn. We can explore this by reflecting on two approaches that might be captured through e-learning, constructivism and collaborative enquiry (Rambe, 2012). For instance, constructivism describes the view of learning in which the students construct their own unique understanding of a subject, through a process that includes social interaction, so the learner can explain his or her understanding of the topic under study and thereupon receive feedback from academics who we assume to hold the knowledge (Wilson, 1996; Wilson, Gasell, Ozyer, & Scrogan, 2016). While collaborative enquiry via Internet-mediated communication provides a framework for the mode of learning (Ashley, Jarman, Varga-Atkins, & Hassan, 2012; Nicolaides & Dzubinski, 2016; Stacey, 1998), as all coursework, discussions and group activities are completed in an asynchronous online environment, students and academic instructors are able to collaborate over a specified time period, and while interactions are not real time, there exists space to reflect and to contribute. This mode of teaching requires a rigorous assessment criteria based on (a) levels of participation in discussions that respond to specified questions, with an emphasis on the quality of contribution and not quantity of contribution (thereby requiring an academic judgement on student involvement), (b) original assignments and (c) individual or collective project work. Such an assessment platform provides the foundation to the pedagogy of the programme.

The virtual classroom or VLE provides chat rooms and discussion boards familiar to the online community that are simple to use (Lewis & Allan, 2004; Nielsen & Yahya, 2013; Santy & Smith, 2007). The structure of the online classroom is represented in the integration definition for function modelling (IDEF0) methodology IDEF(0) diagram format. The IDEF(0) modelling technique is designed and developed to facilitate understanding, an instrument for business process reengineering (Soung-Hie & Ki-Jin, 2002). IDEF(0) utilises a modelling method to establish function models, such as core activities within the online classroom like online discussion and assignment submission. Diagrams are formed based on the inputs–controls–outputs–mechanisms (ICOM) code, and there are strict syntax and semantic rules, which ensure that the model is described precisely. Therefore, this model was adopted to represent all the key characteristics for our online classroom presented in Fig. 1 such as the module-related information: syllabus, learning objectives and case study provision presented as either controls or resources. Overall, the IDEF(0) is a mechanism for capturing and representing the pedagogical design of the online classroom (Reid & Southern, 2011).

## *2.3 The Online Discussion*

Through collaboration, socialisation and points-of-conflict students co-construct new knowledge about aspects of module content under investigation. Both students and the academic instructor facilitate this, the latter coaching and guiding the former as and when the need arises. We can see this in the following brief extract from a

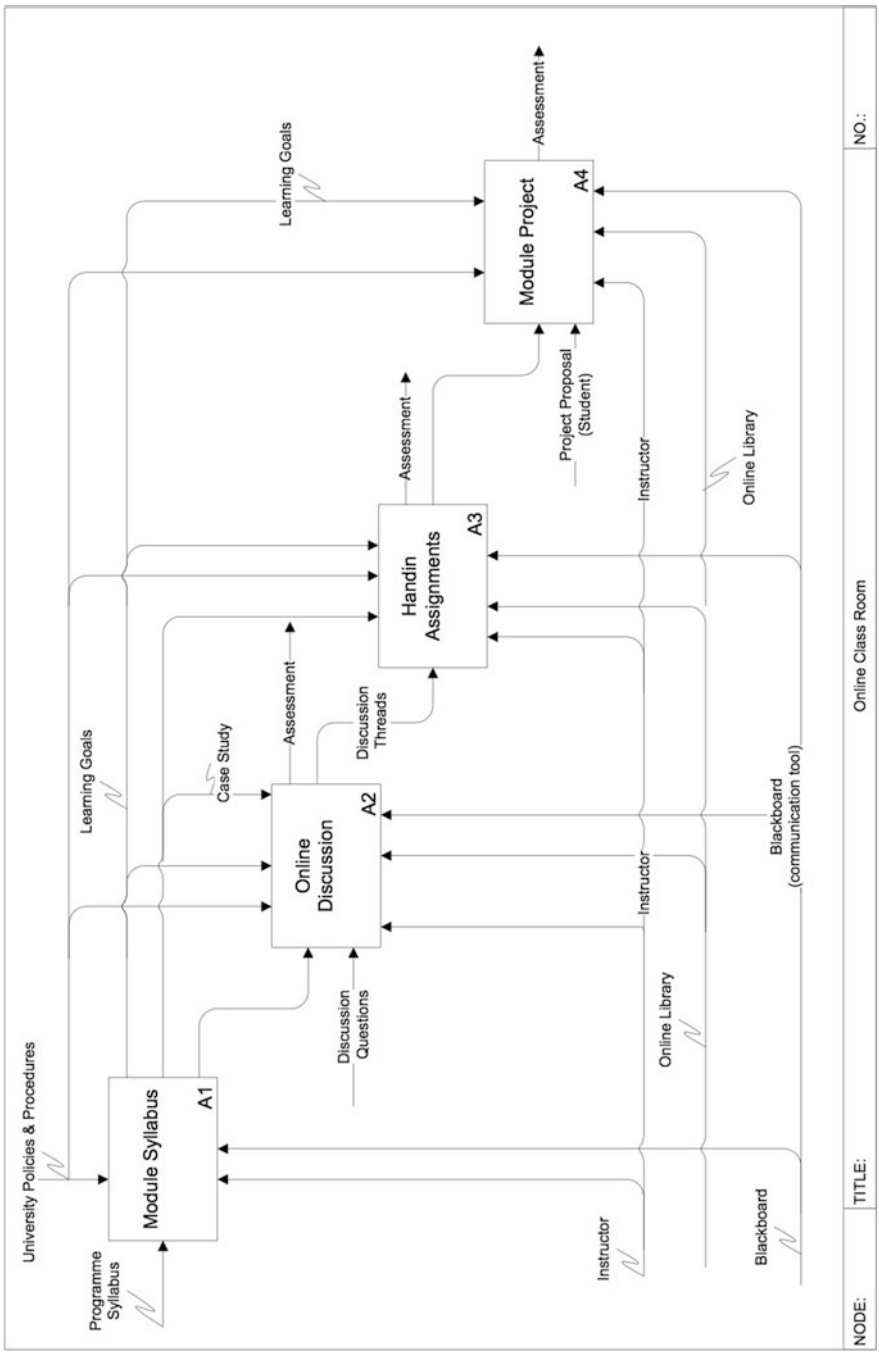


**Fig. 1** Representation of the online classroom (Reid, 2010)

typical online classroom the type of interaction that takes place. Each module is accompanied by a set of discussion exercises to be 'posted' during the teaching week. Towards the end of each week, each student is required to post a critique of at least one other student's response/answer to the discussion questions. Initially within the seminar, the discussion question is posed by the academic:

> Assess the importance of managers, both as the drivers of change and the obstacles to change, in the implementation of lean at Pratt. Support your answer with evidence from the case study.

This provides the platform from which we expect the student to insert their quoted response:

> Student 1: The strategic importance of management to influence the success of any Lean implementation can be deduced from all the case studies reviewed from the inception of this course. The case of Pratt (Womack & Jones, 2003; pp. 153–188) is no different; instead we are better made aware of the gravity of management influence to any successful attempt on adopting Lean as a standard for operations principles 9 and 10 of The Toyota Way (Liker, 2004; pp. 169–184). As explained by Liker (2004) 'the leader's real challenge is having the long-term vision of knowing what to do, the knowledge of how to do it, and the ability to develop people so they can understand and do their job excellently'. This, he claims is the foundation for true and long-term success in any organization…
>
> In conclusion, people are the bane of all organizational processes. They are required to make decisions, and run machinery needed to make the business work. Hence the right attitude to work predominantly determines the success of the enterprise. Managerial influence in the process of change could either make or mar the success of the improvement process. Having the right type of management to provide the needed vision and guidance and know-how from the top, whilst effectively building up employee motivation and participation is critical for the success of any improvement initiative.

What we witness typically are aspects of theory. For example, the leader's real challenge is having the long-term vision of knowing what to do... combined with initial reflection from own experience, such as 'influence in the process of change could either make or mar the success of the improvement process...' and in some instance an anecdote borne perhaps out of frustration as perhaps in 'people are the bane of all organizational processes'. This lays the basis for an initial response from another student in the classroom, who will have not met the original student other than in the virtual environment. As we see here:

> Student 2: Leadership has been often listed as the most important driver of change within an organization. Just as leadership has been regularly identified as the driver of an organization that changes successfully, it is also often cited as the reason for failure. One of the most important things a leader can do is to actively participate in the change, or "walk the talk". However, a leader who thinks that merely communicating the changes without action could be setting the company up for failure. As you mentioned, active leadership has been a theme quoting (Whelan-Berry & Somerville, 2010) "in order to understand the change drivers for organizational change!"

Witnessed here is the reaction, not in real time but after a period of reflection, to the initial post made by the original student. Challenging the anecdote and position of the original student, student 2 seeks to provoke further thought that 'leadership has been regularly identified as the driver of an organization that changes successfully...'.

Further contributions will be made by other students or by the original student who responded to the question in a similar way. At some point, the role of the academic

instructor becomes more specific. He or she helps the student to synthesise the various contributions that are made. This method allows further exploration and development of the issues under consideration. Any form of leading the group to a higher understanding is appropriate here, and interestingly, this is not confined to the academic (who might perhaps sit virtually at the head of the classroom). This design means that discussion is the best opportunity or tool that the academic has in terms of assessing what is said, that is, we see the co-construction of knowledge in respect to supply chain management (SCM), and students understand their own responsibilities for learning. Students implicitly become more demanding while at the same time offer more in terms of ability to assist their peers, as they question their own thinking processes. However, this is about much more than the technology and the platform from which the delivery of learning materials can take place. As theory building and interaction increases, students eventually reach a stage of knowledge construction in which they are highly productive, and collaborative learning begins – students sharing differing views and personal experiences while developing abstract ideas.

## 3 Methodology

In order to explore the challenges of professional accreditations, the authors adopted an action research (AR) approach to investigate the accreditation process and open-access online provision. The authors took on the role of observer and analyst within the organisation, which included a participative role within the model development and analysis (Aquilani, Silvestri, Ruggieri, & Gatti, 2017), with the objective to review the accreditation process. Zimina, Ballard and Pasquire (2012, p. 384) explained that 'action research was introduced by Kurt Lewin to describe a process of organisational change that uses a spiral of steps, each of which is composed of a circle of planning, action, and fact finding about the result of the action', which is also in line with the plan–do–study–act cycle. Checkland (1981) also contributed towards developing the legitimacy of AR in system thinking, and it is now recognised as a method on its own. Baskerville and Wood-Harper (2016) suggested that, by merging research and praxis, AR generates a large amount of data and produces relevant findings, which supported the challenges of professional accreditation. Furthermore, Baskerville and Wood-Harper (2016) highlighted that AR is a method which compliments the post-positivist paradigm, 'as it is empirical yet interpretive; experimental yet multivariate and it is observational yet interventionist'. These different elements fit extremely well with the pragmatic paradigm. The authors established long-term collaboration with the case study organisations, formally and contractually as they were willing and keen to experiment on the plan–do–study–act cycle in the accreditation process for online programmes.

The researcher was directly involved and worked on the accreditation team on a daily basis over an 18-month period acting as both the developer and assessor, as well as supporting the decision-makers to question the uncertainties in order to verify the nature of output. For this research, the following research questions (RQs) were developed: RQ1: Are professional bodies accrediting online programmes, and if so,

what are the requirements and expectations for the online programmes? RQ2: How can the review process be improved to maximise the likelihood of accreditation?

## 4 Case Study

The University of Liverpool started to engage with online programmes in 2000. Initially, this was a joint venture with KIT, an Israeli company, which was subsequently acquired by Laureate International (Dalziel et al., 2013). Unlike competitors in the UK, the University of Liverpool had never engaged in distance learning. This engagement implied making a commitment to the online delivery method, and there was a strong belief that the university would lead the wave of a new generation of methods for delivering postgraduate education. According to Dalziel et al. (2013), the University of Liverpool committed to this method, and particularly why it continued to work with a larger (and at that time publically traded) private sector provider was based on four premises:

(i) The university felt that they were too dependent on undergraduate teaching and the Higher Education Funding Council grant. The revenue growth would come from postgraduate taught education (the Management School had just been established and although there were considerable expectations about MBA growth; undergraduates still dominated the revenue streams). Online provision that would be available globally and on a flexible basis would accelerate entry into this market.
(ii) Constraints of real estate expansion would be a barrier to growth. Online was an attractive alternative.
(iii) There could be a different delivery method for a research-intensive university. On-campus academics would not have their research time constrained by rapid growth in numbers if the university developed materials that could be delivered under supervision through a network of other academics. Given the research objectives of the university, this was an equally compelling reason.
(iv) These ventures and other expansion ventures in higher education need more capital than either the UK Treasury was willing to underwrite or the university could sustain through regular cash flows. Inevitably, more private sector providers would enter the market. At the time, there was a belief that it was better to be on the leading wave of this rather than face competition from much better capitalised competitors later on.

Today, the University of Liverpool's Management School has over 5,500 students registered on either an MBA, specialist Masters or DBA (Dalziel et al., 2013). A proportion of these students will be taking 'taster sessions' to decide whether they use this method of learning (university regulations under which these degrees are awarded require registration for a degree even though a student may only be paying for a single credit course). Since these students are largely professionals at work, some will be inactive for a given time period. On average, an active student takes one

module per semester and takes 3 years to graduate. To compare scale, the 2012–2013 postgraduate entry on campus is approximately 820 full-time students. Over the period 2011–2012, there were 1,000 full-time equivalents active in online programmes (Dalziel et al., 2013). The profile of our online students means that they are particularly suited to benefiting from the mode of delivery. Their average age is 39, and the majority study online while remaining fully engaged at work, often in senior positions (Dalziel et al., 2013). Therefore, they can use their experience as a major source of their learning, engaging with peers and faculty in the co-creation of knowledge with a view to operationalising this knowledge within their environment. The strategic nature of the partnership is important for both organisations although most relevant here, the quality assurance and full control over all academic and teaching aspects of the programme reside with the university.

## *4.1 Case Study 1: Association to Advance Collegiate Schools of Business*

Many HEIs are seeking to create diversity in the classroom, for example, by recruiting more students from overseas and indeed by establishing a base in some form, in other countries, often in developing countries (see, e.g. Hitt, 1998). This is part of the increasingly competitive higher education environment as HEIs seek ways of reaching new students and widening participation. In November 2012, the University of Liverpool Management School (ULMS) was awarded AACSB accreditation, an achievement earned by less than 5% of business schools worldwide.

According to Kunz and Cheek (2016), AACSB current accreditation eligibility procedures for online education as referred to below indicate a recognition of different modes of delivery (including online) and clarify the expectations across models and programmes, such as:

(a) 'Recognize that with the advent of different programmes delivery models ...' (p. 22).
(b) Standard 5 refers to 'students in all programmes, disciplines, locations and delivery modes' (p. 23).
(c) Standard 8: The expectation is that 'educational programmes are structured to ensure consistent, high-quality education for the same degree programmes regardless of difference and changes in technology and delivery modes' (p. 28).
(d) Standard 11 defines teaching/learning models to 'include traditional face-to-face classroom models, distance (online) models, blended models that employ face-to-face and distance 108 (online) components, other forms of technologically enhanced instruction, or any other form of instructional methodology' (p. 33).
(e) Standard 12: 'The school has policies and processes to enhance the teaching effectiveness of faculty and professional staff involved with teaching across the range of its educational programmes and delivery modes' (p. 34).

Today, AACSB appears to support the view that online education has become more integrated with the institutional offerings (Kunz & Cheek, 2016). One significant element

of the accreditation preparation and planning resolved the complex question of how to deliver high volume, fully online, international masters and doctoral programmes to the stringent quality standards required by AACSB. Under the 2003 standards, students had to demonstrate learning achievement; thus, the focus shifted from what teachers taught to what students learned (Martell, 2010). Figure 2 represents the process steps in meeting the new assurance of learning (AoL) standards.

Furthermore, the length of time an institution has been offering online courses may impact on how quality and effectiveness are measured and to what extent training programmes are offered to both faculty and students. One ongoing concern was providing the evidence base for creating and implementing changes to improve student learning. For example, the lack of appropriate knowledge required in carrying out the AACSB audits and assessments from junior to senior members of staff from both the university and external partners echoes the findings of Kelley, Tong and Choi (2010) who captured the perspective of deans from 420 accredited business schools.

In terms of the AACSB assessment and mapping of the learning goals, the student traits consisted of the five following themes:

1. Demonstrate relevant programme-specific knowledge and understanding
2. Demonstrate that they are effective learners, planners and communicators
3. Demonstrate cognitive skills of critical and reflective thinking
4. Demonstrate effective performance in a team
5. Demonstrate that they can analyse business and management issues effectively

These goals would be mapped to both the MBA/MSc programmes, with individual traits would form part of the evidence base as present in Table 1. As part of this process, the university established a steering group to support staff and faculty members in the assessment tasks, including the mapping of the traits, defining the learning goals of the programme and developing instruments to measure student learning, such as sampling 20% of student of the existing cohort.

As part of the assessment process, three stages were critical to the success of the accreditation process: (1) student management and support, (2) programme development and quality assurance and (3) online faculty participation and performance management. Kunz and Cheek (2016) identified a number of core questions key to the online provision for HEIs:

**Table 1** A learning goal and trait: MSc in operations and supply chain management programme

| GOAL 1: Students will demonstrate relevant programme-specific knowledge and understanding | | |
|---|---|---|
| Objective: Students will demonstrate a deep knowledge and understanding of their subject area | | |
| Trait number | Traits | Example evidence of learning |
| T1.1 | Understand the requirements of successful operations and supply chain practice in modern business | KMGT601: Supply Chain Operations Management |

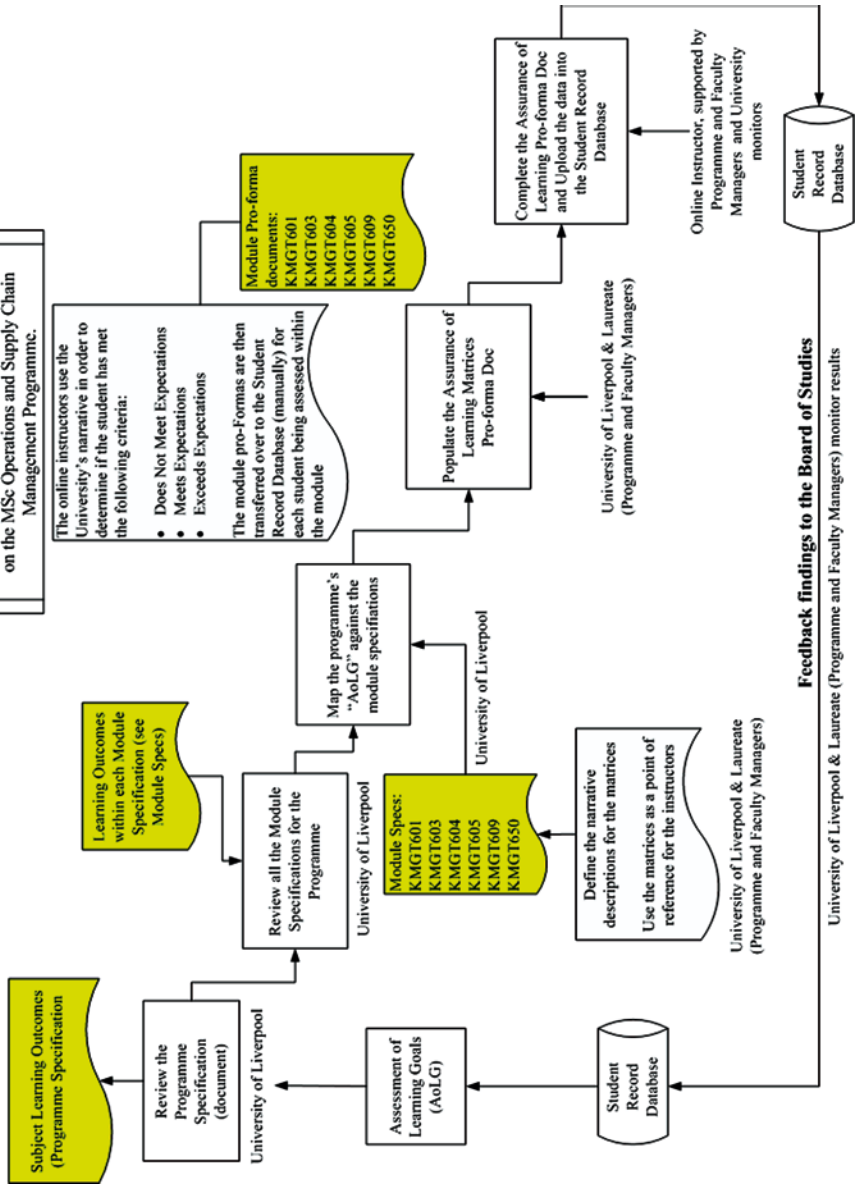


**Fig. 2** Representation of the preparation process

- Are there plans to offer more online courses? Programme? Why or why not?
- Are there plans to change the current review or quality assurance efforts?
- If so, what will the changes include?
- Does the institution plan to maintain the current status of online education?
- Will review standards and practices incorporated across all venues be unified? Why or why not?
- How does the university or college see online education in the institution's future?
- Does the university or school/programmes promote their online offerings? Why or why not?
- If yes, what means of promotion are employed?

The implementation process map (Fig. 2) was invaluable to both the university's procedures and online partner's Laureate Online Education in understanding the processes, as well as the compliance of new assessment standards of AASCB. The process map is also part of the continuous improvement cycle, supporting the assessment and outcome data and evaluating intended programme learning outcomes, thus representing the workflow of the assessment process.

## *4.2 Case Study 2: Chartered Institute of Purchasing and Supply (CIPS)*

### 4.2.1 Overview of Supply Chain Market

Supply chain practitioners often talk about the need to systemise training functions or maximise their investment in education, while many organisations seek to develop the employability of the workforce and remain competitive in the marketplace (Christopher, 1998; Dillich, 2000; Gilly, 2000). This has been an added impetus in the field of SCM where there has simultaneously been a rapid growth of training and educational opportunities. SCM training and education can range from a few sessions in a required course, a particular module or a specialised degree. How to teach the subject to students with different backgrounds and interests has also attracted a great deal of interest and created notable challenges for academics. This is part of the increasingly competitive higher education environment as HEIs seek ways of reaching new students and widening participation. Furthermore, Cousins, Lawson and Squire (2006) who highlight the work of Burgess et al. (2006) exposed some of the challenges and complexities in building theory of SCM. They point to the broader management areas that SCM connects with, such as marketing, procurement and purchasing, TQM and just in time. In addition, Sarkar and Kumar (2016) presented a classroom tool to teach the impact of supply chain disruptions and mitigation strategies based on information sharing and collaboration. Furthermore, Kunz and Cheek (2016) proposed a number of key questions to the online provision for HEIs:

- Are there plans to offer more online courses/modules/programmes (such as the module content, market, mode of delivery)? Why or why not?
- Are there plans to change the current review or quality assurance efforts annually? If so, what will the changes include?

- Will review standards and assessment practices incorporated across all venues be unified? Why or Why not?
- Does the university or school/programmes promote SCM offerings and CIPS relationship? Why or why not?

A further progression over the last 12 years is the way logistics management has been developed within a broader discipline of SCM providing an integration of supply chain functions focused on delivery (of product or service) to the customer in the right quantities, to the right location, at the right time and at optimal cost (Gonzalez et al., 2008). The dynamics of the discipline lead to a dialogue between academics and practitioners in a way that continuously challenges theories and applications in the SCM domain, to overcome the risks inherent in the changing environment of the organisation (Lancioni, Forman, & Smith, 2001).

### 4.2.2 Programme Accreditation: MSc Operations and Supply Chain Management

In response to the critique of HEI provision, professional bodies have sought to effectively 'badge' a number of programmes. This has been one response to the challenges of enhancing quality within SCM programmes and has also been part of a wider encouragement of HEIs collaborating with industry practitioners. The Chartered Institute of Purchasing and Supply (CIPS) is one such accrediting body that has raised the profile of such SCM degree programmes but so too have the Chartered Institute of Transport and Logistics (CITL) and the Institute of Operations Management (IOM), as seen in Table 2. HEIs are keen to provide to graduates recognition of a type that goes beyond the awarded degree, and if this can be an internationally recognised association, then all the better.

We see in Table 3 where the mode of study that the programme is available as, the core and elective teaching associated with the programme, the cost of the programme and whether or not accreditation has been obtained. Furthermore, Table 3 provides a simple and selective comparison of postgraduate programmes within the UK reflecting on cost and content. The consistency of the modules on offer is a feature, with a limited delineation between programmes from different UK HEIs.

**Table 2** Accredited degree programmes with CIPS and CILT

| Accreditation bodies | Members | Number of university degree programmes UG/PG | | Method of learning | | | | |
|---|---|---|---|---|---|---|---|---|
| | | UG | PG | Full time | Part time | Module | E-learning | Distance learning |
| CIPS | 65,000 | 13 | 32 | 10 | 7 | 1 | 1 (Liverpool) | 4 |
| CILT/IOM | 45,000 | 103 | 43 | 103 | | | | 2 |

Adapted from Reid (2010)

**Table 3** Comparison of postgraduate SCM programmes in the UK

| MSc programme | Mode | Fees (approximate) | Core modules | Electives | Accreditation body |
|---|---|---|---|---|---|
| Brunel University, UK | Full time | £10,335 (overseas full time) | • Logistics and Supply Chain Management | • Strategic Analysis and Management | CITL, CIPS |
| MSc: Global Supply Chain Management | Part time | £5,165 (overseas part time), | • International Management | • Knowledge, Innovation and Learning | |
| | | £5,990 (home and EU full time), £2,995 (home and EU part time) | • Financial Resources Management | • International Business Strategy | |
| | | | • Operations Management | | |
| | | | • International Business Ethics, Sustainability and Corporate Governance | | |
| | | | • Understanding Business and Management Research | | |
| | | | • Dissertation | | |
| Cranfield University, UK | Full time | £17,500 (overseas) | • Manufacturing and Spares Management | • Simulation | CITL, CIPS |
| MSc in Logistics and Supply Chain Management | | £9,500 (home and EU) | • Quantitative Modelling | • Distribution Centre Design | |
| | | | • Organisation Development and Project Management | • Performance Measurement in the Supply Chain | |
| | | | • Supply Chain Process Re-design | • Logistics Outsourcing | |
| | | | • Freight Transport | • Marketing | |
| | | | • Business Statistics | • Demand Chain Management | |
| | | | • Warehouse Design and Operations | • Sustainable Supply Chain Management | |
| | | | • Demand and Inventory Planning | • Road Freight Transport | |
| | | | • Procurement Management | • Planning and Resourcing for Road Freight Transport | |
| | | | • Logistics and the Supply Chain Concept | • Six Sigma in the Supply Chain | |

| | | | | | |
|---|---|---|---|---|---|
| Heriot-Watt University, UK | Full time | £10,545 (overseas) | • Logistics and Supply Chain Strategy | • MSc Dissertation | CITL, CIPS |
| MSc Logistics and Supply Chain Management | | £5,799 (home and EU) | • Global Purchasing and Supply | | |
| | | | • Freight Transport | | |
| | | | • Inventory and Operations Management | | |
| | | | • Design and Operation of Logistics Systems | | |
| | | | • Distribution Centre Design and Management | | |
| | | | • Green Logistics | | |
| | | | • Supply Chain Improvement and Control | | |
| University of Liverpool, UK | Full time | £12,600 (overseas on campus) | • Strategic Operations Management | On-campus | CIPS, CILT |
| | | | | • Operations Modelling and Simulation | |

(continued)

**Table 3** (continued)

| MSc programme | Mode | Fees (approximate) | Core modules | Electives | Accreditation body |
|---|---|---|---|---|---|
| MSc Operations and Supply Chain Management | Part time | £6,500 (home and EU on campus), home /EU£10,800 | • Supply Chain Operations Management | • e-Business Tools and Technologies | CIPS (online) |
| | Wholly online | £10,800 (wholly online) | • Logistics and International Trade | • Total Quality Management | |
| | | | • Business Analysis and Assessment | • e-Business Strategy | |
| | | | • Total Quality Management | • e-Business Enterprise Systems | |
| | | | • Lean Thinking | • Project and Product Management | |
| | | | Students choose one from Group A and one from either Group A or Group B | *Online*: | |
| | | | | Group A | |
| | | | | • Operations Modelling and Simulation | |
| | | | | • Project Management | |
| | | | | • E-Commerce | |
| | | | | Group B | |
| | | | | • Marketing Management | |
| | | | | • International Business and Emerging Markets | |
| | | | | • Performance Management | |
| | | | | Specialisation modules: Oil and Gas | |
| | | | | • Economics of Oil, Gas and Energy | |
| | | | | • Managing Energy Sources | |

| | | | | | |
|---|---|---|---|---|---|
| Lancaster University, UK | Full Time | £12,500 (overseas) | • Problem Solving and Consulting Skills | In addition, you choose 30 credits: | CILT |
| MSc Logistics and Supply Chain Management | | £8,000 (home and EU) | • Spreadsheet Modelling Skills | • Problem Structuring (10 credits) | |
| | | | • Introductory Statistics | • Computer Simulation (10 credits) | |
| | | | • Introduction to Operational Research Techniques | • Forecasting (10 credits) | |
| | | | • Introduction to Logistics and Supply Chain Management | • Stochastic Modelling (10 credits) | |
| | | | • Introduction to Marketing Analytics | • Optimisation and Heuristics (10 credits) | |
| | | | • Software Support for Logistics and SCM (10 credits) | • Public Sector Analysis (10 credits) | |
| | | | • Manufacturing Management (10 credits) | • Revenue Management (5 credits) | |
| | | | • Logistics (10 credits) | • E-business (5 credits) | |
| | | | • Strategic Supply Chain Management (10 credits) | • Project (60 Credits) | |
| University of Warwick | Full time | £15,000 (overseas) | • Financial Analysis and Control Systems | • Choice of 2 from 61 electives | CIPS, CILT |
| MSc Supply Chain and Logistics Management | | £5,570 (home and EU) | • Logistics and Operations Management | • Project 50% final grade | |
| | | | • Organisations, People and Performance | | |
| | | | • Procurement and Inventory Management | | |
| | | | • Supply Chain Management | | |
| | | | • Problem Solving with Statistics | | |
| | | | • Storage and Warehouse Techniques | | |
| | | | • Transportation Techniques and Management | | |

Adapted from Reid (2010)

**Table 4** University of Liverpool student profile prior to CIPS accreditation in 2010

| Anticipated enrolments | Status | Count | Status | Count |
|---|---|---|---|---|
| | Active in modules | 194 | In progress | 39 |
| | Dissertation ready | 17 | On boarding complete | 21 |
| | Dormant | 34 | Deferred FC | 12 |
| | In dissertation | 39 | Preparing to start | 72 |
| | **Total in study** | **284** | | |
| | | | **Grand total** | **356** |

This would indicate the key aspects of the discipline, acknowledged by the accreditation agencies, and some attempt at differentiation based around research strengths in the respective HEI. In terms of price for an international student, the lowest fee of £10,335 and the highest of fee £17,500 do indicate some degree of differences (Reid, 2010). Notably the programme with the latter fee has both CIPS and CILT accreditations; it is unlikely that accreditation alone would account for the difference. Again, research reputation and international standing in the particular discipline will be crucial in determining the price. We might suggest that accreditation agencies place a particular value on these competencies and therefore by association (or to be precise by membership) and the career progression for students.

## 5 Findings

The authors suggest that accreditation agencies place a particular value on the mode of delivery, the competencies of an online provision and the association subject matter relevant to the profession, such as SCM professionals. The AACSB (see case study 1) and other accreditation agency such as CIPS have also raised the demands on HEIs to provide quality education and to recognise the complexity of management and the role of SCM as part of this. Simultaneously, the requirement to understand SCM in an international context is also considered to be significant.

Furthermore, CIPS provides programmes of continuous improvement in 24 professional standards and raises awareness of the contribution that purchasing and supply make corporate, national and international prosperity. These competencies can be summarised as follows: concepts and theories from marketing including customer relationship management and buying strategies; industrial economics including make or buy, procurement and supplier/customer evaluation; operations management to include inventory management and production planning; logistics, particularly distribution planning and transportation management; the global environment with a focus on international business and organisational management, team building and internal coordination, strategic issues, organisation and procedure, partnering and building strategic alliances; and information technology such as electronic data interchange (EDI), online bidding and bar coding. This tends to show how SCM has become integrated into the practice and theories of management, perhaps at the confluence of many other interrelated disciplines.

By drawing on these fields to inform its integrative philosophy, SCM necessarily incorporates the various concepts, theories and methods found in each of these other disciplines, including qualitative, contextual, analytical and quantitative approaches. Academics have followed a shift in SCM research emphasis to developing management models that guide SCM implementation. Furthermore, anticipated enrolments also come into consideration (Table 4). The institute has a membership structure which caters for different educational and professional needs, both of those working directly in purchasing and supply chain management and its associated disciplines, and of those with an interest in the area, which include leading business people, professional managers and academics, and those working in the purchasing and supply profession.

## 6 Conclusion

Accreditation agencies have raised the demands on HEIs to provide quality education and to recognise the complexity of management through their rigorous professional accreditation process. Simultaneously, the requirement to understand the value of professional accreditation in an international context is also considered to be significant. To recap:

RQ1: Are professional bodies accrediting online programmes, and if so, what are the requirements and expectations for the online programmes?

> In response to the critique of HEI provision, professional bodies have sought to effectively 'badge' a number of online programmes. Contrary to many preconceptions, online learning, in the mode we have described, is very far from being an impersonal and alienating experience. We believe that both staff and students find it to be a stimulating and challenging mode of teaching and learning that has more in common with small-group seminar-based learning than it has with conventional lecture-based teaching and we might add, other methods of distance learning.
>
> The online provision is a highly competitive environment, and if institutions ignore the provision of online and value of professional accreditations on the demand for quality online education, students will find alternatives elsewhere, even globally through the provision of online anytime, anywhere. HEIs are keen to provide to graduates recognition of a type that goes beyond the awarded degree and if this can be an internationally recognised association then all the better.

RQ2: How can the review process be improved to maximise the likelihood of accreditation?

> The challenges of enhancing quality within Management and SCM programmes through professional accreditations such as AACSB and CIPS has also been part of a wider encouragement of HEIs collaborating with industry practitioners. There is, we believe, the environment in which a co-construction of knowledge is enabled through an online provision. In this way, we have considered that learners are also able to actively contribute to a wider understanding of management and SCM theory and practice. The virtual classroom is pedagogically driven; the conditions are created to examine theory, to share knowledge about practice, to synthesise knowledge about theory and practice in a collaborative manner in an

international context and to apply this knowledge in an organisational setting in real time. The online learning environment is providing new ways in which HEIs can promote a widening participation and reputation through such professional accreditation bodies. However, the real message is that this environment is providing new and exciting ways in which learning is shaped and transformed.

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# Online Program Unlocks Opportunities Which Are Not Possible In Traditional Work Models

**Tanja Haller**

**Abstract** It seems unimaginable in the twenty-first century, even in today's world, not everyone talented enough can attend tertiary education. There are still obstacles to attend University education, no matter in which part of the world one lives. Barriers for higher education can be geographical, monetary, or societal. Online programs can fill this gap and provide opportunities for people currently deprived of higher education. In developing countries, with proliferation of Internet access across rural areas, online programs can have a target audience so far out of reach of higher education. In industrialized countries, online education may be the choice for people working full-time and/or having childcare duties, which does not allow them to attend on campus studies. In this paper, the author describes based on her personal experience, how online programs can unlock opportunities, allowing coexistence of traditional work/life models with higher education. The online program came with the challenge of self-discipline, required a thoroughly structured week and a good priority management to meet deadlines. But it also came with the flexibility of taking breaks in between modules if the work/life situations required it. The virtual multinational classroom enhanced the experience and provided added value to discussions. With the number of higher education students worldwide projected to double between 2012 and 2025, online programs can target different audiences than traditional Universities. They can fill a gap, providing higher education to people not able to pursue traditional on campus studies. A barrier for online education might be employers' lack of acceptance of online degrees. Also, the risk is that higher education online degrees will be diluted by massive open online courses (MOOCs).

**Keywords** Challenge • Career opportunities • Unlock potential

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## 1 Introduction

Working as a Project Manager for 8 years and having earned an IPMA degree 5 years before, it was time to take the next step in the author's professional career. After checking some MBA courses, it became clear that this was not the path to follow. The author's interest was with Project Management, and she had, by the time, built a reputation in the company as the "go-to" person for that topic. It was back in 2010 and not many options for further PM education were around. Eventually, the author found an online master's (MSc) program in the UK and knew instantly, this was it.

The program offered the possibility of achieving a master's degree at University level, being able to manage time herself. Working only part-time, earning less and attending an on-site school would have come along with many challenges. A 100% online program was therefore the ideal solution. A course is considered online if at least 80% of its content is delivered online (Allen & Seaman, 2013). The author seems to be a representative of online students in industrialized countries. Dutton, Dutton, and Perry (2002) found that online students are older and usually not enrolling in undergraduate programs. The usual online student has a job and/or childcare responsibility and takes an interest in lifelong learning.

## 2 Discussion

With globalization impacting our workplaces and workforce competition growing harder, lifelong learning becomes more important. Overall higher education has grown 2.6% annually between 2002 and 2011. Online education, during the same period, has even experienced an annual growth rate of 17.3% (Allen & Seaman, 2013). It is obvious that online learning has become a mainstream activity, and there is still huge potential for growth. Emerging countries like Vietnam, Romania, India and China have experienced large growth rates of 30% or more in online learning during the past few years (Bates, 2016).

Collaborating with students from all over the world enriched the online experience for the author, and meeting some of the fellow students at graduation day on the University campus was the ultimate highlight. The author's online program brought together people from various cultural and professional backgrounds during each of the modules. This variety of perspectives added to the (online) classroom discussions, increasing diversity and therefore quality of the discussion forum. The author, working in a multinational company, profited from the daily interaction in the classroom discussion forum with fellow students from around the world.

Studying online while working full-time was very intense. Online learning may therefore not be appropriate for everyone. In 2012, academic leaders rated the statement "Students need more discipline to succeed in online courses" with 88.8% as *Important* or *Very Important* (Allen & Seaman, 2013). Without doubt, studying

online required a lot of self-discipline. During the week, studying was done every evening for 2–3 h, after a full and often stressful working day, when the mind was tired or had a headache. On the weekend, it required 4–5 h study each day. Students deciding for online programs must be able to structure their days and weeks well and set the right priorities in order to keep all deadlines. One advantage of choosing an online program was that the own pace of studying could be selected. Modules could be booked as per convenience, so either one after the other or with a few weeks' break in between, depending on the work/life situation. A perceived disadvantage could be social isolation, up-front costs and worst case, technical problems (Cook, 2007). In fact, in a 2008 survey, Ghanaian students rated their online learning experience as not favorable, they still preferred face-to-face learning and classroom courses (Asunka, 2008). However, this result may be biased by the students' expectations. After all, these students did attend on campus University, and only some subjects were taught online. Survey results might have been different with students consciously registering for an online program.

Online programs can unlock opportunities for ambitious and talented people who don't have the possibility to attend on campus studies, be it for geographical or societal reasons. For example, currently only approx. 12% of young people in India can attend University. The Indian government has set the target of 30% University enrollment by 2030. For that number of students, this would mean building thousands of Universities. India's current education system does not have the capacity to meet the ambitions of the young and talented generation (Coughlan, 2016). It is therefore a huge opportunity for online courses to fill the gap and provide access to University education for ambitious young people. According to Maslen (2012), the worldwide number of higher education students will double by 2025. Most of this increase will be in developing countries, over 50% of which will be in India and China.

Looking onto the African continent, we find that currently only 6% of young people in Sub-Saharan countries, compared to 26% global average, are enrolled in higher education institutions. Despite the small number of University students, there are 50% more students per professor compared to the global average. Already today there is a shortage of trained teachers, instructional material and supplies as well as poorly stocked libraries (AAI, 2015). The number of University-age students in Africa is being forecasted to double from 200 to 400 million by 2045 (University of Oxford, 2015). This shows the huge potential that online education carries, as it does not need the infrastructure of a campus and, given Internet access, can be provided wherever people are. With proliferation of Internet access across rural areas, Universities are therefore getting closer to potential students and can have a target audience so far out of reach of tertiary education. Last but not least, an average 1-year increase in tertiary education results in a 12% increase in GDP (AAI, 2015).

For generation Y and Z people, being global citizens, online education has a high potential. Working in different countries every few years would mean a disruption of studies in traditional on campus studies. Many higher education institutions have started to provide complete online programs, and the ratio of students enrolling in at

least one online course is at an all-time high of 32%. However, a lack of acceptance of online degrees by employers might still be a barrier for many potential online students. Also, with an uncountable number of online course providers, risk is that higher education online degrees will be diluted by massive open online courses (MOOCs) (Allen & Seaman, 2013). In fact, the University of Oxford (2015) is citing a 2013 study, which revealed that only approx. 5% of students from 17 Coursera MOOCs had completed their courses. The most successful students had previously completed a high-level education. This showed that MOOCs do not necessarily deliver benefits to the target group.

## 3 Conclusion

For the author, the chosen online program was the ideal solution for achieving a tertiary education degree while still being able to sustain normal life's responsibilities. The online program benefitted the author as well as her employer, as the achieved knowledge could be applied immediately in daily work. Like with most investments, it took a while until the time and money spent had paid off. The enlarged knowledge base, coupled with sound work, raised the author's reputation at work to a next level. It was thanks to the online program that the author could have taken this career step at all. Without this opportunity, the author could have never achieved a tertiary education degree, and without that degree, no next career step was possible. Higher education online degrees might have a different target group than traditional Universities. Online programs enable higher education for people with a full-time job and/or childcare responsibilities as well as people living in rural areas, without suitable Universities near them. Ultimately, education benefits the individual, its domestic circle, as well as society.

While a few years ago South Korea, Malaysia, Australia, and South Africa were also listed among the eight countries leading in online education (ICEF, 2012), only the USA, China, and India have made it from that list to the latest ranking (EU Business, 2016). As mentioned above, China and India will be accountable for more than half of the projected rise in global number of higher education students (Maslen, 2012), so there lies a huge potential in online education to unlock opportunities for hundreds of millions of people worldwide.

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# Online Supply Chain Education in a Digital World

**Mark Morrissey**

**Abstract** The subject of this paper is the reasons why the author selected to do his master's degree online versus attending a traditional classroom environment. The reasons include access to programs not typically offered by Universities within the author's region and the flexibility required so as not to impact the demands of his career at the same time. The paper discusses reasons the author sought a University which offered a program in supply chain management. The Universities in his region offered supply chain content within a traditional MBA program but did not offer a dedicated supply chain management program. The paper also discusses the author's goals for taking a master's degree in which his goals did not differ from if he had taken the program through traditional education formats. The paper reflects on whether the author's goals were met and other benefits for his career and personal objectives from having completed the program. The section on goals also talks to the value and return on effort and cost associated with the degree. Lastly the paper speaks to how the author thinks business schools can better develop their processes and tools to accommodate online learning.

**Keywords** Differentiate • Flexibility • Goals • Collaboration • Tools

## 1 Introduction

The world is becoming digital with private and public organizations alike adopting digital capabilities to better connect with the public and customers. Gartner reports that technology is an enabler of new capabilities and necessary as a competitive differentiator in Universities of the future (Gartner, 2016a). An article in The Economist talks to challenges Universities are facing with rising costs for education delivery associated to technology, salaries and administrative costs. At the same time, mature students require more education to retrain for new jobs and to keep ahead of the skills curve as employers need new and different skills (The Economist, 2014). To the author's thinking, new capabilities and the ability to differentiate include offering courses to students further

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afield and the ability of students to access programs which are not offered from local Universities. This includes the flexibility to accommodate students who might not otherwise attend University due to other life demands. Thus, Universities are able to leverage digital capabilities to deliver educational programs and reach students who would not otherwise have considered a particular institution due to region or time and attract people who might not have considered continuing their education.

## 2 Reasons

Selection and flexibility were the primary reasons why the author selected to do a master's degree online versus attending a traditional classroom environment. To augment his career and provide the academic credentials aligned to his experience, it was important to select a path of study focused on supply chain management. Through research the author noted Canadian Universities were incorporating more supply chain content into MBA programs, but none were focused on supply chain management as a concentration area. This resulted in the author having to choose an out of country school. Career and obligations limited this option as the author needed to also continue working full time while studying. Considering a University which offered study online provided the flexibility to maintain his employment while pursuing the desired concentration of study. More Universities are providing distance learning where the students are usually mature adults who are professionals and seeking to advance their careers or increase their salary (Bowness, 2015). For example, the University of Waterloo in Ontario saw enrolment in online graduate programs triple between 2009 and 2013. The author further researched online education and learned that many Universities are moving to this format to reach a larger student body offering the same programs and content offered through in class study. The final degree does not distinguish between online education and in class education. The demands of a demanding career and the requirements of study made it challenging at best as the author needed flexibility in study. Alternatively the online environment meant the classroom was wherever the author was located at any time, and availability permitted the author to participate any time of day accommodating other demands. The online tools enable class participation and discussion much like that of a classroom only the conversation was over a longer period of time. The author realized this had additional benefit as the manner of conversation permitted more time to respond and put forward arguments which were researched and thought through. This resulted in the conversation being of greater depth of understanding.

## 3 Goals

The author's goals from taking a master's degree online were no different than if the author had taken a traditional classroom-based approach. The goals were to strengthen the author's knowledge adding academic credentials to the copious experience

obtained through years working in the supply chain field. Much focus has been placed on the monetary cost versus benefit of continued education (The Economist, 2014a, 2014b). The author, however, believes the true return on investment is not measured by increase in earning potential but career satisfaction. The author's opinion is higher education is an enabler of personal and professional growth associated to personal brand. Albeit the author has come to understand that after a point in one's career experience opens opportunities, it is still education which closes the deal. One of the benefits of a master's degree program is to engage other practitioners and students in discussion pertaining to the subject. This benefit is enhanced through discussions with students and practitioners globally versus from the same region. Supply chains are global with different risks and approaches aligned to global regions. There is benefit to learn directly how supply chains are influenced around the globe as the views and thinking vary in different regions. These insights added color to the conversation which would not have been realized if everyone spoke from the same paradigm. Higher education has a cost and students anticipate a strong return on investment associated to this cost and personal effort. On reflection the author believes the return on investment was realized through having a degree from a strongly recognized school and the depth of knowledge obtained through study. The author is able to promote his personal brand as an expert in the field of supply chain supported with the master's degree. Having completed the degree through an online forum was an enabler to being able to pursue the program and offered greater rewards through broader insights from fellow students and a larger network of alumni.

## 4 Improvement Opportunities

Gartner (2016b, p. 3) reports "the higher education industry in 2016 continues to be challenged by a number of factors, including an underlying global, booming need for education." Gartner (2016b) goes on to explain that online education is one of the innovations being adopted to address this need. The increased demand for education coupled with access to innovative new technology is enabling schools to reach greater numbers of students and increase their teaching capacity. The author sees two primary areas where schools are at an inception point requiring greater resources. These two areas combined will be a catalyst to education migrating from the current traditional education experience to a new education experience based on more autonomous study supported with greater access to information and collaboration tools as illustrated in Fig. 1.

The first area is greater utilization of cloud-based information and research. Schools should be providing more open and greater access to information by students enabling them to conduct deeper research into a topic. This will enable students to continue to build upon current research and improve their knowledge of a subject through increased access to information. Organizations are building exostructures of standards enabling schools to put more information in the cloud and to easily share the information with one another (Gartner, 2014).

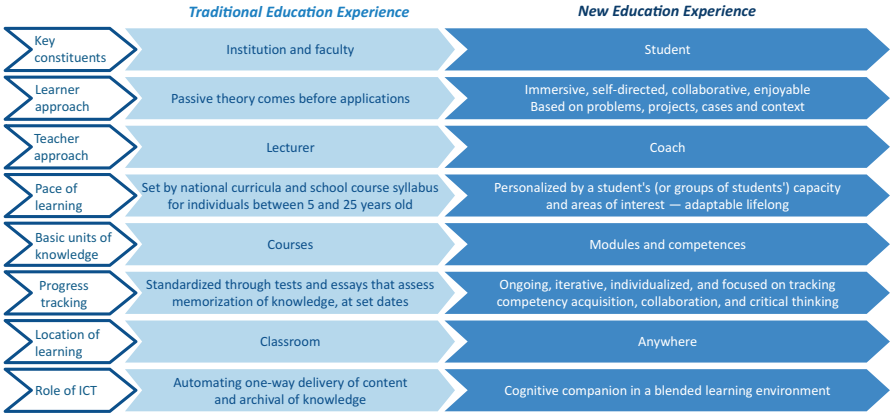


**Fig. 1** Migration of education (Source: IDC, 2016)

The second area is collaboration tools. The author has spoken to the benefit of collaborating with students from various areas of the world. Technology is available to expand on the ability to collaborate and share information in current time mimicking the depth of conversation and debate students share when physically in the same location. People are having ever-increasing exposure to digital technology and so too are the numbers of "digital natives" and "digital immigrants" as coined by Marc Prensky in 2001 (Gartner, 2015, p. 2). This shows how people are becoming more accustomed to using digital tools in their lives within work and private lives. It, therefore, would be a natural progression that digital enablers would also expand into education offering the same levels of flexibility which people are beginning to expect within their working lives. At the same time, people are social animals and research confirms people still desire a degree of face-to-face collaboration (Gartner, 2015). The author sees where digital online learning tools need to evolve to enable students to have greater real-time access to one another during their studies. Greater access in collaborative opportunities would position online learning to yield greater results than traditional brick and mortar classrooms. These results would come from sharing of knowledge and experience with more students who have wider variance in experience and background.

## 5 Outcome

Online education is the result of a world becoming more digitally oriented as technology is increasingly an enabler of collaboration. While at the same time, Universities are wrestling with increasing costs associated with brick and mortar content delivery where costs are allocated over a student body limited by the size of a lecture hall. People need to continue their education as workplace skills evolve and career paths change. These disruptors are merging where Universities will

adopt technology to expand their student body beyond regional confines allowing them to deliver programs to more students at a lower cost per student. At the same time, it removes a barrier to mature students continuing their education allowing them to keep current with workplace skills required by employers. The author directly benefited from an online education through collaboration with other students in different countries where each student brought a unique perspective from the regional challenges and influencers of supply chain management. These are insights hidden from students who come from the same paradigm associated to being in the same region.

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# Perspective: Online Business Education (The Enabler of Opportunity)

**Anna Stocker**

**Abstract** Online business education and the globalization of the business environment have promoted a paradigmatic shift in the capacity of education – the amplified accessibility to knowledge calls for a transformation in the academic community and all complementary aspects.

Traditional business education delivery systems suffer from limited access to student populations who are unable to physically engage in a "bricks and mortar" learning environment. Students who suffer from impeding external factors are now provided with an educational outlet to fulfill their ambitions. People (and subsequently businesses) will benefit from the flexibility of an online learning program, which promises to bridge the challenge of career progression requirements while validating experience-based knowledge through formal credentials.

While acting as an enabler of business education, web-based instruction questions the traditional institutional framework and approach to teaching. As conventional methodologies are set aside, institutions may now emphasize the importance of networked learning, peer mentoring, professional forums, and virtual interactions, resulting in a social constructivist approach to enable the delivery of a traditional education using nontraditional methods. The design and supply of business education in a globalized setting must overcome external barriers of age, culture, and language, calling for an increasingly holistic method for business education delivery and transition into the increasingly competitive labor force.

Web-based learning does not discriminate. It thrives with opportunity for stakeholders directly related to education development.

**Keywords** Globalization • Enable • Opportunity • Integration • Development

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## 1 Introduction

Technology and the globalization of the business environment have promoted a paradigmatic shift in the role of education (Harasim, 2000). Enabling access to knowledge through online delivery brings new opportunities for a changing student demographic and work force. It stimulates new methods of educational development from the institutional perspective and proliferates the role of education in international business development.

The digital age has acted as a great facilitator of quality education delivery – promising to distribute equal access to for all demographics regardless of geographic location. From this emerge new types of students and new considerations of how to best educate them to guarantee an added-value experience compared to traditional, rigid educational models. As the "student" definition is now so vague and extensive, education providers must evaluate their knowledge delivery and management methods to attain a new strategic fit for both students and the educational business model.

As globalization places pressure on capacity development, online business education alleviates this pressure while promising to fulfill the increased demands set by the labor market for qualified workers. Examining the entrenched value of online education from diverse perspectives underscores its role as an integrator of opportunity for students, education providers, and businesses alike.

## 2 The Student

The inequality of access to educational opportunities has increased. Pardeck (2002) concludes that hostile external factors infringe on the ability to access education in its traditional form. The author extrapolates on national research conducted within the United States, by illustrating that wealth, race, and regional inequalities influence on the attainment gap. Only by focusing on closing this attainment gap can community objectives and development be realized (Joseph, 2010).

In a global setting, with consideration for diverse races, cultures, languages, political regimes, and so on, the challenge is justifiably exponential.

Communication technology delivers potential in closing this attainment gap, especially in the area of business education where subject material can easily be delivered in a virtual context, while simultaneously offering the possibility of worldwide classrooms undefined by the race, belief system, class, or nationality of its students or teachers. Participants may be pulled in from several geographic locations and study a wide variety of subjects, at the same time, without needing any tangible interaction. New interactive technologies have ultimately empowered learners by the ability to access a once inaccessible education, specific to their needs (Bates & Santos, 2007).

By essentially removing boarders for students in remote locations, accessing a business education online empowers them through enriching their resource base by not only a (perhaps) higher-quality curriculum but also the possibility to engage with others to create knowledge together. Enabling communication using a broad selection of media (audio, video, text, graphics, animation, virtual reality, etc.) removes a screen that would conventionally restrain learners' viewpoints, while providing time to form (and vet) opinions, simultaneously moving easily from formal activities to casual peer interaction and business networking. Harasim (2000) suggests that the design of an asynchronous network for communication cultivates equal participation, where there are fewer prospects for few to dominate and more chances for participation by those who would under traditional circumstances hesitate to speak face-to-face. It can be considered then that the actual design of web-based learning maximizes inclusion by enabling communication essential for educational development. This also holds true for the relationship between student and teacher, resulting in unprecedented innovative methods of academic and social interaction.

The offer of online learning reconfigures and enables the opportunities of business education for students. The combination of place-independent, asynchronous interaction and increased user control through the dissolution of physical restrictions imposed on by traditional networks results in an equal distribution of education. An updated approach to teaching business and adjusted learning outcomes focused on international perspectives, limits the dichotomy between business theory and business practice.

## 3 The Institution

The increased distribution of knowledge imposes obsolescence on what was previously learned, putting mounting pressure on established models of education to provide new ways of knowledge delivery (Farrell, 1999). As more people pursue lifelong learning initiatives, with increasingly assorted personal circumstances, the need for flexible access to education, where the venue is not restricted to the campus-based institution, proliferates. For educational institutions to remain responsive to this reality, the requirement to update the delivery model essentially mitigates obsolesce of education itself. Kraiger (2008) discusses a third-generation model for learning and research, where if institutions wish to remain effective, the design and supply of their offer must overcome the barriers of globalization through increasingly holistic methods of knowledge delivery. Subsequently, while meeting demands of educational development standards, institutions are also provided with new opportunities of business expansion.

Online education systems enable institutions to develop their brand and broaden their target market through tapping into new (and otherwise unattainable) populations (Suarez-Orozco, 2007). The potential for business development multiplies significantly, while simultaneously reducing costs, increasing productivity, cultivating

brand capital, and benefiting from economies of scale within the existing framework, through inclusion of virtual delivery models. Kanwar, Kodhandaraman, and Umar (2010) determine that the shift toward online education results in the "unbundling" of functions that have typically been provided by a single institution.

The use of third parties to deliver education enables an academic institution to align with the developing educational market, without diluting their offer. Adding a new element of delivery considerations into the educational supply chain. Virtual organizations that are not direct providers of education, but can relieve institutions of functions, such as the distribution of learning materials, financial control, learning support, and general administration, provide opportunities for added-value partnerships for both private and public sectors. The division of the market by specialization permits individual entities to focus on their "core business" while behaving as an integrated model to provide value for their end consumer – the student.

## 4 The Market

Changes in the labor market incite changes in educational systems. For example, reforms of educational systems in the past have included adding years of studies in vocational programs, providing new relevant theoretical subjects, changing entry requirements for higher education, etc., with the objective of reducing student exposure to unemployment rates in the labor market (Harrison & Stephen, 1996). Educational systems are hence required to be adjusted and increasingly dynamic in order to hedge the challenges linked to the development of the world market.

As result of considerable migration flows, economic realities, technology development, and increasing cultural diversity, online education has changed the way in which organizations seek to develop, source, distribute, outsource, and value their human capital. As education reaches a greater audience, organizations ultimately benefit from globally balanced distribution (and consequent sourcing) of capacity. For example, there are now over three million Indians, Russians, and Chinese with higher education, which compete for employment with graduates from top universities in the Western world. The significance of this is evident when we see that the introduction of India, Russia, and China into global production, distribution, and consumption has added over one billion workers into the international labor force over the last 20 years (Suarez-Orozco, 2007).

However, although this enables the possibility of sourcing increasingly qualified labor on a global scale, Brown (2003) suggests that the extension of higher education does not necessarily echo the demand for highly skilled labor in specialized business areas, but instead causes a type of credential inflation (Collins, 2011). Like monetary inflation, where when the supply of money is greater than the supply of goods/services, it leads to the increased cost of those goods/services (inflation) – in this case, the greater supply of education results in an oversupply of credentials, effectively decreasing their value.

In as much as online education may in fact contribute to credential inflation, through its facilitation to attain credentials, it is also perhaps the only form of combatting (or at least distributing) the attainment gap and global imbalance of education. Providing a platform where qualifications are more globally dispersed, while enabling new avenues for specialization and opportunity for expertise.

If we accept that the integrated educational model enables education, perhaps facilitating the opportunity of education does not however guarantee equality of outcome, suggesting that intangible elements of character, experience, and skill are once again increasingly presenting their importance in the measure of success and employability. While all may be encouraged and provided with the equal opportunity to do their best, the irrevocable truth is that we cannot all be the best.

## 5 Conclusion

Globalization has put business education at the center of the economic and social agenda, emphasizing that the integration of technology with education is today considered a qualifying factor for success by providing agility and strategic fit for business education's role in the modern world.

The appeal to study online stems from several incentives – the provision of flexibility, the possibility of gaining a credential from a world-renowned university to compliment on-the-job experience, and the added-value of networking with fellow students from all walks of life were among the most appealing aspects. As the course progressed, it became evident that without the enabling nature of studying online, a master's degree would not have been attainable due to imposing personal developments and travel obligations related to employment.

The institutions' business model involved the integration of separate entities to manage the progression of the course, where there was a clear separation between academic learning and the administrative management. Although the consistency between the institutions was at times questionable, ultimately the fact that there was a division of labor but focus on an integrated model of education delivery meant that administrative issues were streamlined and resolved quickly. The program proved to be an enabler of opportunity. Perhaps the significance of the credential is less valuable in a market where masters' degrees are increasingly "easier" to access, but from a personal perspective, the confidence and opportunity to acquire specialized knowledge without having to compromise career progression was instrumental – a benefit which people with other vocations that still require tangible engagement cannot entirely take advantage of. The experience highlighted the necessity of lifelong learning initiatives in order to remain part of an increasingly competitive labor environment. An online business educational platform recognizes that an end to education acquisition is a thing of the past and that education is now a facilitator of knowledge, progression, and business development.

The increased value in credentials emphasizes the necessary relationship between education establishments that provide knowledge and the global job market. The

belief is that higher qualifications ultimately represent the ability to get good jobs with superior rewards while offering an efficient (and objective) selection criterion centered on individual accomplishments. Credentials have become the currency of opportunity (Brown, 2003). Organizations focused on global development, such as the Organization for Economic Cooperation and Development (OECD), have widened the approach and fostered investing into education to distribute opportunity and promote success and neutrality for students.

Socially responsible, intellectually inquisitive, cognitively self-aware, democratically engaged, contributing, and mindful people – those who are a product of globalization – cannot be educated with a redundant twentieth-century model of instruction.

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# The Capstone Project: An Opportunity for the Company?

**Michael Stein**

**Abstract** During the final phase of the online MBA, electives have to be chosen, and there is the opportunity for a Capstone Project. The Capstone Project is a student's in-depth investigation of a problem with the support of a mentor provided by the University. The student has the opportunity to align their electives and Capstone Project with an area of specific interest for the company that employs them. This paper shares how the Capstone Project can be used to create additional value for the company.

In an online setting, the supporting resources (especially mentors) available for a Capstone Project are not geographically limited and can therefore be specifically adapted to the project. At the same time, the student can determine an area of interest for their employer and is already familiar with the company's activities and goals. All this makes it possible to select a Capstone Project that combines a student's and their employer's interests.

Aside from the subject and the quality of the Capstone Project itself, there are other factors that influence if it is a success from the company point of view – the structure of the organization and the place of the employee within the structure can have a significant influence. Often the Capstone Project will be in an area which is the responsibility of a different department, which may be more or less open to outside contribution; the direct manager and the HR department may be willing and able to facilitate cooperation with this department or not.

**Keywords** Capstone Project • Value for company • Relevance • Integration

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## 1 Why an Online Business Program?

I was working as a plant manager for a large multinational corporation when doing my online MBA. Like many companies, my employer put a lot of emphasis on personnel development. Aside from company internal courses and position or task-specific external courses, they also supported more general development opportunities – in my case they were willing to pay for the online MBA, as long as I committed to stay with the company for a few years after its completion. Completing the MBA was part of my development plan, and the development plan was part of the bonus calculations.

I chose an online MBA because I was working at a relatively remote location (at that time I worked in Saskatoon) and had a somewhat unpredictable work schedule – special situations that required longer working hours as well as occasional travel commitments made it difficult to pursue a continuing education that would require presence on several days of the week.

## 2 The Capstone Project: Aligning with Company Needs

During the final phase of the online MBA, electives have to be chosen, and there is the opportunity for a Capstone Project. The Capstone Project is a student's in-depth investigation of a problem with the support of a mentor provided by the University. In an online environment, there is no requirement for the mentor to be in a specific geographic location, and an ideal fit for the project can be established. There is also the opportunity for the student to align their electives and Capstone Project with an area of specific interest for the company – and this is obviously an area where a company can profit from the development of their employee.

The reasons that led the employee to pursue an online education (e.g., unpredictable work schedule due to managerial or other work responsibilities, located in a relatively remote area) also often mean that they have a more diverse perspective of a company's activity. From the company point of view, the ideal Capstone Project will either provide a solution to an identified problem or will identify new opportunities. It will practically be a consulting project at reduced rates – the employee's hourly rate (for the part of the work done during regular hours) will be lower than a consultant's rate and the mentor's support is practically free – done by a person already familiar with the environment.

To create additional value for a company, the Capstone Project has to be relevant for the company, and it has to be integrated into the company's problem-solving and decision-making process. There are some exceptions – for example, when a product development is kept secret – but in most cases, it will be relatively easy to determine the relevance of a Capstone Project. Sources for determining relevance can be presentations by upper management, information distributed by the corporation, key performance indicators, and a person's own assessment of gaps between the

goals of the company, the business unit or any specific subunit, and its actual performance.

Integrating the Capstone Project into the actual decision-making and problem-solving process will be more challenging, especially in a large corporation. This may partially due to friction normal in a large corporation – a department may see its position threatened when competence is built up by another unit, members may be reluctant to discuss their approach with outsiders ("not invented here"). However, there may also be more practical aspects making this cooperation difficult. Discussing an alternative approach may be problematic for a project schedule, and the resources for this specific project may be limited, not allowing for an in-depth discussion of the approach. It may also be advisable to choose a common approach for the whole company, even if it is not optimal for specific areas.

## 3 Focus Area for Capstone Project

I was very interested in corporate sustainability and had chosen one of my electives in that area. It was easy to determine from presentations, materials posted on the company's website (e.g., corporate sustainability report), and goals (corporate as well as business unit and plant goals) that corporate sustainability was very important for the corporation (and it still is). When it was time to choose a Capstone Project, I chose to develop a carbon footprint for the plant I was managing at this time. Determining a carbon footprint, with the goal of reducing it, at that time was one of the corporate sustainability initiatives; therefore, relevance was easily established.

The project itself was a success – the carbon footprint for the plant and its products was calculated, and a methodology was developed that could be copied easily and was later published. During a Responsible Care verification conducted in 2009, this process was considered an "extra mile," and it also demonstrated the company's commitment to sustainability to the local community.

However, on the corporate level, there was limited feedback regarding the project and the results. The department in charge with developing the carbon footprint for the company's products was not really interested in discussing questions regarding differences in approach and the carbon footprint allocated to raw materials. It seems that in this case, the company for reasons discussed under Sect. 2 was interested in a top-down approach, not a bottom-up approach, and that limited project resources as well as a tight time line made an in-depth discussion difficult. Additionally, geographic separation and organizational separation made it impossible to establish an informal personal contact, which can be helpful for coordination and a dialogue about open questions.

I do not know how successful the top-down approach for establishing a carbon footprint was. While the value chain carbon footprint was assessed as planned), the (admittedly very limited) data I saw indicated that the results of the assessment were not very accurate because the on-site processes were not well understood and

mistakes were made when assessing raw material carbon footprint and allocating carbon emissions to processes.

## 4 Personal Development and Company Requirements

In my opinion, personal development should have been more integrated with company requirements and the company structure should have been more open to a bottom-up approach or at least input from the operational level. While HR policies supported personal development, the question "how can we ensure that X's development activities can be integrated with company goals and approaches" was not asked – feedback was basically limited to "aha, nice."

Integrating personal development and individual initiatives like online MBAs and Capstone Projects with corporate initiatives and projects, especially those led by other business units, can be promoted by an employee's manager, but there is not necessarily much contact to the central function at this level, and a high workload due to a flat organizational structure and additional tasks are an additional barrier to an effective support. Ideally, there will be a central function supporting this integration, but in my case, this support was not available – the position that could have taken over the role had been eliminated. Consciously or unconsciously, the decision seems to have been made that certain development activities simply did not benefit the company, and that a bottom-up approach to addressing improvement opportunities and initiatives like developing a carbon footprint was simply too resource consuming to coordinate.

The muted feedback for my project may also have been at least partially due to the changes implemented at the same time in the human resources department. The company was developing centrally driven development and engagement programs. A consequence was that priorities and resources to address personal development plans and to align nonstandard approaches in these plans with corporate requirements and initiatives were simply not available. The company's contribution to online MBAs and similar development programs was cut by 50%.

## 5 Getting More from Capstone Projects

A Capstone Project in an online environment has the advantage that resources are not geographically limited – in my case I could remain at my workplace and address the necessary current work issues while, at the same time, company internal information as well as the necessary online resources were readily available. It is also possible to choose the project mentor with the best fit for the project without being limited by any geographical considerations.

For a Capstone Project to be successful as a project and to provide a return on investment for the company, it has to be relevant for the company, and it has to be

integrated into the company's processes and projects. Establishing relevance is relatively unproblematic as long as the company has a process established to communicate its goals and expectations. However, while integrating a Capstone Project into the company's processes and projects may be relatively easy for small companies, it is more problematic for large companies – interdepartmental rivalry, inflexible project schedules and budgets are examples for challenges to a successful integration. Often the personal contact, which could be used to bridge these issues, is missing due to the size of the company and geographic separation. To alleviate this situation, ideally there should be coordination (by the HR department or another function with suitable responsibilities) between Capstone Projects and similar activities and the departments responsible for projects in the same area. This coordination will ensure that Capstone Projects contribute to a company's success by providing better solutions and identifying new opportunities.

# Perspective: The Unexpected 51-Hour Conversation (An Emphasis on the Importance of In-Person Encounters)

**Deborah Dull**

**Abstract** I pursued a graduate degree for rapid professional progress; the experience during graduate school enhanced my effectiveness professionally. Online education was the right fit for earning a degree, as it allowed for schedule flexibility and access to a diverse student base. As I moved from a commercial supply chain into the public health sector, I realized a missed opportunity in failing to deeply connect with student peers. These peers lived in the countries I was now aiming to support. The online experience did not have in-person encounters that allow for easier networking. Additionally, these countries often experience infrastructure challenges which make virtual forms of communications less leverageable. Despite advances in technology, I find myself traveling long distances to meet supply chain teams in person to properly diagnose supply chain challenges and explore innovations for public health.

**Keywords** Professional progress • Human connection • In-person meetings • Business travel

## 1 My Journey as a Professional

I joined the Microsoft supply chain straight from university, through a "college hire" program that their supply chain leadership supports each year. Though the program takes students from undergraduate and graduate programs, we were expected to contribute the same value and perform at the same level as an "industry hire" – those who came in to the Microsoft supply chain with 10 or more years of experience. As I sought strategies and approaches to gain professional credibility, it occurred to me that adding actual years of experience can't be accelerated; a year of experience takes a year to earn. I looked instead to adding additional education, hoping exposure to a broad student base, and developing a deeper theoretical

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understanding of supply chain, would help level the footing for strong professional debate and supply chain solution design.

The strategy was successful. I used the experiences from graduate school to build stronger supply chain solutions, and discovered my delight and skill for solving complex supply chain problems. After developing and managing the operations budget for warehousing and logistics, my teams built and geo-expanded the Microsoft Retail Stores supply chains which acted as the exclusive channel for the global Surface launch. Experiences in these roles, as well as managing Channel Operations for both retail markets and the digital supply chain, highlighted the importance of the customer voice and human engagement. As the role of digital in the supply chain and the customer experience continued to emerge as an important theme, I completed my master's thesis on the digital supply chain and delivery of digital content.

A few years after finishing my degree, I moved from the Microsoft supply chain into the nonprofit, public health, and global development communities. I have adapted my experiences in supply chain incubation, launch, and digital integration to my current role, where supply chain constraints are vast and varying, and the fundamentals of supply chain hold true. This role fully relies on relationship development and partnering across UN and government agencies to diagnose supply chain challenges and explore innovations for public health.

## 2 The Role of a Business Online Degree

Though my original goal of earning a master's was for professional advancement rather than for qualifying for a new role, the role I have now requires a graduate degree in supply chain management.

The practical and theoretical approach of a professional supply chain background coupled with deeper theoretical foundation matches well with what the public health community needs.

Turning to an online format wasn't my original intent. I started looking, as many others did, with my local university network. A full-time program wouldn't work as the purpose of the degree was to improve my professional performance. Taking a break from work was not considered an alternative. I wanted exposure to a new student base to increase the diversity of my solution sets and flexible classroom hours to bend around work as my priority. This led me to online education, which meant schedule flexibility and access to a wider base of students that in-person universities can offer.

## 3 Unexpected Benefits

During the degree, I experienced the benefits that are familiar to online students. The one I experienced daily was the flexibility in schedule and location. It was easy to complete assignments and participate in discussion during the commute to work,

during vacation, or from any location with a Wi-Fi connection. I moved internationally during my degree, and the online format was the only way I could have finished.

The distance also created the unanticipated benefit of insulating me from my more egregious academic mistakes. Most notably when I failed the first of two possible dissertation attempts and didn't have to tell my professor in person; the reluctant news was sent with the buffer only an email can afford.

## 4 Challenges and Missed Opportunities

This "benefit" of an impersonal buffer was also a missed opportunity. The interaction with my professors was one of the most important parts of my undergraduate degree as they offered additional challenges, debates, and ideation that went beyond the standard curriculum. I imagine my online master's would have been a very different experience with additional intellectual opportunities if in-person interaction was possible. Motivation gained from discussions and debate with professors was certainly missed, and the human connection was undeniably lost.

This missed human connection also extended to my classmates. Even though one of my major motivations of getting an online degree was to seek a diverse peer base for the interesting exposure to other markets and industries, the online format made it a challenge to connect with other students. I missed having the chance to observe my peers in their thinking process during class discussion, or brainstorm assignment challenges and options before or after classes. While the university provided online forums for this type of discussion, I didn't invest the extra time to try to seek these connections. Although flexibility in schedules was a benefit of the online format, the "forced engagement" with other students was certainly a missed opportunity. As I started my current role, it was with regret that I realized that many of those same classmates with whom I failed to connect, lived in the same countries I support, aiming to serve as the most important "voice of the customer" yet. One reason to seek a master's degree in a management field is to gain a professional network. The online format presented a larger, unexpected challenge to meaningfully network than anticipated.

This experience and realization suggests an interesting debate/cross road. Today's world looks undeniably different than it did a decade ago in terms of connectivity and communication methods. Infrastructure and technology changes mean (often instantaneous) access to information and to colleagues, business partners, family, and friends. People have become more mobile, and businesses have grown and shifted to adapt to a global marketplace and geographically fluid workforce. As such, video conferencing and virtual work space allow teams to emulate an in-person brainstorm session. Businesses have developed; it's reasonable that online classrooms can do the same. While my online degree unquestionably improved my technical capability through the existence of this recently connected world, the human connection was lost. My experience shows that the human connection continues to sit at the heart of supply chain solution design. As such, there are certainly times when businesses choose to invest in in-person meetings.

## 5 The Role of Travel in a Changing Business Environment

Even with video conference, messaging across multiple devices, and shared virtual work spaces, business travel remains. Today's professionals often greet each other with an acknowledgement of distance and time spent to ensure meetings can happen in person. These meetings may be for sensitive discussions, technical brainstorms, or establishing team relationships. From a technical supply chain perspective, it's difficult for me to do my job without traveling to have these in-person meetings. These supply chains experience a range of infrastructure, policy, and market constraints – the nuance of which can be easily missed without an in-person visit. The work of identifying chronic issues in supply chains and building sustainable improvement plans, together with the teams that manage the supply chains, seems nearly impossible to do at a distance.

Additionally, infrastructure constraints in the geographies I support mean that many of the standard commercial communication paths such as video conference and live content sharing are not feasible to leverage. Even phone calls are sometimes a challenge as spotty reception often interrupts meaningful conversation. The conversations I have together with the teams located in these constrained geographies are often about pioneering into unknown worlds as a risk-taking team, and these types of decisions are difficult to take over the phone, even if infrastructure constraints were removed.

## 6 Professional Impact

The technologies we use today often aim to replace and, at times, improve in-person encounters. Translating this to online education brings both challenges and benefits. Once I reached a certain pace of professional progress, it was difficult to continue to balance a busy workload with the widely accepted experience of an often lonely marathon of a finishing a dissertation. On the other hand, it was the online format which allowed me to pursue the degree at all. Access to a global, virtual classroom could be immediate and provide exposure to a broad range of classmates.

Connecting, brainstorming, and influencing are all much more difficult for me to do virtually than in person. In my experiences, there is profound context in witnessing the nuance of expression as a person considers, rebuffs, or accepts an idea that is entirely lost over the phone. I now find myself rarely questioning 50 hours of return travel to have a one hour conversation with important and curious partners. These 51 hours of travel, planning, thought, and discussion are still central to the in-person encounters that propel supply chain progress.

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A. Khare, D. Hurst (eds.), *On the Line*, DOI 10.1007/978-3-319-62776-2