A literature review: efficacy of online learning courses for higher education institution using meta-analysis

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Abstract

The Internet has made online learning possible, and many educators and researchers are interested in online learning courses to enhance and improve the student learning outcomes while battling the shortage in resources, facilities and equipment particularly in higher education institution. Online learning has become popular because of its potential for providing more flexible access to content and instruction at any time, from any place. It is imperative that the researchers consider, and examine the efficacy of online learning in educating students. For this study, the researchers reviewed literature through meta-analysis as the method of research concerning the use of ADDIE (Analysis, Design, Development, Implementation and Evaluation) framework for designing and developing instructional materials that can provide wider access to quality higher education. This framework can be used to list generic processes that instructional designers and training developers use (Morrison et al., 2010). It represents a descriptive guideline for building effective training and performance support tools in five phases, as follows: 1.) Analysis, 2.) Design, 3.) Development, 4.) Implementation, and 5.) Evaluation. The researchers collected papers relating to online learning courses efficacy studies to provide a synthesis of scientifically rigorous knowledge in online learning courses, the researchers searched on ERIC (Education Resources Information Center), ProQuest databases, PubMed, Crossref, Scribd EBSCO, and Scopus. The researchers also conducted a manual search using Google Scholar. Based on the analysis, three main themes developed: 1.) comparison of online learning and traditional face-to-face setting, 2.) identification of important factors of online learning delivery, and 3.) factors of institutional adoption of online learning. Based on the results obtained 50 articles. The researchers examine each paper and found 30 articles that met the efficacy of online learning courses through having well-planned, well-designed courses and programs for higher education institution. Also, it highlights the importance of instructional design and the active role of institutions play in providing support structures for educators and students. Identification of different processes and activities in designing and developing an Online Learning Courses for Higher Education Institution will be the second phase of this study for which the researchers will consider using the theoretical aspect of the ADDIE framework.

Keywords Online learning courses · ADDIE framework · Efficacy and meta-analysis

1 Introduction

The management and operations of educational activities in academic institutions were revolutionized because of the rapid development of Information and Communications Technology (ICT). Introduction of ICT different methodologies in the learning environment became one of the most significant factors in the teaching and learning process as part of the educational system today. Application of information technology tools in classroom learning and methodology for teaching helps to improve the quality of education in schools, universities, and institutions.

One of the greatest contributions of Information and Communications Technology is the birth of the Internet. The Internet and the World Wide Web (WWW) have made significant changes to almost all aspects of our lives ranging from a global economy, personal, and professional networks to sources of information, news, and learning. The Internet has made online learning possible, and many educators and researchers are interested in online learning courses to enhance and improve the student learning outcomes while pacing the different challenges particularly in higher education institution (Pape, 2010). Moreover, there have also been increases in demand for online learning from students from all paces of life.

Online learning is not a new development in the field of education. According to Sherry in her study entitled "Issues in Distance Learning", it has existed for more than a century and has its beginnings in European correspondence courses. It is a field of education that allows students to participate in classes while never setting foot inside a classroom (Sherry, 1995). One reason why there is so much discussion around online learning is that there are many claimed benefits and uses of online learning. Some of the most important ones are its effectiveness in educating students, its use as professional development, its cost-effectiveness to fight the rising cost of postsecondary education, postgraduate education and the possibility of providing a world-class education to anyone with a broadband connection (Lorenzetti, 2013).

With today's world population increasing, the people's trend to study is growing rapidly; education situations are changing and universities are looking to reach more and more students who bring them more marketing. Nowadays many college and university students are married, have children, involved in part-time or full-time jobs and other responsibilities to meet the needs in their lives, the size of the cities is increasing and many students are living a far distance from college and universities. The need for online learning becomes essential to assist today's student's learning and educational trends. The growth of the internet and its influence on the educational system has created a significant factor that is considered as a great help in the world of education. Online learning refers to the type of learning that people take a professional or educational course without the use of traditional methods, taking a course or program using the web as a classroom. Online learning also refers to the delivery of educational material via any electronic media such as the internet, intranet, extranets, satellite broadcast, audio/videotape, CDs, video conferencing and computer-based training. Online learning currently is one of the most popular models of learning, because of its advantages. Finch and Jacob, stated these advantages like reducing the time and costs for travel; increasing opportunities to access and collaborate with expert professionals in a global range; providing students with the flexibility to access courses

at their convenience; and allowing adjustments to subjects and content need (Finch & Jacobs, 2012).

The fast development of the Internet and the World Wide Web has produced numerous benefits to education. Online learning provides potential opportunities to open up new markets for schools, universities, and institutions. Many adult learners may enjoy the flexibility when they have to balance their work, study, and family responsibilities. The wide range of various technological advancement used by online learning programs may enhance the interaction between students and among students at large (Bell & Fedeman, 2013). Besides, the nature of the privacy in the online environment may allow more students, who otherwise do not want to attend face-to-face classes because of their shy personality, to participate in online learning where they do not physically see each other. Also, the upgraded technology and software may allow educators, students, and university administrators to collect data, feedback, and evaluation regarding their online experiences.

With the ever-increasing popularity of online learning, there is a strong need for developing an effective instructional design model to facilitate the development and delivery of online learning environments. Instructional design (ID) models have some history in education and thus many instructional design models exist, yet few are specific to course design for online teaching and learning. The two most frequently cited ID models are the ADDIE model (Razali & Nadiyah, 2015) and the Dick and Carey model (Dick et al., 2014). Though online learning has been existing for a long time, there are few online instructional design models, theories, and standards exist. Literature review reveals that there are five instructional design models, theories, and standards relevant to online learning design that derives from ADDIE model and Dick and Carey model. They are: (1) Alonso, Lopez, Manrique, and Vines' E-Learning instructional model, (2) the Instructional Design Model for Online Learning (IDOL), (3) Roblyer's online and blended learning design theory, (4) the online instruction rubric by Quality Online Learning and Teaching (QOLT), and (5) Quality Matters (QM) Publisher Rubric (Chen, 2016). Each of the model or rubric will be described and reviewed below.

In 2005, Alonso, Lopez, Manrique, and Vines proposed a web-based e-learning education model with a blended learning approach (Alonso et al., 2005). They describe their model is "a psycho-pedagogical instructional model based on content structure, the latest research into information processing psychology and social constructivism, and define a blended approach to the learning process". They claimed that the purpose of their model is "for learners to be engaged by the e-learning contents to the extent that they get to understand things that they did not comprehend before. This will make them ready to practice and take action to perform new activities."

IDOL model planned and proposed by Siragusa, Dixon, and Dixon (Siragusa et al., 2007), gears toward online course design in higher education with three proposed main steps: analysis, strategy, and evaluation. One can tell that the model originates from the two above-mentioned instructional design models, ADDIE and Dick and Carey model. It presents 24 pedagogical considerations when designing online learning. The main drawback of the model for online design is that it is only recommended for use alongside with other ID models and is inefficient to use alone for designing an online course.

Roblyer's instructional design model was proposed in his book, entitled "Introduction to Systematic Instructional Design for Traditional, Online, and Blended Environments" published in 2015 (Roblyer, 2015). His theory also draws from ADDIE and Dick and Carey model. Besides the traditional instructional design process, he proposes how to organize traditional, online, and blended learning environments. Strictly speaking, it is not an online instructional design model but just suggestions and considerations for online instructional design.

The rubric for online instruction by QOLT was first released in 2010 (Rubric for Online Instruction, 2010). It is a state-wide program developed by the California State University System. It provides a model for online course design and delivery and it also serves as a means for supporting in developing online instruction. According to QOLT (Rubric for Online Instruction, 2010), the rubric can be used for designing online learning in two ways: "(1) as a course "self-evaluation" tool – advising instructors how to revise an existing course to the Rubric for Online Instruction, and (2) As a way to design a new course for the online environment, following the rubric as a road map". Although the rubric provides a great checklist to design online courses, it overlooks the actual implementation and evaluation of online instruction.

Quality Matters Publisher Rubric (Quality Matters, 2015) was created by Quality Matters (QM), a non-profit organization dedicated to assuring the quality of online and blended instruction. There are two sets of rubric: one for higher education and the other one for K-12 education. The rubric was created to address the need for design standards for higher education and K-12 educational settings to guide the design of online and blended instruction. The QM rubric is also a great guide for designing online courses.

The main goal of the online instructional design model is to assist online instructors to better design online courses or programs, to facilitate online students focusing on their learning, and to promote active teaching and learning. Today, the influence of the ADDIE method can be seen on most ID models being used. Educators, instructional designers, and training developers find the ADDIE model very useful because of having stages which are clearly defined that it can facilitate the implementation of effective training tools. As an ID model, ADDIE Model has found wide acceptance and use (Serhat, 2017).

2 Methodology

This study is a literature review using meta-analysis. Meta-analysis is a review of research results systematic, especially on the results of research empirically related to online learning efficacy for designing and developing instructional materials that can provide wider access to quality higher education. The researchers collected papers relating to online learning courses efficacy studies to provide a synthesis of scientifically rigorous knowledge in online learning courses, the researchers searched for nineteen (19) published research journal articles, thirteen (13) meta-analyses, eight (8) systematic literature reviews, four (4) literature reviews, three (3) report, two (2) case studies, and one (1) book on ERIC (Education Resources Information Center), ProQuest databases, PubMed, Crossref, Scribd EBSCO and Scopus. The researchers also conducted a manual search using Google Scholar. Based on the results obtained, the researchers found 30 articles that met the online learning efficacy for a higher

education institution. The results indicate that there are factors that influence the efficacy of online learning programs which includes the assessment, benefits, constraints and the design delivery method. The assessment, benefits and constraints are dependent on the design delivery which effects the evaluation of the efficacy of online learning program. Each of these variables has either a positive or a negative effect on the design delivery and the efficacy of online learning, while the design delivery plays a major role in the evaluation of the efficacy of online learning programs.

The researchers noticed that through the use of the ADDIE model for designing and developing instructional materials it can provide quality and better design courses for a higher education institution. Among other instructional design models, ADDIE Model can motivate online educators to come up with more effective guidelines and checklist when designing online courses materials. Proper implementation of this model can support an online student's engagement, involvement, motivation, and focus on learning. The main goal of using ADDIE Model for the online instructional design is to assist online educators to have a better design for online courses, to facilitate online students focusing on their learning, and to promote active teaching and learning. The ADDIE instructional design model provides a step-by-step process that helps training specialists plan and create training programs that can help to address the different factors affecting the efficacy of online learning programs. Figure 1, shows the instructional design process of the ADDIE Model (Intulogy, 2010).

The first step is the Analysis phase, it lays down the foundation because the designer has to identify the goals that will be achieved, know the intended user, the learning environment, and the materials that must be taught. The second step is the Design phase, it is carefully designing a task analysis that includes a list of the main steps the learner must take, along with a flowchart that maps out the entire training process. The
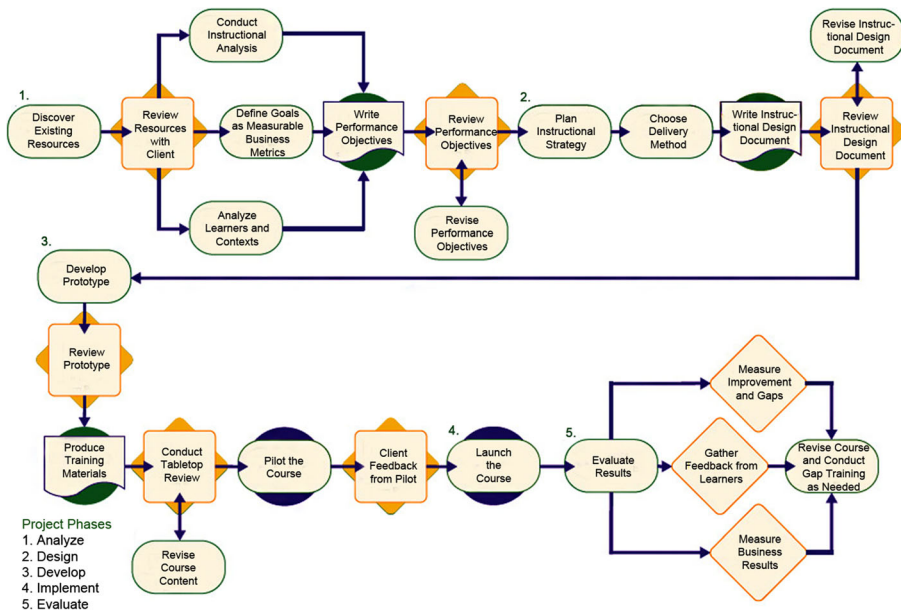

Fig. 1 Instructional Design Process. Source. Adapted from Intulogy (2010)

Table 1 Studies on the Online Learning Courses Efficacy

No	Year Published	Researchers	Title	Source
1	2016	Li-Ling Chen	A Model for Effective Online Instructional Design	http://infonomics-society.org/wp-content/uploads/iicej/published-papers/volume-7-2016/A-Model-for-Effective-Online-Instructional-Design.pdf
2	2015	Cordelia Obizoba	Instructional Design Models -Framework for Innovative Teaching and Learning Methodologies	http://www.ijhem.abmm.com/admin/content/pdf/i-3_c-22.pdf
3	2015	Razali Sharifah Nadiyah Shahbodin Faaizah	The Development of Online Project Based Collaborative Learning Using ADDIE Model	http://www.sciencedirect.com/science/article/pii/S1877042815038719
4	2014	Nurul Farhana Jumaat Zaidatun Tasir	Instructional Scaffolding in Online Learning Environment: A Meta-analysis	http://ieeexplore.ieee.org/abstract/document/6821832/
5	2014	Singh Gurmak Hardaker Glenn	Barriers and enablers to adoption and diffusion of eLearning: A systematic review of the literature – a need for an integrative approach	http://www.emeraldinsight.com/doi/abs/10.1108/ET-11-2012-0123
6	2013	Anna Ya Ni	Comparing the Effectiveness of Classroom and Online Learning: Teaching Research Methods	http://www.jstor.org/stable/23608947?seq=1#page_scan_tab_contents
7	2013	Aubteen Darabi Xinya Liang Rinki Suryavanshi Hulya Yurekli	Effectiveness of Online Discussion Strategies: A Meta-Analysis	http://www.tandfonline.com/doi/abs/10.1080/08923647.2013.837651
8	2013	Barbara Means Yukie Toyama Robert Murphy Marianne Baki	The Effectiveness of Online and Blended Learning: A Meta-Analysis of the Empirical Literature	http://s3.amazonaws.com/academia.edu.documents/43209482/study_online_and_blended_learning.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1490245895&Signature=jhuIQB8%2BPnPKpWFTVMOsIa0xnJA%3

Table 1 (continued)

No	Year Published	Researchers	Title	Source
				D&response-content-disposition=inline%3B%20filename%3DStudy_online_and_blended_learning.pdf
9	2013	Chia-Wen Tsai Pei-Di Shen Yi-Chun Chiang	Research trends in meaningful learning research on e-learning and online education environments: A review of studies published in SSCI-indexed journals from 2003 to 2012	http://onlinelibrary.wiley.com/doi/10.1111/bjet.12035/full
10	2013	David A. Cook Yvonne Steinert	Online learning for faculty development: A review of the literature	http://www.tandfonline.com/doi/abs/10.3109/0142159X.2013.827328
11	2012	Brian Jurewitsch	A Meta-analytic and Qualitative Review of Online versus Face-to-face Problem-based Learning	http://search.proquest.com/openview/7317fb2d262abdf60b4668cd8f0bc483/1?pq-origsite=gscholar&cbl=446313
12	2012	Georgianna Ravenna Chris Foster Carolyn Bishop	Increasing Student Interaction Online: A Review of the Literature in Teacher Education Programs	https://eric.ed.gov/?id=EJ975827
13	2011	Don Kirk Macon	Student Satisfaction with Online Courses versus Traditional Courses: A Meta-Analysis	https://eric.ed.gov/?id=ED526373
14	2011	Horng-Ji Lai	The Influence of Adult Learners' Self-Directed Learning Readiness and Network Literacy on Online Learning Effectiveness: A Study of Civil Servants in Taiwan	http://www.jstor.org/stable/jeductechsoci.14.2.98?seq=1#page_scan_tab_contents
15	2011	J.W. Gikandi		http://www.sciencedirect.com/science/article/pii/S0360131511001333

Table 1 (continued)

No	Year Published	Researchers	Title	Source
16	2010	D. Morrow N.E. Davis	Online formative assessment in higher education: A review of the literature	http://www2.ed.gov/rschstat/eval/tech/evidence-basedpractices/finalreport.pdf
		Barbara Means Yukie Toyama Robert Murphy Marianne Bakia Karla Jones	U.S. Department of Education. (2010). Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.	
17	2010	Charlotte Neuhauser	Learning Style and Effectiveness of Online and Face-to-Face Instruction	http://www.tandfonline.com/doi/abs/10.1207/S15389286AJDE1602_4
18	2010	David A. Cook Anthony J. Levinson Sarah Garside	Time and learning efficiency in Internet-based learning: a systematic review and meta-analysis	http://link.springer.com/article/10.1007/s10459-010-9231-x
19	2010	Dongsong Zhang	Interactive Multimedia-Based E-Learning: A Study of Effectiveness	http://www.tandfonline.com/doi/abs/10.1207/s15389286ajde1903_3
20	2010	Elaine Allen Seaman, J.	Class Difference§: Online Education in the United States.	http://sloanconsortium.org/publications/survey/class_differences
21	2010	Kristin Ewing	Online Learning in the K - 12 Environment: A Synthesis of Research in Online Learning	http://edtech2.boisestate.edu/kristinewing/portfolio/docs/501-OnlineLearning-FINAL_Ewing.pdf
22	2010	Mark Nichols	Designing for E-learning	http://creativecommons.org/licenses/by-nd/3.0/nz/
23	2010	Mickey Shachar Yoram Neumann	Twenty Years of Research on the Academic Performance Differences	http://jolt.merlot.org/vol6no2/shachar_0610.pdf

Table 1 (continued)

No	Year Published	Researchers	Title	Source
			Between Traditional and Distance Learning: Summative Meta-Analysis and Trend Examination	
24	2010	Shanna Smith Jaggars Thomas Bailey	Effectiveness of Fully Online Courses for College Students: Response to a Department of Education Meta-Analysis	https://eric.ed.gov/?id=ED512274
25	2010	Tony Bates	The Online Higher Education Market in the USA	www.tonybates. ca/2010/02/08/the-online-higher-education-market-in-the-usa.
26	2009	Barbara Means Yukie Toyama Robert Murphy Marianne Bakia Karla Jones	Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies	https://eric.ed.gov/?id=eD505824
27	2009	Doris U. Bolliger Oksana Wasilik	Factors influencing faculty satisfaction with online teaching and learning in higher education	http://www.tandfonline.com/doi/abs/10.1080/01587910902845949
28	2009	Fan Liua Meng Chang Chenb Yeali S. Suna David Wiblec Chin-Hwa Kuod	Extending the TAM model to explore the factors that affect Intention to Use an Online Learning Community	http://www.sciencedirect.com/science/article/pii/S0360131509002498
29	2009	J.B. Arbaugh Michael R. Godfrey Marianne Johnson Birgit Leisen Pollack Bruce Niendorf William Wresch	Research in online and blended learning in the business disciplines: Key findings and possible future directions	http://www.sciencedirect.com/science/article/pii/S1096751609000268

Table 1 (continued)

No	Year Published	Researchers	Title	Source
30	2009	Richard D. Johnson Hal Gueutal Cecilia M. Falbe	Technology, trainees, metacognitive activity and e-learning effectiveness	http://www.emeraldinsight.com/doi/abs/10.1108/02683940910974125
31	2009	Susan Patrick Allison Powell	A Summary of Research on the Effectiveness of K-12 Online Learning	https://eric.ed.gov/?id=ED509626
32	2007	Lin Y. Muilenburg	Student barriers to online learning: A factor analytic study	http://www.tandfonline.com/doi/abs/10.1080/01587910500081269
33	2007	Shu-Sheng Liaw	Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system	http://www.sciencedirect.com/science/article/pii/S0360131507001029
34	2007	Wendy Hui PJ h. Hu T.H.K Clark KY Tam J. Milton	Technology-assisted learning: a longitudinal field study of knowledge category, learning effectiveness and satisfaction in language learning	http://onlinelibrary.wiley.com/doi/10.1111/j.13652729.2007.00257.x/full
35	2006	Dongsong Zhang Lina Zhou Robert O. Briggs Jay F. Nunamaker Jr.	Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness	http://www.sciencedirect.com/science/article/pii/S0378720605000170
36	2006	Mary K. Tallent Runnels Julia A. Thomas William Y. Lan Sandie Cooper Terrence	Teaching Courses Online: A Review of the Research	http://journals.sagepub.com/doi/abs/10.3102/0034654307600109³
37	2006	Sean B. Eom Joseph H. Wen Nicholas Ashill	The Determinants of Students' Perceived Learning Outcomes and Satisfaction in University	http://onlinelibrary.wiley.com/doi/10.1111/j.15404609.2006.00114.x/full

Table 1 (continued)

No	Year Published	Researchers	Title	Source
38	2006	Traci Sizmann Kurt Kraiger David Stewart Robert Wisher	Online Education: An Empirical Investigation*	http://onlinelibrary.wiley.com/doi/10.1111/j.17446570.2006.00049.x/full
39	2005	John Bourne Dale Harris Frank Mayadas	Online Engineering Education: Learning Anywhere, Anytime	http://onlinelibrary.wiley.com/doi/10.1002/j.21689830.2005.tb00834.x/full
40	2005	Ronald B. Marks Stanley D. Sibley J. B. Arbaugh	A Structural Equation Model of Predictors for Effective Online Learning	http://journals.sagepub.com/doi/abs/10.1177/1052562904271199
41	2005	Shih-Wei Chou Shien-Hung Liu	Learning effectiveness in a Web-based virtual learning environment: a learner control perspective	http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2729.2005. 00114.x/full
42	2003	Brian Cameron	The effectiveness of simulation in a hybrid and online networking course	http://link.springer.com/article/10.1007%2FBF02763200?LI=true
43	2003	Jennifer Richardson Karen Swan	Examining Social Presence in Online Courses in Relation to Students' Perceived Learning and Satisfaction	https://www.ideals.illinois.edu/handle/2142/18713
44	2003	Karen Swan	Learning Effectiveness Online: What the Research Tells Us	http://virtualchalkdust.com/wpcontent/uploads/2016/03/Swan-Learning-Effectiveness-Online.pdf
45	2002	Chumley-Jones, Heidi S.; Dobbie, Alison; Alford, Cynthia L.	Web based Learning: Sound Educational Method or Hype? A Review of the Evaluation Literature	http://journals.lww.com/academicmedicine/fulltext/2002/10001/web_based_learning__sound_educational_method_or.28.aspx

Table 1 (continued)

No	Year Published	Researchers	Title	Source
46	2002	Judith B. Strother	An Assessment of the Effectiveness of e-learning in Corporate Training Programs	http://www.irrodl.org/index.php/irrodl/article/viewArticle/83/160 Tauber?utm_campaign=elearningindustry.com&utm_source=/dramatically-reduce-corporate-training-costs&utm_medium=link
47	2002	Richard Curtain	Online delivery in the vocational education and training sector: Improving cost effectiveness	https://www.ncver.edu.au/publications/publications/all-publications/online-delivery-in-the-vocational-education-and-training-sector-improving-cost-effectiveness
48	2001	David D. Curtis	Exploring Collaborative Online Learning	https://pdfs.semanticscholar.org/30b5/b12979f7b12c758c997509ec82e46abfeea5.pdf
49	2001	John Ed. Stephenson	Teaching & Learning Online: Pedagogies for New Technologies.	https://eric.ed.gov/?id=ED456817
50	2000	Steven Bradford Smith Sean Joseph Smith Randall Boone	Increasing Access to Teacher Preparation: The Effectiveness of Traditional Instructional Methods in an Online Learning Environment	http://journals.sagepub.com/doi/abs/10.1177/016264340001500204

third phase is the Development, the performance objectives are written and assessments are created to provide feedback to the educator about the learner's performance in completing the goal.

The fourth phase is the Implementation where the overall plan is put into action by setting procedures for training the learner. Instructional strategies, distribution of materials, media selection, and first draft materials are also included in this phase. The final phase is the Evaluation, which consists of two different types of evaluation: formative and summative. Formative evaluation plays an active role in each stage of the ADDIE process while summative evaluation is used for instructional feedback so that revisions can be made to improve or enhance the program.

3 Result and discussion

The study of the literature shows that there has been much research done in the field of online learning courses. Table 1 shows the results of the identification of research related to the efficacy of using online learning courses for higher education institutions in particular.

Based on the data in Table 1, each researcher has a different point of view in determining the factors to measure the efficacy of online learning courses to create an efficient and effective instruction for higher education institution. Also, from the examination of the 50 studies, it highlighted the three main themes of the study: 1.) comparison of online learning and traditional face-to-face setting, 2.) identification of important factors of online learning delivery, and 3.) factors of institutional adoption of online learning. In addition to the thematic analysis of this research literature, some findings from Table 1 will be discussed and reviewed below:

Charlotte Neuhauser, conducted a study entitled, "Learning Style and Effectiveness of Online and Face-to-Face Instruction," she compared two sections of the same course. One section was online and asynchronous; the other one was face-to-face by examining gender, age, learning preferences and styles, media familiarity, the effectiveness of tasks, course effectiveness, test grades, and final grades. The two sections were taught by the same instructor and used the same instructional materials. The results revealed no significant differences in test scores, assignments, participation grades, and final grades, although the online group's averages were slightly higher. 96% percent of the online students found the course to be either as effective as or more effective to their learning than their typical face-to-face course. There were no significant differences between learning preferences and styles and grades in either group. The study showed that equivalent learning activities can be equally effective for online and face-to-face learners (Neuhauser, 2010).

Dongsong Zhang conducted two experiments to assess effectiveness of interactive e-learning in his study entitled "Interactive Multimedia-Based E-Learning: A Study of Effectiveness," he found out that students in a fully interactive multimedia-based e-learning environment achieved better performance and higher levels of satisfaction than those in a traditional classroom and those in a less interactive e-learning environment (Zhang, 2010).

Class Differences: Online Education in the United States, 2010 represents the eighth annual report on the state of online learning in U.S. higher education. The survey is

designed, administered and analyzed by the Babson Survey Research Group with support from Alfred P. Sloan Foundation. Data collection is conducted in partnership with the College Board. The study aimed at answering some of the fundamental questions about the nature and extent of online education. Based on responses from more than 2500 colleges and universities, the report showed that online instruction is as good as or better than face-to-face instruction (Allen & Seaman, 2010).

Another study entitled, "Research in online and blended learning in the business disciplines: Key findings and possible future directions," the authors examine and assess the state of research of online and blended learning in the business disciplines with the intent of assessing the state of the field and identifying opportunities for meaningful future research. The researchers reviewed research from business disciplines such as Accounting, Economics, Finance, Information Systems (IS), Management, Marketing, and Operations/Supply Chain Management. They found that the volume and quality of research in online and blended business education has increased dramatically during the past decade. Results from the comparison studies suggest generally that online courses are at least comparable to classroom-based courses in achieving desired learning outcomes (Arbaugh et al., 2009).

Susan Patrick and Allison Powell examines the outcomes and descriptions of the existing studies on K-12 online learning effectiveness and provides a literature review. Several rigorous studies have examined the question, "Is online learning effective?" However, there is not a single, large-scale, national study comparing students taking online courses with traditional students, using control groups in the instructional design. The most in-depth, large-scale study to date is a meta-analysis and review of online learning studies from the U.S. Department of Education. The paper contains three sections: (1) a summary of the major study by the U.S. Department of Education, (2) a brief literature review of online learning research and studies, and (3) future research recommendations. The meta-analysis of these studies concludes that online learning offers promising, new models of education that are effective (Patrick & Powell, 2009).

3.1 Comparison of interaction between online and face-to-face settings

The adoption of online learning also revealed various disadvantages of teaching and learning in the online environment such as the cost for the training of educators, feelings of isolation, and technology gaps. Therefore, recognizing a great opportunity and numerous potential threats with the introduction of online learning programs, educators, policymakers, and other relevant stakeholders raised questions about whether instructional technology affects learning and contributes to student achievement (Schmid et al., 2014). This resulted in the researchers to provide evidence about whether the design and structure of online learning influence the performance and learning of the student. Initially, the researchers compared online learning with the traditional classroom setting in order to check whether the online learning mode really worked. The comparison of the two delivery media in terms of the efficacy for improving learning outcome, student satisfaction with online courses, time and learning efficiency and the effectiveness of problem-based learning demonstrated that online learning is at least as effective of the traditional face-to-face learning (Table 2).

Figure 2 below, shows the conceptual model that concisely synthesizes the findings of the study regarding online learning programs. The results further indicate that contemporary research into online learning almost univocally agrees that structured online discussions with clear guidelines and expectations, well-designed courses with interactive content and flexible deadlines, and continuous educator involvement that includes the provision of personalized, timely, and formative feedback are the most promising approaches to fostering learning in online environments. However, this also

Table 2 Comparison of Interaction between Online and Face-to-Face Settings

	Online	Face to Face
Mode	Discussions through text only; Can be structured; Dense; permanent; limited; stark	Verbal discussions: a more common mode, but impermanent
Sense of Instructor Control	Less sense of instructor control; Easier for participants to ignore the instructor	More sense of leadership from the instructor; Not so easy to ignore the instructor
Discussion	Group contact continually maintained; Depth of analysis often increased; Discussion often stops for periods of time, then is picked up and restarted; Level of reflection is high; Able to reshape conversation on basis of ongoing understandings and reflection	Little group contact between meetings; Analysis varies, dependent on time available; Discussions occur within a set of time frame; Often little time for reflection during meetings; Conversations are less likely being shaped during a meeting
Group Dynamics	Less sense of anxiety; More equal participation; Fewer hierarchies; Dynamics are 'hidden' but traceable; No breaks, constantly in the meeting; Can be active listening without participation; Medium (technology) has an impact; Different expectation about participation; Slower, time delays in interactions or discussions	Anxiety at beginning/during meetings; Participation unequal; More chance of hierarchies; Dynamics evident but lost after the event; Breaks between meetings; Listening without participation may be frowned upon; Medium (room) may have less impact; Certain expectations about participation; Quicker, the immediacy of interactions or discussions
Rejoining	High psychological/emotional stress of rejoining	The stress of rejoining not so high
Feedback	Feedback on each individual's piece of work very detailed and focused; Whole group can see and read each other's feedback; Textual feedback only; No one can "hide" and not give feedback; Permanent record of feedback obtained by all; Delayed reactions to feedback; Sometimes little discussion after feedback; Group looks at all participants' work at same time	Less likely to cover as much detail, often more general discussion; Group hears feedback; Verbal/visual feedback; Possible to "free-ride" and avoid giving feedback; No permanent record of feedback; Immediate reactions to feedback possible; Usually some discussion after feedback, looking at wider issues; Group looks at one participant's work at a time
Divergence/Choice Level	Loose-bound nature encourages divergent talk and adventitious learning; Medium frees the sender but may restrict the other participants (receivers) by increasing their uncertainty	More tightly bound, requiring adherence to accepted protocols; Uncertainty less likely due to common understandings about how to take part in discussions

Source. Adapted from McConnell (2000)

implies a more complex role for the educator in online settings and a need for research on instructional design strategies that would allow for the development of student self-regulatory skills. Implications for future research and practice for the position of online learning are further discussed.

Primary elements of online learning are students, educators, and content. The learning experience is primarily shaped by the interaction of students with content, other students, and educators. In order to successfully engage in interactions, students are required to possess high levels of digital literacy, to be self-efficient and properly motivated to productively engage in learning activities. Likewise, it is educators' attitude towards technology use and their levels of digital literacy play an important role in shaping overall learning experience. Educators should also pay special attention in planning and designing course interactions, given the evidence of its advantages over contextualized interactions. The quality of learning content is also important, particularly informal educational settings, where standards of learning quality are of particular importance. In addition to role of the students, educators, and content, our findings indicate that other factors such as academic support, institutional adoption, and course
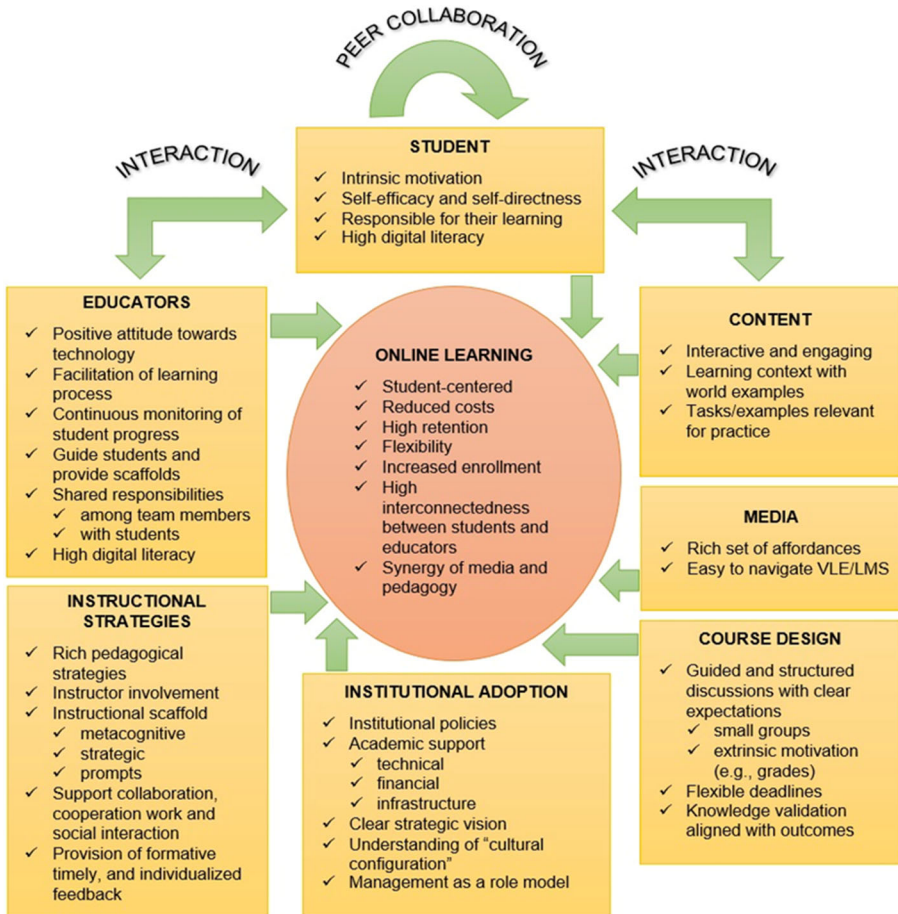

Fig. 2 A Conceptual Diagram of Online Learning Settings

design play an important moderating role on the final learning experience and achievement of learning objectives. Important course design characteristics that shape learning experience are flexibility, personalization, forms of assessment, use of small group learning and designed interactions, and soundness of adopted mix of pedagogies, technologies, and media. Likewise, factors related to the level of institutional adoption of online learning include the quality of technological infrastructure, support for academic staff, and role of academic management, level of coordination between involved parties, and governmental support and policy development. Finally, academic support for students, including technological and financial support is particularly important for students that do not possess required levels of literacy and self-efficiency, and for understanding the reasons behind student attrition (Siemens et al., 2015).

4 Conclusion

Online learning programs are an important strategy to improve course access and flexibility in a higher education institution, especially in universities, with benefits from both the student perspective and the institutional perspective. From the student perspective, the convenience of online learning is particularly valuable to adults with multiple responsibilities and highly scheduled lives; thus, online learning can be a help to workforce development, helping adults to return to school and complete additional education that otherwise could not fit into their daily routines. From an institutional perspective, online modalities allow colleges to offer additional courses or course sections to their students, increasing student access to required courses. Finally, to maintain or increase enrolments, universities must be responsive to the needs and demands of their students and believe that their students need the flexibility of online learning (Parsad & Lewis, 2008). Given the value of these benefits, online learning courses are likely to become an increasingly important feature of postsecondary and postgraduate education. Accordingly, universities, offering open-access to education, need to take steps to ensure that students perform as well in online learning courses as they do in face-to-face courses.

5 Recommendations

It has become clear that online learning education is entering the mainstream and becoming a growing market as it continues to expand access to learning for more people (Gallagher & LaBrie, 2012). Therefore, online educators and students need to synthesize information across subjects to critically weigh significantly different perspectives and incorporate various studies. In doing so, they need to conceptualize such possibilities utilizing nurturing critical learning spaces, where students are encouraged to increase their abilities of analysis, imagination, critical synthesis, creative expression, self-awareness, and intentionality in action. Only well-designed and effectively delivered online courses can survive to achieve the possibility of joining together the borders of the classrooms and to connect formal learning to broader space and massive social issues through an active online learning community (Saba, 2012). In the end, education is about encouraging different ideas, various viewpoints, and more creative design that

really give enthusiast to the students. Educators should encourage students to relate their discussions, assignments and group work to their own experiences, to the viewpoints of others, to subject matters, and to their learning and work. The proposed development of Online Learning Courses for Higher Education Institution for the online instructional design program will assist online educators and instructors to have a better design for online courses, to facilitate online students to focus on their learning, to promote active teaching & learning and provide differentiated online instructions through the course design.

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