The Design and Delivery of a Holistic BPM Education Programme

Rehan Syed, Moe Thandar Wynn(✉), and Wasana Bandara

Queensland University of Technology, Brisbane, Australia
m.wynn@qut.edu.au

Abstract. In the dynamic business environment of today, BPM professionals must adapt to cutting-edge technologies, evolving methodologies, and rapidly changing market conditions. Consequently, educational programmes should be sufficiently adaptable to incorporate emerging trends and equip learners with the technical dexterity and process thinking required to effectively lead organisational digital transformation. This adaptability ensures the continued relevance of BPM education and produces graduates that are capable of driving innovation and organisational success.

The goal of this study is to share the key features and report on the key lessons learned from our experiences conducting BPM education programmes for over two decades. We argue for the holistic and flexible nature of BPM education by explaining how a variety of learner-focused technical and managerial factors influence our BPM education framework. We underline the necessity for a well-balanced BPM curriculum that covers both technical topics like process mining and automation and managerial topics like process governance and process strategic alignment. We show how industry and students' needs may be balanced in the BPM curriculum to produce job-ready graduates. This study will contribute to the BPM education community's knowledge base by reporting on the critical dimensions of a programme design that encapsulate our shared experiences in delivering a holistic and flexible BPM curriculum to varied learners using different delivery channels. The details discussed will assist BPM experts in designing and delivering a comprehensive curriculum to tackle BPM programme design and its relevance to today's dynamic business environment.

Keywords: BPM Education · Programme Design · Learner Profile · Programme Theory · Case Contribution

1 Introduction and Background

Business Process Management (BPM) has established itself as an industry best practice to reach an organisation's strategic goals, such as improving customer experience and optimising operational costs through business process efficiencies. BPM's interdisciplinary nature provides a unique opportunity to integrate information technology, data science, and managerial concepts and theories to build robust process solutions and, most importantly, develop an organisation-wide process thinking culture. BPM competencies

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are highly in demand in Australia, as evidenced by the jobs advertised on the main job search portals. A recent search resulted in 5,917 jobs on Seek and 1,312 jobs on LinkedIn for "Business Process Manager" and 3,065 jobs on Seek and 1,016 jobs on LinkedIn for "Business Process Analyst," indicating a relatively high demand for BPM skills. BPM education equips individuals with the necessary knowledge and skills to analyse, design, implement, and improve business processes, leading to enhanced organisational efficiency and competitiveness. The importance of BPM education is discussed in the literature, highlighting its relevance in today's dynamic business environment. However, vom Brocke [1] stated that due to the rapid development of the field, BPM curricula and training run the risk of rapidly becoming obsolete. To date, there has been limited attention given to BPM education by the BPM community, with only a handful of studies explaining the status, structure, and best practises adopted by BPM education providers [2–7]. Another study [4] suggested that BPM professionals and their employers should build awareness of the existing BPM education options and understand their relevance in meeting industry requirements.

We explain the importance of a comprehensive BPM programme design that includes both technical and managerial competencies in consideration of the industry's multidisciplinary skill demand. We share our insights from delivering BPM education to a diverse range of learners at Queensland University of Technology (QUT), Brisbane, Australia, over the past two decades. QUT was one of the first universities to offer dedicated BPM education courses in the Southern Hemisphere. As of today, only four universities in Australia offer limited BPM units as part of their IT degrees. Globally, UNIR (Spain) is the only university that offers a full BPM programme apart from QUT, whereas a few universities in Europe, the USA, and South America offer BPM education in the form of Postgraduate certificates and CPE.

QUT offers BPM courses to undergraduate Information Technology and Business students, postgraduate Information Technology, Business, and Data Science students, and industry participants. These courses are taught by research-active academics from the Process Science group[1] (formerly the BPM group). The focus of QUT's BPM programme design is on the learners' needs, where individuals seek to acquire a comprehensive understanding of the principles, techniques, and tools required for effective process management through BPM education. We emphasise the need for educational programmes to offer a curriculum that not only addresses the technical aspects of BPM, such as process modelling, improvement, and automation, but also managerial topics, such as governance and strategic alignment. A holistic approach ensures that our graduates have a well-rounded skill set, allowing them to resolve the myriad challenges and opportunities that BPM initiatives present in today's dynamic environment.

This paper unfolds as follows: In Sect. 2, we discussed the key dimensions of QUT's BPM education framework. We emphasised the incorporation of practice-focused, real-world research to enhance the graduates' problem-solving and critical-thinking capabilities. By incorporating research and practice into our programmes, we remain abreast of the most recent BPM developments, industry best practices, and theoretical advances. Section 3 summarises the learners' testimonials and key lessons learned.

[1] https://research.qut.edu.au/bpm/

2 Curriculum Design and Delivery

The BPM curriculum at QUT is a carefully curated design that amalgamates several critical elements aimed at heightened levels of pedagogical excellence. The structure is well aligned with programme theory, which advocates the development of a "plausible and sensible model" of how a programme should work by continuously analysing cause & effects relationships between inputs (material, teaching resources, etc.), learners' activities (learning, assessments, etc.), outputs (feedback, results, performance, etc.), and the desired outcomes [8, 9]. This holistic design is the outcome of over two decades of BPM education and continuous reviews and enhancements.

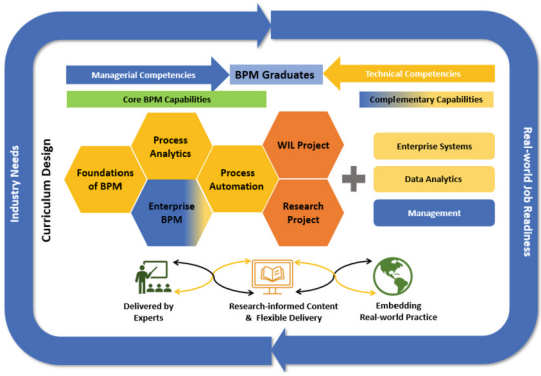

Fig. 1. Overview of the BPM Curriculum Design at Queensland University of Technology

Figure 1 provides an overview of the various dimensions that inform the design and delivery of our curriculum. The course design emphasises the core competencies that a BPM graduate should demonstrate (i.e., process modelling, automation, analytics, and management). These competencies are then demonstrated through real-world practice (an industry project and a research project). Depending on a learner's background knowledge and their desired career path, they can undertake complementary studies in a range of areas. The course is then delivered by experts, both from academia and industry, in a flexible manner using a combination of on-campus, blended, and online modes of delivery.

2.1 Holistic Curriculum Design

The core of the curriculum is made up of four specialised units dedicated to delivering core BPM capabilities. The focused capabilities are determined using feedback from the Industry Expert Group (IEG), alumni, and recruiters at both course and unit levels. These BPM capabilities are then applied through a 'BPM in Practice" project–designed within a work integrated learning (WIL) setup, and a research project. Depending on the learners' profile, they may select from a suite of other unit offerings designed to deliver complementary skills. The number of units depends on the course that they are

enrolled in (i.e., a graduate certificate in BPM requires 2 core and 2 elective units, while the master's course requires 4 core, 4 elective, and 2 project units).

The **'Foundations of BPM'** unit provides an in-depth introduction to the management of a business process and takes learners through the fundamental lifecycle phases of a typical business process improvement initiative, from process identification to process monitoring, covering process modelling, analysis, improvement, and automation [10]. On successful completion of this unit, learners will be able to: (i) explain how the business process management lifecycle is applied to guide the management and improvement of organisations' processes; (ii) analyse a business scenario to identify opportunities for business process improvement; (iii) generate and evaluate business process improvement ideas using a variety of quantitative and qualitative analysis techniques; and (iv) create as-is and to-be business process models using BPMN. This unit is the first to be completed and acts as a prerequisite to the other three BPM core units.

The **'Process Analytics'** unit introduces learners to the principles behind various process analysis techniques used during the design, execution, and post-execution stages of the BPM life cycle. By applying techniques such as process verification, process simulation, and process mining, the unit teaches learners how to gain insights into both current and future business operations of an organisation, which in turn can lead to continuous process improvement. Learners learn how to: (i) create executable business process models using the Workflow-net formalism based on an analysis of a domain; (ii) verify the correctness and other properties of these executable models; (iii) evaluate the performance of multiple scenarios using process simulation tools; (iv) analyse existing processes by discovering process models automatically and assess the performance using process mining techniques; and (v) recommend and justify data-driven process optimisation opportunities.

The **'Process Automation'** unit provides a detailed technical and practical exposition of modern business process automation. The learners' learning journey starts with a detailed contextual overview of process automation that also explains the necessity to have executable process instances and how processes can be designed, executed, monitored, analysed, and improved using BPM Systems. Other major themes the unit covers include the theoretical and operational underpinnings of process automation, a detailed discussion on workflow patterns, runtime process flexibility, and exception handling, and the design, implementation, and deployment of process specifications using a state-of-the-art business process automation environment. The unit equips the learners to: (i) apply the theories, strategies, tools, and techniques that inform and support the automation of business processes; (ii) analyse a real-world business scenario to identify opportunities for business process automation; (iii) design and implement automated business processes and supporting components for deployment in process-aware systems environments; (iv) write efficient code for specialised applications that builds services to handle automation tasks; and (v) write user and technical documentation and reports for specialist and non-specialist audiences.

The **'Enterprise BPM'** unit shifts the focus from managing a single process to effectively managing a portfolio of business processes that can be in diverse stages of their respective lifecycles. This unit presents strategic and tactical business and IT management issues with a process-oriented perspective on enterprises and their IT applications.

Based on a comprehensive discussion of key factors surrounding the process-oriented management of an enterprise, BPM capability models are introduced as the baseline tool to use to assess the current status of organisation-wide BPM and to design action roadmaps for BPM capability enhancements across the entire organisation. Learners will be able to: (i) explain why an organisation should adopt a portfolio approach to managing business processes and how to manage BPM portfolios; (ii) select, tailor, and implement BPM capability frameworks to meet the specific needs of diverse organisational contexts; (iii) evaluate the maturity of an organisation's BPM capabilities using capability frameworks; (iv) recommend and justify BPM solutions to a client; and (v) effectively communicate these to an audience that may have little or well-developed BPM skills.

To enable the learners to obtain real-life BPM research and practise skills, they also have to complete a **'BPM in Practice'** project designed within a work-integrated learning (WIL) setup and a '**Research Project'**. With the WIL project, learners have to deliver (pre-agreed) artefacts that will contribute to resolving an issue or realising an opportunity that can be addressed by BPM. The deliverables can be quite diverse; examples include a process architecture for the whole organisation, process improvement recommendations within a set area of the business, a process analytics report for a specific process, or specific algorithms (or algorithmic enhancements) to support process automation efforts. We have dedicated project coordinators whose role entails: (a) managing the learner-educator-industry partner relationships and deliverables; (b) ensuring that the participating case organisation gains value from the engagement; and (c) ensuring that the learner learning outcomes are met. The research projects are also similarly overseen by a dedicated research project coordinator. The research projects fall into two key categories: basic research, where new knowledge is added to the BPM Body of Knowledge by the learner and the supervising educator, or applied research, where the application of existing BPM knowledge into a novel context is studied and evaluated. The research projects often align with QUT's Process Science research group's ongoing portfolio of BPM research activities, where the learner(s) can benefit from a larger ecosystem (e.g., with access to other BPM researchers internally and externally, access to industry partners, and specialised research training and mentoring).

These six units are designed to provide full coverage of the BPM lifecycle. Figure 2 illustrates the alignment of units with the BPM lifecycle. The core units are aimed at developing the foundation for advanced skills, whereas the integrated units provide learners with an opportunity to apply their advanced skills to real-world problems and develop robust solutions.

Finally, learners must also complete at least four approved elective units aimed at equipping them with essential complementary skills. These electives cover Managerial capabilities, such as change management and consultation skills, Enterprise Systems capabilities such as Enterprise Architecture, Enterprise Systems, and Data Analytics capabilities, such as Data analysis for decision making and Foundations of decision science.

	Process Identification	Process Discovery	Process Analysis	Process Re-design	Process Implementation	Process Monitoring & Control
Foundations of BPM	Developed	Developed	Developed	Developed		
Process Analytics		Mastered	Mastered			
Process Automation				Mastered	Mastered	
Enterprise BPM	Mastered				Mastered	Mastered
WIL Project	Applied					
Research Project	Applied					

Fig. 2. Mapping with BPM Lifecycle.

2.2 Understanding Industry Needs and Ensuring Real-World Job Readiness

A good education programme must ensure that the contents are aligned with industry needs, delivered by competent facilitators, and provide the learners with an opportunity to apply their knowledge in practical settings. Our learners' real-world job readiness and how well our course can produce graduates who meet industry needs are routinely assessed, with continuous improvements implemented. The curriculum is continually peer-reviewed using multiple feedback mechanisms that include "Industry Expert Group" consultation, learner feedback, and Expert Peer Review (exPrep). We deploy diverse mechanisms such as Focus Groups with practise leaders (both national and international), in-depth interviews and/or focus groups with our alumni and current learners, environmental scans that look at BPM job offerings and industry demand for BPM [11, 12], and comparisons with other BPM course offerings [2]. We also conducted international peer reviews with BPM experts to ensure that our curriculum is current and relevant. We do these as part of our compulsory course review and accreditation cycles, which occur every five (5) years.

2.3 Accommodating Diverse Learner Profiles

When designing educational activities, the use of various elements of a learner's profile can significantly enhance engagement and learning outcomes. Learner profiles encompass an extensive array of characteristics, including learning preferences, multiple intelligences, interests, and strengths. Educators can design learning experiences that accommodate diverse preferences and learning styles by considering these variables. The educators can empower learners to take ownership of their education by considering a variety of learner profiles, such as, interests, career objectives, current skills, and strengths, when designing academic programmes. Learner profiles ultimately aid in the development of successful educational initiatives that promote fruitful learning outcomes and contribute to the overall development of each learner.

QUT's BPM programme has been designed to provide a flexible structure for learners. A BPM professional today is expected to have a strong understanding of both technical and managerial capabilities to lead and contribute to digital transformation initiatives. Learners from technical backgrounds seeking to further their knowledge and skills can select advanced technical units from a wide list of technical units in the Enterprise Systems and Data Analytics clusters. On the other hand, learners seeking to change their

career path can develop skills that are more skewed towards managerial topics and have the option to select the required units from the managerial capabilities cluster while maintaining their strong BPM core capabilities. The learning materials are designed using a wide range of techniques, including original case studies, videos, video case studies, industry special seminars, internal research conferences (for research projects), and Work-Integrated Learning projects. The materials can then be consumed by the learner in various manners: face-to-face, hybrid or flip-classroom, hands-on practise, virtual participation, etc.

2.4 Nested Course Structure and Flexible Delivery

The holistic curriculum is complemented by a robust (flexible and nested) course structure to ensure maximum engagement by learners with diverse needs (see Fig. 3). The post COVID-19 era has impacted the design and structure of academic programmes in an unprecedented manner. A specific trend is associated with the high demand for short-term options by industry professionals. Although the short-duration programme offering is not a new concept and there are plenty of examples available, such as MOOCs, edX, and Coursera, their completion rate has been reported to be between 5 and 15% [13]. The Corporate Professional Education pathway allowed learners to complete the required knowledge areas in an accelerated mode (offered in blocks) and receive a certificate of completion upon successfully meeting the required assessment criteria. Once completed, the CPE credits allow learners to join either the Graduate Certificate in BPM or Master of BPM (MBPM) with full recognition of their completed credits.

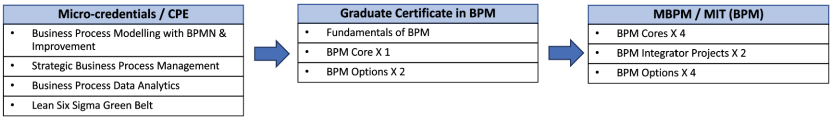

Fig. 3. BPM Course Pathways - A Nested Approach

The Graduate Certificate is offered on a full-time (one semester) or part-time (one year) basis and allows learners to complete an industry-recognised postgraduate qualification. The PGC credentials open the pathway for an advanced entry into the Master of BPM. The Master of BPM is designed to attract learners with prerequisite knowledge of Information Systems or Business Management and is designed to cover the full spectrum of BPM core and complementary skills.

To get the most out of the course, how you deliver the materials is equally important as what learning materials are used in the course. To cater to a variety of learning needs, the courses are offered in a range of modes. On-campus 13-week delivery represents the traditional way of teaching both undergraduate and postgraduate learners, with weekly lectures and tutorials that enable learners to learn and complete hands-on practise. Face-to-face delivery of lectures and tutorials is supplemented by short videos, tool demos, and real-world case studies. Learners will undertake several assessment items, both independently and within a group setting, to demonstrate their grasp of the learning

materials. This mode is well suited to full-time learners who are completing a bachelor's or master's degree. Online 10-week + delivery mode is a new mode where learners worldwide can update their knowledge on the fundamentals of BPM. Such a flexible delivery allows interested learners to sample the course content without committing to completing a QUT degree.

To cater for professionals who would like to upgrade their knowledge and capabilities in BPM, we offer the learning materials in block mode as QUTeX continuing professional education offerings. This typically involves a 3- to 4-day intensive short course where groups of 10–15 learners, facilitated by a BPM expert trainer, work through both theoretical and practical components of the learning materials. Additional case studies and homework tasks are set, with assessment items undertaken after the course delivery to help students apply the learning materials at their own pace. This intimate setting with a small group of learners with lived experiences of BPM problems provides rich examples for the learners to share best practises and further enhance their BPM skills.

During and post-COVID-19, such short courses for practitioners are being delivered online only with a mix of synchronous and asynchronous delivery options. For example, a 4-day course is offered as a 2-day course over 2 weeks with the time in between set aside for hands-on practice work. During the day, the course design contains both asynchronous (readings/self-study) and synchronous modes (content delivery/presentations) with discussions and questions via chats and small group meeting rooms supported by technologies such as Zoom.

3 Discussion

3.1 Selective Learner Testimonials

The feedback received from the learners who successfully completed the BPM education programmes at QUT supports the effectiveness of this programme design. For example, the importance of placing **equal emphasis on technical and managerial competencies** has been mentioned as a key feature of the programme by a learner. *"The course really appealed specifically to what I was interested in doing, which was learning about how to link business ideas of a product with an IT solution and how to do that in an efficient manner (MBPM student), it was "…a means to enhance both my technical and management skills in order to drive organisational excellence" (Alumni-1).*

Input design features such as **real-world problem-solving, and industry-informed faculty with practical knowledge of BPM** were well regarded as key factors in meeting the desired outcomes. "*It's terrific getting a connection from theory to real-world practice and being able to ask them questions."* (*MBPM student*). "*I enjoyed hearing from industry experts who shared their experiences and insights in a highly relatable manner" (Alumni-2). "The teaching staff and researchers associated with the Master of BPM programme at QUT are outstanding. They not only provided us with theoretical foundations, but also shared practical insights based on their industry and lived experience. Perhaps most notably, the programme consistently challenged us to apply critical thinking and problem-solving skills, which are essential in any technical or leadership role" (Alumni-3).*

The relevance of the learnings to the individual's career progress was highlighted; *"The course gave me insight and knowledge that I can apply in many aspects of my career. I not only learned new skills, techniques, and a better way to think, but I gained an overall confidence which has helped me progress further in my career" (Alumni-4).* The flexible delivery of the units opened more learning opportunities to busy professionals: *"Thank you for running the class in hybrid mode, because of this, I was able to never miss a class despite the several interstate work trips and family challenges" (MBPM student*); *"Despite not being able to get to Brisbane, I never felt isolated in my learning- there were so many things set up online to help me feel connected/ present and very much part of the class" (MBPM student).*

3.2 Key Lessons Learned

A BPM programme should have a 'holistic curriculum design', which covers skills and competencies required for the various stages of the BPM lifecycle and thus equips the learners with both technical and managerial skills for the continuous management of individual processes and also for process portfolio management. Other aspects pertaining to this principle of holism include career advice through the course coordinator, industry mentors, and formal (e.g., via work-integrated-learning projects) and informal (e.g., via our network and invited guest speakers) mechanisms to assist our graduates in finding BPM job opportunities.

A BPM programme should be **adaptable**—able to cater to emerging industry trends and individual learners career aspects. This requires continuous review and enhancement of the offerings, both in terms of content and delivery. One way we have addressed this at QUT is by trying to maintain a close alignment with our staff's research expertise and teaching content, both of which are driven by contemporary industry demands. We also team-teach and have formal and informal mentoring and coaching in place. We also ensure that students are exposed to various tool sets for modelling, simulation, and process mining.

Industry participation is essential to both the **design** and **delivery** of the curriculum. We accomplished this by establishing a formal "**Industry Advisory Board**," leveraging our staff's extensive industry network, and maintaining close ties with our alumni. These industry representatives play a significant and active role in the course evaluations as well as in the delivery of the learning through guest lectures and projects that require students to 'problem-solve' in the real world.

Flexible delivery is necessary to accommodate the diverse learning preferences of our student populations. Students have requested multiple ways to consume course content, such as (i) on-campus, online, and hybrid modes; (ii) the option to have block-structured offerings (rather than learning over the course of an entire semester); and (iii) units that can yield micro-credentials (so that they can obtain some qualifications as they progress through the course). To adequately resource such diverse learning options, a critical mass of BPM students is required. Therefore, having multiple entry points to the programme(s), as well as a **distinct identity** and **value proposition**, is essential for the programme's long-term success.

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