Developing Industry-Ready Business Analysts: Guiding Principles for Effective Assessment for Learning (AfL) in a BPM Course

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Abstract. This paper discusses a unique assessment approach that is implemented in the Business Process Management (BPM) course for Masters' students at the University of South Australia. The Active Learning and Assessment for Learning (AfL) principles are incorporated into this course to prepare industry-ready business analysts who will play an important role in the future business environment. We provide a detailed description of the design decisions, the implementation and resulting benefits of three major assignments in the course. The assessment is designed according to guiding principles that include 1) a focus on developing real-world skills for the future digital business environment, 2) following a process-oriented approach in both teaching and assessment, 3) motivating students to challenge assumptions and status quo by asking 'why' and 4) encouraging continuous self-reflection and a willingness to receive and provide constructive feedback. These guiding principles can be leveraged by other educators in the BPM community to design and implement an effective assessment structure for developing future-focused and industry-ready business analysts.

Keywords: Business Analyst · Business Process Management · Business Process Modelling · Active learning · Assessment for Learning

1 Introduction

Business analysts play a critical role by working with stakeholders to understand the organisation's current state, identify opportunities for improvement and define the business requirements for, amongst others, digital solutions. The education in Business Process Management (BPM) is crucial for the development of industry ready business analysts. Different educators employ different teaching and assessment techniques with varying degrees of effectiveness, when teaching a BPM course (Antonucci, 2010). This paper discusses how future business analysts' skills and attitude are developed through active learning and Assessment for Learning (AfL) approaches in the Masters' course Business Process Management (BPM) at the University of South Australia.

Related work about business process management education techniques found a lack of pedagogical resources and qualified instructors, large variations in content related to managerial and technical topics, limited pedagogical research on BPM education and

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unclear BPM industry pathways for students (Bandara et al., 2010; Chakabuda, 2014). Further research identified a capability gap, related to industry demand in the Australian context (Mathiesen et al., 2013). To address the business process management education gap, the teaching and assessment design approach needs to be flexible to address these industry needs.

The teaching philosophy embodied in this course is active learning, which is based on "instructional activities involving students in doing things and thinking about what they are doing" (Bonwell & Eison, 1991) to empower students to acquire e.g. critical thinking, problem-solving, and effective communication skills (Brame, 2016). The active learning approaches (Michael & Modell, 2003; Prince, 2004; Michael, 2006; Cattaneo, 2017) as applied in this course are as follows:

- *Collaborative learning,* where students work together to solve problems, complete assessments, or critically discuss course material.
- *Inquiry-based learning,* as students are encouraged to listen and ask questions, explore new ideas, and seek answers through research and investigation.
- *Project-based learning,* where students interview a real-world client and apply BPMN skills to model as-is and to-be processes.
- *Case-based learning* involves students engaging in role-play and simulations to explore complex concepts or issues.
- *Problem-based learning* involves presenting students with case studies and challenging them to find solutions.
- *Discovery-based learning* involves students investigating their learning contexts through experimentation and trial-and-error based on specific requirements provided.

Active learning is done through a *flipped classroom* approach, where students are expected to read materials outside of class and use class time for discussions, problem-solving activities, or group work (Bishop & Verleger, 2013). Students are very actively involved in the learning activities and the assignments typically have high engagement and completion rates. Through active learning, students engage with new concepts, develop important skills, and reflect on their learning throughout the course (Michael & Modell, 2003).

In the next section we describe the unique way the assessment is designed for Learning and to develop the knowledge, skills and mindset attributes required of future business analysts.

2 Assessment Overview

In this section we describe the assessment philosophy and structure, emphasising the scaffolding aspects of the assessment design and highlighting the primary aims, tools used, and skills learned in each of the assignments.

2.1 Assessment Philosophy

Assessment philosophies focus on the central impact of student-teacher roles and relationships on the learning journey, a conducive learning environment and attaining specific educational outcomes (Schellekens et al., 2021). Assessment for Learning (AfL)

is a suitable assessment approach in the context of business analysis, because it focuses on designing assignments that directly form part of the student's learning process and empower the learner through regular continuous feedback mechanisms (Wiliam, 2011; Brady et al., 2020). Instead of simply using assessment to record learning progress, AfL aligns teaching and learning strategies with assessment needs (such as industry relevancy) and furthers formative assessment strategies by identifying students' learning gaps and motivating them to engage in activities to address these learning gaps (Berry, 2008; Wiliam, 2011). In AfL, student learning needs are mapped to course learning outcomes, the instructional assessment design offers a reliable way to assess these needs, and student learning progress is regularly monitored (Berry, 2008).

Brady et al., (2020) propose five key AfL characteristics that can be embedded in course design, namely:

- *Balance of summative and formative assessment* where students experience a mix of assessed and non-assessed learning activities to encourage a more holistic reflection of knowledge and skills.
- *Authentic and complex assessment,* where the assessment design represents industry relevant contexts and higher-order learning skills.
- *Rich formal and informal feedback, as* a variety of quality feedback is provided at regular intervals through learning activities.
- *Opportunities for practice and confidence building,* as students grapple with new concepts or unlearn existing concepts before these concepts are formally assessed.
- *Opportunities to evaluate and direct own learning,* as students are encouraged to motivate and monitor their learning progress through formal and non-formal learning activities.

By embedding active learning and assessment for learning (AfL) design principles, students are less incentivised to seek the use of generative AI tools or other sources that risk academic integrity. Students are motivated to drive their own learning given the strong industry links and the opportunities to receive formative feedback on their learning progress.

2.2 Assessment Design and Structure

As shown in Fig. 1, the assessment of this course is designed and structured to develop a variety of skills through three scaffolded assignments. Assignment 1 builds skills required in assignment 2, which in turns builds skills that students will need in assignment 3. By scaffolding the assignments, we aim to support students to build confidence and become more independent learners, develop problem-solving skills to successfully complete complex tasks (Witt et al., 2019). Students are encouraged to continuously reflect on their learning and the processes used to complete each assignment. We ask questions that prompt students to think about what they have learned, what worked well, and what they might do differently next time. Students receive feedback on their work, and they are encouraged to use the feedback to improve their work.

By conducting a Systematic Literature Review, students develop skills in information searching, reading, analysing literature, and writing a literature review report. Students are assigned an industry and a list of research databases. The topic involves around

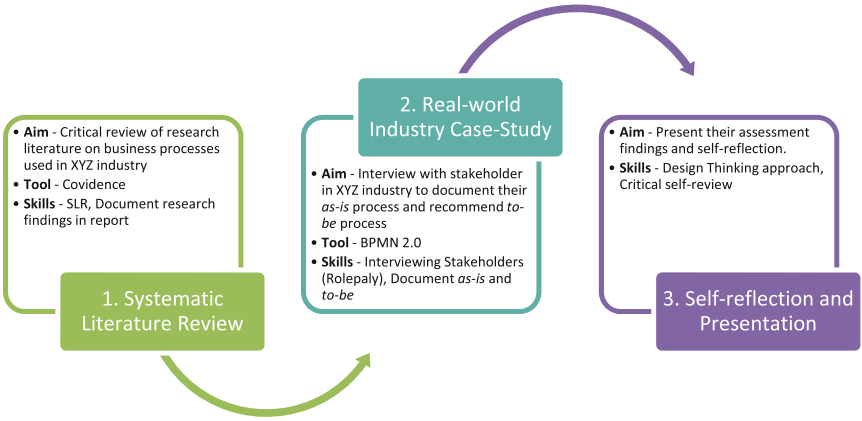

Fig. 1. Overview of the assessment structure

finding and documenting business process used in a specific industry in different contexts, for example how business processes have evolved through time or how they have changed with respect to digital business transformation within that industry. The process of finding and reviewing literature is not arbitrary if a Systematic Literature Review (SLR) methodology is followed. The web based Covidence tool is used to ensure that students follow the correct process for performing a systematic literature review. Finally, students produce a report about the business processes they found in their allocated industry. These insights are useful as a basis to conduct a personal interview with an external stakeholder from the same industry in the follow-up assignment.

The real-world case study allows students to develop professional communication skills with external stakeholders, to conduct a semi-structured interview, to analyse and model processes and to work effectively in a team. Students are randomly divided into groups of 3–4 to mimic collaboration in the real world. The group must find and interview a business analyst or manager of their choice in their assigned industry. The aim of the interview is to understand and document the *as-is* state of one business process. Students then analyse the business process and recommend an improved *to-be* state of the business process. The output report of Assignment 2 is shared with the industry stakeholder to elicit feedback about the *to-be* diagram and its implementation feasibility. In their course evaluation feedback, students often comment on both the professional and interpersonal skills they have learned as part of the groupwork and their interactions with a real-world industry stakeholder. The knowledge and skills developed in assignment 2 prepares the students for the next assignment.

In the assignment following the industry interview, students learn about doing an oral presentation, self-reflection, giving and receiving constructive feedback, and making recommendations to the industry client regarding process improvement. Self-reflection and dealing with feedback are important skills for students as it supports deeper learning, self-awareness, and growth. Self-reflection helps students develop a deeper understanding of themselves, their strengths, and areas for improvement. This can lead to better

decision-making, self-regulation, and personal growth. Since students are asked to articulate their own experience and learnings, students present naturally and confidently during their presentation.

3 Assignment Details

In the previous section, we provided an overview of the assessment design and structure. In this section, we discuss each of the three assignments in more detail. We explain the aim of each assignment, how we prepare students for each assignment through formative in-class activities, and the benefits gained by students from the unique way in which assignments are designed and conducted.

Assignment 1: Systematic Literature Review
In Assignment 1, students conduct a Systematic Literature Review (SLR) to study the business processes of a particular industry. The aim of conducting an exhaustive SLR is to make students aware of the business processes that are executed in the industry and appraise the technical jargon used in that industry.

To ensure that students execute the SLR process correctly, they must use the Covidence (https://www.covidence.org/) tool. Every step the students perform is documented and the teaching team is added as reviewers in the setup of the Covidence account, which provides the teaching team with a mechanism to audit the progress of students in the various stages of SLR. Using Covidence to perform SLR ensures that students do not use Artificial Intelligence tools (such as ChatGPT) to write the assignment.

Every student is assigned 3–4 specific research databases for their search. Both academic and industry papers, including journal, conference, and white papers, can be sourced. Students typically include more than 100 potential papers into Covidence, before reviewing the abstract and eliminate the papers that are not completely relevant for their topic. After reviewing the abstract, students must review the full paper in Covidence to identify the best 15–20 papers for inclusion in the final literature review report. Students also create a data extraction spreadsheet with general information about the papers, e.g., the publication type, publication year, keywords, research methodology, et cetera. We ensure that students perform the process steps within the timeline, by including regular milestones. For the literature review, students highlight the most important findings of previous research, they compare different viewpoints, and write an integrated and concise report that includes quotes, paraphrasing and in-text referencing.

To equip students with skills to execute the SLR, detailed documentation is provided including suggestions on use of appropriate combinations of search keywords for the best search results. Dedicated workshops are held to walk through an example SLR process and to assist students with the use of the Covidence tool to complete the SLR process.

Assignment 2: Real-World Industry Case Study
This assignment prepares students for the capstone project course and a career as a business analyst. Students receive real-world exposure when they conduct a personal interview with an industry stakeholder to understand one of the existing business processes in

their organisation and identify ways to improve the process. They learn to communicate professionally when trying to find a suitable interviewee (through personal contacts, email, or LinkedIn) and during the interview.

The knowledge about the allocated industry sector, as obtained in the SLR, is leveraged in Assignment 2. This is a group assignment and hence students learn skills to work collaboratively in pre-defined groups to find and interview an industry stakeholder. They develop and document the interview questions beforehand and aim to elicit as much information as possible about a particular business process used in the interviewee's organisation. Students use the BPMN 2.0 notation to create the process diagram to model the *as-is* and *to-be* processes of the organisation.

The report produced by the students is shared with the industry partners to receive feedback about the *as-is* diagram and the feasibility of the suggested improvements as captured in the *to-be* improvement diagram.

To prepare the students for this assessment, we simulate a 'ball in the bucket' process where students try to toss a ball in a bucket from a distance. Through playing the game students learn to identify and improve process inefficiencies. In preparation for the real-life client interview, students experience a mock user requirements elicitation during a role-play exercise, to develop empathy, critical thinking, and problem-solving skills. In addition, guest lecturers are invited to discuss the role of the business analyst in industry and address students' questions. During workshops, students practice the drawing of the *as-is* and *to-be* states of business processes in BPMN 2.0 notation based on multiple case studies of varying complexity.

Assignment 3: Self-reflection and Presentation

In this assignment students reflect upon their strategy and approach to the previous assignments (i.e., the process they used) and the outcomes they achieved. While doing so, students must consider the design thinking approach and how it overlaps with, and differs from, the BPM lifecycle approach they followed in Assignment 1 and 2, While developing a *to-be* state of business processes, students often do not consider the feasibility of implementing and testing their suggested solutions. In Assignment 3, we ask students to brainstorm and deliver an oral presentation about their findings from Assignment 1 and 2, to discuss the implementation of their suggested improved *to-be* business process and the lessons learned. They also share the feedback received from their industry stakeholder and many of the student groups realise that they did not ideate well enough, and that the changes they suggested are not realistic to implement, especially from the time and budget constraints point of view.

We can overlay the design thinking principles with the three major assignments. Assignment 1 corresponds to the *Empathise* stage, where students become aware of the processes used in the industry through conducting an SLR. Assessment 2 corresponds to the *Define* and *Ideate* stage where students *empathise* with the industry stakeholders by understanding the existing *as-is* business processes used in the organisation. After the interview, students *ideate* to discuss possible solutions to improve the *as-is* business process and suggest the best solution as the *to-be* process. As preparation for assignment 3, students are expected to regularly reflect articulate their viewpoints in tutorial sessions. The design thinking approach and its underlying principles are explained to students in detail.

The next section describes the guiding principles underpinning the assignments in this BPM course. Other educators in the BPM community can benefit from incorporating these principles in their course assessment.

4 Guiding Principles

In all the BPM assignments (as explained above), we follow four underlying guiding principles (GP1-GP4), which are explained in this section. We have explained our approach in this paper, which can be adapted as required. We recommend that the BPM teaching community incorporate these principles in the design of their assessment structure. This can be done in various ways.

Below is a summary of the principles we follow in this course:

GP1: Cultivate real-world skills to produce industry-ready business analysts
The course develops an understanding of a specific industry and the processes it employs, through conducting an SLR. Students are given an opportunity to communicate with a real-world industry stakeholder by connecting them professionally, interviewing them, and asking for feedback about real world implementation constraints (such as time and budget). The seminars in this course include discussions about real-world organisations such as Toyota and Uber, and real-world challenges (e.g., disruptive technologies and COVID-19) and business process improvement approaches (Kaizen and Six Sigma).

The course also provides graduates with a foundation towards preparing for industry certification from e.g., the International Institute of Business Analysis (IIBA) or the Project Management Institute (PMI).

GP2: Follow a process-oriented approach
Understanding the importance of processes and following a process to execute a task are very essential skills for a graduate to be ready for industry (Hrabala et al., 2017; Seethamraju et al., 2012). A process approach is followed throughout the teaching and assessment of the course. Students apply the process embedded in the Covidence tool to conduct a systematic literature review, which illustrates the advantages of executing a process in steps. Students are exposed to both business process management lifecycle and design thinking, and how these two approaches differ.

GP3: Challenge assumptions by asking *why*
The BPM whole course is based on the principle that changes/improvements to business processes are not made for the sake of making them, but for a specific reason and in line with a business' strategy. Asking "why" is a fundamental aspect of a business analyst's critical thinking, problem-solving, and decision-making. It is important because it helps students to understand the root causes of a situation or problem, and to identify the underlying motivations, assumptions, and beliefs that are driving their own or others' behaviours. Asking "why" is a powerful tool for gaining deeper insights, challenging assumptions, and making better decisions, whether one is working on a complex problem or simply trying to understand a situation. By asking "why" repeatedly, students can drill down to the underlying cause of an issue rather than simply treating the symptoms. We

find that students from countries with a high 'power difference' (Hofstede, 2011) are not encouraged to challenge and ask why and this course provides them the freedom to do so in a safe learning. As future BAs their mindset changes to be more self-directed, motivated, and capable.

GP4: Encourage self-reflection and willingness to receive/provide constructive feedback

Self-reflection and giving/receiving feedback are important skills for students as they support deeper learning, self-awareness, motivation, and growth (Jalali, 2018). In this course a whole assignment is dedicated to self-reflection and feedback. Students are encouraged to think about what they've learnt. They receive feedback from other students, lecturers, and the industry stakeholder. Students also provide feedback to each other and to lecturers about ways to improve the course. The oral presentation builds students' confidence in articulating their thoughts, because they're talking about their own experience and mistakes they've made while completing the assignments.

5 Discussion

The overarching goal of this course is to prepare students for the capstone project and for the world of work, by providing then with useful and applicable business analysis skills and knowledge. In this paper we suggest the key guiding principles for assessment design that we apply in this BPM course, which integrate active learning and assessment for learning characteristics.

Active learning (as a teaching and learning philosophy) and AfL (as an assessment philosophy) are both useful approaches in this BPM course because both philosophies empower students to accomplish learning goals that address BPM future industry needs, through scaffolded feedback-driven activities and regular assessment where students are invited to learn, unlearn and relearn BPM concepts and skills. In this course we scaffold the assignments to build upon previous learning. We provide exposure to real-world problems, follow a process-oriented approach in teaching and assessment, and encourage self-reflection and feedback. Feedback can help students understand their progress and provide a sense of achievement and it can also help students identify areas for improvement in their work, leading to higher quality outputs and a deeper understanding of the subject matter. This can increase motivation and engagement in the learning process. Giving and receiving feedback also helps students develop communication skills as they learn to articulate their ideas, accept criticism, and provide constructive feedback to others.

Another important principle of the BPM course is to teach students to ask *why*, instead of blindly accepting what they are taught or what the user asks of them. Student and industry feedback provides a useful perspective on the BPM assessment design principles in this course.

These guiding principles for designing assessment components are mapped against relevant active learning approaches and AfL characteristics for each assignment, as summarised in Table 1.

Table 1. BPM Course Assignment Design Principles Mapped Against Active Learning Approaches and AfL Characteristics

Assignment	Guiding Principle	Active Learning Approach	AfL Characteristics
Assignment 1	GP1, GP2, GP3	Inquiry-based learning, Problem-based learning, Discovery-based learning	Authentic and complex assessment, Rich formal and informal feedback
Assignment 2	GP1, GP2, GP3	Collaborative learning, Inquiry-based learning, Project-based learning, Case-based learning, Problem-based learning	Authentic and complex assessment, Rich formal and informal feedback, Opportunities for practice and confidence building, Chances to evaluate and direct own learning
Assignment 3	GP1, GP2, GP4	Collaborative learning, Inquiry-based learning, Project-based learning, Discovery-based learning	Authentic and complex assessment, Rich formal and informal feedback, Opportunities for practice and confidence building, Chances to evaluate and direct own learning;

6 Future Research

Due to the limitation on the length of this paper, we plan to include further details in an extended paper about the effectiveness of the assessment structure and the guiding principles explained in this paper. This evaluation will be based upon the quantitative and qualitative feedback received from the students at regular intervals and at the end of the course. Additionally, we will provide details on how the learning outcomes from the BPM course connects with, and benefits other courses being taught in the Masters' program at the University of South Australia.

We also plan to provide further details about how the BPM course and other courses in the program prepares our graduates for their important role in the Digital Business Transformation of an organisation and to deliver 'Enterprise 4.0-ready business analysts'.

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