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EXPLORING EDUCATION IN THE DIGITAL AGE: INNOVATIONS, INTERSECTIONS AND INSIGHTS

PREFACE

Dear esteemed readers and contributors,

It is with great pleasure and excitement that I extend a warm welcome to you all to this special edition of our journal, dedicated to exploring the diverse and dynamic themes shaping the landscape of education in the digital era. As we embark on this journey of discovery, each theme serves as a guiding beacon, illuminating the innovative intersections of technology and pedagogy.

Our first theme, Teaching based on Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT), sets the stage for our exploration by delving into the transformative potential of intelligent technologies in education. From personalized learning experiences to predictive analytics, AI, ML, and IoT hold the promise of revolutionizing traditional teaching methods and unlocking new pathways to knowledge acquisition.

Theme 2 invites us to immerse ourselves in the realm of 360 Learning, Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Here, we witness the fusion of physical and digital worlds, as learners embark on immersive journeys that transcend the confines of the traditional classroom. Through experiential learning and interactive simulations, VR, AR, and MR technologies redefine the boundaries of education, offering unprecedented opportunities for engagement and exploration.

In Theme 3, we explore the power of Collaborative Teaching, Global Learning, and innovative practices such as Gamification, Maker-Space, and Maker Lab initiatives. This theme underscores the importance of collaboration, cultural exchange, and hands-on experimentation in fostering creativity, critical thinking, and problem-solving skills among learners worldwide.

Theme 4 sheds light on the paradigm shift towards Open and Distance Learning (ODL), Self-Instructional Materials (SIM), and the utilization of Big Data Analytics in Learning. Here, we witness the democratization of education, as learners gain access to high-quality resources and personalized learning experiences irrespective of geographical constraints. Big Data analytics further enhance the educational landscape by providing insights into learner behavior and preferences, enabling educators to tailor instruction to individual needs.

In Theme 5, we explore the evolving role of Social Media Learning as a catalyst for knowledge dissemination, collaboration, and community building. From online forums to multimedia platforms, social media offers a dynamic space for peer-to-peer learning, digital literacy development, and the cultivation of virtual learning communities.

Theme 6 invites us to embrace Design Thinking for new Learning Delivery, emphasizing the importance of user- centered design principles in creating innovative and inclusive learning experiences. Through empathetic design, educators can reimagine learning environments that foster creativity, adaptability, and lifelong learning skills.

In Theme 7, we delve into Andragogy in technology-based learning, Instructional Design, and Best Practices in e-learning. This theme highlights the importance of learner-centered approaches, effective instructional design strategies, and the dissemination of evidence-based practices to optimize learning outcomes in the digital age.

Finally, Theme 8 explores the Development of e-learning systems, materials, and mobile technologies, including the emergence of MOOC-based mobile learning materials. Here, we witness the evolution of educational technologies, as mobile devices and online platforms redefine the boundaries of access and engagement in education.

As we navigate through these diverse themes, let us embrace the spirit of inquiry, collaboration, and innovation that defines our scholarly community. I extend my deepest gratitude to all the contributors who have enriched this journal with their insights and expertise. May this edition inspire new ideas, spark fruitful discussions, and contribute to the ongoing dialogue surrounding the future of education.

Thank you for your dedication and commitment to advancing the frontiers of knowledge in the field of education.

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Incorporating the Concept of A.D.A.B into Curriculum Design: A Reflection Journey

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ABSTRACT
Developing a well-crafted engineering curriculum is paramount, particularly for subjects like thermodynamics. Despite the complexities of the subject matter and the diverse backgrounds of engineering technology students, there is a need for a comprehensive and relevant curriculum. This paper uses the A.D.A.B model to examine the curriculum design process for a thermodynamics course. This model involves the following key stages: Analysis, Design, Assess, and Build in Belief. Theoretical frameworks and practical challenges influence these stages. In addition, the DEAL model, which emphasizes reflection and action, is integrated to articulate the curriculum design process. Following the A.D.A.B model and incorporating insights from experienced experts enabled the instructor to design the course holistically. The curriculum developed was found to be comprehensive and relevant to the needs of engineering technology students. The research emphasizes combining structured methods (A.D.A.B) with reflective practices (DEAL) when developing curriculums. It provides valuable insights for educators and curriculum designers and highlights the significance of reflective essays within the community of practice. This approach ensures a holistic curriculum design and contributes substantially to Scholarly Teaching and Learning (SoTL) research.

Keywords: A.D.A.B model, curriculum design, reflective practice, engineering education

INTRODUCTION

Curriculum design is a multifaceted endeavour, intertwining practical application with foundational academic theories and methodologies. This intricate blending became particularly evident during the author's undertaking to develop a thermodynamics course for a second-year Bachelor in Mechanical Engineering Technology program (BMeT). The significance of adhering to the A.D.A.B principles was not only academically clear but also practically substantial, as these principles greatly influenced the creation of an effective and positive learning environment. In the contemporary educational landscape, where the emphasis on diversity, equity, and inclusivity (D.E.I.) is paramount, integrating A.D.A.B principles is not merely beneficial but a moral imperative. By embracing these principles, educational professionals pave the way for a more inclusive learning environment, empowering every student to reach their maximum potential.

The DEAL model serves as the underlying framework for this paper to provide a structured reflection on this curriculum design journey. While offering a personal account of my experience, this reflection also endeavours to situate the discussion within the broader academic discourse on curriculum design. This research focuses predominantly on the curriculum design process from the viewpoint of the curriculum designer, hereafter referred to as the instructor. The subject matter under scrutiny comprises two cohorts of students who have completed the course. Although the primary scope of this paper does not extend to a critical discussion on the students' perceptions, there will be some reference to the students' behaviour in the context of the "Assess and Evaluate the Action Taken" section, as observed from the instructor's vantage point. I have set the boundaries of this research paper with deliberate intent, and I hope they are seen as justified and relevant.

GUIDING LENSES: A.D.A.B AND DEAL MODELS EXPLORED

Clear and specific theoretical frameworks play a vital role in curriculum design. The A.D.A.B and DEAL models are two pivotal frameworks that offer a holistic view of the curriculum design process, combining action and reflection. Although each model has unique principles and methodologies, their roles and synergies are crucial in shaping and articulating the curriculum design journey. This section explores the significance of these models in the experience described in this paper, highlighting their intertwined roles.

A.D.A.B Model

Curriculum design has been the focus of numerous academic explorations, with various models and frameworks emerging over the years to guide educators. Central to this paper's reflection is A.D.A.B, a model rooted in deep-seated principles of Analysis, Design, Assess, and Build in Belief. The A.D.A.B model is extracted from a branch of Islamic Philosophy – the concept of *adab* – which emphasises a holistic approach to inculcating knowledge into human beings in any undertaking by understanding the appropriate contexts and proper order of things (Edy & Permata Sari, 2022). Hence, *adab*, concerning curriculum design, presents a structured and holistic methodology.

The Collaborative Group (C.G.) of the A.D.A.B Model is one of the innovative groups in the Centre for Innovative Delivery and Learning Development of Universiti Teknologi MARA, Malaysia. The C.G. introduced the A.D.A.B model to meet the objectives of the Malaysian

Educational Plan 2015-2025 (for tertiary education). The purpose also manifests the National Education Philosophy's goal to mould a balanced individual – physically, emotionally, spiritually, and intellectually. Under the guidelines of Education 5.0 at UiTM, the A.D.A.B model is emphasised in academic delivery and learning. This model is designed to guide and support academic members in delivering and planning learning activities based on the principles of *adab* and *amanah*. The A.D.A.B model consists of seven elements: Situate, Digest, Synthesise, Create, Connect, Reflect, Value, and Extend. The illustration of these elements that can be retrieved from the C.G. webpage https://cidl.uitm.edu.my/CG-ADAB.php is akin to the book's end concept in a unit of classroom delivery. Each element's explanation demonstrates how each can be performed in a unit classroom delivery. Consequently, the A.D.A.B model offers educators a holistic roadmap to effectively integrate and apply these elements in their teaching methodologies.

In my experience, incorporating the A.D.A.B model into thermodynamics courses has proven to enhance students' comprehension and application of the subject matter. This structured approach to teaching thermodynamics facilitates a more thorough understanding of complex concepts and their real-world relevance. Implementing the A.D.A.B model not only sparks students' interest and enthusiasm for learning but also contributes to improved academic performance and a deeper grasp of the material. Overall, it serves to create a more enriching learning experience for both students and educators. It concerns more than just disseminating information in the classroom: the A.D.A.B model should serve as the foundation of any effectively structured curriculum and a thriving academic program. The formulation of a comprehensive curriculum plays a vital role in preparing students for their desired career paths, and the inclusion of the A.D.A.B model is an indispensable instrument in accomplishing this objective. According to Miseliunaite et al. (2022), a holistic curriculum encompasses education that harmoniously integrates the intellectual, emotional, physical, social, aesthetic, and spiritual aspects of individual learning. It focuses on academic knowledge and developing the whole person, addressing their spirituality, inner self, and life skills. Hence, prioritising the A.D.A.B model during the early stages of curriculum development can foster a cohesive approach to inclusive education at both the classroom and unit levels. This assertion will be further explored in the next section by discussing reflective practices.

DEAL Model

On the other hand, in this paper, the DEAL model, distinguished by its phases of Description, Examination, and Articulation of Learning, serves not as an action guide but as a reflective lens. In this regard, the DEAL model offers a structured approach to reflection (Cowan, 2014). Thus, it provides a comprehensive framework for deepening understanding and fostering critical thinking in advancing SoTL research.

In an educational setting, students often engage in reflective writing to enhance learning outcomes and promote deep learning (Allan & Driscoll, 2014). However, reflective essays are also crucial for educators and the benefits extend beyond scientific paradigms. Morton (2009) underscores its power to refine teaching methods, even in rigorous scientific fields like physiology. Ramlal and Augustin (2020) emphasise that deliberate reflection boosts critical thinking and nurtures personal and professional growth. This sentiment is echoed by Cohen-Sayag and Fischl (2012), who found a direct link between reflective writing and enhanced teaching during teacher education. McKinney and Sen (2012) further advocate for its dual benefits: professional development and personal growth. These resources highlight the significant impact reflective writing has on professional development. Hence, by leveraging established reflection models, educators can sharpen their practices.

The research presented demonstrates that reflective writing is highly beneficial to teaching practice. However, help was needed in gathering sufficient SoTL research material to inform the design of the thermodynamics course. While empirical research on teaching and learning covers various topics like problem-solving techniques, memory retention, gamification, and motivation, the author's primary interest was personal accounts that provide insight into the process and key takeaways. Upon reflection, these experiences have provided valuable insights that equip me to make well-informed decisions when designing my curriculum (Miles et al., 2016). Thus, it is crucial to document the process undertaken to fill the knowledge gap in teaching practice and SoTL research.

THE FOUR STEPS OF THE REFLECTIVE PROCESS IN CURRICULUM DESIGN

Reflection plays a crucial role in curriculum design, enabling educators to develop material that connects learners on various levels. Throughout my journey in designing the thermodynamics course, I have encountered both enlightening and challenging moments. In retrospect, the A.D.A.B. model has provided valuable guidance for me during this process. This section delves deep into this transformative experience, shedding light on the nuances of each step, the intricacies of decisions made, and the underlying rationale that steered the path. To structure and display this reflective process, I employ the DEAL model, a robust framework that allows for a comprehensive exploration of experiences, enhancing our understanding and appreciation of the decisions and actions undertaken.

Step 1: Analysis to Acknowledge the Current Situation

As I began designing the course, I thoroughly examined the educational landscape to ensure my approach was innovative and relevant. In line with the A.D.A.B model's principle of '**Analysis'** and the **'Description'** phase of the DEAL model, this stage involves a deep understanding of the challenges faced by the instructor. I aligned the program outcome with specific course objectives and carefully selected relevant materials for effective delivery. Leveraging eight years of educator training, which encompassed a certificate in education, curriculum design, innovative assessment design courses, and a venture into a PhD in engineering education, comprehensive insight into the analysis process is gained. Additionally, I have applied educational theories such as experiential learning and social constructivism to this process. The analysis process will be presented in two parts. Firstly, the challenges faced by the instructor will be explored/outlined/examined. Secondly, the engineering technology accrediting board's program standard manual will be used to illustrate how these difficulties were overcome.

Challenges Ahead: An In-depth Examination

Two significant challenges were encountered when curating the curriculum for the BMeT program. The first of these challenges related to the design of a syllabus, the delivery of the material, and the evaluation of students. It is important, for example, to determine the appropriate depth and breadth of knowledge required for a bachelor's in engineering technology program, as distinct from engineering. Notably, Doorsamy and Padayachee (2019) articulated that transitioning from practical to theoretical ways of knowing indicates a shift from contextual to conceptual knowledge in engineering technology programs. It is also important to highlight that while engineering and engineering technology programs might present overlapping content and evaluation methodologies, distinctions exist in their roles and practices within the professional domain, as revealed by Rivera-Reyes et al. (2013).

The second challenge is to ensure that the BMeT program is aligned with the institution's mission and vision. One key consideration was designing the program to accommodate students from diverse educational backgrounds. This diversity was evident in the enrolled students' backgrounds, which included vocational education, local higher institution technician education, and engineering diploma graduates. Given Malaysia's diverse tertiary education system, developing a curriculum that offers fair content and assessments presents an opportunity for innovation and adaptation in the face of varied admission prerequisites. This presented a challenge: ensuring that all enrolled students, regardless of their educational backgrounds, have access to fair and high-quality content and assessments.

Navigating Solutions: Adopting the ETAC Program Standards

As described above, the first challenge in designing the curriculum for the BMeT program was resolved by understanding the program's standard guidelines and then choosing the program outcome standard that applies to this course. The International Engineering Alliance (IEA) clearly distinguishes between engineering and engineering technologies. It has established a set of Graduate Attributes and Professional Competencies (2021) that have been agreed upon by all signatories of the Washington and Sydney Accords. As Malaysia's representative among the signatories, the Board of Engineers Malaysia (B.E.M.) has created a program standard manual for both programs that all higher education institutions in the nation must adhere to. The Engineering Technology Accreditation Council (E.T.A.C.) oversees the Engineering Technology Programme Accreditation Standard for the engineering technology program. The guideline manual specifies 12 Program Outcomes (P.O.) that all curricula in the program must address.

Choosing an outcome that meets the E.T.A.C. program standard manual requires a careful and intricate process. It involves collaboration among the program and course experts, and the curriculum expert team works together to ensure that the outcome conforms to the outlined guidelines. This process is crucial in ensuring that the outcome is selected appropriately. E.T.A.C. mandates the involvement of an external examiner (EE) who is an academic in the relevant field from another higher education service provider. Moreover, an Industrial Advisory Panel (I.A.P.) in the same area assists in understanding the industry's current needs. Drawing upon the E.E. and I.A.P.'s valuable input, in addition to the instructor’s professional experience teaching thermodynamics courses, and a clear understanding of the attributes that define 12 Program Outcomes (P.O.), the first challenge was overcome by carefully choosing three P.O.s out of the 12 as shown in Table 1.

Table 1. Program Outcome Excerpt from Engineering Technology Programme Accreditation Standard 2020

Program Outcome	Program Outcome Description
PO2: Problem Analysis	Identify, formulate, research literature, and analyse broadly defined engineering problems, reaching substantiated conclusions using analytical tools appropriate to their discipline or area of specialisation.
PO3: Design/ development of solutions	Design solutions for broadly-defined engineering technology problems and contribute to designing systems, components, or processes to meet specified needs with appropriate consideration for public health and safety and cultural, societal, and environmental considerations.
PO7: Environment and Sustainability	Understand the impact of engineering technology solutions on broadly-defined engineering problems in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

While developing my course content, I primarily focused on the three program outcomes that necessitated my attention. Concurrently, I remained conscious of the anticipated diverse backgrounds of my prospective students. To effectively address this expected diversity, I employed the principle of constructive alignment. The process of the principle began with the selection of assessments based on the predetermined program outcomes, followed by the content selection for the course. To ensure the inclusivity and effectiveness of my course materials, I sought insights from the appointed EE, an expert who has previously taught the Bachelor of Mechanical Engineering Technology at their respective institution. Additionally, guidance from the appointed I.A.P. for the BMeT program proved invaluable in refining the assessments. The subsequent design section will present a comprehensive discussion of these methodologies.

Step 2: Design that Meets the Analysis

Gaining insights from experienced professionals was an absolute necessity in navigating the complexities of curriculum design. This phase was vital and aligned with the **'Design'** stage of the A.D.A.B Model and the **'Examination'** phase of the DEAL model. These consultations highlighted the intricacies of thermodynamics and its real-world applications, providing a roadmap for the curriculum design process. The course design process is inherently dynamic and non-linear, consisting of three main stages. Initially, insights are gathered from professionals. Then, cross-examination with assessment tasks takes place. Finally, a constructive alignment is achieved by harmonising the content, assessment, and delivery approach through the student learning time (S.L.T.). These stages often overlap and require frequent iterations and adjustments instead of following a strict sequential order. The following two sections describe the expert consultation process and a threefold assessment approach.

Expert Consultation: Setting the Curriculum's Cornerstones

I used the constructive alignment method to craft this curriculum, prioritising the assessment task as the starting point. This approach centres on identifying students' critical steps (related to program outcomes) and determining the most effective way to assess their proficiency. To achieve this, I drew from three educational theories: authentic assessment promoting real-world problem-solving (Dorfling et al., 2019), timely delivery ensuring continuous improvement, and scaffolding aiding students in methodical knowledge acquisition (Frank et al., 2018). This method has improved student satisfaction and academic grades (Larkin & Richardson, 2013).

Academic literature for thermodynamics engineering were utlilised as a research source to thoroughly benchmark multiple mechanical engineering technology programs. This first step facilitated a comprehensive understanding of the subject matter, helped identify areas of particular interest, and provided relevant insights to incorporate into content delivery. As Wolff (2017) emphasises, engineering education must prioritise real-world problem-solving, including the ability to navigate diverse contexts, which needs to be more apparent in curricula. Additionally, recognising the various broad practices – both in terms of knowledge and the people involved – that are necessary for real-world engineering situations is essential.

Incorporating insights from industrial practitioners into engineering curricula can be beneficial and necessary, according to Trevelyan (2019). However, many engineering schools need faculty members with practical, outside experience beyond research laboratories. Hence, the faculty's knowledge of current industry practices can be limited. To bridge the gap between academic education and the practical needs of the engineering industry, including insights from industry experts is essential. Expert consultation was undertaken via the E.E. panel and I.A.P. Their feedback was utilised to inform the selection of topics and assessment tasks aligned with industry best practices. Therefore, it is imperative to develop authentic learning and assessment opportunities that focus on understanding concepts, adapting to various contexts, recognising different organising principles, and not relying solely on conventional assessments like final examinations.

After conducting a comprehensive analysis of the E.T.A.C. standard's predetermined Program Outcomes (P.O.s) for this course, thoroughly reviewing meticulously curated course content and benchmarks, and consulting with the E.E. and I.A.P. regarding content materials and necessary skills to be assessed, the conclusion was reached to assess students' proficiency in this course through two distinct forms of evaluation. These assessments will gauge the mastery of three P.O.s.

Dissecting the Threefold Assessment Approach

Prioritising the assessment approach in designing the course is necessary because every student must achieve the desired course outcome that aligns with the established program outcome at their best level, considering their diverse academic backgrounds. According to Bergin et al. (2015), to ensure students have the necessary knowledge to excel in their learning, the first thing is to address the learning outcomes and then develop assessment criteria directly related to these. Doing so ensures that the content, assessments, and learning outcomes align and are critical to effective learning and teaching. Hence, in this course, two assessment forms, namely, the final exam and the assignments, are used to measure the three P.O.s. The final exam tests students' understanding of fundamental thermodynamic concepts (PO2). The remaining two assessments are assignments that assess students' problem-solving skills (PO3) and their comprehension of sustainability concerns (PO7) in various industrial scenarios.

Final Examination: Assessing Fundamental Thermodynamics Concept

The primary objective of assessing PO2 is to evaluate students' capability to identify problems associated with thermodynamic concepts. Students' proficiency in the course can be discerned from their mastery of analysing these concepts. The design of the final exam questions is guided by Bloom's Taxonomy, which requires students to comprehend the core concept of a problem and then apply the appropriate mathematical expressions for its resolution. By evaluating the results of this assessment, I can identify the course's most talented students. It is noteworthy that the P.O.s are exclusively assessed through the final examination.

Consequently, the results from this examination provide invaluable feedback, enabling the instructor to undertake continuous quality improvement (CQI) initiatives. This feedback aids in refining the alignment between the taught content and the elements assessed in the final examination. It also serves as a guiding reference in scrutinising the exam questions to ensure their quality.

Assignments: Evaluating Problem-solving Sustainability Insights

On the other hand, the primary goals behind assessing PO3 and PO7 are twofold. Firstly, it aims to introduce students to authentic assessment, where they are confronted with problems mirroring real-world scenarios. Sokhanvar et al. (2021) highlight that such authentic assessments can profoundly enhance the learning experiences of higher education students by bolstering their engagement, augmenting their satisfaction, and positively shaping their endeavours to attain educational objectives. Jonassen et al. (2006), who emphasised the importance of providing students with real-world problem-solving skills throughout their academic journey, have long emphasised this sentiment. This proactive approach prepares them to address challenges smoothly upon transitioning to the professional sphere.

To align the assignment task with the course content and the expected outcomes of a BMeT graduate, I incorporated a natural language processing A.I. chatbot to formulate a hypothetical case centred on various industrial scenarios. To illustrate the process in this paper, I have chosen to focus on the steam power plant industry. This thematic choice resonates with the engineering thermodynamics applications presented within the course. The development of this case study was a mix of textbook research, desktop benchmarking, and invaluable insights from appointed E.E. and I.A.P. experts. It is worth noting that the material, once curated, underwent careful review by the I.A.P., a professional with over two decades of experience in the oil and gas industry. His expertise in talent selection augmented the authenticity of the assignment, offering a realistic perspective on the role of a mechanical engineering technology graduate in the scope of steam power plants.

Step 3: Assess and Evaluate the Action Taken

Upon gaining a more precise understanding, I incorporated insights and feedback from various stakeholders to develop a teaching curriculum that balanced challenges with constructive alignment. This transformative process was emphasised by the **'Assess'** stage of the A.D.A.B.

model and the first two parts of the **'Articulate Learning'** phase of the DEAL model. Since September 2023, I have successfully taught the planned thermodynamic course for two consecutive semesters to a diverse range of entry-level students, including those in matriculation, vocational education, polytechnic, and engineering diploma programs. As previously mentioned, my curriculum design centres around assessment. As a result, the potential effects of changing my curriculum design concerning the evaluation within the constructive alignment framework are intriguing. In this section, the valuable lessons learned will be explored in further detail.

<u>The Authentic Assessment Paradox: From Contextual Approaches to Modularity</u>

The adoption of authentic assessment was driven by creating evaluation tasks that were not just a measure of knowledge but a comprehensive evaluation of a student's capacity to apply, analyse, and synthesise knowledge in scenarios that reflect real-world situations (Sokhanvar et al., 2021). The approach aimed to ensure that assessments were not isolated academic exercises but were closely linked to practical relevance and applicability. To better align assessments with learning goals, each task was carefully designed to measure specific skills and knowledge areas, to evaluate knowledge and its application in real-world contexts beyond the classroom.

My attempt to create an authentic assessment benefited from a thorough combination of textbook research, desktop benchmarking, and crucial insights from appointed E.E. and I.A.P. experts, ensuring that the task was academically challenging and resonated with real-world industrial scenarios. The case development, while enriched with authentic insights and professional expertise, particularly from an I.A.P. professional with over two decades of experience in the industry, inevitably became a focal point around which the learning experiences orbited.

Miseliunaite et al. (2022) rightly point out the challenges of incorporating authentic assessments into a standardised curriculum, which mirrors the complexities encountered by the author. Each authentic assessment, such as the one focused on the steam power plant industry, was carefully designed to be practical and applicable to the industry. However, the unique context of these assessments also created distinct learning modules that were limited to the scope of each assessment task. As a result, the curriculum offered rich and authentic learning experiences for each segment. Still, there was a risk of becoming an isolated island of knowledge and skills tightly tied to its corresponding assessment. While each module provided depth and relevance in its learning experiences, the overall connectivity and integrated application of knowledge across different modules became obscured.

As I strived to deliver authentic, practical, and industry-oriented educational opportunities, I stumbled upon a modular curriculum. However, upon reflection, I appreciate the need for a delicate balance between maintaining the authenticity of assessments and preserving a cohesive, interconnected learning journey for students. This realisation is pivotal in shaping curricular, and assessment approaches that provide students with genuine and relevant learning experiences and facilitate a comprehensive understanding and practical application of their knowledge and skills across diverse domains.

Final Examinations: Balancing Contentment and Fundamental Comprehension

As a professor, I really can't emphasize enough how crucial it is to receive feedback from final exams. It's an invaluable tool that helps me enhance the quality of my teaching. Analyzing exam results allows me to fine-tune the course content and ensure that the exam questions closely reflect the material covered. I've noticed that while both sets of students, I've taught have generally balanced confidence and preparedness, every student possesses a distinct learning style and individual goals. Hence, it has made me realise that students need to have realistic expectations of undergraduate studies and that their academic and behavioural confidence should be boosted, as scholars such as Nicholson et al. (2013) suggested.

Unfortunately, I have noticed that some students who perform well in coursework tend to become overconfident and fail to prepare adequately for final exams. This pattern has made me consider the psychological factors influencing student readiness and academic performance. It is crucial to address these factors so that students can achieve their full potential in their educational pursuits. Final examinations comprehensively evaluate a student's underlying knowledge and understanding of a subject. When dissociated from the influence of coursework grades, these exams offer an authentic glimpse into the extent of students' grasp of essential concepts, their analytical prowess, and their aptitude for applying acquired skills to practical scenarios. Unlike cumulative coursework achievements that can sometimes be softened by sustained performance, final exams present an unfiltered assessment that captures and demonstrates students' genuine abilities without external buffering or bias.

Step 4: Build in Belief from the Experience

The culmination of this journey was rich in insights and growth. The built-in belief stage of the A.D.A.B. model and the more profound reflections of the second part of the 'Articulate Learning' phase of the DEAL model underscore the dual advantages for educators and students. On the one hand, the journey provided personal growth and insights into embedding reflection and espoused value.

Embed Reflection: The Mirror Experience and Practice

The importance of reflection in this curriculum design context was particularly evident in the complex process of navigating the program's guidelines and selecting a program outcome standard that aligns with the course. The choice of program outcome was not a mere compliance exercise but a deeply reflective process. It required an introspective exploration of the delicate balance between adhering to established guidelines and ensuring the relevance, applicability, and authenticity of the program outcomes in the context of the course.

Throughout the reflective process, each stage was executed with meticulous attention and enthusiasm, from understanding the specified graduate attributes to choosing from the 12 program outcomes (P.O.) of the Engineering Technology Accreditation Council. The collaboration with subject matter experts, the external examiner (EE), and the Industrial Advisory Panel (I.A.P.) added substantial value to the process. It integrated external expert perspectives into the internal reflections, ensuring that the selected outcomes were theoretically sound and validated through practical, industry-relevant insights and academic expertise.

This reflection shaped the curriculum and teaching practices to remain dynamically aligned with explicit and implicit requirements. It ensured they were molded with a deep understanding and consideration that only a reflective, holistic approach could provide. Such an approach fosters the development of a curriculum that meets the needs of the students, the course, and the broader educational journey.

Espouse Values: Anchoring Practices in Principles

Incorporating values into the educational journey ensures students have an enriching and supportive learning experience. By evaluating every aspect of the learning experience through the lens of these values, we create a learning environment that is both academically enriching and ethically and emotionally supportive.

One example of this values-driven practice is the challenge of aligning the program with institutional directions. The curriculum was designed to align with the UiTM's mission and vision, enabling students from various educational backgrounds to join the program. These backgrounds included vocational education, technician education from local higher institutions, and engineering diploma graduates. Creating a curriculum that could cater to all these backgrounds posed a challenge. However, the A.D.A.B model enables instructors to ensure equitable access to content and assessments, reflecting the values of inclusivity and student prioritisation in curriculum development and implementation.

Another value that became evident in the course design was prioritising student needs. The assessment process requires addressing learning outcomes and developing criteria to align content, assessments, and learning outcomes. While the final examination assesses students' cognitive skills in analysing a problem, assignments assess students' ability to solve a hypothetical real-world problem while gauging their awareness of sustainability issues. This approach aims to ensure that every student, regardless of their diverse capabilities, can achieve the desired course outcome, reflecting a practical application of the value of guaranteeing academic enrichment.

NAVIGATING AHEAD: KEY GOALS FOR FUTURE ENDEAVORS

Developing a comprehensive and adaptable curriculum for higher education is a multifaceted task that requires careful consideration. The A.D.A.B model provides valuable insights on how to approach this challenge. In promoting continuous growth, it is essential to prioritise student-centred learning by leveraging students' active engagement in giving feedback. In this section, I propose strategic areas of focus based on my reflective journey.

Implementing an assessment-driven curriculum has enriched understanding and enhanced student engagement strategies. These strategies involve integrating active learning techniques and understanding the specific needs and preferences of the student demographic. Employing pedagogical methods, such as flipped classrooms or problem-based learning, will enable students to immerse themselves actively in the learning process. The aim is to establish a learning environment where students are not merely passive recipients of information but are actively involved in constructing their knowledge and skills.

The Assess and Build in Belief phase is the steppingstone to continuous professional development. It is essential to go beyond merely participating in professional learning communities and focus on an iterative process of learning, applying, reflecting, and modifying teaching practices. This approach ensures that teaching practices align with current educational research and meet the unique needs of students. By synthesising theoretical knowledge from scholarly teaching and practical insights from the classroom, we can develop a well-informed and balanced approach to curriculum development and delivery. Doing so will create a more impactful educational environment where students can thrive and reach their full potential.

CONCLUSION

The intricate process of designing a well-tailored engineering curriculum necessitates a harmonious blend of structured models, like A.D.A.B, and reflective practices, as emphasised by the DEAL model. This research underscores the significance of these elements in addressing the diverse needs of students and the inherent complexities of subject matters. The implications for the CoP are clear: a systematic approach to curriculum design and continuous reflection can drastically enhance the learning experience and elevate the professional endeavour. Collaborative efforts through expert consultations play a vital role in improving the comprehensiveness and relevance of the curriculum. By integrating these insights and engaging in SoTL research, educators can create holistic courses that align with the evolving demands of the educational landscape. This paper highlights the value of combining structured methodologies with reflective actions, paving the way for educators and curriculum designers to chart a path forward.

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Conflict of Interest

The author declares no conflicts of interest regarding this research study.

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