



**Real Application of
Transformative Approaches for**

Teaching and Learning in the 21st Century

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Special Dedication

This book is dedicated to UNIMAS academicians who work hard in conducting the best teaching and learning experience. This book is hoped to be an inspiration to educators on how to implement the teaching and learning process more effectively.

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Preface

“It’s not just learning that’s important. It’s learning what to do with what you learn and learning why you learn things that matter.” -Norton Juster

The Real Application of Transformative Approaches for Teaching and Learning in the 21st Century book was produced to appreciate the transformative work of lecturers in teaching and learning. This book is expected to serve as a guide to other lecturers in helping them to improve their teaching approach, delivery, and assessment of their courses. Lecturers can also use this book to develop their ideas and creativity in designing teaching and learning according to current needs and align with the learning outcomes of the course.

Global changes in the twenty-first century have altered the landscape of teaching and learning, particularly in delivery methods, approaches, and assessments. This is due to the fact that the student body is made up of generation Z, who have different styles of learning than that of the lecturers. Conventional methods used by lecturers are no longer an option for today’s students. Therefore, lecturers must transform their teaching and learning in order to be relevant to today’s students.

The combination of transformative approaches introduced becomes the strength of this book's content. Authors combine diverse approaches, delivery, and assessment in teaching to ensure the effectiveness of teaching to students. Moreover, the collaborative approach used provides an alternative for lecturers to minimize the burden on students for courses taken. This approach has the potential to have a greater impact, particularly in terms of student understanding of learning.

The element of creativity incorporated is also a strength of this book. Authors explain some terms and concepts using diagrams and figures to help the reader understand. The steps and procedures for carrying out teaching and transformative approaches are stated in a systematic manner to help the reader understand what is being conveyed.

The book also includes writers from various backgrounds. This distinguishes it as a unique and comprehensive manuscript. Readers are guided through conceptual and practical understanding of teaching and learning methods. The author's presentation of basic concepts and applications can help the reader understand knowledge more deeply and broadly.

Crafting a learning environment where students are able to explore and understand how the physical world works, and to connect complex scientific concepts to their daily lives is vital. It also includes building students' confidence in their ability to solve challenging problems and empowering them to build a better future for themselves and others. CTS is one of a better way of learning that will prepare students towards focusing on being very collaborative, self-motivated and self-directed all the time staying true to the lifelong learning values, which are imperative to carve a better future for the students in their field of choice.

The next project is related to the environmental issues relating to solid waste, wastewater, and hazardous waste viewed in the context of their treatments. This course has been implementing service learning (SULAM) as a part of an immersive learning approach since Semester 2, 2017/2018. In the previous years, i.e. 2017/2018, and 2018/2019, the

course assessment included either a final examination (40%, session 2017/2018), or a mid-term examination (30%, session 2018/2019). Although SULAM implementation in this course has generally improved the CLO achievement since 2017/2018, the pen and paper examination has resulted in some students not achieving the intended CLOs. Instructors were not sure on the effectiveness of examination in creating a deep learning experience for students.

Therefore, in semester 2, 2019/2020, mid-term examination was replaced with case-study analysis to (1) encourage higher order thinking skills among students and (2) cultivate the sense of commitment and responsibility among students to find innovative solutions towards waste management issues. In addition, students' e- SULAM projects as well as group discussion and engagement with target community were implemented on online platforms. Students' reflection on their e-SULAM projects was recorded on their e-portfolio. Implementation of immersive learning through blended learning in this course has resulted in improved CLO achievement as compared to the past two years. Students' reflection on their learning experience in this course implied the effectiveness of immersive learning (blended learning) approach in this course.

Besides that, the project involved transforming the typical class lecture into an interactive scientific communication environment. Students were exposed to the real scientific communication via workshop-style delivery, project-oriented problem-based learning (PoPBL) on proposal writing projects, and brainstorming/discussion activities during weekly meetings. The initiative eliminated the traditional lecture and end-of-semester assignment practices.

Another project is MATHX Project, a new project-based learning instrument that allows digital students to work collaboratively, purposely implemented to develop teamwork and student's management skills. Students translated acquired knowledge to applications and STEM projects. The integration of digital technology used in this project helps students create meaningful and enjoyable learning experiences in Mathematics.

The following project is related to the assessment in learning. In order to improve learning via assessment conduct, assessment must be objective, significant, and magnitude. OSPE has/have been adapted and implemented for Biology students in Centre for Pre-University Studies to assess know-what and know-how practical competencies following the objective and structured manner with direct observation of the students' performance. The assessment provides meaningful learning experience to the students as it can assess all three domains (cognitive, affective, and psychomotor).

Furthermore, the enriching immersive learning experience during movement control order (MCO) was possible through blended learning substitution method. Finally, one project is related to social media and animation software offering several attractive features that may overcome the limitations of the existing educational portals. The team introduced the use of YouTube, Instagram, and Doodly as supplementary platforms for teaching Environmental Biotechnology in Semester 2 2019/2020 which resulted in excellent academic performance and positive feedbacks from the students.

Finally, this book discussed also describe the course MDP30609 Community Medicine and Public Health posting, the assessment has been modified by adopting the Alternative Assessment method. The Alternative Assessment is regarded as comprehensive, where it assesses the candidates' ability to integrate writing task and performance, divergent thinking in solving problems and enhancement of meaning skills.

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Experiential Learning in Introducing Information Systems

Ahmad Alif bin Kamal, Adrus bin Mohamad Tazuddin, Chong Chee Jiun, Tarmizi bin Mohammad Shukri

Summary/Synopsis of Project/Initiative

Introducing new knowledge with certain depth such as “Information Systems” to pre-university level has always been challenging. Majority of the students came from pure sciences background, and there are some among them with IT sciences in SPM yet still have limited exposure to the ICT field. To tackle this issue, experiential learning was implemented. The students undergo a series of activities for them to experience the workflow of a System Analyst before facing the assessment for this learning unit. A System Analyst expertise and specialize in Information Systems building and designing.

Project Rationale

Information systems topic or learning unit often requires the theory and concept to be read and elaborated for students or learners to grasp its understanding. Usually, the topic is often delivered in a dull and inactive manner via lecture with wall of texts in lecture notes or

slides. Furthermore, assessment is commonly carried out conventionally through tests or quizzes where those who can memorize better will score more as compared to the others. Additionally, it is hard to enhance and capture students' interest and motivation to enjoy the learning process for this learning unit.

In the effort to empower students in their learning and making the process personalized, experiential learning concept was used to tap into learners' own wisdom to experience and grab the new knowledge and theory. As to promote active learning, experiential learning approach is in line with student-centric and social constructivism. Generally, there are four steps in experiential learning [1] (i) experience; learners perform classroom activities, (ii) reflection; students reflect upon the knowledge learned in the activities, (iii) generalization; the process where learners fit the knowledge acquired into a more general, real-world understanding and circumstances, and (iv) application; students display their learning through new behaviours. The four steps are closed in a loop (after "application" it goes back to "experience"). ICT knowledge are relatable to real-world [2] as it is applied and the tools advance and expand daily as the biggest purpose to deploy experiential learning.

Approach

The transformative approach based on the philosophy above is designed originally as in-the-task sheet displayed in eLEAP. The whole session is developed with the thoughts on following the four steps previously described. In the first step, introduction of the learning unit is given. Also, learning materials are provided virtually in eLEAP. In the second step, students will be engaged in a group activity by creating a design of an Information Systems of their choice. In the third step, the instructor reviewed and gave feedbacks on students' work as well as provided some authentic examples. Lastly, students took their assessment and evaluate the session.

The classroom (session) follows the task sheet provided. The class schedule is released prior for the students' early reference. At the start of the session, a lecture was conducted to debrief the session, shared the course outline and unit learning outcomes as well as introduced the Information Systems. A short video followed to provide a multimedia presentation on the topic. Then, students went into their groups and used the lesson plan in eLEAP as learning materials to prepare a "paperwork" containing the design of an Information Systems of interest by following the instruction in eLEAP. Each instruction that the students must follow was prepared in the paperwork provided in the lesson plan. After all groups have submitted their paperwork, the instructor reviewed and provided feedbacks for the class. A few more examples were also shared. Then, the students took a quiz, where the marks were recorded as their carry marks and the session was then concluded with reflection writing. In a nutshell, this implementation is designed to be meaningful for other ICT sessions which involved designing an idea or framework related to the concept. Moreover, the process here is prepared to cater large group of students and make it implementable in a session lasting for a couple of hours.

This approach focuses on the learning process to empower students [3]. It allows the students to learn at their own pace [4], but the timing is controlled within the session. Students own wisdom play out as the class activity requires them to select their desired interest as the learning content for their group work. Moreover, this increase their innate motivation [5] as it caters their interest. As they undergo the process of designing the Information Systems, they will have to think within the ICT aspects and aspects to improve the daily lives. Feedbacks provided by instructor onto their design enable students to evaluate their own work and improve their learning experience. Additionally, informal learning happens [6] as well which have improved their communication and team working ability.

When students wrote how fun the session was, it demonstrated that they were engaged in the activities provided. To them, their participation towards making and submitting interesting works were in line with the learning unit. They also felt that the activities were helpful. The positive feedbacks given showed that the learning materials used for their discussions and task completion were able to engage them actively with the learning process.

Impact on Students' Learning

Based on the students' quiz result shown in Figure 2, the approach enabled an increase in students' knowledge performance for this learning unit. As shown in the graph, the results are skewed to the left, meaning that most of the students scored a 3 to 5 marks out of the total 5 marks given. The mean mark for 205 students taking the course was 3.69, equivalent to 73.77%, with standard deviation of 1.01. Zero students scored a 0 for the quiz even though there is a small number of students that obtained 1 mark.

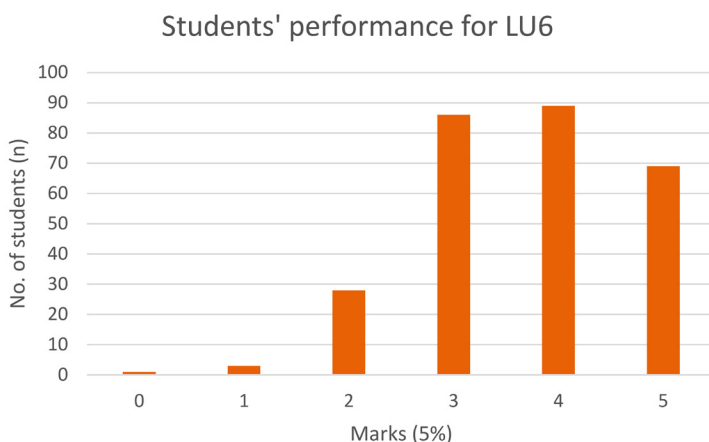


Figure 2: Students' LU6 quiz results

This project also requires students to handle eLEAP modules which include the lesson plan, embedded video, forum for general use, and quiz. Through engaging discussions, students together ruled out a point of interest

for their group submission enabling them to enhance their functional skills such as digital, analytical, and critical thinking skills.

To actively learn and complete their group work, communication is imperative [7] for all individual group members. This is especially important when trying to convey their thoughts and opinions on a new concept. Teamwork played a huge role in ensuring their group was able to prepare a submission of quality to achieve the learning outcomes. Leadership in some of the group members was another attitude that have contributed towards an improved learning experience.

Improvement Project/Initiative in Future

Experiential learning has huge success [8] and applications in terms of improving teaching-learning delivery [9] and experiences, not limited to ICT courses only. However, implementing it requires an in-depth planning to ensure learner empowerment is achieved. In the future, teaching-learning initiative such as this would be considered and planned for more learning units, across multiple fields and courses, to observe more variation and execution of experiential learning philosophy.

In recent global pandemic, this initiative can also be further enhanced through the capabilities of e-learning. As connectives and engagement which plays a wider role in shaping the global education today, researchers must be updated with the advancement and study more on how to connect and reshape these teaching philosophies together to ensure that no learner will fall behind through this tough times.

Related Learning Outcome Clusters MQF 2.0

Cluster 5

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Keywords

Learner empowerment, experiential learning

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