THE EFFECT OF PROJECT-BASED LEARNING THROUGH MOOC IN DEVELOPING 21st CENTURY SKILLS AMONG KPTM KUANTAN STUDENTS

NURUL HUDA BINTI IBRAHIM

UNIVERSITI PENDIDIKAN SULTAN IDRIS

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ABSTRACT

This study aimed to investigate the implementation of project-based learning to enhance students' skills in the 21st -century. The constructivist perspective was adopted, in which the study participants immersed themselves in the activity and built new skills in the MOOC Module. The scope of the study encompassed 196 students was selected from the Semester One students in Kolej Poly- tech MARA Kuantan. The research methodologies used to conduct the study were qualitative (questionnaire) and quantitative (interview and observation). The data were collected, codified, and analyzed based on the instrument adapted from the work of multiple researchers. According to the interview and observation findings, PjBL had a beneficial effect on students. Results from a paired sample t-test analysis indicate that a growing number of skills in communication skills ($t = 60.86$), creativity skills ($t = 43.00$), problem-solving skills ($t = 30.87$), and critical thinking skills ($t = 67.76$), and collaborative skills ($t = 2.06$) have been developed as a result of the implementation of PjBL via MOOC. The study results indicated an increase in skills developed following the implementation of PjBL through MOOC and broadening opportunities for discussion. Results from the questionnaire distribution, observation, and interviews revealed that the respondents accepted the project-based learning through MOOC. Using PjBL, through MOOC, allows students to apply their knowledge to in-depth investigation and documentation of education, resulting in students taking control of their learning responsibilities. In this work, significant recommendations were included for educational leaders, educators, parents, and students to focus on academic achievement especially in collaborative skills.

KESAN PEMBELAJARAN BERASASKAN PROJEK MELALUI MOOC DALAM PERKEMBANGAN KEMAHIRAN ABAD KE 21 DIKALANGAN PELAJAR KPTM KUANTAN

ABSTRAK

Kajian ini bertujuan untuk mengkaji perlaksanaan pembelajaran berasaskan projek yang bertujuan untuk meningkatkan kemahiran pelajar abad ke-21. Menurut sudut pandangan konstruktivis, di mana peserta kajian telah menyertai aktiviti dan meningkatkan kemahiran baharu dalam modul MOOC. Kajian ini melibatkan 196 pelajar, yang dipilih secara rawak daripada semester satu di Kolej Poly- tech MARA Kuantan. Metodologi yang digunakan untuk menjalankan kajian adalah strategi penyelidikan kualitatif (soal selidik) dan kuantitatif (pemerhatian dan temubual), untuk mengumpul maklumat bagi menjawab persoalan kajian. Data yang dikumpulkan, dikodkan, dan dianalisis berdasarkan instrumen yang diadaptasi daripada beberapa penyelidik. Berdasarkan dapatan kajian melalui sesi temubual dan pemerhatian, PjBL melalui MOOC memberi kesan yang positif terhadap kemahiran pelajar. Keputusan daripada analisis ujian *t* menunjukkan peningkatan kemahiran komunikasi ($t = 60.86$), kemahiran kreatif ($t = 43.00$), kemahiran menyelesaikan masalah ($t = 30.87$) and kemahiran berfikir secara kritis ($t = 67.76$) dan kemahiran kolaborasi ($t = 2.06$) selepas perlaksanaan PjBL melalui MOOC. Secara keseluruhan keputusan daripada kajian ini menunjukkan peningkatan kemahiran abad ke 21 dan memberi peluang yang luas untuk kajian ini dibahaskan dengan lebih mendalam. Hasil keputusan kajian dari soal selidik, pemerhatian dan temubual menunjukkan pelajar menerima pembelajaran berasaskan projek melalui MOOC. Pembelajaran berasaskan projek melalui MOOC ini memberi peluang kepada pelajar untuk mengaplikasikan siasatan secara mendalam di mana pelajar mengambil tanggungjawab dalam kawalan kendiri. Kajian ini juga memberi cadangan kepada pendidik, ibubapa dan pelajar dalam memberi fokus kepada peningkatan dalam akademik terutamanya dalam aspek peningkatan kemahiran kolaborasi.

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LIST OF ABBREVIATIONS

PjBL	Project-Based Learning
MOOC	Massive Open Online Course
MOE	Ministry of Education
NEB	National Education Blueprint
ADDIE	Analysis, Development, Design, Implementation, and Evaluation Model
CTS	Critical Thinking Skils
ZPD	Zone Proximinal Development
KPTM	Kolej Poly-Tech Mara

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In this age of the 21st-century curriculum paradigm shift, educators and students must be prepared to keep up with the times in terms of competencies, skills, attitudes, and learning resources. In the 21st century, change occurs at an incredibly rapid pace and is extremely difficult to predict from all aspects of life. Attempts to foresee and manage 21st-century change through education are crucial, education plays a major role in shaping the younger generation's abilities and the overall direction they take, so those young people have special abilities in preparing for the 21st century. It is suggested that the 4C's abilities to deal with question are: 1) critical thinking and problem solving skills, 2) creativity and innovation, 3) communication, and 4) teamwork. Students especially in the areas of geography that need to have an understanding of academic content at a higher level to meet the interdisciplinary theme of the 21st century, such as global awareness, civic literacy, health literacy, and environmental literacy, are required to study far more intensely than in any other subject.

The higher education trajectories that will really help students to prepare for the future have a great impact on students and families, investing both time and money, and on employers and community candidates who are interested in a professional career. It also raises a more general question such as should graduates' employability be at the heart of higher education's mission? A few exceptions have been made, such as workforce development programs and specialized degrees for licensed professions, which were previously considered non-traditional. As time goes on, teachers are required to bring forth a lot of breakthroughs in order to fulfill educational goals. The innovative breakthrough that is planned is, for instance, making available updated learning strategies such as instructional strategies, instructional methods, and learning techniques to support students' access to 21st-century competencies. In the process of implementing education reform, educators encounter failure in multiple aspects of education reform planning, learning processes, and evaluation because of incorrect identifications of technical problems. To complete this section, it should be noted that teachers concentrate on helping their students hone their critical thinking skills by incorporating that into their subjects; not teaching critical thinking skills separately, so it results in suboptimal pedagogy.

The educators should identify the various skills that a student must acquire in order to be a beneficiary of the international economy. General education of poor quality, it is claimed, hinders a workforce's ability to be trained, to adapt, and to be productive. This is especially true when it comes to social and emotional skills. After developing at a young age, it is difficult to change these abilities and characteristics once they have been established. It will be easier for educators to transform their classrooms into places where students are empowered and prepared for success if they

learn a living while they are teaching. There have been numerous studies conducted to determine the types of skills required by the global economy. Skills such as generic abilities, operational abilities, intellectual abilities, communication abilities, social abilities, technological abilities, economic abilities, emotional abilities, and a slew of other abilities must be developed at the elementary and secondary levels. These requirements must be incorporated into the general education programs that we provide. This is the challenge that we are facing right now: the transformation of knowledge into skills.

There are field learning techniques or experiential learning and outdoor study techniques which renew every year in geography subjects. Developing 21st-century methods such as role-play and debate in which consideration is given to how appropriate these methods are for communication and critical thinking while they take into account their qualities are designed for students to gain a better understanding of interdisciplinary topics like global awareness, civic literacy, health literacy, and environmental literacy. Since we are having new concepts in experiential learning-based learning methods and in providing students with the concepts of global awareness, civic literacy, health literacy, and environmental literacy, we will also have new methodologies to assist with students' communication and cognitive thinking skills.

Up to now, Malaysia faces a new set of challenges in the twenty-first century. It provides the highest level of skill development of any educational institution for students, preparing them to lead the next generation with the soft skills required to lead society. Furthermore, people with well-developed soft skills have better opportunities to apply their skills in the real world than those who do not have soft skills find

themselves without skills (Wikle and Fagin, 2014; Tsitskaria et al., 2016). Because of recent graduates' insufficient skills, the percentage of unemployed graduates rises year after year. In 2015, about 40,000 college graduates between the ages of 25 and 34 had a 15.3 percent unemployment rate. Another 27.9 percent of college graduates aged from 25 to 34 were unemployed in 2015.We calculated the graduates' unemployment rate at the school to be 28.9%. The unemployment rate for graduates with a bachelor's degree from private universities was 26.3 percent in 2016 (Seng, 2018). The Department of Statistics Malaysia (2020), stated that the number of unemployed graduate is a critical issue.This number is expected to rise by 5.3% to 5.7% per year by 2020. The main contributing factor to such a problem is the degree to which graduates have gained or lost their soft skills. Today's students only continue their education to pass the exam, with no improvement in social knowledge or soft skills. **Figure 1.1** shows the unemployment rates of recent graduates over the next several years**.**

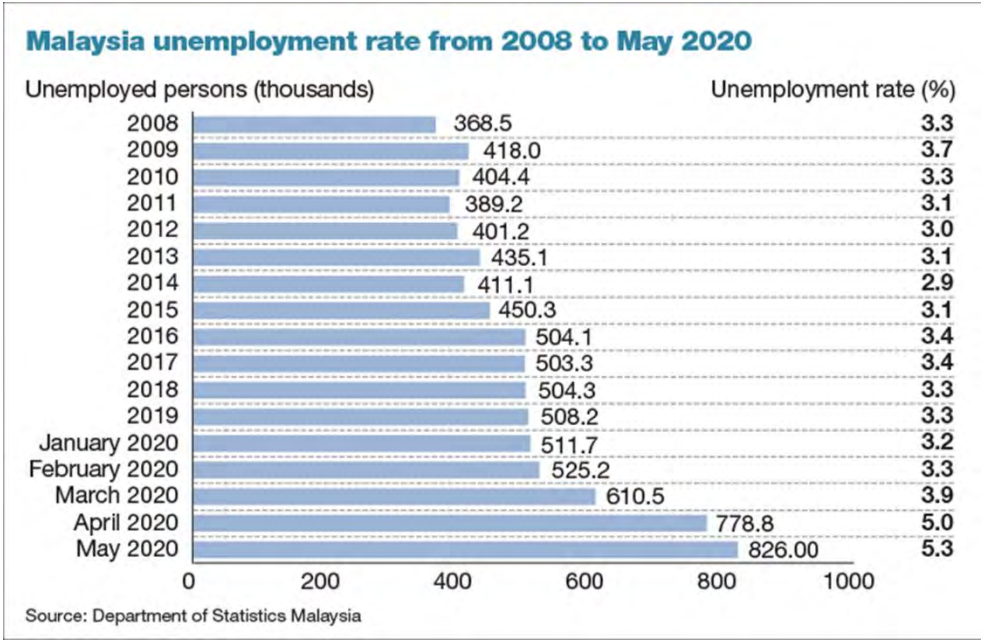

Figure 1.1. Malaysia's unemployment rate from 2008 to May 2020

According to Khir's (2006) study, most Malaysian graduates lacked both technological knowledge and generic know-how. Aside from that, other researchers have widely observed this phenomenon (Soh, Arsad, & Osman, 2010). The employer must emphasize novel thinking, problem-solving, and analytical skills to remain a nimble workforce and face its obstacles. A total of 200,000 graduate students in Malaysia have been unable to find work due to a lack of soft skills such as problem-solving, communication, and creative ability (the Edu Advisor, 2016). Effective learning cannot occur unless the educational system implements new, more efficient teaching methods and encourages two-way communication between students and educators. The learning process must be made more effective to improve these skills, necessitating two-way contact between educators and students. Many students, especially undergraduates, underestimate the value of transferable skills, and believe that mastery of skills within their discipline is sufficient to achieve the desired career change after obtaining a graduate degree (Robinson and Garton, 2007). Despite this, many people believe that college and university graduates frequently lack the skills needed to succeed in the workplace.

This problem arose when the Malaysian government was allocating funds to develop higher education annually. In addition to monetary grants, the steadily rising number of higher education institutions is an essential indicator of the country's efforts to provide its citizens with more excellent opportunities for access to higher education. However, graduate unemployment problems and employment difficulties contribute to a negative perception of the country's higher education development policies.

Furthermore, prolonged youth unemployment makes it difficult to find and retain talent in supply markets where demand is higher and more complex. Such a

situation leads to supply shortages that become increasingly difficult to meet. Graduates must possess the skill sets necessary to facilitate knowledge workers to advance to the middle of organizations to become successful members of society and meet customer quality demands. These include general academic ability (such as analysis, reflection, and a strong understanding of boundaries) as well as more specific subject-specific abilities (such as manufacturing, assembly, and data entry).

Rahmah et al. (2011) stated that the low quality of Malaysian diplomas contributes to the unemployment problem. Industry employers have given negative feedback and comments on the graduates, indicating that they lack the necessary competencies and skills to meet industry requirements. Furthermore, graduates have a low employability rate and underperform. The Central Bank of Malaysia (2002) discovered that Malaysian graduates are less skilled in technical expertise, problem-solving, and communication skills when compared to international graduates.

Based on the findings of Hanapi and Nordin (2014), graduates should acquire employability and technical skills since they are critical criteria for obtaining jobs. The study results focus on the students' skills, which have become a factor in unemployment, as well as technical and employability skills. According to the findings, most respondents agreed that most graduates have difficulty applying what they learned in their educational institutions. Besides, most students struggle with employability issues, such as poor communication skills, particularly in English, as well as a lack of discipline and leadership abilities.

Aside from that, the Higher Education Ministry of Malaysia (2006) highlighted that graduates should have soft skills to meet their employment requirements. Among

the skills that graduates should possess are communication skills, critical thinking, problem-solving, teamwork, developing entrepreneurial proposals and opportunities (competence), applying ethical principles, and developing, planning, supervising, and leading business opportunities. Perhaps the most serious disadvantage of this problem, as observed by the researcher over the last ten years, is that a student cannot solve a problem, express an opinion, think critically about what has been learned, lack communication skills, and is unable to decide when necessary. The factors that contribute to this situation are that the student is more reliant on the instructor to pass on the experience. According to the study of Krajcik and Blumenfeld (2006), student participation can also help students gain a better understanding of the subject being taught. Students will be more interested in studying and learning if they are a part of a class that is not entirely dependent on the instructor. The issue may be reflected in the graduates during the job interview, and this situation may lead to graduates being unemployed if they are unable to master the necessary skills. By keeping students hands-on, they would learn how to complete their assignments constructively. Students excelled in the exercise, demonstrating a thorough understanding of both the assessment and conventional learning. Students would be more successful if the tasks were designed to support credible learning with specific intent and objectives. Through the Student-Teacher's continuing practice of concentrated learning, students can quickly think outside the box and solve real-world problems.

Several issues have been raised regarding the unemployed graduate's ability to meet the job market requirements. Education systems need to change to reduce unemployment among graduates. The expectations have always been high for higher education institutions and graduates. For centuries, universities have been the place

where higher-order knowledge and abilities have been developed, refined, and nurtured. This expectation should have produced better and high-quality graduates in the future. However, higher education expectations have never been so strongly expressed and explicitly defined before, especially by employers. As the education field concentrates on graduate skills, universities or colleges must apply fundamental skills at least at the basic skill levels such as numeracy, literacy, and computer skills. Education should focus on producing better graduates who can meet industry demands to address this issue.

Advocates for better educational environments in the 21st century pointed to educational problems and rising student expectations, issues that educators are facing, and the learning competencies required by educators. Thus, technological development, educational environment, practical education, globalization, interactive / interactive education, international education, exams and measurement and evaluation, commercialization and economic strength, learning, learning to learn, thinking skills, values education, language communication and program obtained and interpreted (Gelen, 2018). Teaching has the potential to not only be done in schools and classrooms, but also lead to new social aspects and the introduction of an e-world of teachers. This also makes apparent the additional things that language and communication skills, personality traits, and guidance skills will require, such as self-sufficiency and self-improvement for teachers, and the teacher's ability to make use of their own skills, traits, and abilities. To complement all these new developments and ideas, it is at the same time the point at which new issues will appear. For example, in new environments (including technological, management, competence, and security), there is an important role for teachers in some fields of software and robots, facial education is in decline,

and teaching is harder than it should be. Additionally, because of current youth issues, learning a foreign language is essential. Finally, in evaluations, programs have been behind innovations and the negative impact of education on the workforce has not been as significant as it should be.

As the problem emerges and could present a problem to graduate students in the future, the researcher proposed using Project-Based Learning (PjBL) through MOOC as a teaching method. Introducing an innovation in teaching and learning and integration with technology will entail using multiple approaches to deliver content as outlined to develop soft skills. Project-based learning is encouraged for the lecturers to use as teaching and learning resources. Educators need to introduce Project-based learning (PjBL) to create an exciting classroom environment with increased student participation and deep apprehension of the subject (Krajcik and Blumenfeld 2006). Furthermore, Shafaei, Poorverdi, and Parvizi (2007) stated that Project-based learning is widely accepted as an effective methodology today. Its advantages are well documented: with PjBL, learners are known to develop better communication, thinking, and problem-solving skills than in traditional lecture-based education. PjBL also excels in making connections between different concepts within a subject clearer, and it has been used successfully in interdisciplinary courses.

Fong, Sidhu, and Fook, (2013) proposed another 21st-century research project on 21st-century skills, specifically improving critical thinking, imagination, and communication skills. Although Rameshwor (2016) conducted the research, PjBL has developed communication, teamwork, innovation, critical thinking, and leadership skills in the twenty-first century, but these skills lack soft skills. The researcher found that investigating students' problem-solving skills are crucial in the teaching and

learning process. Students will need that skill in the future when deciding how to solve their problems. PjBL develops and improves critical thinking or problem-solving skills, teamwork, and technical literacy among science students. It is stated in more detailed research on 21st-century skills by Tuan Mastura, Kamisah, and Nurazidawati (2010) and Caturraga (2014).

1.2 Research Background

Under the Ministry of Education (MOE), the Malaysian government's primary responsibility is to provide quality training to Malaysians. Malaysian education starts with pre-school and continues through post-secondary education. The government's view is that Malaysia should be a center of excellence in education. According to MOE sources, the government funds nearly all primary and secondary education (i.e., 90% or more) and 60% of all tertiary education (Ministry of Higher Education, 2009). In the past decade, Malaysia has witnessed sweeping changes and transformations in its education system. Until the British colonized the region, informal education was used to provide individuals with essential life skills. Even during the British colonial period, there was no educational policy to ensure critical education in the nineteenth century. Several different vernacular schools were established to meet the needs of specific ethnic groups, such as Malays, Chinese, and Indians.

The government was able to use education to promote unity and nation-building through standard curricula and curricula. The national teaching philosophy was published in 1989 and was later included in Malaysia's 2020 Vision, which stated that

the country would be developed by 2020. In December 2012, the Ministry of Education (MOE) unveiled a new National Education Blueprint (NEB), intending to help meet Vision 2020 objectives and better prepare students for the demands of the twenty-first century. Besides, the MOE has transformed the current higher education system into a new system that will meet a national building's demands with a 2020 vision and nine key challenges. Moreover, the government has established strategies and plans to support the expansion of change and excellence in the face of global competition at colleges and universities (HEIs). These plans seek to ensure Southeast Asian countries have world-class universities and serve as a significant higher education hub (Ministry of Higher Education, 2007).

The concept of teaching and learning is included in the 2007–2010 NHEAP Strategic National Plan for Education and Learning. According to the first draft, the plan included a new five-year plan that would commence in 2007 and end in 2010. (KPTM, 2007). The first step in transforming higher education is to develop a series of short-term action plans. First, it laid the groundwork for implementing the essential fundamentals that could be applied in stages of development spanning the next four phases (Grapragasem et al., 2014), as depicted in **Figure 1.2**.

Figure 1.2. Phases of the National Higher Education Strategic Plan

At the beginning of 2004, Malaysia's higher education trended toward internationalization to meet globalization's new era. With the revision of the education policy, foreign stakeholders were able to run partnership programs with local universities and colleges, and open Malaysia's international branch campuses. The actions reflected the government's wishes and efforts to make Malaysia a regional hub for higher learning and the topmost priority for international students and intellectuals until 2020 (MoHE, 2007). Dynamic and relevant curricula and pedagogy are required to ensure a stable and robust institution. A well-designed higher education curriculum should include creativity, innovation, leadership, and entrepreneurship. It should equip students with the necessary skills to compete in a challenging global market. Peer review and industry collaboration must be strengthened in the development and evaluation of curricula.

On the other hand, the National Graduate Employability Blueprint 2012-2017 focused on four aspects of graduate employment: academic attributes, personality management, exploration, and connectivity. The details are as follows:

i. Academic characteristics that reflect their grades should be highly academic in their particular study field.

ii. Graduates should have appealing personality management characteristics, such as positives, a strong sense of responsibility, and a critical understanding of the role.

iii. A graduate must acquire exploratory skills that demonstrate high employability as well as being imaginative and innovative.

iv. Connectivity attributes include communication and the skills that are essential for good group dynamism and interpersonal relationships.

While the global demand for higher education continues to rise, so does the proportion of unemployed students in Malaysia. Malaysia's most recent university plan recognizes this trend. One of the five aspirations is to improve the diploma quality, which is vital due to imbalanced production and lack of employment. Despite claims by Ji (2013), and Mohd Zain, Aspah, Abdullah, and Ebrahimi (2017) that Malaysia's unemployment rate was low (3.3 percent), the unemployment rate remained high by December 2012. Therefore, the government has taken precautions to solve the problem and improve their industrial training and student learning experiences by implementing internship programs and assisting the industry in taking the lead in curriculum design and delivery through partnerships. These initiatives are intended to improve graduate and institutional quality in general.

Effective teaching and learning necessitate an efficient delivery system. Textbooks are no longer an essential component of knowledge acquisition. Electronic media and information technology (ICT) is being used to establish themselves as the primary means of communicating information and higher education knowledge. ICT has altered students' learning behaviors and aided in transforming content-oriented curricula from teacher to teacher-centered delivery forms (Oliver, 2002). ICT progress has also changed how teaching and learning are delivered. Although it is still used in Malaysian public and private schools and universities, the traditional communication method via face-to-face interactions is regressing as virtual classrooms, e-learning, and mixed studies gain traction.

Engaging students aids and encourages students to learn effectively. Intentionally, learners' direct involvement fosters a stronger sense of responsibility in future students, which they can carry into the workplace and beyond the university.

Littlewood (1992) proposed several elements that enhance learner learning, including the followings:

i. The classroom should be conducive to communication and learning;
ii. Learning must be relevant to students' interests and needs;
iii. Classrooms should involve processes and products;
iv. Students must take on active roles in the classroom.

The training and learning should include a national plan to reach developed countries by 2020 and be the result of the government's concerted effort to promote higher education (Laird 2015 in Mohd Zain, Aspah, Abdullah, and Ebrahimi, 2017). Inputs from Malaysian and international experts in education were combined to develop MHEB 2015–2025; including UNESCO, Organization for Economic Cooperation and Development (OECD), university administrators, board members, the academic community, syndicated associations and associations, ministry staff, industrial bodies and employers, relevant agencies, parents, and students.

Previous studies have shown that the use of project-based learning has a positive effect on student achievement. For this analysis, the researcher focused on investigating the characteristics or pedagogies that affected students with low soft skill levels inside MOOCs in PjBL. Students have not been able to develop the skills required for 21st-century applications by simply learning about information. However, to apply in the real world, students needed new communication instructional strategies that were both practical and resourceful (Buck Institute for Education, 2011). Improvements to PjBL, such as computer technology, cooperatives, other technological resources, qualities such as encouragement, and work attitudes, have been shown in studies to result in

effective learning and increased commitment (Smith, Sheppard, Johnson, and Johnson, 2005).

On the other hand, a study in e-learning conducted by Norazah, Mohamed Amin, and Zaidan (2011) shows that Higher Education Institutions in Malaysia offer more than half of their courses online. According to the data, more than 13.8 percent of educators provide that 80 % of students prefer to read materials uploaded by their teachers, while 44.6% prefer to read materials online. Furthermore, the findings indicate that students are highly motivated to prefer online courses. Lecturers also agree that incorporating e-learning into their courses has benefited students. Overall, the implementation of e-learning is accepted as a medium of teaching and learning in higher education institutions.

Research has shown that the teaching method of interaction influenced student motivation to learn something new through project-based learning, and acquire and recognize 21st-century skills cited by Buck Institute for Education, (2011). By limiting the supervision of teachers or educators, PjBL could promote social and intellectual development among students. They actively participate in searching for information or knowledge and in the classroom (Kettahun, 2014). According to Marshal and Horton (2011), traditional teaching approaches that emphasize memorization must be replaced with new approaches that promote students' critical thinking in the future. On the other hand, conventional instructional technique instrumentation is deeply embedded in learning, and many educators are hesitant to relinquish control over the learning process (Hmelo-Silver, 2004). Active learning allows students to explore, inquire, solve problems, and think critically (Asgar et al. 2012; Levine and Mosier, 2014).

Aside from that, according to the National Higher Education Strategic Plan in Phase 1 pillar four: Laying the Foundation (2007–2010) stated, “Teaching and learning provide holistic programs, resulting in students who are more balanced and trustworthy. Academic staff will lead and focus on innovative curriculum delivery modes in their respective fields, and institutions must develop dynamic curriculum and pedagogy. Academics are expected to take advantage of enrichment courses while also demonstrating their teaching abilities and professionalism. Many languages, and the use of English in teaching and learning, are still encouraged in the curricula. The Malaysian Qualifications Framework has also been established as a benchmark for facilitating quality assurance in higher education.”

Thus, for teaching systems to be most effective, they must be designed to assist students in learning and using new technology. Particularly for preparing students for the 21st century, instructional systems must assist students in acquiring new skills in both learning and technology use. Accordingly, the commitment of those in education necessitates that they must investigate and understand the most effective ways to stir students' creativity and interest in learning. Though it is found that the current teaching systems emphasize knowledge or ability in terms of improvements, focusing on learning by heart, rather than thinking skills, e.g. analytical thinking, synthetic thinking, and critical thinking, these teaching systems do not consider other approaches. Because they will be able to help the students who begin working, their thinking skills will be advantageous. Students should be the main focus when determining whether or not a teaching system is effective. Enthusiastic students should be allowed to use a variety of learning tools, which will increase their enthusiasm for learning. Additionally,

satisfaction should be available to any individual, as well as the requirement, curiosity, and individual differences.

The education scenario experienced an unprecedented acceleration in both science and technology development in the modern era, which has created a significant increase in the amount of information and necessitated individuals to remain constantly up-to-date. Educational institutions should not be considered the only means through which individuals should learn. Rather, individuals must continually seek to improve their knowledge and skills with the knowledge and skills they already have learned in educational institutions as well as learning outside of educational institutions. Individuals must be highly self-directed in their learning (SDL) so that they are prepared for all kinds of situations. Because students who know how to pursue their learning take responsibility for planning, initiating, and evaluating their learning processes (Wilcox, 1996). It is hypothesized that individuals with SDL will get the knowledge and skills they need to succeed in today's workforce by being conscious of their own learning needs and developing the capability to master 21st-century skills.

1.3 Problem statement

According to HRM ASIA (2012), 150,000 Malaysian university graduates fail to find work each year. Also, according to the report, approximately 44,000 Malaysian graduates were still looking for work in 2011. This figure had risen from 41,000 in 2009 to 43,000 in 2010. Poor command of the English language, poor problem-solving skills,

and a lack of professional identification contributed to the phenomenon. The unemployed Malaysian graduates lack the necessary skills that employers seek.

On the other hand, graduate employability has become more rigid in recent years, with industry demanding graduates' academic qualifications and their ability to expose to soft skills. However, few exit test instruments are available in higher learning institutions that could gauge the graduates' soft skills competence before graduation. Therefore, education is now confronted with new challenges, such as achieving a higher level of student skills to prepare the next generation with excellent soft skills to lead society. The education system will be a shift in overcoming these challenges through curriculum material and learning experiences that contribute to the growth of the physical, mental, spiritual, and intellectual importance to current and future needs. The most crucial aspect of a lack of effective teaching and learning methods in identifying students' skills is the educational institution's role in providing the quality of graduates for early preparation before they go to their marketplace.

As a result, the industry's employer prefers a more diverse workforce with specialized technical knowledge and well-developed skills such as innovative thinking, problem-solving, and analytical skills. Furthermore, employers in the industry are desperately needed to meet the challenges that businesses face. The researcher discovered that the students who attended their industrial training lacked soft skills. Most industrial supervisors stressed this issue and requested that the institution assist the student in resolving it. The college should find a way to address learning difficulties among its students to meet an employer's requirements and ensure that the graduate students can assist with the best preparation and satisfy the work requirement. The learning process must be more constructive and include a two-way interaction between

educators and students to improve those skills. Students may pass the test, but they do not improve their social or soft skills. It is because they fail to provide relevant content and data required by the industry.

As mentioned previously, this issue also affected KPTM students, who have consistently ranked among the highest rates of unemployment over the years. An examination of industrial supervisor comments to KPTM industrial training students revealed this issue. They identified a number of factors that could contribute to graduates' inability to find work. Among the factors highlighted in the analysis are lack of problem-solving skills, adaptability to the industry, technological-savvy, collaborative team, communication skills (both verbal and nonverbal), and leadership skills.

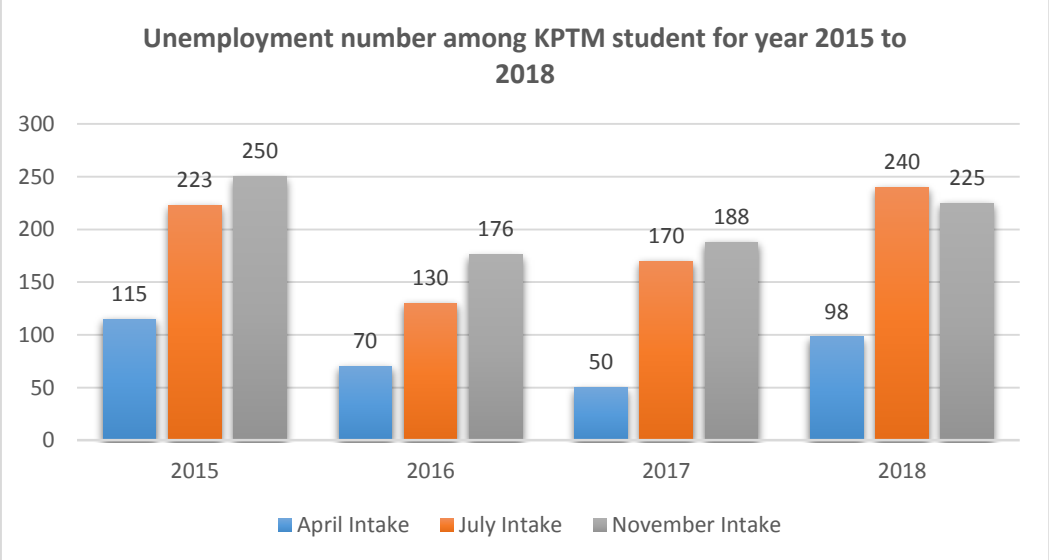

Figure 1.3. The number of unemployment among KPTM students in the year 2015 to 2018

According to the figure 1.3, the total number of KPTM students who are unemployed has increased. This situation may cause students to lack the necessary skills. To alleviate this situation, KPTM should change its teaching and learning

methods. The rising rate of unemployment may be a sign that the educational system isn't working well because it only focuses on academics instead of improving students' skills. Among the issues raised by the industrial supervisor were problem-solving skills, collaborative abilities, a lack of creativity, a lack of communication skills, and a lack of critical thinking in the generation of ideas. This problem may prompt the researcher to assist future graduates in acquiring at least the fundamental skills required to meet market demand. This comment, which also supported by the study of Mastura et al. (2011), revealed two factors that cause the rise of unemployed graduates in Malaysia were over-supplied and graduates' lack of industry-required skills. They claimed that the latter appeared to have a better relationship with employability than the former. However, despite the professional and formal training provided to graduates, there is still a skill gap in workplace circumstances (C. Alih et al., 2018).

As stated in KPTM education philosophy, tertiary education is a continuous effort to develop self-potential through knowledge, skills, and entrepreneurship value in attempt to improve status in society and contribute to the nation's human capital development. In order to achieve this value, KPTM must address this issue in order to produce high-quality graduates with marketable skills. This is also inline with the MARA education philosophy which MARA's education is a never-ending effort to develop holistic and balanced human capital, guided by knowledge, technology, and entrepreneurship values. Year to year, the number of underemployment among KPTM students is increased. This situation may lead to a problem for the KPTM itself. Introducing the new method of teaching and learning, will help the institution to minimize the unemployment among KPTM's graduates as well as to achieve one of the

KPTM objectives which are to produce graduates who are competitive, well-rounded, and capable of realizing the country's goals.

Many factors contribute to graduate unemployment, as discussed in the previous section. The educational system must evolve to meet the industry's demand for graduates. Hence, educational institutions have to improve students' soft skills and other job market requirements. Kolej Poly-tech MARA (KPTM) takes the lead in meeting this requirement by introducing project-based learning to improve those skills through assessment. It enables the lecturers to employ project-based learning as a means of teaching and learning. Project-Based Learning (PjBL), which was introduced as a teaching method through MOOC, will require multiple approaches to deliver content, with the hope of improving students' soft skills and social skills. PjBL should be used in the classroom as part of the curriculum and evaluated to enhance those skills. In line with that introduction, KPTM has introduced the initiative to improve teaching, which is also aligned with the international education framework.

Since the PjBL approach is widely used in teaching and learning, KPTM has shifted from the traditional teaching method to the modern method. The researcher used the ADDIE model as a guide in implementing PjBL in teaching and learning through MOOCs. Features in 21st-century skills will define the dimensions and characteristics of students' reflections on their learning approach. Therefore, the researcher's aim in this report is to resolve the gaps in PjBL research through MOOCs and provide the required information on how to train PjBL learners to develop their 21st-century skills.

However, no attempt is made to examine the purpose of implementing PjBL through MOOC, and there is no evidence that MOOC enforces PjBL in the classroom.

Many studies on the use of MOOC classes have used problem-based learning and not project-based learning approaches (Verstegen, Spruijt, Dolmans, and Merrienboer (2016); Verstegen et al. (2016). According to the study by Al-Atabi and Deboer (2014), the MOOC is a helpful forum for teaching entrepreneurship because it allows students to learn collaboratively. The teaching method enables individuals to advance with realistic primary entrepreneurial elements, such as identifying opportunities and acquiring the skills to address these challenges.

In conclusion, practical training will result in trained and qualified graduates who are ready to enter the work field. It also produces graduates with good working ethics, proactive, and capable of resolving work problems. A student is hired because the employer believes that the student has superior knowledge and skills to other candidates. Pang (2011) identified that three main strategies for building an integrated workforce are as follows: (a) restructuring the educational system to enhance student performance, (b) increasing graduate qualifications to improve graduate's marketability, and (c) restructuring the labor market to develop Malaysia as a high-income country.

1.4 Research Objectives

The study aims to analyze PjBL implications through MOOC in developing 21st-century skills among KTPM students. The purpose of this study is to accomplish the following objectives which are as follows:

1. To examine the student's perception of the implementation of project-based learning through MOOC.
2. To investigate the effect of PjBL through MOOCs of communication skills between pre-test and post-test
3. To investigate the effect of PjBL through MOOCs of collaborative skills between pre-test and post-test.
4. To investigate the effect of PjBL through MOOCs of critical thinking skills between pre-test and post-test.
5. To investigate the effect of PjBL through MOOCs of creativity skills between pre-test and post-test.
6. To investigate the effect of PjBL through MOOCs of problem-solving skills between pre-test and post-test

1.5 Research Questions

The following research questions will be addressed in this study.

1. How do students perceive the PjBL implementation through MOOCs?
2. What is the effect of PjBL through MOOC of communication skills between pre-test and post-test.
3. What is the effect of PjBL through MOOC of collaborative skills between pre-test and post-test
4. What is the effect of PjBL through MOOC of critical thinking skills between pre-test and post-test.
5. What is the effect of PjBL through MOOC of creativity skills between pre-test and post-test.

6. What is the effect of PjBL through MOOC of problem-solving skills between pre-test and post-test

1.6 Research Hypotheses

Research hypotheses are built on the foundation of research questions. The research hypotheses would answer the following statements on the effect of PjBL through MOOC after the pre and post-test.

i. *H01: There is no significant effect of communication skills in the pre-test and post-test*.

ii. *H02: There is no significant effect of collaborative skills in the pre-test and post-test.*

iii. *H03: There is no significant effect of critical thinking skills in the pre-test and post-test.*

iv. *H04: There is no significant effect of creativity skills in the pre-test and post-test.*

v. *H05: There is no significant effect of problem-solving skills in the pre-test and post-test.*

1.7 Operational Definitions

The operational definitions of this study are based on the following variables: 21st-century skills (communication skills, collaborative skills, critical thinking skills,

creativity skills, and problem-solving skills), Project-based-learning (PjBL), Massive Open Online Courses (MOOC)

1.7.1 21st-century skills

21st-century learning skills are defined as the student's ability to collect or retrieve information, organize and manage data, evaluate the quality, relevance, and usefulness of information, and generate the data's accuracy through the use of living resources. The student may emphasize the core subjects and use 21st-century tools (PjBL) to develop learning styles and learn in a 21st-century setting and substance and assessments that measure the student's 21st-century skills. Students today have the opportunity to participate in authentic tasks that extend far beyond the confines of their classroom's advent of the Internet. The late John Dewey, a true visionary, defined an educated person as one who thinks and reflects before acting, responds intelligently to a problematic situation, and finally assesses the consequences of a chosen plan of action (Johnson and Reed 2008).

For this research, the researcher adopted the 21st-century skills proposed by the Partnership for 21st-Century Learning and Innovation Skills (2009). The 21st-century skills proposed by Partnership for 21st-Century Learning and Innovation skill (2009) are as follows: communication skills, collaborative skills, critical thinking skills, creativity skills, and problem-solving skills.

1.7.2 Communication skills

Effective communication can be defined as the process of passing on a message as well as effectively interacting with others. Communication occurs in stages that include the initial selection of information or messages, the expression of information or messages, and the interpretation of information or messages (Luhmann, 1992). It should be noted that the interpretation could also manifest itself as a misinterpretation during the third stage. It was implied by Gelen (2018) that being able to communicate well is a necessity, having good written and verbal communication skills, common language skills, possessing at least one foreign language at a good level and having strong communication skills. To communicate with others, we must be able to speak, whether it be to voice our thoughts or to exchange information. An excellent way to interact with others is through clear and effectively spoken communication. Dewey (1929) explained, "A true communication of information occurs where events such as the weather, the tides, and the weather cycles are revised and reconsidered because of the communicative event." Society growth happens when communication and collective experiences create a bond that members rely on (Dewey, 1934). On the other hand, one of the key abilities required of students to perform effectively in academic settings is the ability to communicate ideas and thoughts as a member of a group or as an individual with various backgrounds to come up with a viable solution in any learning scenario. The English proficiency requirement entails being able to identify, access, organize and convey information in both written and oral English, as well as good listening skills (Hadiyanto, 2018).

Furthermore, Ceyhan (2006) found that communication skills include being able to discern what the speaker is thinking and feeling by empathetically reflecting their thoughts and feelings, as well as the ability to accurately respond to information, the willingness to listen, the willingness to focus on what you are hearing, and the willingness to give feedback. There are many communication skills on this list, and these may be considered either verbal or nonverbal. While Korkut (2005) found that students who have effective communication skills and who enjoy communicating with their peers in social settings report feeling significantly more enthusiastic about doing so. Yuksel-Sahin (1997) found that those with improved communication skills were more inclined to participate in interpersonal activities and activities. Evidence from previous research supports the notion that communication skills can be taught to students by school administrators or teachers, and this can have a positive effect on student engagement and motivation.

When individuals can communicate well, they will put in the work necessary to solve the problem (Akgul, 2020). Each problem solved gains another step closer to personal improvement. Skills that are relevant to being empathetic, communicating, and being aware of other people's feelings include behavioral patterns and empathy, interpersonal communication, communication in the workplace, professional competence, professional qualifications and principles of behavior, and self-criticism. All of these factors are expected to contribute significantly to personal growth.

In this study, communication skills refer to students' ability to organize their thoughts, data, and findings, sharing them virtually through a variety of mediums, as well as orally and in writing. Students may be able to communicate their ideas and opinions through verbal and nonverbal cues.

1.7.3 Collaborative skills

Collaborative skills refer to learners' ability to solve problem by answering questions, to work in teams efficiently and respectfully to achieve a common goal, and to share responsibility for project completion. The researcher used role-playing and team-building activities to help students develop their collaboration skills. Students reflected on their thinking and problem-solving processes in writing journals, which they acknowledged they would need to explain in their oral presentation. Each team hesitated while playing to assess how well they collaborated and communicated, using rubrics they had prepared with the lecturer's guidance. Collaboration is a method of working in a group "to promote individual learning while also contributing to others' learning" (ISTE, 2007).

Collaborative is defined as working together in a team. Although various definitions qualify this, we'll expand on two of them. Collaborative can also be defined as creating or accomplishing something can be described as adding to produce or generate something, as well as accomplishing something or carrying out an activity. It's often assumed that everyone involved has the same goal in mind. When collaboration is defined as "the process of working together to the same end", "working or acting together for a common purpose", and so on, it does not contrast with other definitions. Collaborative tend to be considered to be a less fully engaged model of working together, however, cooperation and other forms of working together are the same. When it comes to talking about group work, teamwork, and cooperative learning, the terms are used interchangeably and are sometimes used synonymously (Wilczenski, Bontrager, Ventrone, & Correia, 2001). In this study, the researcher defines

collaborative skills as students' ability to work cooperatively in a group to solve a problem as well as collaborate with group members.

1.7.4 Critical thinking skills

Critical thinking skills involve assessing complex problems, examining questions that are not explicitly answered, and evaluating different datasets or sources. Besides, critical thinking is the capacity to reach sound conclusions based on evidence and logical reasoning. On the other hand, critical thinking is the ability to think critically and address complex issues (Marzano and Heflebower, 2012). A PjBL expert, Markham (2012), defined *critical thinking* as "a combination of attributes, such as habits, attitudes, and emotional openness, thinking strategies, background knowledge, conceptual knowledge, and assessment standards." They have also claimed that students in the 21st century should be individuals with a high level of cognition who are good at teaching, who learn how to think, who are skilled at associating, who synthesize, who gather information, who lean in life, who think for themselves, who question, who research, who think creatively and critically, who interpret, who decides, and who put forth an effort. This definition goes on to say that teachers should not just be someone who limits students, but someone who guides resolves, and becomes an enigma with competencies that enable students to acquire these skills.

In addition, critical thinking is both an art of thinking and a discipline for obtaining a higher quality, more consistent, more accurate, and more easily understood ideas. A critical thinker is defined as an open-minded individual who is generally

curious and patient when dealing with complex events and can postpone their decision when necessary and are more positive in their attitude toward various viewpoints and perspectives (Profetto-McGrath, 2003). In our current world, it is essential that the new generation breaks with conventional thinking and possesses a particular way of thinking when they realize that problems that might be encountered in the future are unknown or have not been calculated. The possibility of an individual being able to utilize multiple capacities is the ability for a person to use multiple capacities to blend many ideas. In this research, critical thinking is defined as open-minded, higher-order thinking in boosting ideas.

1.7.5 Creativity skills

Creativity is often manifested through the production or development of new ideas. It is common to hear the idea that ideas should be created to benefit the situation. In addition, it is seen as the first step in the creative process, especially when thinking outside of traditional modes of thinking (Ramankulov, Dosymov, Mintassova, and Pattayev, 2019). Many people believe that creativity is a part of general intelligence and that it is a field to which it is connected. Individuals with a high level of intelligence are more creative, so intelligence itself is the cause of creativity (McCrae and Ingraham, 1987).

Creative personalities show specific “traits, tendencies, and characteristics” (Ranco, 2007). Ranco (2007) has categorized the creative skills as identified as autonomous, flexible, drawn to complexity, open to new experiences, open to

ambiguity, risk-taking or risk tolerance, motivated by inherent abilities, psychologically androgynous, confident, interested in a wide range of topics, and curious. Additionally, the creative also values creativity and intentionally dedicates time and effort to cultivating creativity. The vast majority of them choose to pursue their creative potentials and choose unconventional and original ideas and careers. While Kelly & Kneipp, (2009) identify creativity as demonstrated by the research reviewed, are evidenced by various characteristics and activities. It was based on the Scale of Creative Attributes and Behavior and were identify five different components including the following:

a) Involving in creative activities with a preference for doing so, as well as committing time to those activities, is what being creative means to you. the cognitive style that is uniquely creative.

b) The cognitive aspect of creativity involves the act of divergent thinking and problem-solving.

c) Spontaneity is a way of thinking that is characterized by impulsivity and novelty-seeking.

d) To be tolerant is to have the attitude of flexibility and openness to other people's ideas and experiences.

e) Fantasy is an activity of the imagination, often in the form of daydreaming and fantasy.

In addition to the increasingly extensive data sets in need of improvement, it has been previously argued that creativity is the most frequently mentioned fundamental skill for the new millennium (Kereluik, Mishra, Fahnoe, and Terry, 2013). Students with creativity skills can generate and refine solutions to complex problems or tasks using deductive reasoning, analysis, and combining or presenting what they have

learned in innovative methods. Aside from that, they should think outside the box to figure out how to solve the problem.

On the other hand, Rhodes (1961) stated the framework for creativity as 4P (person, place, process, and product. Creativity that can be easily applied to education and that resonates well with the rhythms of classroom life, among other things (Smith & Smith, 2010). According to Rhodes' (1961) 4-Ps model, the first P is person, which includes information such as personality, intelligence, temperament, attitudes, behaviors, and all other elements that are unique to each individual. The second P is placed, which includes information such as place and time. In the second type, there is the concept of process, which is perhaps the most fascinating and mysterious aspect of creativity. Process, in general, refers to the sequence of activities that are carried out during the course of a creative project. For both researchers and practitioners, a variety of theories and models have been proposed to aid in the creation of assessments and the implementation of interventions. The third aspect of creativity is the process, which is the end result of the creative process and is the focus of this article. However, it is not limited to perceptible items such as architectural structures, paintings, and inventions, but is also applicable to creative ideas that can be translated into tangible forms (Rhodes, 1961). The final categories is called place, and it refers to the ecological environment in which individuals exist. In the last two decades, there has been a great deal of interest in the creative environment.

Aptitude for creative thinking is the capacity to generate a range of new and original ideas and possibilities (Meintjes 2010). For more creative thinking to be born, abilities must be present. Extremely inquisitive and adept at reading are good attributes to have. A creative person is defined as having some kind of passion, interest, or

curiosity and wanting to experiment intuitively. For this study, creativity skills are defined as students' ability to generate novel ideas and works.

1.7.6 Problem-solving skills

Problem-solving, which is one of the most necessary and important skills in daily life, can be defined as the ability to cope with the problems and difficulties faced by individuals. Past experiences and previous knowledge of the individual also contribute significantly to the problem-solving ability, which is a cognitive process in general (Yurtseven and Dogan, 2019) and Gurbuz et. al (2017) contend that problem-solving should not just be seen as solving mathematical problems, just like algorithmic thinking but instead as a means of solving the algorithmic process developed for the individual in a social context.

On the other hand, problem-solving skills apply to well-planned projects that challenge students to solve significant problems and synthesize the information available to solve the problems they confront (Bender, 2012). Although problem-solving skills are considered relevant even after graduating, they are assumed to influence educational achievement and the ability to navigate in the real world. To the extent possible, the students ought to learn methods to tackle difficulties whenever they may arise (Hadiyanto, 2010). In this research, problem-solving skills refer to students' ability to solve issues for which no previously learned solution exists, make decisions at different managerial levels, and execute real-world solutions into action

1.7.7 Project-Based Learning (PjBL)

Project-based learning (PjBL) enables students to conduct research, plan, design, and reflect on creating a project (Doppelt, as cited in Doppelt, 2005). As reported, PjBL promotes creative thinking during the invention process of their projects, and it entails changing the instructional method and learning environment, as well as adopting new assessment methods (Doppelt, 2005). Project-based learning allows students to produce disciplines by developing an idea in a selected subject, participating in provisioning, designing the concept, and evaluating the estimation's strength. PjBL is defined in this study as an activity that enables students to research, plan, and design projects related to the module's topic.

1.7.8 Massive Open Online Courses (MOOCs)

The first MOOCs were founded and organized by George Siemens and Stephen Downes (de Waard et al., 2011). MOOCs are acronyms for Massive Open Online Courses, which provide anyone in the world free access to high-quality learning materials provided by universities or colleges (Abeer and Miri, 2014; Cormier and Siemens, 2010; Kop and Carroll, 2011). Besides, MOOCs are described in this study as online learning platforms that support the PjBL process in the classroom.

Furthermore, they are free web-based distance learning programs that welcome students from all over the world to participate. MOOCs are based on the principle that knowledge should be shared and accessible to everyone. These types of courses require

a pedagogical transformation to virtual environments, which incorporate new instructional models and pedagogical strategies that advocate for equal educational opportunity. MOOCs are innovative technologies that democratize education and create open learning communities (González, Del Pozo, Paredes, and Del Pozo, 2018). Despite this, MOOCs have low completion rates and an increased need for new pedagogies, methodologies, and evaluations which need to be adapted to an enormous scale (Loeckx, 2016), which is why this study is being presented.

In some cases, before the face-to-face classroom meeting begins, the MOOC is already complete. This situation is called a Pre- MOOC or xMOOC. The Pre-MOOC is used when learners require prior knowledge on a particular subject, which facilitates comprehension and communication between teachers and students during subsequent classroom meetings Ebner, Schon & Braun (2019). In this study, xMOOC or MOOC is a term used to describe instructional tools that can create open learning experiences for students as a platform for implementing project-based learning in the classroom.

1.7.9 KPTM students

KPTM students are defined as first-semester current students registered for the Study Skills (MPU2223) class from three different KPTM Kuantan study programs: Diploma in Accounting, Diploma in Human Resources, and Diploma in Business Management.

1.8 Conceptual Framework

This section will explain the conceptual framework in **Diagram 1.1**, which represents the current state of the relationship between 21st-century skills in learning and PjBL through MOOC. The main idea represents the learning theory and the instructional design model for MOOC in teaching and learning. This conceptual framework is mainly based on the triangulation of two theories proposed by Vygotsky and Dewey and one instructional design model, the ADDIE model for developing the PjBL module.

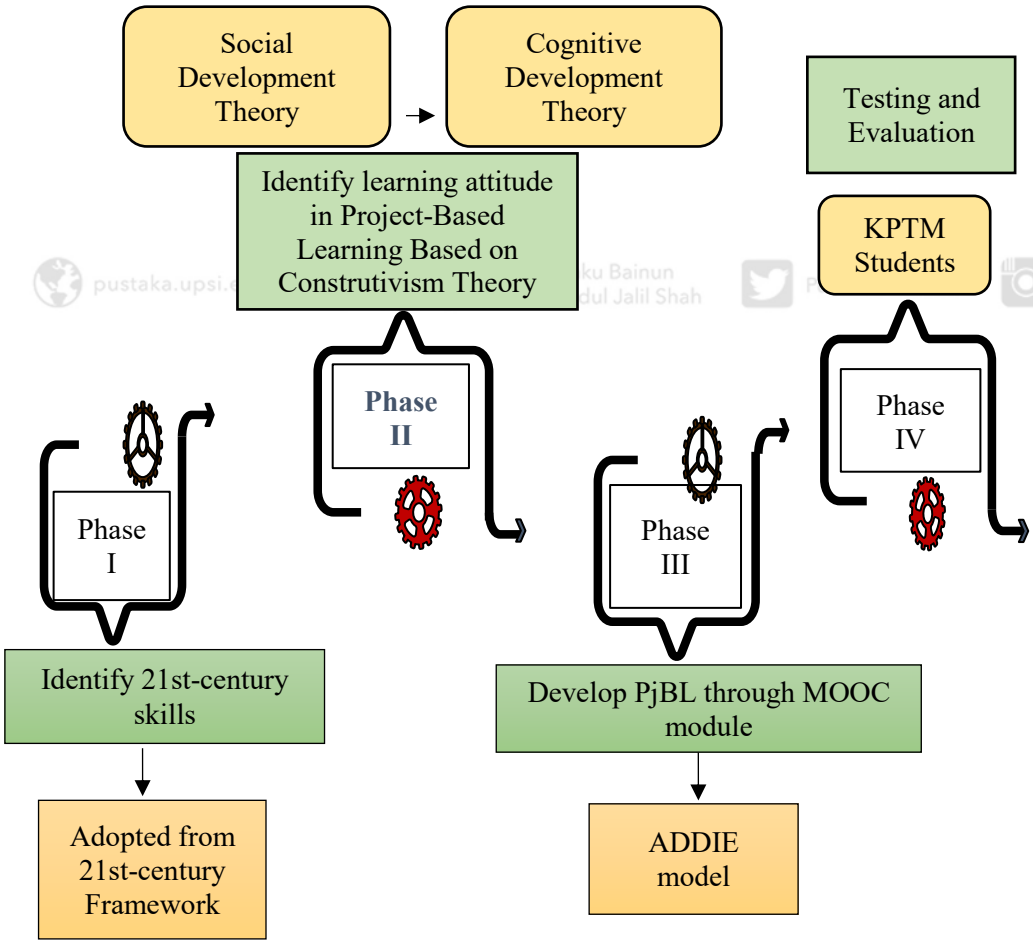

Diagram 1.1. The Conceptual Framework for the implementation of PjBL through MOOC

Diagram 1.1 depicts the conceptual framework of this study. The conceptual framework of the analysis suggests that the investigation comprises four phases. Phase I is the identification of the 21st-century skills adopted under the 21st-century framework. In Phase II, project-based learning will be developed to implement and assess 21st-century skills based on the Social Development Theory and Cognitive Development Theory as an introductory guide to exploring the learner's attitude toward the new learning environment. John Dewey founded constructivism theory which promotes immersive learning, comprehensive literary analysis, and theoretical comparisons, such as project-based learning. Instead of memorizing information, constructivist approaches motivated students to learn and speak about what they had learned through traditional education. Students will prepare for real-life technology projects by studying (Speckels, 2011). Designing projects will also pique students' interests. The researcher discovered that the theory of constructivism is related to project-based learning (PjBL). The theories are based on the Cognitive Development Theory of Piaget and the Social Development Theory of Lev Vygotsky.

In contrast, Phase III involves developing a training curriculum for students using PjBL through MOOC to improve their 21st-century skills. In this phase, the MOOC module will be developed using the ADDIE model. Finally, Phase IV is the assessment and evaluation process which includes KPTM students as participants in this study. **Diagram 1.2** shows the theoretical framework to explain the research findings of the hypotheses.

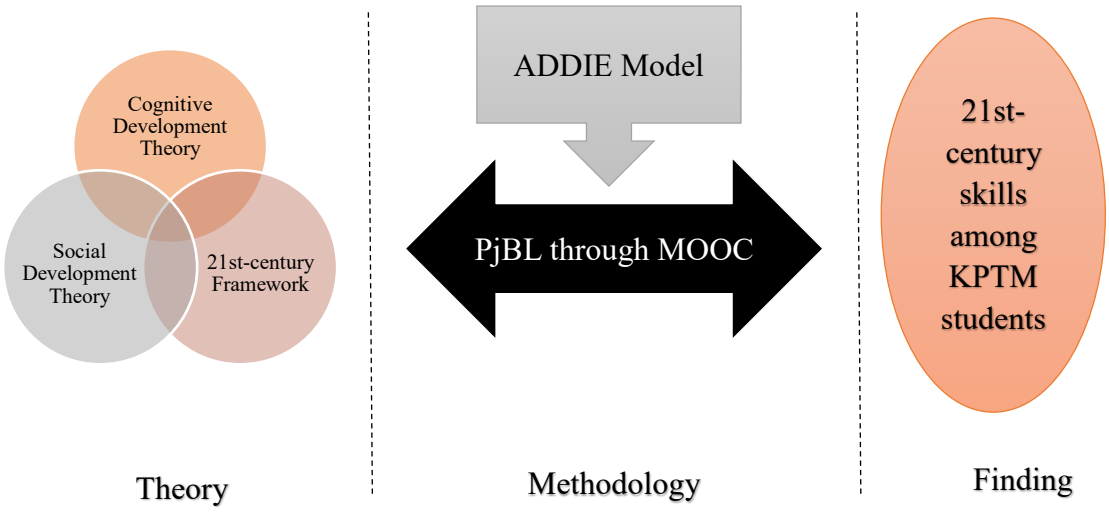

Diagram 1.2. Theoretical Framework

1.9 Research Significance

Appropriate assessment of 21st-century skills is crucial for instilling value and motivation in students and structuring pedagogical approaches (Swan, Shen, and Hiltz, 2006). However, any evaluation must resolve tensions about its validity, reliability, comparability, and delivery. A satisfactory definition of the construct for evaluation purposes has always been regarded as an essential principle in determining the teaching method's effectiveness. Compared to the new trend in education delivery, educators rely on chalk and talk or face-to-face communication. However, educators must consider a more interactive method of imparting the necessary skills to students. This situation will impact students' performances and abilities at the end of the learning process. Today's educational institutions have to consider the changing needs of students and ensure that students improve their global and urban societies' accomplishments.

Such work has aided in the adoption of project-based learning to improve soft skills. PjBL promotes teamwork and collaboration between group leaders while emphasizing learning, cognitive, and student learning achievement (Hung, Hwang and Huang, 2012; Johnson, Johnson and Holubec, 1994). According to Johnson and Johnson (1987), it also fosters trust among participants through face-to-face (F2F) interactions. The survey's values and outcomes can be utilized to investigate the impact of PjBL in the classroom on KPTM students. This work will allow readers to recognize skills that should be more focused on the learning process and help students develop skills, and promote learning opportunities to enable them to learn. The researcher will engage with interactive teaching and learning through multiple teaching methods to achieve this objective. Also, the researcher will respond to recent research arguments to improve soft skills so that students can apply their creative ways and real-life skills. Besides, this work allows educators to identify the students' abilities and develop teaching methods to enhance student learning and motivation in their current learning style, which is the traditional method.

1.10 Conclusion

In conclusion, this chapter explains an overview of the research by implementing PjBL as a critical concept in providing the researcher's rationale for conducting the research. This study's primary focus is to determine which 21st-century skills will emerge due to implementing PjBL through MOOC. Based on the study's focus, the researcher develops research questions and research objectives to better understanding 21st-century skills among KPTM students.