THE SIGNIFICANT IMPACTS OF MASSIVE OPEN ONLINE COURSE ON CONTRACT ADMINISTRATION SUBJECT AMONG QUANTITY SURVEYING UNDERGRADUATES' STUDENTS

Siti Suhana Judi[1], Wan Mohd Nurdden Wan Muhammad[2*], Zulkhairy Affandy Mohd Zaki[3], Mohd Khairul Fitri Othman[4]

[1] College of Built Environment, Universiti Teknologi MARA (UiTM), Malaysia,
   E-mail: sitisuhana@uitm.edu.my
[2] College of Built Environment, Universiti Teknologi MARA (UiTM), Malaysia,
   E-mail: nurdden@uitm.edu.my
[3] College of Built Environment, Universiti Teknologi MARA (UiTM), Malaysia,
   E-mail: zulkhairy86@uitm.edu.my
[4] College of Built Environment, Universiti Teknologi MARA (UiTM), Malaysia,
   E-mail: fitiriothman85@gmail.com
[*] Corresponding Author

Article Info:

Abstract:

This study investigates the significant impacts of Massive Open Online Courses (MOOCs) on the Contract Administration subject (Professional Practice) among Quantity Surveying undergraduates at Universiti Teknologi MARA (UiTM) Shah Alam. The research employed a quantitative methodology, distributing 100 questionnaires to final-year students, with 67 valid responses obtained. Data analysis was conducted using SPSS software, focusing on dimensions such as course relevance, content delivery, and professional development impact. The results reveal high levels of student satisfaction, indicating that MOOC effectively meets educational expectations and significantly enhances students' understanding of contract administration principles. Specifically, students reported that the course content was relevant and directly applicable to their professional practice, contributing to improved academic performance and career readiness. The interactive and flexible nature of the MOOC platform facilitated a more engaging learning experience, accommodating diverse learning styles and schedules. In conclusion, the MOOC demonstrates the transformative potential of MOOCs in Malaysian higher education, particularly in the field of Quantity Surveying. By enhancing the accessibility and quality of education, MOOCs can play a crucial role in supporting lifelong learning and professional development. The findings advocate for continued investment in digital infrastructure and learner support

to overcome existing challenges and maximize the benefits of MOOCs in higher education.

Introduction

The current global panorama of industrial operations, business management, and education has undergone significant transformation due to technological advancements and innovation. The most recent technological advancements in education have changed the game, especially when it comes to higher education institutions. A new method of teaching and learning has indirectly replaced the traditional classroom instructional procedures due to the widespread use of mobile devices like smartphones and tablets in daily tasks (Abdul Wahab et.al, 2019). This paper is aimed to survey the significant impacts of Massive Open Online Course on contract administration subject among quantity surveying undergraduates' students. The scope of the survey is among final year students of Quantity Surveying degree program in UiTM Shah Alam.

Massive Open Online Courses (MOOCs), have been around for a while now, and they were created to keep up with the latest technology advances. The way that teachers teach has changed as a result of this new learning strategy, which has also changed how students acquire knowledge. Yu (2015) defines MOOCs as massive open online courses that are readily and broadly accessible over the Internet to an infinite number of learners. It functions as an open education system in which students are free to enrol in any top-notch course, however some do have a small cost. MOOCs provide for flexible learning without time or location constraints because they are delivered online. MOOCs covers all the technical and non-technical courses, mostly free of charge or with a minimal cost, it is open virtually for anyone to be enrolled, thus it provides a platform for potential learners to experience a quality education at their own pace and time.

The requirement for physical presence in traditional learning models poses significant barriers to accessibility. This model disproportionately affects those in remote areas or those with economic constraints who cannot afford the travel or living expenses associated with campus-based education. While MOOCs address these issues by providing global access and flexible scheduling, they are not without their limitations. For example, the quality of internet access still poses a barrier in many regions, potentially limiting the true reach of MOOCs. Additionally, the self-paced nature of MOOCs can lead to procrastination and low completion rates, as students may lack the external motivation provided by structured classroom settings (Onah, Sinclair & Boyatt, 2014).

The high costs associated with traditional education tuition, accommodation, commuting, and textbooks can be prohibitive for many potential students, limiting diversity and equity within these institutions. In contrast, MOOCs often offer a low-cost or free alternative, significantly lowering the financial barriers to education. However, the reliance on digital platforms may incur hidden costs such as the need for personal computers and high-speed internet. Furthermore, while MOOCs reduce direct costs, they rarely confer the same level of accredited

qualifications as traditional degrees, which can affect the long-term value of the education received (Hollands & Tirthali, 2014).

Traditional courses often lag behind advancements in professional fields due to lengthy approval processes and bureaucratic protocol, resulting in graduates who may not possess the latest skills demanded by employers. MOOCs can swiftly integrate new developments and cutting-edge knowledge into their courses. However, this agility comes at the cost of depth and rigor, as courses designed to be quickly updated may lack the comprehensive coverage found in traditionally vetted courses. Additionally, the broad focus of MOOCs might dilute the specialized, context-specific knowledge provided by conventional education (Margaryan, Bianco, & Littlejohn, 2015).

Traditional classrooms face physical constraints that limit student enrolment, which can affect the student-to-teacher ratio and reduce the amount of individual attention students receive. The ability of MOOCs to scale and serve thousands of students simultaneously is one of their greatest strengths. However, this scalability often results in a lack of personal interaction between students and instructors, potentially reducing the quality of feedback and support. Large-scale courses also struggle with adequately assessing individual student performance through standardized automated methods, which may not accurately reflect student learning outcomes (Breslow et al., 2013).

Literature Review

The section for literature review is divided into two (2) main sections: Massive Open Online Courses (MOOCs) and the Professional Practice Course. Further discussion on those two (2) sections is explained in this section.

Massive Open Online Course

Massive Open Online Courses (MOOCs) have become an important part of modern higher education, offering easy access to learning for people all over the world. The term "MOOCs" was first used in 2008 by Dave Cormier and Bryan Alexander in Canada, to describe an online course called "Connectivism and Connective Knowledge" at the University of Manitoba. This course, created by Stephen Downes and George Siemens, was unique because it was offered to 25 on-campus students who paid tuition, while also being open to 2300 members of the public for free. This marked the beginning of a new era in online education.

In 2012, MOOCs gained widespread attention in major media outlets, highlighting their growing influence in education. Although some experts, like Daniel (2012), were initially sceptical about the future of MOOCs, these courses continued to develop and attract interest in the following years. MOOCs are known for their flexibility and accessibility, allowing learners from anywhere to join courses without the need to be in a specific location or follow a strict schedule. As noted by Liyanagunawardena et al. (2013), the number of studies on MOOCs has grown rapidly, showing their importance in today's education system.

In Malaysia, the use and growth of MOOCs have been particularly significant, especially in public universities. Understanding the factors that influence the adoption of MOOCs, as well as studying how satisfied students are and how ready they are to use these courses, is important for understanding their overall impact. MOOCs not only provide a way to share knowledge but also encourage interaction and collaboration among participants, making the learning

experience richer. The idea of simultaneity and instantaneousness described by Koutropoulos and Hogue (2012), captures the complex nature of MOOCs, which use various digital platforms and social networks to support learning (Zakaria et al., 2024).
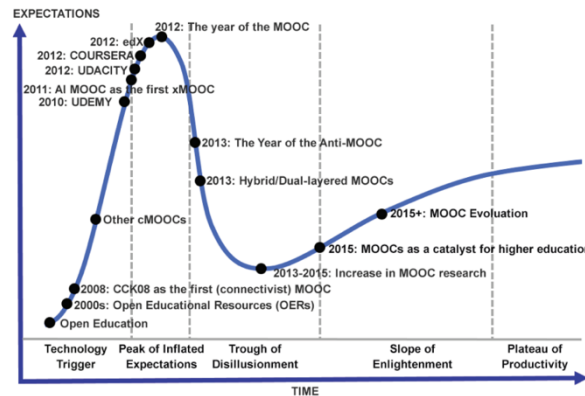
Figure 1: Gartner Hype Cycle of Key MOOC Events/Developments
Source: (Bozkurt, Özdamar Keskin, & de Waard, 2016)

Over the time, MOOCs have evolved to include blended designs that mix different teaching approaches. Initially seen as a potential game-changer in higher education, MOOCs continue to be a major topic of research and discussion. This section aims to add to the existing literature by exploring how MOOCs have evolved, particularly in Malaysia and its public universities, while also examining what drives their adoption, how satisfied students are, and how prepared they are to engage with this new way of learning (Zakaria et al., 2024).

Development of Massive Open Online Courses (MOOCs) in Malaysia Higher Education
The adoption of MOOCs in Malaysia has been influenced by several key factors, including the government's commitment to digital transformation in education, the increasing availability of digital infrastructure, and the growing demand for flexible learning options. The Malaysian Ministry of Higher Education (MoHE) has played a pivotal role in promoting MOOCs through various initiatives and policies. One of the significant milestones was the introduction of the Malaysia Education Blueprint (2015-2025), which emphasized the integration of digital learning tools, including MOOCs, to enhance the quality of higher education (Ministry of Education Malaysia, 2015). Following this, the Malaysian Qualifications Agency (MQA) introduced guidelines to recognize MOOCs for credit transfer, further legitimizing their use in formal education (MQA, 2019).

Over the years, Malaysian universities and educational institutions have increasingly incorporated MOOCs into their curricula. Notable universities, such as Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM), and Universiti Putra Malaysia (UPM), Universiti Teknologi MARA (UITM) have developed and offered various MOOCs across diverse disciplines. These courses are available through platforms like Open Learning and Future Learn, which have partnered with local institutions to provide a range of courses tailored to the Malaysian context. The implementation of MOOCs has also been supported by technological advancements and increased internet penetration in Malaysia. According to the Malaysian Communications and Multimedia Commission (MCMC), internet penetration in Malaysia reached 88.7% in 2022, facilitating greater access to online learning resources (MCMC, 2022).

Advantages of MOOCs in Higher Education

MOOCs offer numerous advantages that make them a valuable addition to higher education. Their ability to provide accessible, flexible, and cost-effective learning opportunities addresses many of the challenges faced by traditional educational models. Additionally, MOOCs support lifelong learning and skill development, facilitate collaborative learning and networking, and offer scalable solutions to meet the growing demand for higher education. As MOOCs continue to evolve and improve, they hold the potential to further revolutionize the educational landscape, making quality education accessible to all.

Over the past decade, scholarly discussions on the benefits of MOOCs (Massive Open Online Courses) have highlighted their transformative impact on education. Initially praised for their cost-effectiveness and accessibility, MOOCs have been recognized for promoting professional development and democratizing education by reaching underserved populations. Scholars have also emphasized the career advantages for learners, the role of MOOCs in fostering a global learning community, and the benefits for educational institutions in expanding their reach. The adaptability of MOOCs during the COVID-19 pandemic demonstrated their value in ensuring educational continuity, while advancements in learning analytics have allowed for more personalized learning experiences. Overall, MOOCs have continually evolved to meet the diverse needs of learners and institutions, solidifying their role in modern education. Table 1 array the key benefit of MOOCs according to various authors.

Table 1: Key Benefit of MOOCs

Year	Scholar(s)	Key Benefits Mentioned
2014	Hollands, F. M., & Tirthali, D.	Discussed cost-effectiveness, noting that MOOCs provide free or low-cost education compared to traditional higher education.
2015	Margaryan, A., Bianco, M., & Littlejohn, A.	Highlighted the opportunity for professional development and lifelong learning through MOOCs.
2016	Ebben, M., & Murphy, J. S.	Addressed the diversity of course offerings and the potential for MOOCs to democratize education by reaching underserved populations.
2017	Shah, D.	Provided evidence of career benefits, including skills enhancement and career advancement for MOOCs learners.
2018	Bali, M.	Discussed the role of MOOCs in fostering a global learning community, promoting cross-cultural understanding and collaboration.
2019	Li, K. C., & Wong, B. T. M.	Analysed the benefits of MOOCs for educational institutions, including the ability to reach a wider audience and increase institutional visibility.
2020	Reich, J., & Reich, J., & Ruipérez-Valiente, J. A	Explored the role of MOOCs in continuing education and their adaptability in response to the COVID-19 pandemic.
2021	Zhu, M.	Focused on the use of learning analytics in MOOCs to personalize learning and improve learner engagement.

| 2022 | Jordan, K. | Discussed the ongoing benefits of MOOCs in providing educational access in developing regions. |
| 2023 | Zhu, M. | Highlighted the post-pandemic adaptation of MOOCs and their role in maintaining educational continuity during global disruptions. |

- **Accessibility**

One of the most significant advantages of MOOCs is their ability to democratize access to education. Traditional higher education often comes with barriers such as geographical location, financial constraints, and limited availability of institutions. MOOCs eliminate these barriers by providing free or low-cost access to high-quality courses from renowned universities worldwide (Gaebel, 2013). This increased accessibility is particularly beneficial for learners in developing countries or remote areas where educational resources are scarce.

- **Flexibility**

MOOCs offer unparalleled flexibility in terms of time and pace of learning. Unlike traditional classroom settings that require synchronous attendance, MOOCs allow learners to access course materials at their convenience. This flexibility is advantageous for working professionals, parents, and others with time constraints who wish to pursue higher education without disrupting their daily responsibilities (Jordan, 2015). Furthermore, MOOCs enable self-paced learning, allowing individuals to progress according to their understanding and comfort level.

- **Cost-Effectiveness**

The financial aspect of higher education is a significant concern for many students. MOOCs address this issue by offering courses at no or minimal cost, thereby reducing the financial burden associated with obtaining a higher education degree (Yuan & Powell, 2013). Additionally, MOOCs often provide free access to textbooks and other educational resources, further lowering costs for learners.

- **Lifelong Learning and Skill Development**

MOOCs cater to the growing need for lifelong learning and continuous professional development. In today's rapidly changing job market, individuals must continually update their skills and knowledge to remain competitive. MOOCs offer a wide range of courses in emerging fields such as data science, artificial intelligence, and digital marketing, enabling learners to acquire new skills and enhance their employability (Pappano, 2012). This emphasis on lifelong learning aligns with the demands of the modern workforce, where continuous education is crucial for career advancement.

- **Collaborative Learning and Networking**

MOOCs also facilitate collaborative learning and networking opportunities. Many MOOCc platforms incorporate discussion forums, peer reviews, and group projects, fostering a sense of community among learners from diverse backgrounds (Hew & Cheung, 2014). These interactions not only enhance the learning experience but also provide valuable networking opportunities that can lead to professional growth and collaboration.

- **Scalability**

The scalability of MOOCs is another critical advantage. Traditional educational institutions often struggle with limited capacity and resources to accommodate growing student populations. MOOCs, on the other hand, can reach a virtually unlimited number of learners simultaneously, making them an efficient solution for expanding access to higher education (Sanchez-Gordon & Lujan-Mora, 2014). This scalability ensures that educational institutions can meet the increasing demand for higher education without compromising quality.

Challenges and Future Directions

Despite the positive developments, the implementation of MOOCs faces several challenges. These include issues related to course completion rates, the digital divide, and the need for continuous quality assurance. During the pandemic, Zhu (2023) deduced that MOOC developers often facing challenges such as maintaining engagement and course completion rates, while also identifying new opportunities for expanding access to education through MOOCs. While MOOCs have expanded access to education, the dropout rates remain high, indicating a need for better learner support and engagement strategies.

Moreover, addressing the digital divide remains critical, as not all learners have equal access to digital devices and high-speed internet. The government and educational institutions need to invest in infrastructure and support mechanisms to ensure equitable access to online education. In addition, the content of MOOC should be improvised especially the course design and student engagement, which are critical aspects of modern MOOCs (Gupta & Sambyal, 2021). In terms of ethical aspects, Tzimas and Demetriadis (2021) wrote that, the developer of MOOC should be emphasized for clear guidelines to ensure ethical practices in data collection and usage. The research addresses the growing concerns around privacy and data security as MOOCs continue to evolve.

Looking ahead, the future of MOOCs in Malaysia appears promising, with potential for further growth and innovation. Continued collaboration between government, educational institutions, and industry stakeholders will be essential in enhancing the quality and reach of MOOCs. Additionally, leveraging emerging technologies such as artificial intelligence and data analytics can help in personalizing learning experiences and improving learner outcomes.

Massive Open Online Course (MOOC) for Professional Practice Course

Professional Practice course aims to provide students with comprehensive knowledge of various clauses in standard forms of contract used in the construction industry, with a specific focus on their application in quantity surveying and building practices. By the end of the course, students are expected to relate the provisions in standard forms of contract to their application as mechanisms for contract administration and interpret the quantity surveyor's responsibility in managing contract administration. The teaching methodologies employed in this course include lectures and tutorials. Lectures are designed to deliver both theoretical and practical knowledge, while tutorials provide interactive sessions that reinforce learning and the practical application of the course content.

The structure of the Massive Open Online Course (MOOC) for Professional Practice course is divided into five main chapters which discussing in-depth into several sub-topics. The chapters and sub-topics are aligned with Course Learning Outcome and Syllabus contents. All the chapters are designed with interactive and effective videos, lectures notes, activities and

assessment. To ensure high engagement among the students, all the course material developed within MOOCs utilise latest educational game-based learning such as Kahoot and Quizzes. The course can be accessed at U Future platform.

Theoretical Framework- The Diffusion of Innovations Theory

The Diffusion of Innovations Theory, developed by Everett Rogers, offers a robust framework for understanding how new ideas, technologies, or practices like MOOCs spread within social systems. It can significantly enrich your journal article by providing a structured lens through which to examine the adoption and proliferation of MOOCs in the educational sector.

In this paper, the structure of MOOCs' diffusion is the evaluation each of these factors based on empirical data, or surveys within educational institutions. This approach not only provides a theoretical base but also offers a practical examination of the variables affecting MOOCs' adoption. For each factor, consider providing specific examples from both successful and unsuccessful attempts to integrate MOOCs into educational systems. This contrast can offer nuanced insights into what drives or hinders the broader adoption of innovative educational technologies. By using the Diffusion of Innovations Theory as the guiding framework adds a layer of depth to the analysis, helping readers understand not just the current state of MOOCs adoption, but also the factors that influence its future trajectory. This could significantly enrich the contributions to the field of educational technology.

Research Methodology

This study employs a quantitative research design to assess the effectiveness and impact of the Massive Open Online Course for Professional Practice among final year students of the Bachelor (Hons) Quantity Surveying program at Universiti Teknologi MARA (UiTM) Shah Alam. Quantitative research was selected for its ability to provide objective, numerical data that can be analysed statistically to draw generalizable conclusions. The target population for this study consists of final year students enrolled in the Bachelor (Hons) Quantity Surveying program at UiTM Shah Alam. A total of 100 questionnaires were distributed to these students to gather their feedback and insights regarding the course. Out of the 100 distributed questionnaires, 67 were completed and returned, yielding a response rate of 67%. Data were collected through a structured questionnaire designed to capture various aspects of the course, including participant expectations, course design, activities, student-tutor engagement, and the impact of learning. The questionnaire was distributed to the respondents in both online and physical formats to ensure maximum reach and convenience for the students. The survey was distributed from 10th February 2023 to 17th February 2023 with a duration of one (1) week.

The questionnaire was divided into several sections, each focusing on a different aspect of the MOOC:

- Section A: Participant Expectations - Assessed whether the course met participants' expectations in terms of content relevance, professional development, and overall satisfaction.
- Section B: Course Design - Evaluated the navigability, attractiveness, and appropriateness of the course content.
- Section C: Impact of Learning - Evaluated the overall impact of the course on participants' professional performance and their likelihood to recommend the course.

The collected data were analysed using SPSS (Statistical Package for the Social Sciences) software. Descriptive analysis was employed to summarize and describe the main features of the data. This included calculating mean scores to determine the level of satisfaction and effectiveness across various dimensions of the course, as well as examining the variance to understand the distribution and variability of responses. This methodology provides a structured approach to quantitatively evaluate the course, offering insights into its effectiveness and impact on final year Quantity Surveying students at UiTM Shah Alam. The use of SPSS software for data analysis ensures a rigorous and statistically sound evaluation of the collected data, contributing to the reliability and validity of the research findings.

Results and Discussions

This analysis focuses on evaluating the Massive Open Online Courses (MOOCs) to determine the extent to which it met participant expectations, the effectiveness of its design, the appropriateness of its activities, and the overall impact on learners. The findings are derived from statistical measures including mean, which provide a comprehensive view of the course's performance across various dimensions.

Table 2: To Measure Whether the Learning Has Met the Participants' Expectation

Description	Mean
The topics were relevant to the course.	4.69
To interpret the quantity surveyor's responsibility for management of contract administration.	4.57
Develop students professionally.	4.51
Met students' needs.	4.51
To relate provisions in standard forms of contract and contract administration	4.59
Met students' expectations.	4.45

The data in Table 2 evaluates whether the course met participants' expectations through various metrics. The highest satisfaction was regarding the relevance of topics, which received a mean score of 4.69, showing that participants found the topics highly pertinent to the course. The course was also effective in clarifying the quantity surveyor's responsibilities for management of contract administration, scoring a mean of 4.57. Professional development aspects and the course met students' need received positive feedback with a mean of 4.51. Participants (students) expressed high satisfaction with the course's ability to relate provisions in standard forms of contract and contract administration, as indicated by a mean score of 4.49. The course largely met student expectations, with scores of 4.45

Table 3: To Measure Course Design

Description	Mean
The course pages were easy to navigate (for online courses).	4.28
The course pages were attractive (for online courses)	4.22
The information (lecture notes, video) was pitched at the right level.	4.43

Table 3 assesses the course design in terms of navigability, attractiveness, and appropriateness of content. Most participants found the course pages easy to navigate, reflected by a mean score of 4.28. The visual appeal of the course pages received a generally positive mean score of 4.22. Additionally, participants agreed that the lecture notes and videos were appropriately pitched, with a mean score of 4.43.

Table 4: To Measure Impact of Learning

Description	Mean
Helping to improve performance at work	4.55
Would you to recommend this course to a friend/colleague?	4.19
Overall rating on the experience of the course.	4.40

Table 4 evaluates the overall impact of the course on participants' professional performance and their likelihood to recommend it. Participants reported significant improvement in work performance with a mean score of 4.55. The likelihood of recommending the course to others received a positive mean score of 4.19. Overall, the course experience was rated positively, with a mean score of 4.40. The analysis of the course indicates high levels of participant satisfaction across various dimensions of the course. The course effectively met participant expectations, provided relevant and appropriately pitched content, and facilitated significant engagement between students and tutors. The positive impact on participants' professional performance and their general willingness to recommend the course further underscores its success. However, areas with higher variability in responses, such as the attractiveness of course pages and the overall experience, suggest room for improvement to enhance the course's overall effectiveness and appeal.

Conclusion

The research on the implementation of the Massive Open Online Course (MOOC) for the Professional Practice course among final year Bachelor (Hons) Quantity Surveying students at Universiti Teknologi MARA (UiTM) Shah Alam has yielded significant insights into the efficacy and impact of MOOCs in Malaysian higher education. The findings indicate that the course has successfully met participant expectations, delivering relevant and high-quality content that has effectively enhanced students' understanding of contract administration. The high levels of satisfaction reported in areas such as course relevance, professional development, and content delivery underscore the course's success in fulfilling educational objectives.

Additionally, the course demonstrates the broader advantages of MOOCs, including accessibility, flexibility, and cost-effectiveness. These attributes are particularly beneficial in addressing the challenges associated with traditional educational models, such as geographical and financial barriers. The study also highlights the potential of MOOCs to support lifelong learning and professional development, essential in today's rapidly evolving job market.

However, the research also acknowledges challenges, such as high dropout rates and the digital divide, which need to be addressed to maximize the potential of MOOCs. Ensuring equitable access to digital resources and providing robust learner support systems are critical steps toward improving MOOC completion rates and overall effectiveness.

In conclusion, the positive outcomes of MOOC underscore its potential to revolutionize higher education in Malaysia. The significant impact of MOOC is proven by the respondents' satisfaction and giving positive feedback on the course. By making quality education more accessible and flexible, MOOCs can play a pivotal role in supporting the nation's educational goals and fostering a culture of continuous learning. Future efforts should focus on enhancing MOOC quality, expanding digital infrastructure, and leveraging emerging technologies to further personalize and improve the learning experience. Continued collaboration between government, educational institutions, and industry stakeholders will be essential in realizing the full potential of MOOCs in Malaysia's higher education landscape.

The research makes several important contributions to the field of education, particularly within the context of quantity surveying. By focusing on the integration of MOOCs into the curriculum for contract administration, the research offers subject-specific insights that highlight how online education platforms can effectively support specialized fields of study. This is particularly valuable for disciplines like quantity surveying, where the educational requirements are unique and often require practical, industry-specific knowledge.

One of the key contributions of the research is the provision of empirical evidence on the effectiveness of MOOCs in enhancing learning outcomes for quantity surveying students. By examining the impact of MOOCs on students' understanding of contract administration, the research provides concrete data that can be used to advocate for the inclusion of MOOCs as a supplementary resource in traditional educational settings. This evidence not only supports the potential of MOOCs to improve students' grasp of complex concepts but also emphasizes the role of online platforms in complementing traditional classroom instruction.

The research also contributes to pedagogical advancements by demonstrating how MOOCs can be integrated into existing educational frameworks. The study highlights innovative strategies for combining online and offline learning, suggesting that MOOCs can offer flexibility and additional resources that enhance the overall student learning experience. This contribution is particularly relevant for educators who are seeking to adopt blended learning approaches that cater to the diverse needs of their students.

Furthermore, the findings of the research have the potential to influence curriculum design within quantity surveying programs. By providing evidence of the benefits of MOOCs in teaching contract administration, the research may encourage educational institutions to incorporate MOOCs as part of their official curricula. This could lead to more dynamic and interactive learning environments that better prepare students for the demands of their profession.

Additionally, the research offers valuable guidance for educators on the practicalities of using MOOCs in their teaching. By addressing both the benefits and challenges associated with MOOC integration, the research helps educators make informed decisions about how to effectively utilize online resources in their courses. This guidance is crucial for ensuring that MOOCs are used in a way that maximizes their educational value.

Overall, the research adds to the broader literature on MOOCs by exploring their application in a specific professional field. It highlights the versatility of MOOCs in different educational contexts and their potential to make a significant impact across various disciplines. Moreover,

the insights gained from the research could have important policy implications, encouraging the adoption of digital learning tools in higher education and supporting the continued evolution of educational practices in the digital age.

Recommendation For Future Research

Ethical Considerations and Data Privacy
With the increasing use of learning analytics and big data in MOOCs, future research should address the ethical considerations related to data privacy, security, and consent. This includes exploring frameworks for ethical data use, understanding learners' perceptions of data privacy, and developing guidelines to protect user information while leveraging data for educational improvement.

MOOC Accessibility and Inclusivity
Ensuring that MOOCs are accessible to all learners, including those with disabilities, should be a priority for future research. Studies should focus on designing MOOCs that are inclusive, addressing issues related to accessibility features, language barriers, and the provision of support services for learners with diverse needs.

Engagement and Retention Strategies
Research is needed to identify effective strategies for increasing learner engagement and retention in MOOCs. This includes exploring motivational factors, the role of community building and social interaction in online learning, and the impact of different course formats on learner persistence. By addressing these areas, future research can contribute to the continued evolution and improvement of MOOCs, ensuring they remain a valuable and accessible educational resource for learners worldwide.

References
Abdul Wahab, N., Othman, J., Kadar, R., & Warris, S. N. (2019). A review of MOOCs implementation in Malaysian higher education system. *Journal of Computing Research & Innovation (JCRINN), 4(2)*. https://doi.org/10.24191/jcrinn.v4i2.200

Bali, M. (2018). MOOC pedagogy: Gleaning good practice from existing MOOCs. *MERLOT Journal of Online Learning and Teaching, 10*(1), 44-56.

Bozkurt, A., Özdamar Keskin, N., & de Waard, I. (2016). Research trends in Massive Open Online Course (MOOC) theses and dissertations: Surfing the tsunami wave. *Open Praxis*, 8(3), 203-221. https://doi.org/10.5944/openpraxis.8.3.287

Breslow, L., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A. D., & Seaton, D. T. (2013). Studying learning in the worldwide classroom: Research into edX's first MOOC. *Research & Practice in Assessment, 8*, 13-25.

Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education, 2012*(3). https://doi.org/10.5334/2012-18

Ebben, M., & Murphy, J. S. (2016). Unpacking MOOC scholarly discourse: A review of nascent MOOC scholarship. *Learning, Media and Technology, 41*(3), 328-345. https://doi.org/10.1080/17439884.2015.1049943

FutureLearn. (2023). Courses by Malaysian universities. Retrieved from https://www.futurelearn.com

Gaebel, M. (2013). MOOCs: Massive open online courses. *European University Association*.

Gupta, R., & Sambyal, N. (2021). A comprehensive systematic review of MOOC research: Research techniques, topics, and trends from 2009 to 2019. *Educational Technology Research and Development*. https://doi.org/10.1007/s11423-020-09901-1

Hew, K. F., & Cheung, W. S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. *Educational Research Review, 12*, 45-58.

Hollands, F. M., & Tirthali, D. (2014). MOOCs: Expectations and reality. *Center for Benefit-Cost Studies of Education, Teachers College, Columbia University, NY*.

Jordan, K. (2015). Massive open online course completion rates revisited: Assessment, length, and attrition. *International Review of Research in Open and Distributed Learning, 16*(3), 341-358.

Jordan, K. (2022). Massive open online courses (MOOCs) for development: Trends, challenges, and opportunities. *Journal of Learning for Development, 9*(2), 254-269.

Koutropoulos, A., & Hogue, R. J. (2012). How to succeed in a MOOC - Massive online open course. *Elearning!, 2012*(4), 22-23.

Li, K. C., & Wong, B. T. M. (2019). Factors related to the perceived benefits of MOOCs: From the perspective of learners in higher education. *Asia Pacific Education Review, 20*(2), 289-299. https://doi.org/10.1007/s12564-018-9566-8

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008-2012. *The International Review of Research in Open and Distributed Learning, 14*(3), 202-227. https://doi.org/10.19173/irrodl.v14i3.1455

Malaysian Communications and Multimedia Commission (MCMC). (2022). Internet users survey. Retrieved from https://www.mcmc.gov.my

Malaysian Qualifications Agency (MQA). (2019). Guidelines on credit transfer for MOOCs. Retrieved from https://www.mqa.gov.my

Margaryan, A., Bianco, M., & Littlejohn, A. (2015). Instructional quality of massive open online courses (MOOCs). *Computers & Education, 80*, 77-83. https://doi.org/10.1016/j.compedu.2014.08.005

Ministry of Education Malaysia. (2015). *Malaysia education blueprint 2015-2025 (Higher Education)*. Putrajaya: Ministry of Education Malaysia.

Onah, D. F. O., Sinclair, J. E., & Boyatt, R. (2014). Dropout rates of massive open online courses: Behavioural patterns. *EDULEARN14 Proceedings*, 5825-5834.

Pappano, L. (2012). The year of the MOOC. *The New York Times*.

Reich, J., & Ruipérez-Valiente, J. A. (2020). The MOOC pivot. *Science, 367*(6483), 34-35. https://doi.org/10.1126/science.aba8691

Sanchez-Gordon, S., & Lujan-Mora, S. (2014). MOOCs gone wild. In *Proceedings of the 8th International Technology, Education and Development Conference* (pp. 1449-1458). IATED.

Shah, D. (2017). By the numbers: MOOCs in 2017. *Class Central*. Retrieved from https://www.classcentral.com/report/mooc-stats-2017/

Tzimas, P., & Demetriadis, S. (2021). Ethical considerations in learning analytics in MOOCs: A systematic review. *Education and Information Technologies*. https://doi.org/10.1007/s10639-020-10312-2

Yuan, L., & Powell, S. (2013). MOOCs and open education: Implications for higher education. *JISC CETIS*.

Yu, C. (2015). Challenges and changes of MOOC to traditional classroom teaching mode. *Canadian Social Science, 11*(1), 135-139. https://doi.org/10.3968/6023

Zakaria, I., Anual, N., Abdul Karim, Z. H., Kozako, I. N. A. M. F., & Zamri, M. N. (2024). The evolution, challenges, and prospects of implementing massive open online courses (MOOCs) in Malaysian public universities. *International Journal on e-Learning and Higher Education, 19*(1).

Zhu, M. (2021). Learning analytics for MOOCs: Measuring and optimizing learner engagement. *Educational Technology Research and Development, 69*(5), 1-20. https://doi.org/10.1007/s11423-021-09936-9

Zhu, M. (2023). Adapting MOOCs for post-pandemic education: A systematic review. *Journal of Online Learning and Teaching, 27*(2), 149-165. https://doi.org/10.24059/olj.v27i2.2499