Learning Quality Innovation through Integration of Pedagogical Skill and Adaptive Technology

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Abstract: *This paper aims to explore the modern learning environment (MLE) which may emerge from the secondary education into the tertiary education. This integration usually derives from enhancing the pedagogical skill and adaptive technology to strengthen the teaching and learning process. Literature review from referred books and journals was conducted with thematic analysis. The investigation was employed in depth analysis from referred books, journals and conferences using the keywords of pedagogical skill and adaptive technology and modern learning environment. The multiple finding from met-synthesis was conducted by searching for the information which is organised using substantive keywords. The findings reveal that the role of MLE can be divided into attempting to perform learning quality, integrating the learning with continuous process, making easy in getting the sources, creating flexibility in learning. This study is expected to contribute the way of maintaining inside factor within the human being which is significantly necessary to make effort in assisting spirit performance in teaching process. To assist students across learning environment by pedagogical skills with encouraging higher teaching and learning, making convince into the pedagogy might be necessary a way to promote a range of pedagogical skills continuing integration with technological tools. In addition, using experience to boost the abstract ideas acquired in certain subjects as the source of knowledge itself can become a particular principle for the enhancement of learning in higher education.*

Index Terms: *learning quality, innovation, pedagogical skill, adaptive technology, 21 century learning, modern learning environment, openness in education, access to resources, flexibility in learning.*

I. INTRODUCTION

In the last few decades, the emergence of technological tool with the necessary benefits like flexibility, openness and access to resources has been existed in supporting strengths-based teaching and learning (Keppell, Souter, & Riddle, 2012). It aims to give the value with the experiences in creating the typical connections beyond the teaching and learning boundary (Anderson, 2008). As a result, to assist

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students across reaching academic knowledge, the role of modern learning environment (MLE) has the chance to integrate between pedagogical skill and adaptive technology. It can also be engaged into the digital era (Beetham & Sharpe, 2013) to encourage higher teaching and learning to make convince which is necessary as a way to maintain the motivational intention of constructivism and relevance to emphasise students' learning experience. Thus, this paper attempts to critically explore the role of MLE in supporting the 21 century learning. This study begins with elucidating the conceptual framework on literature review on 21 century learning and MLE.

A. Towards Modern Learning Environment

Modern Learning Environment (MLE) has been introduced as the learning model supported with environmental section into the modern path. It covers the pedagogical and technological approach in creating classroom model more convenient. Designed to the teaching and learning process to support educational model, MLE is a kind of educational circles required in schools and also in higher learning around the world to support multimodal learning styles, as well as collaborative communication styles (Sankey, Birch & Gardiner, 2010). MLE designed to support learning styles can exactly make the classroom environments to be modern. The form of classrooms refers to enhance knowledge inquiry rooted in pedagogical and technological approach. With regard to supporting learning styles in knowledge inquiry, facilitating the tools can be taken in consideration to create such bright which may stimulate classrooms to enable student to accept the learning to additionally get access to online resource. To give such description into the space with open and flexible learning spaces, the views on some elements will help improve students' learning and outcomes. Moreover, some particular additional facilitation like multi-purpose spaces and technology-rich spaces seem to be considerable chances to enhance the learning instrument relating to the present time. Some particular additional facilitation can be seen such as breakout spaces, multi-purpose spaces and technology-rich spaces (Vänttinen & Pyhältö, 2009).

As a result, the views on some elements on the modern style will help improve students' learning and outcomes which consider a great chance to enhance the learning instrument relating to the present time.

B. About 21st Century Learning

The learning framework of 21st century was developed as an attempt to illustrate the skills and knowledge which students should possess to enable them get success in their life in terms of work, learning and citizenship (Garrison, 2011; Trilling & Fadel, 2009). To support the systems necessary for 21st century learning outcomes, it has been used into the series of higher-order skills, abilities, and learning dispositions (McPhail & Rata, 2016). This is part of a growing movement focusing on the skills required for students to master in preparation for success in a rapidly changing, digital society (Beetham & Sharpe, 2013). Many of these skills are also associated with deeper learning, which is based on mastering skills such as analytic reasoning, complex problem solving, and teamwork with learning preferences (Othman et al, 2016). These skills differ from traditional academic skills in that they are not primarily content knowledge-based. The figure below illustrates that the student outcomes and support systems should be involved with learning and innovation skills.

The skill of learning and facilitated support has to be prepared well together with making learning environment in 21st century. During the latter decades of the 20th century and into the 21st century, society has undergone an accelerating pace of change in economy and technology. Its effects on the workplace, and thus on the demands on the educational system preparing students for the workforce, have been significant in several ways.

C. Between Pedagogical Skill and Adaptive Technology

Recognised as the learner-centred teaching practices, pedagogical skill can be actively engaged to the planning and making decisions related to the practice to help teachers to ensure learning opportunities among the students. Among the knowledge, experience, situation, environment, and learning goals, the pedagogical skills are essential for classroom management (Brown, 2007) with referring to instructional design model which has analysis, design, development, implementation, and evaluation (Koehler & Mishra, 2009). It ensures that learners with different learning styles can be taught and can learn similarly within the same lesson or activity. With regard to the instructional design models, adaptive technology can be also engaged to continue to influence pedagogy on the learning style which has the relevance among instructive strategies. Being personally meaningful into the instructor governed by the correlation with referring to the first phase of the project highlighted that the more students were involved as active participants in their own learning (Huda et al, 2017; Mishra & Koehler, 2007). As a result, the way to conduct in the classroom with adaptive technology can be employed into the classroom management strategies. It can be considered as the reflection to encourage the students' learning to be active participants in the culture and activities. Moreover, they can also utilise the educational technology in the classroom. In this view, having good pedagogical skills is essential for classroom and behaviour management.

II. METHODOLOGY

The methodology used in this study is an empirical literature review critically on proposing the model framework of understanding the role of MLE as the integration between pedagogical skill and adaptive technology. The strategy and application in the technological tool associated with skills will be constructed from recent reviews on technological strategy and application among the students. The investigation will be conducted using keywords of modern learning environment in terms of pedagogical basis and technological adoption. This derives from searching for peer-reviewed journals and books. After removing duplicates and articles beyond the scope of this study, such articles will be selected for reviews. In particular, employing meta-synthesis will be used to integrate, evaluate and interpret the findings of multiple types of research from recently grounded theory. Those ideas will be combined to identify their common core elements and themes. Then, key elements into interpretations and conceptualizations of the role of MLE by integrating pedagogical skill and adaptive technology will be analysed and synthesized. In particular, this profound discussion at a conceptual level will be transformed into technical requirements and specifications.

III. ANALYSIS AND DISCUSSION

A. Understanding the Role of Modern Learning Environment (MLE) in 21 Century Learning

Since there emerges the advancement of 21 century learning and also the innovations on integration between pedagogical aspect and technological adoption, understanding the role of MLE in the specific way on the conceptual progression to assist students across the learning experiences needs to enhance the empowerment to support their learning. To make effort in assisting the spirit performance in that process, addressing the teacher's performance in making convince into the pedagogy to maintain the motivational intention emphasise students' experience in outlining their experience (Rata, 2015). In particular, MLE has been transformed into the virtual, online and remote in today's interconnected and technology-driven world (Sankey et al, 2010). This aims at supporting the educational element including structures, tools and communities that accommodate the uniqueness to support the positive insights for effective learning. As a result, making the better way in learning environments is supposed to develop widely in today's educational policy to give inspirational essence for students and educators to attain the knowledge and skills.

B. Attempting to Perform Learning Quality

As an attempt to perform educational outcomes with strongly influencing several ways like online learning integrated from recommending pedagogy and integrating technology in the curriculum, developing the approach for making the rules and example models to control educational practices should be well prepared in schools and places of higher

education. Preparing the educational outcomes with learning quality equipped with the insights involving values and skills to lead to the students' learning (Ramsden, 2003), the learning environment comprising school, classroom and library is enhanced to support the advocacy of dynamic with modern and educational buildings eco-friendly and technologically advanced (Brown, 2007). Since the rise of the quality to do in the school and educational institution by the deeper underlying relationship between conceptions and design intention for 21st century's educational systems (Beetham & Sharpe, 2013), this learning model is supposed to establish a coherent approach to expanding intelligence to develop leadership approaches to empower learners in strengthening learning character which supports innovation as the preparation for educational outcome. As a result, fostering more intelligent learners may also be founded research to grow the teacher's role about learning. It can also build independence and responsibility by monitoring practice to improve the quality of learning.

C. Integrating the Learning with Continuous Process

Considered to drive the learning process, enhancing this stage can be engaged to give the opportunities to enable learners to observe and learn with continuous process. Integrating the learning process is regarded to pursue the element within users, namely learners and teachers (Kayes, 2002). Among the distinctions are concerning to create enjoyable condition (Gültekin, 2005; Shernoff & Csikszentmihalyi, 2009). With this regard, it is responsible for both students and teachers to try conceptualising a good circumstance to underlie learning-teaching performance. Continuous process with lifelong learning skills can be achieved to ensure that appropriate way with the strategic option in building the schools and educational facilities can be achieved through the learning process among children, school-leavers and graduates (McPhail, 2015). MLE with such environments including the delineation between formal and informal learning enables learners to practically and freely deploy flexible and modular furniture. It can also enable them the creation of groupings to dissolve and merge with others to form new groupings. As a fundamentally pedagogical model, the flexible space in learning has to do increasingly with perceiving learning schedules with strengthening continuous process.

D. Making Easy in Getting the Sources

MLE has potency in enhancing the learning source with enabling the learners to access it easily. It can be viewed that technology which is typically a learning common surrounded by a range of wireless and wired technology to offer access the students' need. Within the flow of the learning with the flexible learning environment, continuously improving community of practice with the technology's transformational impact can be employed. In addition, the significance of technology on education has been considered to do with online learning implementation, like Big Data approach as learning trends (Anshari, Alas & Guan, 2015; Anshari et al, 2016a), smartphone use on learning assistance (Anshari et al, 2017; Shin et al, 2011), supporting teacher education (Duhaney, 2001) and also for innovative teaching (Huda et al, 2016). In particular, an attempt to establish

communication through adopting the Internet and computers is significant to make an effective medium for educational institution (and those involved among between schools, teachers, students and parents to handle many issues surrounding them such as difficulties on finding address through geographical limitations due to lack of adequate training technologies.

E. Creating Flexibility in Learning

With regard to create flexibility in learning, the strategy implementation becomes one of the important elements to underlie outcomes learning. It has the meaning of the flexibility to enable learning with accessing the responsive way combined with pace, place and delivery mode (Sharma & Kolb, 2010). Set out from accumulating and transferring the subject matter, some components including using technology to provide remote or online study is entirely to do with work-based learning and employer engagement (Lejeune et al, 2009). As a result, creating flexibility here can be initiative on the teaching and learning process with a significant and strong role to show the lesson with the students' attitudes in their daily lives. To achieve this purpose in the way that the lessons should be transformed amongst the learners, it is necessary, therefore, for the teacher to take responsibility to make students more aware of space and flexibility in learning. Moreover, teachers need to improve the lesson by using different types of teaching methods, technique application and motivational approaches.

IV. CONCLUSION

This paper does elaborate the MLE in conjunction with the modern style of learning process. Some necessary benefits like flexibility, continuous process and getting access easily to sources, it is considered in supporting strengths-based teaching to add the value to the users' experiences and also create new relevance and connections beyond the school boundary. To assist students across learning environment by pedagogical skills with encouraging higher teaching and learning, making convince into the pedagogy might be necessary a way to promote a range of pedagogical skills continuing integration with technological tools. Maintaining the motivational intention to emphasise students' experience will lead to the development of learning environment that aligns better instruction in both student and teacher. Moreover by critically exploring the pedagogical and technological basis can be viewed into attempting to perform learning quality, integrating the learning with continuous process, making easy in getting the sources, creating flexibility in learning. As a result, this attempt is supposed to contribute the ideas acquired in certain subjects to become the particular principle for the enhancement of learning in higher education.

REFERENCES

1. Keppell, M., Souter, K., & Riddle, M. (2012). Physical and virtual learning spaces in higher education: concepts for the modern learning environment [Preface] (pp. xvi-xx). PIGI Publishing (IGI Global).
2. Anderson, T. (2008). *The theory and practice of online*

learning. Edmonton, Canada: Athabasca University Press.

3. Beetham, H., & Sharpe, R. (2013). Rethinking pedagogy for a digital age: Designing for 21st century learning. New York and London: Routledge.

4. Sankey, M., Birch, D., & Gardiner, M. (2010). Engaging students through multimodal learning environments: The journey continues. In *Proceedings ASCILITE 2010: 27th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education: Curriculum, Technology and Transformation for an Unknown Future* (pp. 852-863). University of Queensland.

5. Anshari, M., Almunawar, M. N., Shahrill, M., Wicaksono, D. K., & Huda, M. (2017). Smartphones usage in the classrooms: Learning aid or interference?. *Education and Information Technologies*, 1-17.

6. Anshari, Alas, Y., & Guan, L. S. (2015). Developing online learning resources: Big data, social networks, and cloud computing to support pervasive knowledge. *Education and Information Technologies*, 1-15.

7. Anshari, M., Alas, Y., Sabtu, N. I. P. H., & Hamid, M. H. S. A. (2016a). Online Learning: trends, issues and challenges in the Big Data Era. *Journal of e-Learning and Knowledge Society*, *12*(1).

8. Anshari, M., Alas, Y., Hamid, M. H. S. A., & Smith, M. (2016b). Learning Management System 2.0: Higher Education. *Handbook of Research on Engaging Digital Natives in Higher Education Settings*, 265.

9. Brown, M. R. (2007). Educating all students: Creating culturally responsive teachers, classrooms, and schools. *Intervention in school and clinic*, *43*(1), 57.

10. Duhaney, D. C. (2001). Teacher education: Preparing teachers to integrate technology. *International Journal of Instructional Media*, *28*(1), 23.

11. Garrison, D. R. (2011). E-learning in the 21st century: A framework for research and practice. London, UK: Taylor & Francis.

12. Gültekin, M. (2005). The Effect of Project Based Learning on Learning Outcomes in the 5th Grade Social Studies Course in Primary Education.*Educational Sciences: Theory & Practice*, *5*(2).

13. Huda, M., Anshari, M., Almunawar, M. N., Shahrill, M., Tan, A., Jaidin, J. H. & Masri, M. (2016). Innovative Teaching in Higher Education: The Big Data Approach. *The Turkish Online Journal of Educational Technology*, *15*(Special issue), 1210-1216.

14. Huda, M., Sabani, N., Shahrill, M., Jasmi, K. A., Basiron, B., & Mustari, M. I. (2017a). Empowering Learning Culture as Student Identity Construction in Higher Education. In *Student Culture and Identity in Higher Education* (pp. 160-179). IGI Global.

15. Huda, M., Jasmi, K. A., Hehsan, A., Shahrill, M., Mustari, M. I., Basiron, B., & Gassama, S. K. (2017b). Empowering Children with Adaptive Technology Skills: Careful Engagement in the Digital Information Age. *International Electronic Journal of Elementary Education*, *9*(3), 693-708.

16. Huda, M., Shahrill, M., Maseleno, A., Jasmi, K. A., Mustari, I., & and Basiron, B. (2017c). Exploring Adaptive Teaching Competencies in Big Data Era. *International Journal of Emerging Technologies in Learning*, *12*(3), 68-83.

17. Huda, M., Jasmi, K. A., Mustari, M. I., Basiron, B., Mohamed, A. K., Embong, W., ... & Safar, J. (2017d). Innovative E-Therapy Service in Higher Education: Mobile Application Design. *International Journal of Interactive Mobile Technologies*, *11*(4), 83-94.

18. Huda, M., Jasmi, K. A., Basiran, B., Mustari, M. I. B., & Sabani, A. N. (2017d). Traditional Wisdom on Sustainable Learning: An Insightful View From Al-Zarnuji's Ta 'lim al-Muta 'allim. *SAGE Open*, *7*(1), 1-8.

19. Kayes, D. C. (2002). Experiential learning and its critics: Preserving the role of experience in management learning and education. *Academy of Management Learning & Education*, *1*(2), 137-149.

20. Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge. *Contemporary issues in technology and teacher education*, *9*(1), 60-70.

21. Lejeune, A., Ney, M., Weinberger, A., Pedaste, M., Bollen, L., Hovardas, T. & De Jong, T. (2009, July). Learning Activity Spaces: Towards flexibility in learning design?. In *2009 Ninth IEEE International Conference on Advanced Learning Technologies* (pp. 433-437). IEEE.

22. McPhail, G., & Rata, E. (2016). Comparing curriculum types:'Powerful knowledge'and '21st century learning'. *New Zealand Journal of Educational Studies*, *51*(1), 53-68.

23. McPhail, G. J. (2015). Conceptual Progression in Innovative Learning Spaces. *New Zealand Journal of Teachers' Work*, *12*(1), 6-8.

24. Mishra, P., & Koehler, M. J. (2007). Technological pedagogical content knowledge (TPCK): Confronting the wicked problems of teaching with technology. *Technology and Teacher Education Annual*, *18*(4), 2214.

25. Othman, R., Shahrill, M., Mundia, L., Tan, A., & Huda, M. (2016). Investigating the Relationship Between the Student's Ability and Learning Preferences: Evidence from Year 7 Mathematics Students. *The New Educational Review*, *44*(2), 125-138.

26. Ramsden, P. (2003). *Learning to teach in higher education*. London and New York: Routledge.

27. Rata, E. (2016). A pedagogy of conceptual progression and the case for academic knowledge. *British Educational Research Journal*, *42*(1), 168-184.

28. Sharma, G., & Kolb, D. A. (2010). The learning flexibility index: Assessing contextual flexibility in learning style. *Style differences in cognition, learning and management: Theory, research and practice*, 60-77.

29. Shernoff, D. J., & Csikszentmihalyi, M. (2009). Cultivating engaged learners and optimal learning environments. *Handbook of positive psychology in schools*, 131-145.

30. Elena V. Smirnova, B. Ayshwarya, Phong Thanh Nguyen, Wahidah Hashim, Andino Maseleno, Using Shell Programs in Educational and Methodological Support for Learning Foreign Language, International Journal of Applied Exercise Physiology, Vol. 8 (2.1), 2019. pp. 1027-1032.

31. Inga E. Rakhimbaeva, Aleksandr A. Korostelev, Indira A. Shakirova, B. Ayshwarya, Phong Thanh Nguyen, Wahidah Hashim, Andino Maseleno, Integration of the Educational and Didactic Systems in the Training of Future Teachers, International Journal of Applied Exercise Physiology, Vol. 8 (2.1), 2019. pp. 1033-1038.

32. Alla L. Busygina, Elena M. Chertakova, Darya B. Shtrikova, B. Ayshwarya, Phong Thanh Nguyen, Wahidah Hashim, Andino Maseleno, Professional forms of Employment in the Russian Federation: Problems and Challenges, International Journal of Applied Exercise Physiology, Vol. 8 (2.1), 2019. pp. 1039-1045.

33. Olga I. Pugach, Andrei V. Ochepovsky, Wahidah Hashim, Andino Maseleno, B.Ayshwarya, Phong Thanh Nguyen, To the use of English Words When Learning Programming, Information Systems and Technologies, International Journal of Applied Exercise Physiology, Vol. 8 (2.1), 2019. pp. 1046-1051.

34. Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. San Fransisco, Canada: John Wiley & Sons.

35. Zakirillah, Noorminshah, A. I., Huda, M., Fathoni, & and Heroza, R. I. (2016). Design of a Mobile based Academic Cyber Counselling Application in Higher Education. *Journal of Information Systems Research and Innovation*, *10*(3), 1-9.

36. Grigory Olegovich Yarygin, Aleksandr Aleeksevich Korostelev, Rafis H. Mukhutdinov, Andino Maseleno, Elections and Russian Citizens Residing Overseas: Prospects for Internet Voting, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 52-57, 2019.

37. Larisa Akhunzhanovna Apanasyuk, Elena Vladimirovna Smirnova, Rafis H. Mukhutdinov, Andino Maseleno, The Problem of the Organization of Socio-Cultural Environment for Adaptation and Development of a Student-Migrant's Bilingual Identity in the Conditions of the Russian Higher Education, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 63-70, 2019.

38. Alla L. Busygina, Liliya A. Meteleva, Darya B. Shtrikova, Rafis H. Mukhutdinov, Andino Maseleno, Bases of Formation of Women's Professional Mentality in Russia, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 71-77, 2019.

39. Oleg N. Yarygin, Aleksandr A. Korostelev, Linar G. Akhmetov, Andino Maseleno, Modeling of Competence as a Tool of Goal Setting for Education in Modern Society, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 78-86, 2019.

40. Raven John, Aleksandr A. Korostelev, Oleg N. Yarygin, Rafis H. Mukhutdinov, Andino Maseleno, The Genesys and Base Concepts of Competentology, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 87-95, 2019.

41. Bogdanova Anna Vladimirovna, Aleksandr Alekseevich Korostelev, Rafis H. Mukhutdinov, Indira A. Shakirova, Andino Maseleno, Formulation of the Problem of Mathematical Modeling of Accommodation of Basic Stations of Cellular Communication in Residential Territories for Students of It-Directions of Preparation, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 96-100, 2019.

42. Bogdanova A. Vladimirovna, Aleksandr A. Korostelev, Olga L. Shepelyuk, Anna E. Rodionova, Irina N. Fardeeva, Andino Maseleno, Reengineering of Business Processes of the Higher School: Its Prerequisites, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 101-104, 2019.

43. Rustem R. Vakhitov, Anna E. Rodionova, Elena V. Smirnova, Rafis H. Mukhutdinov, Mariya I. Arzhakova, Andino Maseleno, Crisis of Higher Education in Russia, International Journal of Recent Technology and Engineering (IJRTE), Vol. 7, Issue 6S5, pp. 105-109, 2019.