MOBILE LEARNING TO ENHANCE STUDENT SOFT SKILLS

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***Abstract* – 21st century skills, such as problem solving, critical thinking and effective communication are fundamental skills that students need to master to ensure their future success. Critical thinking skills are often associated with soft skills. The incorporation of technology in the teaching of 21st century skills will encourage students to be more active in teaching and learning activity. However, to this day teachers are still trying to understand new ways of developing 21st century students' soft skills especially in analysing, problem solving, designing, communicating, and collaborating. Implementing M-learning in their fieldwork activity will allow students to learn new skills in applying 21st Century technology and skills within themselves by integrating their own learning experiences. The methods of incorporating technology into teaching to improve student skills are still unclear. The quantitative method was used in this study involving 90 form 6 student from Pre-University centre located in the district of Kota Kinabalu, Sabah, Malaysia. All students taking geography subjects were taken as samples. Questionnaire was used as an instrument in this study to determine how M-learning can enhance student's soft skills.**

***Keywords* – Mobile Learning, Soft skills, Fieldwork activity**

I. INTRODUCTION

The teaching of Pre-University or Form 6 students emphasizes the aspect of soft skills, which are integrated into its curriculum. This is in line with the aspirations of the Malaysian Ministry of Education, which prioritizes students 21st century skills and reduces emphasis on examinations oriented only (Subramaniam, 2013). However, weaknesses in the mastery of soft skills among Form 6 students will have an impact on themselves and the need to face the learning environment at the higher education level.

Therefore, the teaching of Form 6 requires a paradigm shift that can enhance the quality of the students themselves as they prepare to enter the university setting.

The Ministry of Higher Education has introduced seven elements of soft skills that need to be incorporated into the students' learning in higher education institutions, namely: 1) communication skills, 2) critical thinking skills, 3) problem-solving skills, 4) teamwork skills, 5) continuous learning and information management skills, 6) entrepreneurship, moral and professional ethics skills, and 7) leadership skills (Abdullah *et al.*, 2012).

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In this study, the focused soft skills are based on the soft skills emphasized in the Form 6 geography curriculum (Malaysian Examinations Council), which include communication skills, critical thinking skills, problem-solving skills, teamwork skills, and moral and ethical skills.

II. PROBLEM STATEMENT

The pre-university or Form 6 education level is crucial for students as it serves as a bridge between their educational development and professional life. Therefore, soft skills need to be imparted to students at this level to facilitate their progression to higher education or entry into the workforce. To achieve the development of students' skills at this stage, they need to be more open-minded and independent. It is essential for teachers who instruct students at this level to utilize more suitable teaching methods to ensure that students' soft skills development is clear and achievable (Samson and Vyjayanthi, 2013).

III. LITERATURE REVIEW

Soft skills are not only meant for students in higher education institutions, but they are also essential elements that should be taught to all students within the education system. These skills are one of the important components alongside academic knowledge and technical skills possessed by students. The development of soft skills is a multifaceted process. It is influenced by various contexts, including the family, school, community, and workplace (Ikesako and Miyamoto, 2015). Studies have found that there is an optimum time for developing soft skills (Kautz, Heckman, Diris, ter Weel, and Borghans, 2014). For example, adolescence is considered the best stage for acquiring higher-order thinking skills because it is a phase where cognitive abilities support the development of reasoning among teenagers (Guerra, Modecki, and Cunningham, 2014).

Studies have shown that information technology, especially mobile technology such as smartphones or tablets, is one of the methods that can help enhance students' soft skills (De Freitas and Conole, 2010). Through the use of modern technology, students can also develop their thinking skills beyond relying solely on textbooks and reference books. Additionally, it can contribute to the advancement of STEM education (science, technology, engineering, and mathematics) (Gallup, Little, Serianni, and Kocaoz, 2017).

Soft skills are not only important for preparing students for the job market but also crucial for university admissions, particularly to secure admission into better and more suitable programs or fields of study. Malaysian students who have achieved excellent results in the

Malaysian Certificate of Education and the Malaysian Higher School Certificate examinations are often required to undergo interviews with certain universities to assess their soft skills. Soft skills are part of the curriculum taught in higher education institutions, especially for students pursuing social science programs (Ramlan and Ngah, 2015). Students, schools, and the Ministry are key stakeholders in determining the success of students' educational development (Matteson, Anderson, and Boyden, 2016).

Communication Skills

Communication skills involves effective communication. It refers to the ability to convey ideas clearly, effectively, and confidently, both orally and in writing. It also encompasses the ability to practice active listening skills, provide accurate feedback, and deliver presentations clearly, confidently, and tailored to the audience's level (Pachauri and Yadav, 2013). Communication is the process of exchanging information between two or more individuals to enhance understanding of a particular matter (Rogers, 1995). Communication is crucial for the exchange and sharing of knowledge, skills, and abilities, benefiting both educators and students. It includes verbal communication, which involves the transfer of information or ideas orally from one individual to another, as well as non-verbal communication, which involves communication through gestures or body language. With the presence of technology, it can help improve communication skills, for example, through applications such as Skype, blogs, and other social media platforms (Abou El-Seoud, Karkar, Al Ja'am, dan Karam, 2015).

Critical thinking and problem-solving skills

Critical thinking and problem-solving skills refer to the ability to think critically, creatively, innovatively, analytically, and to apply understanding and knowledge to new and different situations, especially in task execution. It is one of the elements encompassed in 21st-century skills (Education Technology Department of Malaysia, 2012). In the process of decision-making and problem-solving, critical thinking and creative thinking skills are interrelated, as it enables us to evaluate ideas while creative thinking allows us to generate and produce new, original ideas (Snyder and Snyder, 2008). In the process of problem-solving or decision-making, both thinking skills should be fully exploited to solve problems and make decisions, reconsidering what we have thought in order to make sound judgments (Toharudin, 2017). Preparation in terms of soft skills is crucial, especially in ensuring that students are ready to complete tasks, particularly during group activities, where it helps enhance their critical thinking skills (Yadin, 2012). Hwang and Chang (2011) found that the use of mobile technology in learning can enhance student engagement, motivation, and learning itself. It further contributes to strengthening students' critical thinking skills.

Professional ethics and moral skills

Professional ethics and moral skills involve the ability to uphold high moral standards in professional practice and social interactions. This includes the ability to understand the economic, environmental, and sociocultural impacts within professional practice, as well as the ability to analyze and make decisions regarding ethical problem-solving (Pachauri and Yadav, 2013). Professional ethics and moral skills also play a crucial role in honing an individual's abilities, alongside other fundamental skills (Ngang and Chan, 2015). Ethics and morality have their own distinct definitions. Various definitions of ethics have been provided by past researchers. Ethics refers to an individual's capacity to assess whether something is right or wrong and subsequently act accordingly (Hassan, Silong, and Muslim, 2009). On the other hand, morality stems from the Latin word "moralis," which denotes customs, virtues, or manners. Good morality encompasses all behaviors consisting of customary values and aspirations that have been accepted by a particular society regarding desirable conduct, ultimately shaping the lives of individuals and communities.

Continuous learning and information management skills

Continuous learning skills and information management involve self-directed learning efforts in acquiring new skills and knowledge. This includes the ability to search for and manage relevant information from various sources, as well as the ability to embrace new ideas and possess autonomy in learning (Pachauri and Yadav, 2013). When Form 6 students pursue higher education, many institutions consider them to have the necessary foundational knowledge and experience, particularly in the learning process.

In traditional methods, listening and taking notes on the materials presented by lecturers during lectures remain the main focus in higher education institutions across the country. The current trend in teaching and learning methods in higher education leans towards the flipped classroom approach, collaborative learning, and collaborative note-taking, where these approaches are more interactive or student-cantered. In this situation, lecturers assume that students already possess these skills, which they have used during their time in form 6 or before entering university (Kuznekoff, Munz, and Titsworth, 2015). However, there are still students who face challenges with these methods, leading to a decrease in their motivation and subsequently affecting their academic performance.

Teamwork skills

Teamwork skills refer to the ability to collaborate in groups or with others from diverse social and cultural backgrounds to achieve common goals (Gallie, Zhou, Felstead, and Green, 2012). Among the elements encompassed in teamwork skills are the ability to build good relationships, interact with group members, and work effectively together to achieve objectives, as well as the ability to understand, recognize, and respect the attitudes, behaviors, and beliefs of others (Ahmad Esa, Suhaili Padil, and Asri Selamat, 2013).

Due to the borderless education revolution happening everywhere, one of the elements that contributes to the

successful use of mobile technology is teamwork, as the implementation of mobile technology adds value to producing quality and effective teamwork activities. According to Raj (2012), the ability to build relationships and work in teams is a fundamental requirement of interpersonal skills among peers. The use of mobile devices in learning is a method that can support student collaboration and cooperation, such as the use of social media applications like WhatsApp Messenger and other freely available social media applications (Dawood, 2013).

The use of mobile devices also supports collaborative activities among students and between students and teachers. For example, sharing data and learning resources or coordinating activities with each other (Constantinidis *et al.*, 2013). Additionally, collaborative learning activities can be developed or used during fieldwork with the assistance of mobile devices through online learning (Hamid, Waycott, Kurnia, and Chang, 2010). Mobile technology can be used to create a more flexible learning environment and provide students with various collaborative learning methods that foster teamwork activities (Abou El-Seoud *et al.*, 2015). Introducing the use of technology in fieldwork activities can help develop students' technological skills (Mavroudi and Jöns, 2011; K. E. Welsh, France, Whalley, and Park, 2012).

In conclusion, teaching methods that utilize mobile technology such as smartphones or tablets are an interesting new research trend that many researchers are exploring. They examine its impact on students and teachers, as well as develop the necessary learning infrastructure to facilitate online teaching and learning. Researchers aim to maximize the utility of mobile technology in higher education while maintaining the mission and vision of educational development in the present time. The advantages of technology in enhancing soft skills can be observed in several past studies. Studies by Gallup et al., (2017) and Chassidim, Almog, and Mark, (2017), for example, found that advancements in technology have the potential to support the development of students' soft skills and improve the quality of education, particularly in enhancing teamwork skills and communication skills.

Although students show acceptance and readiness to use mobile technology in fieldwork activities, there is a gap in that acceptance and readiness do not necessarily enhance student soft skills, and students are still unaware of the benefits of using mobile technology in carrying out fieldwork. Today's teachers face unique challenges compared to previous generations of teachers. They need to educate students about the skills required to navigate the digital world and society.

This study aims to explore the potential, limitations, and usage of mobile learning (implementation of mobile technology) such as smartphones/tablets as tools to cultivate 21st-century soft skills in geography fieldwork among students. The M-fieldwork module is used in this study, which involves learning using mobile technology such as smartphones/tablets. The M-fieldwork module is a teaching method based on Mobile Learning (M-learning), which can be done anywhere and at any time (Martin and Ertzberger, 2013). This study utilizes existing applications in smartphones/tablets such as video, recorder, Google Maps, Dropbox, and others that can be downloaded from Google Play or the Apple App Store. These are among the mobile applications that can be used in the field of education in the present time. However, most previous studies focused more on the use of modified mobile applications and less on utilizing existing applications (Lin, Lin, Yeh, and Wang, 2016).

IV. METHOD

Quasi-experimental design with pre-post test design was selected for this study to examine how mobile technology-based learning can enhance soft skills among Form 6 students taking Geography at SMK Putatan, Sabah. Purposive sampling method was used, which involves selecting samples based on research needs and specific characteristics (Etikan, 2016). The respondents involved in the study need to be selected accurately and carefully to ensure accurate and reliable data can be collected and analyzed. A total of 90 students taking Geography were selected as the study sample. These students will conduct fieldwork according to the schedule provided by the school, based on the guidelines provided by the Malaysian Examination Council. The selected sample shares similar characteristics, consisting of Form 6 students aged between 18 and 19 years. The students will be divided into two groups: the experimental group and the control group. The researcher will conduct the experiment on experimental groups to determine whether the use of the M-fieldwork module in fieldwork activities can enhance students' soft skills through pre and post-questionnaires. The instrument used in this study is a questionnaire on soft skills designed by Ngoo YT, Tiong KM, and Pok WF, (2015), adapted from the studies of Nikitina and Furuoka, (2012) and Walker, (2008), to measure the extent to which the use of M-fieldwork in geography fieldwork activities can impact students' soft skills.

The method of using the M-fieldwork module in fieldwork activities will be implemented online through the Google Meet application after the students have attended the geography coursework briefing. A guide for using the M-fieldwork module will be provided to the experimental group to facilitate the learning process and implementation of fieldwork activities in Geography, while the control group will conduct fieldwork activities as usual (traditional method) based on the research topic of Interdependence between Rural and Urban Areas in the Study Area.

The framework of this module will focus on digital mapping techniques, data storage, data sharing, and data processing using mobile technology such as smartphones or tablets. Essentially, this module is developed based on the students' needs to master the use of mobile technology, particularly in terms of utilizing existing applications on their smartphones/tablets. Each component will include relevant notes, followed by practical exercises on the use of mobile technology in fieldwork activities.

Once the students have fully mastered the use of the M-fieldwork method in geography fieldwork activities, the fieldwork activities will commence. The

implementation of fieldwork activities will be carried out according to a predetermined schedule based on the guidelines provided by the Malaysian Examination Council.

The data analysis in this study is based on descriptive and inferential analysis. The data obtained from the questionnaires will be analyzed using the Statistical Package for the Social Sciences (SPSS Version 22.0) software. This study begins with a quasi-experimental design. Therefore, the first phase of data analysis will focus on quantitative data analysis.

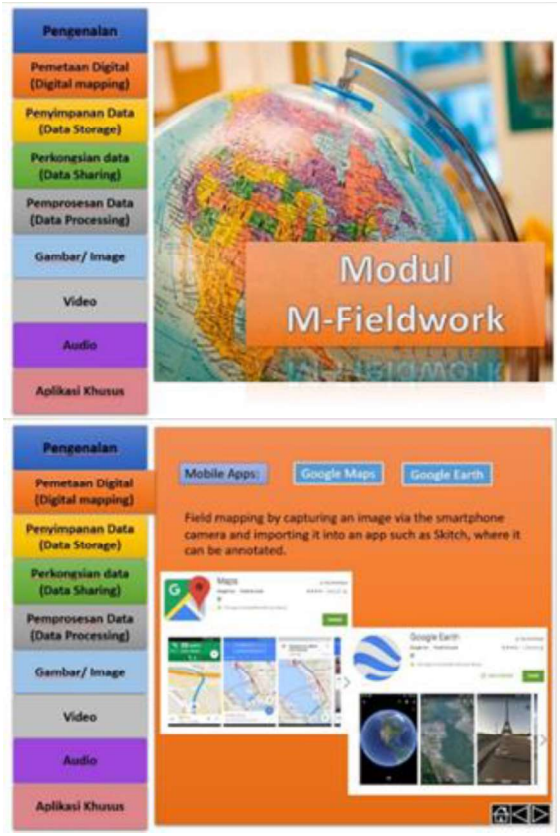

Figure 1. M-fieldwork Module

V. FINDINGS

In this section, the collected data from the study conducted at SMK Putatan, Sabah will be presented. The obtained data will be analyzed according to the discussed research procedures. The research findings will address research questions, which are as follows:

1. Is there a significant difference in the mean scores of soft skills between the pre-test and post-test for the experimental group and control group in the geography fieldwork activities?

TABLE I: DESCRIPTIVE STATISTICS FOR SOFT SKILLS BETWEEN THE PRE-TEST AND POST-TEST FOR THE EXPERIMENTAL GROUP

Soft Skills	n	Pre-Test		Post-Test	
		Mean	Std. Deviation	Mean	Std. Deviation
Communication	45	58.71	12.95	60.91	12.72
Critical Thinking and Problem Solving	45	72.96	16.03	75.24	13.53
Professional Ethics and Moral	45	34.09	6.86	34.11	7.74
Continuous Learning and Information Management	45	34.60	6.63	36.31	7.10
Teamwork	45	58.16	9.61	66.24	10.05
Total	45	258.52	52.08	272.81	51.14

Results revealed that on experiment group, communication skills have mean of post-test is higher 60.91 (SD: 12.72) then pre-test 58.71 (SD:60.91). Secondly, Critical Thinking and Problem-Solving skill revealed a higher mean of post-test 75.24 and a standard deviation of 13.53 than pre-test 72.96 with standard deviation of 16.03. The third subscale of soft skills, Professional Ethics and Moral showed higher mean of post-test 34.11 and a standard deviation of 7.74 than pre-test results show mean of 34.09 and a standard deviation of 6.86.

The fourth which is the Continuous Learning and Information Management skills yielded the following means and standard deviations (mean = 36.31, standard deviation = 7.10) of post-test higher than pre-test (mean = 34.60, standard deviation = 6.63). Lastly, teamwork skills in the experiment group had a higher mean of post-test 66.24 and a standard deviation of 10.05 than pre-test a mean of 58.16 and a standard deviation of 9.61.

TABLE II: DESCRIPTIVE STATISTICS FOR SOFT SKILLS BETWEEN THE PRE-TEST AND POST-TEST FOR THE CONTROL GROUP

Soft Skills	n	Pre-Test		Post-Test	
		Mean	Std. Deviation	Mean	Std. Deviation
Communication	45	55.00	11.57	56.40	8.216
Critical Thinking and Problem Solving	45	66.68	13.99	69.26	10.739
Professional Ethics and Moral	45	30.82	8.349	32.24	5.971
Continuous Learning and Information Management	45	32.80	5.569	33.30	7.44
Teamwork	45	55.54	6.456	57.66	12.159
Total	45	243.46	53.508	246.24	36.951

Results revealed that on control group, communication skills have mean of post-test is higher 56.40 (SD: 8.216) then pre-test 55.00 (SD:11.57). Secondly, Critical Thinking and Problem-Solving skill revealed a higher mean of post-test 69.26 and a standard deviation of 10.739 than pre-test 66.68 with standard deviation of 13.99. The third subscale of soft skills, Professional Ethics and Moral showed higher mean of post-test 32.24 and a standard deviation of 5.971 than pre-test results show mean of 30.82 and a standard deviation of 8.349.

The fourth which is the Continuous Learning and Information Management skills yielded the following means and standard deviations (mean = 33.30, standard deviation = 7.44) of post-test higher than pre-test (mean = 32.80, standard deviation = 5.569). Lastly, teamwork

skills in the control group had a higher mean of post-test 57.66 and a standard deviation of 12.159 than pre-test a mean of 55.54 and a standard deviation of 6.456.

VI. DISCUSSION

Implementation of M-fieldwork is still in its early stages. The findings of this study indicate that the use of M-fieldwork modules in fieldwork activity is more effective compared to traditional methods. These findings are consistent with the study by Karch, (2014), which reported that the use of M-learning applications is highly effective both inside and outside the classroom. To ensure meaningful and effective use of smartphones/tablets by students, changes in educational pedagogy need to align with 21st-century learning. Mobile technology has great potential to facilitate self-directed learning in geography subjects Hsu and Chen, (2010). From a teaching perspective, the development of M-learning applications by schools should provide basic facilities to enable teachers to implement M-learning, both within the school and during fieldwork activities (Hadiyanto, Noferdiman, Moehamin, and Yuliusman, 2017).

Based on the initial study conducted, it was found that there was an improvement in soft skills before and after the use of the M-fieldwork module in fieldwork activities. However, students still require adequate guidance in learning the use of M-learning applications. Observing the online fieldwork activities of students was also found to be satisfactory, as students were able to collaborate and communicate easily among group members.

Soft skills need to be incorporated into internal and external school activities. Soft skills can also be indirectly developed through support programs such as co-curricular activities. These activities are not purely academic but indirectly assist students in developing their personalities and characters. These programs allow students to explore their interests, which can be nurtured by involving them in co-curricular and extracurricular activities that reflect their interests (Chassidim *et al.*, 2018).

In addition to enhancing social interaction among students, leadership quality, teamwork, and entrepreneurship can be fostered through such activities. These informal activities need to be carefully planned and continuously implemented throughout the semester. To enhance teamwork capabilities, it should involve all students regardless of their ethnicity or gender (Chatziantoniou, Politopoulos, and Stylianidis, 2018). One of the main factors contributing to the failure to develop soft skills is the large number of students in a class or classroom. Most of the time, students do not have the opportunity to develop their soft skills even during tutorial sessions. Tertiary education systems focus more on academics rather than personality development. Student-cantered teaching strategies are not strongly emphasized. Some soft skills need to be developed as students are still young, especially ethical, moral, and professional skills. An 8-week training period is insufficient for students to develop soft skills (Soares, F., Babb, S., Diener, O., Gates, S., and Ignatowski, 2017).

To enhance the use of the M-fieldwork module in developing soft skills, teachers themselves need to plan and incorporate soft skills in their curriculum and fulfil their obligations ethically. Soft skills need to be integrated into all programs or curricula and not treated as standalone subjects. This will allow students to see the relationships and connections between the topics they are learning. Soft skills cannot be taught but must be practiced by setting examples. Teachers should assess students' soft skills through classroom observations and tutorial sessions (Chan, 2010). Appropriate assessment systems should be established to measure students' soft skills. Additionally, students need to be given autonomy to encourage critical thinking.

The M-fieldwork module needs to be improved by incorporating soft skill elements such as teamwork skills, communication skills, leadership skills, and critical thinking skills. These soft skills are not academic components but rather tools for academics. Therefore, they should not be treated as separate subjects. If they become standalone subjects, students will only learn to pass exams without understanding and applying them in their learning process. However, soft skills such as ethics, morals and professional skills, lifelong learning, and information management can be treated as separate subjects.

To develop the M-fieldwork module with good usability and to support the context for geographic fieldwork activities, User-Centered Design principles should be used. The goal of User-Centered Design is to improve the usability of the designed product by involving and focusing on the users during the module development process (Wang, Van Elzakker, and Kraak, 2017). M-learning complements and enriches traditional learning. It arises from technological advancements and changes in our lifestyle, and it plays a role in facilitating learning through customizable solutions based on the available resources at present. It provides a more flexible learning approach. To create effective online learning, teachers and students need to understand social relationships, quality of interaction, and communication to ensure effective communication occurs, including the exchange of information, knowledge, experiences, and skill development.

VII. CONCLUSION

The research on mobile technology through M-learning is rapidly advancing. However, it is still limited in developing the use of M-learning in fieldwork activities that can enhance students' soft skills. Research on M-learning and mobile technology in education needs to consider both student determinants of usage and the desired outcomes for students. This study contributes to the understanding of educational technology and M-learning itself and provides a foundation for future research. Further research is needed to determine its significance as a predictor. School administrators and teachers can also use this M-fieldwork module as a resource and guide for teaching and facilitating the use of M-learning methods in the future.

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