

## **The Dynamics of Mobile Learning Utilization in Vocational Education: Frame Model Perspective Review**

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### **ABSTRACT**

This study aimed to describe the dynamics of content aspects, user aspects and social aspects of mobile learning utilization (m-learning) in vocational education from the FRAME Model perspective review. This study was quantitative descriptive research. The population in this study was teachers and students of state vocational school and private school in Makassar, Indonesia. Samples of the study were 103 teachers and 320 students, determined by a proportional random sampling technique. Data collection techniques were questionnaires. Data analysis uses descriptive analysis techniques. The results showed that the available content on the internet and accessed by teachers were relevant to the major, whereas students stated them relevantly less to their majors, so the value and substance of the utilization of m-learning content were still less relevant. The user aspect showed that teachers and students utilized mobile devices for vocational learning purposes, so the value and substance of m-learning could be still maintained. The social aspect showed that teachers and students expressed socio-cultural support influenced the utilization of m-learning, so that the value and substance of m-learning in vocational education could be continually maintained. So the value and substance of m-learning in these three aspects could be maintained and improved, this study showed alternative model of utilization and development of m-learning that were appropriate for vocational education.

**Keywords:** m-learning utilization dynamics, FRAME model, vocational education

### **INTRODUCTION**

This study was a larger part of doctorate study entitled the dynamics of m-learning utilization on vocational education in Makassar, Indonesia. It focused on the understanding of content aspects, user aspects, social aspects of m-learning utilization, it generated the prototype content of m-learning properly, and found the factors that influenced the acceptance of m-learning (Mahande, 2017). However, this paper was limited to the discussion of m-learning utilization aspects on vocational education.

Vocational education has an important role in the development of human resources (HR) and technology facing global competitiveness. Vocational education is secondary education that prepares learners to work in particular fields (the National Education System Act No. 20/2003 subsection 15). This statement emphasized the vital role of vocational education on preparing students who had quality through knowledge combination, attitudes, and skills based on technological developments so they could compete and enter the labor market.

The preparation of human resources and technology has implications on the characteristics or principles of vocational education, namely, should be responsive and anticipatory towards technological progress (Djojonegoro & Slamet, 1998; Sudira, 2012). Current technological development states that the modernization of vocational education through learning that emphasizes on the shared skills aspects of technological innovation in order to prepare students' competencies is absolutely necessary. Modernization of learning according to Wilson that the integration of ICT learning in vocational education will dominate in the 21st century (Zarini, Wilson, Mar, & Varis, 2009). This lesson emphasizes on the concept of technology that requires media literacy based-ICT, self-study, collaboration, and understanding about technology in general which will be very important to increase competence in vocational education.

Considering the importance of ICT utilization in vocational learning process, several studies to step further on optimizing the utilization of ICT in the effort of transforming conventional learning into digital form, both content and the system is still developing, thus rising to the idea of *e-learning*. The presence of *e-learning* is a must in the field of education today, especially with the benefit of time flexibility and place in the teaching learning process, access to learning resources are varied and fun. But in the middle of the benefits, e-learning is still underutilized because of the awareness and ability of human resources, the availability of infrastructure, especially inland areas, application systems that require cost, and time development. The lack of *e-learning* utilization begins to be overcome by the widespread use of mobile devices among teachers and students in the field of education. Mobile devices will fill the weaknesses to strengthen *e-learning* position with all its advantages, namely smaller size, lighter, easier to carry, cheaper price, easier operational level, and more flexible information access (Mahande, 2017).

The development and ownership of *mobile* devices in accordance with research conducted by the Association of Indonesian Internet Service Providers (APJII) in 2000 internet users in 42 cities in Indonesia showed that 85% of Indonesian internet users were more often connected via smartphones (Marius & Anggoro, 2015). This is due to the increasing number of *smartphones* with affordable prices in the market and also the economical cost of access (Marius & Anggoro, 2015). Accordingly, APJII identifies internet usage through *mobile phone / smartphones* 85%, laptop / netbook 32%, PC / computer 14.0%, and tablet 13% (Marius & Anggoro, 2015).

The data indicated that the majority of internet users through *mobile* devices, such as *smart phones*, would cause tremendous traffic density in accessing information over the internet (teledensity). Gikas (2011) estimates that *mobile* computing services, such as smartphones, will be the main connection to the internet by 2020. This means that the use of *mobile* devices in accessing information from the Internet has become a major choice and will continue to evolve, which must be utilized to support *e-learning*.

The increasing use of mobile devices in the learning process leads to a new terms in learning technology that will play an important role in supporting e-learning, namely *mobile learning* or *m-learning*. *M-learning* is the development of *e-learning* and becomes a new technological trend in the field of modern education and learning. It is reinforced by Reis, Escudeiro, and Escudeiro (2012) that *m-learning* is a type of *e-learning*, a method for distance education using computer and internet technology, that offers learning through *mobile* devices, such as cell phones, *smartphones*, PDAs And tablets. The utilization of *m-learning* in vocational education can provide benefits, namely: (1) learning can occur anywhere and anytime, (2) access to fast and broad learning information, (3) two-way interaction and content collaboration, (4) Learning variation that allows students to gain knowledge at their own pace, (5) motivation with multimedia resources (Campanella, 2012; Sarrab, Al-Shih, & Rehman, 2013; Gikas & Grant, 2013)

The potential value of the utilization of *m-learning* in vocational education matches to the Sharples statement (Fazlina, Manap, & Rias, 2013) that *m-learning* complements formal learning practices in the classroom with non-formal learning situations in the outside of classroom. Furthermore, Ally and Prieto-Blázquez (2014) emphasizes that *m-learning* enables the transfer of working knowledge through the interaction of collaboration among workers in the working world to students in school. vice versa, from the school to the working world, students can access relevant information and resources to *up-to-date* education and vocational training from the web, as well as being able to communicate with teachers and working world instructors in the expertise areas. This statement means that the utilization of *m-learning* in vocational education will support the interaction of collaboration and the relevance of competence in working world.

The high number of *mobile* device users to access the internet and to the benefits of *m-learning* in education, it is not often synchronous between theoretical and fair complex implementations today. As an information material, the profile of internet users in Indonesia in 2014 showed that the penetration of internet users in Makassar (South Sulawesi) reached 3.7 million people (44%) (Marius & Anggoro, 2015). while the device to access the internet mostly use Smartphones (78%) (Marius & Anggoro, 2015). The data provides information that internet access through smartphones in Makassar is very high, but has not yet been followed or utilized for *m-learning*.

Ironically, the results an initial survey conducted by researchers at vocational school (SMK) in Makassar showed that most of vocational school stake holders had already had mobile devices, such as cell phones, *smartphones*, and *tablets*. However, the ownership of these devices is more utilized to send and receive messages. Access to information through mobile devices is still less related to vocational learning. Although some headmasters, teachers, and students actually realized the use of *mobile* devices should be directed to learning especially to support ICT-based learning and to access school e-learning. But it is different from some older and retired

teachers, their willing nesses and technical abilities to utilize mobile devices for learning have decreased (Mahande, 2017).

Moreover, the initial survey also provided information that *m-learning* at vocational school (SMK) in Makassar was still experiencing difficulties in the readiness of use, teacher skills, technical skills, guidance of *m-learning* implementation, and the absence of rules that encourage *m-learning* in learning in vocational education. Specifically, general information obtained that vocational school stake holders want the existence of *m-learning* content related to relevant learning strategies to vocational school (Mahande, 2017). In different contexts, Darmawan (2014) also said that government policies were expected to support the development of teaching materials and the access to *m-learning* among education office, the schools, the LPTK universities. This issue emphasizes the need for in-depth study, especially the readiness of the school's stake holders, the accessible and appropriate content for learning, and the formal rules that underlie or support *m-learning*.

Furthermore, the results of the initial survey at vocational school (SMK) in Makassar provided information that the *m-learning* limitation caused by the lack of awareness of school stake holders, especially teachers (Mahande, 2017). This limitation was not necessarily generalized. It could also be influenced by some factors. Pollara (2011) stated with a different subject, that teachers are still worried if the *m-learning* device will only interfere the learning process. Teachers assumed that *m-learning* would only be used by learners to socialize unrelated to learning. On the other hand, learners stated that *mobile* devices could be used for various learning activities in education. Particularly, learners' believes that the formal use of *m-learning*, both in and outside the classroom could be useful. This fact was a gap that required further investigation of teacher and student readiness in more limited context at vocational school (SMK) in Makassar.

In relation to the results of the field survey, Peters (2007) stated that the minimum use of *m-learning* was caused to teachers' ability, slow changes in educational institutions, and learning designs that have not yet been suitable for education. Furthermore, Pachler, Bachmair, and Cook (2009) suggested that the other challenges of utilizing *m-learning* are physical and social factors, such as potential disturbances or negative behaviors, physical health problems, and data privacy issues. In addition, *mobile* devices may also influence usability and may distract children from the true learning objectives. This challenge also seems to provide information on the importance of the study to find out the readiness of the users, the accessible content and appropriate for *m-learning*, and the learning interaction that should be done through mobile devices.

The minimum use of *m-learning* in learning is in line with Ibrahim and Walid (2014) study which concluded that, although *m-learning* could be theoretically trusted as an important aspect of the learning process, however the results showed that the percentage of respondents who accepted or believed *m-learning* was smaller (17.46%) than who rejected *mobile learning* (22.6%). Furthermore, Yusri and Goodwin (2013) stated the need to have further investigation of the use of *mobile* devices, in particular the readiness to use *m-learning*. This confirms that the need for in-depth analysis of the aspects that affect on it, why *m-learning* is less acceptable even though theoretically has many advantages.

The accumulation of these problems implied the need for an in-depth study of the development, changes, and shifts in vocational education into dynamic and adaptive based on existing information technology trends. These were to see the theoretical and problematic reviews, that there were gaps among theoretical expectations with the realization of *m-learning* utilization in vocational education in Makassar, Indonesia. It raised several issues that became topics in the dynamics of the *m-learning* utilization. The dynamics was such as the readiness of learning content, user attitude, and social interaction in learning. The problems could be grouped into three main aspects that aligned with the Framework for the Rational Analysis of Mobile Education (FRAME) model theory, namely of content aspects, user aspects, and social aspects (Koole, 2009). FRAME model in this research was used as a reference to know and to describe the utilization of *m-learning* in vocational education.

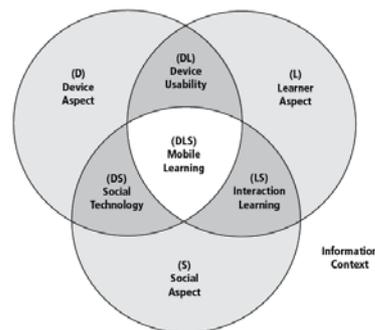
Based on field and literature studies from some of the following experts who have conducted *m-learning* studies with different aspects and focuses, such: Jabbour et al. (2014) on the impact of *m-learning* based on students' attitudes, student achievement, and educational process at higher education. Cheung (2013) on the intentions of *m-learning* by using some aspects of the Frame Model (*learner aspect, online interaction, device features, dependencies & sharing, reference groups, storage and weight*) in Polytechnic. Porumb, Tardini, Bergamin, & Picco-Schwendener (2013) on the design and development of an application used the *framework* of the FRAME model. Shariffudin, Julia-Guan, Dayang, Mislán, & Lee (2012) on the developing survey items depended on the literature and content that was validated according to the learning style of *Myer-Briggs Type Indicator* (MBTI) and FRAME model as the basic framework of *m-learning* understanding in higher education. These studies were related to the FRAME model, but it was limited to the effects of *m-learning*, usage intentions, application

development and the development of survey items in higher education. The results of the relevant research studies showed that there was no study that deepens the aspects of *m-learning* utilization on FRAME model in vocational education especially in Indonesia.

Based on the description previously mentioned, it is considered to conduct a study of dynamics of *m-learning* utilization at vocational education from FRAME model perspective review were investigated by addressing the following research questions: How to describe the dynamics of content aspects, user aspects, and social aspects of *m-learning* utilization in vocational education?

### THEORETICAL FRAMEWORK

FRAME model is useful as a reference for the development of future mobile devices, the development of learning materials, and the design of teaching and learning strategies for education (Koole, 2009). FRAME model in this research is used as a reference to know and describe the utilization of *m-learning* in vocational education.



**Figure 1.** The FRAME Model

The theoretical framework shown in Figure 1 illustrates three circles represent another aspect of the device that was translated in this study, namely, it was related to the content aspect. The learner aspect was translated as the user aspect and the social aspect.

The content aspect described learning content or any content that was normally accessed by teachers and students through their *m-learning*. The *m-learning* content for learning became very important to fit the learning objectives in SMK. Wuebben (2011) asserted that it was important to understand the specific purpose and function of content type generated. The purpose of all content was essentially interesting and useful if used by individuals. The user aspect described how students utilized *m-learning* for learning purposes in vocational high school (SMK). The users' aspects focused on students' cognitive abilities and prior knowledge, characteristics and habits of learners with *m-learning* (Kenny, Van Neste-Kenny, Park, Burton, & Meiers, 2009). These aspects explained how learners used what had already known, accessed, identified, stored, and transferred information. The social aspects described how the ethics and behavior of students in utilizing *m-learning*. Moreover, how communication, collaboration, interaction were done by students through *m-learning*. The social aspect referred to the social interaction (Koole, 2009) and collaboration, access to information, and contextual learning (Kenny et al., 2009; Kearney, Schuck, Burden, & Aubusson, 2012). Social interaction and collaboration were essential for learning from sociocultural perspective, especially for individuals that involved in the discussion (Vygotsky in (Kearney et al., 2012). The importance of interaction and collaboration in this aspect, so that students, teachers, and instructors were expected to follow collaboration rules in communicating, exchanging information, acquiring or building knowledge, and maintaining learning culture practices.

### RESEARCH METHOD

This study used quantitative descriptive research, with the consideration that this study will attempt to describe events or events that have occurred in the present in the form of meaningful numbers. This research was conducted at state vocational school and private vocational school in Makassar, Indonesia. The stake holders of this study were teachers and students of state vocational school and private vocational school in Makassar, consisted of 155 teachers and 5,274 students. The primary sample was 110 teachers and 355 students (Isaac & Michael, 1981) determined by the proportional random sampling technique. Questionnaire verification was done by examining the completeness of the questionnaires in pairs, so there were 103 teacher (approximately 17 each school) and 320 student (approximately 53 each school) questionnaires filled correctly and completely and deserved to be analyzed further. Data collection techniques in this study used questionnaires. Research instruments were prepared based on the FRAME model criteria (Koole, 2009), which contained statements/questions related to content aspects, user aspects, and social aspects. The instrument consisted of 40

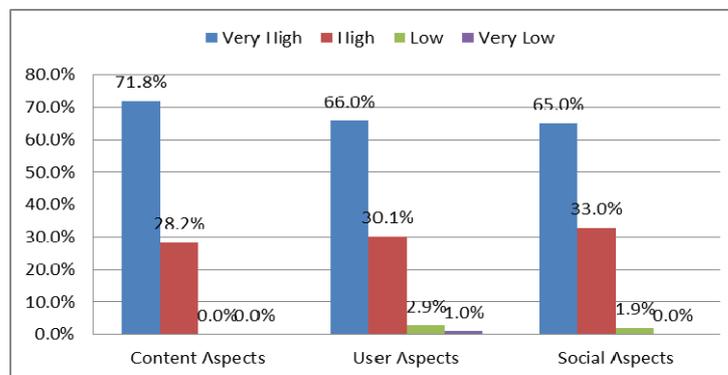
items of statements/questions, used 1-4 scale assessment (very low=1, low=2, high=3, and very high=4). Instrument's validity in this study included the content validity. The content validity of the instrument was done through *expert judgment* by involving fourth experts, from various fields of expertise related to this research: (1) educational technology, (2) vocational learning, (3) informatics engineering, and (4) human computer interaction, ICT in education, user experience. Reliability calculation in this study used the cronbach's alpha ( $\alpha$ )  $\geq 0.70$  (Hair, Black, Babin, Anderson, & Tatham, 2006). Data analysis techniques used in this study was descriptive analysis. Descriptive analysis would present the percentage, bar chart and pie. Descriptive analysis was done by using *IBM SPSS statistic software 20*. The categorization assessment of each aspect referred to the Mardapi (2008).

## FINDINGS

The purposes of this study were to describe the dynamics of content aspects, user aspects, and social aspects of *m-learning* utilization in vocational education with FRAME model perspective review. The study focused on describing aspects of content, user aspects and social aspects of *m-learning* utilization of teacher perceptions and student perceptions of vocational schools in Makassar, Indonesia.

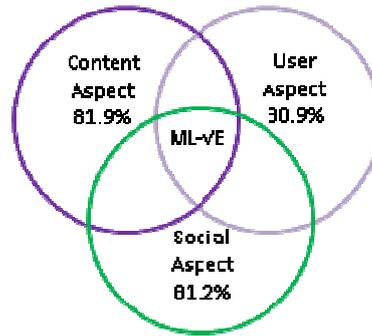
### The description of *m-learning* data utilization by teacher

The description of *m-learning* data utilization by teacher from FRAME Model perspective covers three main aspects, namely content aspect, user aspect, and social aspect.



**Figure 2.** The distribution of frequency in the aspects of teachers m-learning utilization

Figure 2 shows that the average of content aspect in theory was 35 and empirical average was 45.90. Content aspect data show that the empirical average value was greater than the mean of the theory. This means, in general the *m-learning* content utilization by teachers is in very high category. The average aspect of users in theory was 30 and empirical average was 38.82. In general, teacher responses regarding to the use of *mobile* devices for vocational learning were included in the high category, however, there were still low and very low percentages that require further attention. The average of social aspect in theory was 35 and empirical average was 45.45. In general, the teachers' responses to the social aspects of *m-learning* utilization were included in the high category. However, there was still a relatively low percentage, which requires further attention. Furthermore, from the descriptive analysis results are known to achieve three aspects of *m-learning* utilization in vocational education (ML-VE) by the teachers, by comparing the total score, it empirically achieved the highest total score in the theory. The results of the descriptive analysis of three aspects are visually presented in the FRAME model, Figure 3.



**Figure 3.** The percentage of score aspects of teachers' m-learning utilization

#### The aspects of content from teachers perceptions

Figure 3 shows that 81.9% of teachers had utilized the available content from various internet sites accessed through mobile devices. The results strengthened that in accessing the *m-learning* content which was available on the internet, teachers expected to state their frequencies in accessing media-based content, text-based content, and image-based content that were relevant to learning and vocational training purposes. As stated by Quinn (2011) that content was often accessed through mobile devices as media-based content, both dynamic content: audio/video, as well as static ones: graphs, photos, and text that had information for learning. In addition, teachers also strongly expected to the importance of properly sorted content, the availability of communication facilities on content such as discussion forums. Nevertheless, teachers stated if the content was available and accessed which had no navigation and communication facilities that teachers could use sync for *video conference*. Furthermore, content accessed on the internet by teachers had not shown any consideration of the attractiveness of the display.

#### The aspects of users based on teachers perceptions

Figure 3 shows that 80.9% teachers had taken benefits of their *mobile* devices for vocational learning purposes. The results supported that the utilization of *m-learning* from user aspect could be seen from the higher utilization of *mobile* devices for the purposes of vocational learning. *Mobile* devices were used to access and to find interactive relevant information (pictures and video learning) to the needs of learning and vocational training. As stated by Motta, Cattaneo, & Gurtner (2013) that mobile devices serve to capture workplace conditions at work, develop learning activities based on workplace conditions, then the knowledge that has been described during the learning phase at schools is validated at work. The use of *mobile* devices facilitates the acquisition of information and the development of relevant knowledge based on the needs of employment. In this regard, the use of *mobile devices* for learning in SMK required the support from surrounding environment such as leaders of institutions, teachers, friends, and families.

However, teachers did not believe that the use of mobile devices for learning would reduce cognitive burden. This could be caused by two things: *first*, the teachers' *mobile* devices had not been used as places for file storages. *Second*, *m-learning* content contributed to provide contextual access as a cognitive addition or adding memory (Quinn, 2011). In addition to cognitive burden, teachers were also less confident if the use of *mobile* devices was to gain comfort learning. This was followed by the lower utilization of mobile devices to view tutorial videos or simulation of learning theory with practice. The lower utilization of mobile devices to access *m-learning* content from employment sites from different parts of the world. The uses of *mobile* devices for learning by teachers were the dynamics of *m-learning* utilization from user aspect. However, the teacher clearly stated the importance of *mobile* devices for vocational learning in the development era, change, shift of conventional learning toward technology-based learning in vocational education at SMK.

#### Social aspect based on teachers perceptions

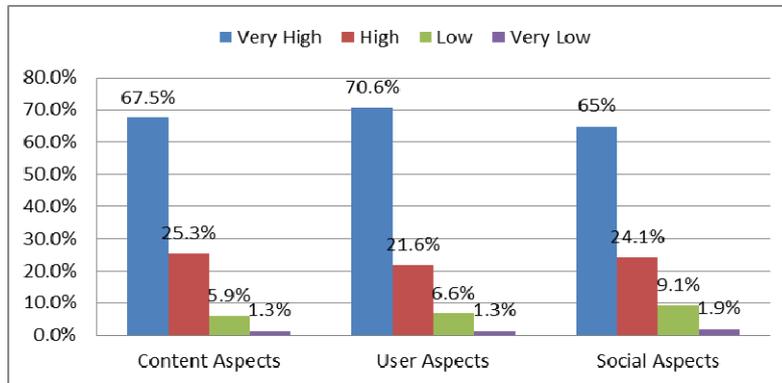
Figure 3 shows that 81.2% teachers had taken benefits of their *mobile* devices to communicate, collaborate, interact, and build learning communities that were appropriate to vocational learning. The results of the study indicated that the ethics of *m-learning* utilization became very important for teachers. This is in line with Kraut (2013) states the importance of promoting the use of *mobile* devices for safe, responsible, and ethical technology learning. More broadly, Pheeraphan (2013) stated the importance of developing a critical and ethical understanding of the use of information technology. This means that, the importance of ethics in the utilization of *m-learning* had been understood by teachers and indirectly promoted safe and responsible utilization. On the other hand, teachers advocated the provision of media space for the development of work-based communities. In

addition, the features or applications of mobile devices based on social media today should be directed to develop the community through related groups or forums to learning and vocational training. Moreover, teachers had utilized *mobile* devices to interact with the instructor's work, communicate and collaborate on vocational learning. According to Vygotsky that interaction and collaboration were essential for learning from a sociocultural perspective especially for individuals involve in learning discussions (Kearney et al., 2012). This was very possible with the availability of various applications in *mobile* devices, such as: text messaging, *e-mail* or *audio conferencing*, which could be used to interact and to collaborate to share information and knowledge (Boyinbode, Ng'ambi, & Bagula, 2013).

Nevertheless, for the purposes of revealing the competencies gained in SMK, teachers were still lack on *mobile* devices utilization to communicate and to collaborate with work instructors. Interaction through m-learning to facilitate the need for knowledge information that was done by teachers was also low. This was followed by the lower utilization of *mobile* devices to collaborate with friends (teachers) on learning.

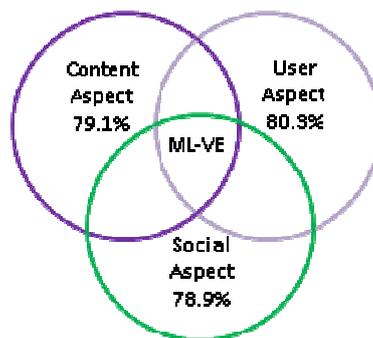
**The description of m-learning data utilization by student**

The description of *m-learning* data utilization by student from FRAME Model perspective covers three main aspects, namely content aspect, user aspect, and social aspect.



**Figure 4.** The frequency of distribution aspects of students m-learning utilization

Figure 4 shows that the average content aspect was 35 and empirical average was 44.30. This data indicated that the empirical average value was greater than the mean of theory. This data indicated that in general the students' responses regarding to the use of *mobile* devices to access vocational learning content are included in the high category. However, there were still very low and very low percentages that require further attention. The average of user aspect was 30 and empirical average was 44.23. In general, students' responses to the use of *mobile* devices for vocational learning were included in very high categories. However, there were still low and very low percentages that require further attention. The average of social aspect was 35 and the empirical rate was 44.23. In general, the students' responses to the social aspects of the utilization of *m-learning* were included in the high category. However, there was still a relatively low percentage that needs further attention. Furthermore, from the descriptive analysis, it is known that the achievement of the three aspects of *m-learning* in vocational education (ML-VE) by students, through comparing the total score empirically achieved with the highest total score in the theory. The results of the descriptive analysis of the three aspects are visually presented in the FRAME model figure 5.



**Figure 5.** The percentage of aspect scale of m-learning utilization by students

### **The aspects of content according to students' perceptions**

Figure 5 shows that 79.1% students had utilized the available content from various Internet sites accessed through mobile devices. Study results indicated that the students felt it is important to utilize *mobile* devices to access and download *m-learning* content based on media, content that provided multimedia facilities interactively, text-based content which was suitable for vocational learning purposes. This statement was as important as the previous teachers' statements. The level of interest was also in relation to the developing of virtual learning that is available today. In addition, virtual learning is able to simulate practical learning (Jin, 2009). Youtube is a multimedia facility commonly used by students and could be an example media for obtaining interactive virtual content in both media-based content and text.

In general, the result of study indicated the low utilization of *m-learning* content by students. Cheon, Lee, Crooks, & Song (2012) recommended the strategic efforts, included by considering the degree of readiness of students from three perspectives, namely: (1) the positive attitude of students, (2) content, and (3) comfort level. Due to the low utilization of content by students, these three viewpoints became important to be reviewed, especially on the accessed content. Although, the use of content was considered lower. Content according to students that the *m-learning* content seen on the internet was less considered attractively, had not provided navigation, communication facilities that could be used in sync such as video conferencing. The use of cameras or video from mobile devices had not been utilized to obtain content from multiple locations.

### **The aspects of users based on student perceptions**

Figure 5 shows that 80.3% students had taken benefits of their *mobile* devices for vocational learning purposes. The results of analysis indicated the higher utilization of *mobile* devices for vocational learning purposes (user aspect, beyond the two aspects: content and social aspects), as study from Martono & Nurhayati (2014) showed that 95% users enjoy the use of *m-learning* applications and only 5% did not enjoy *m-learning* applications. Furthermore, the research results stated that students generally utilized their mobile devices to access and obtain relevant knowledge information toward learning and vocational training. The acquisition of information emphasized to more interactive learning information. This is in line with Koole (2009) that an effective *m-learning* process will enable students to be able to collect and to select information in relevant context and required information. This is in line with the statement of Shariffudin et al. (2012) that *m-learning* helps students to assess and to select relevant information based on the objectives within the *m-learning* environment.

Nevertheless, students used less *mobile* devices to access content from vocational employment websites and to view tutorial videos or to simulate theoretical learning with practice. Furthermore, as well as teachers, students also did not believe if the use of *m-learning* would be able to reduce cognitive burden. Unlike the teachers, students were less likely to require people in the surrounding environment and to encourage them utilizing *mobile* devices for learning. In *mobile* device utilization, students needed the freedom as they desired. This was consistent with Cheung statement (2013) that the use of *mobile* devices for learning was largely determined by the students' willingness and positive attitude. On the one hand, it had a positive impact because it involved the students' awareness, desire and technical abilities, but on the other hand, the lack of environmental support could cause negative impact, namely; the use of *mobile* device became uncontrolled, and it's utilization was out of the essence of vocational learning. This was a challenge for the world of vocational education to formulate more specific rules for *m-learning*.

### **Social aspect based on students perception**

Figure 5 shows that 78.9% students had taken benefits of their mobile devices to communicate, collaborate, interact, and build learning communities that were appropriate to vocational learning. The results stated that social-cultural support was an important factor in influencing the development, change, shift of learning toward the utilization of *m-learning* on vocational education in SMK. This was just as important as the ethics of using *mobile* devices. In addition, students also expressed their unity in communicating and collaborating with friends on vocational learning. Due to socio-cultural and ethical support, students also expressed the need to provide media space or forums for the development of work-based communities. Nevertheless, the uses of *mobile* devices to collaborate and to communicate with workplace structures as an effort to evaluate the competencies acquired in SMK were still lack of implementation. These were followed by the lower utilization of *mobile* devices for learning interaction and collaboration with teachers on vocational learning. Students also less utilized their owned *mobile* devices to interact with work instructors in the workplace. Though this was very important, because an effective *m-learning* would emphasize the improvement of knowledge where students could interact with teachers and work instructors on subject matter from different environments virtually (Koole, 2009). Therefore, the use of *mobile* devices to facilitate interaction and collaboration among students with teachers and work instructors needed to be improved.

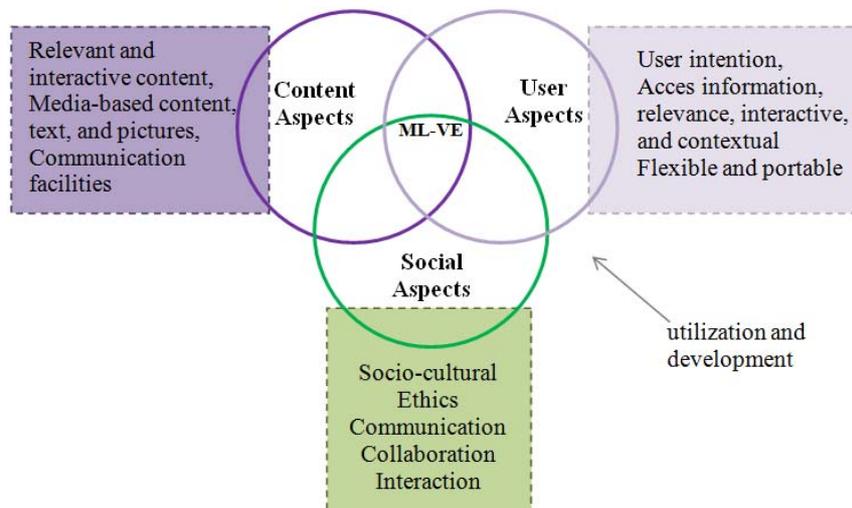
## DISCUSSION

### The dynamics of *m-learning* utilization in vocational education with FRAME Model perspective review

The aspects of utilization made by teachers based on the three aspects, it was more emphasis on aspects of content (81.9%), while students emphasized the user aspect (80.3%). The dynamics of the content aspect explained that in general the development and changes in learning content accessed on the internet through *mobile* devices were relevant to the majors on vocational education in SMK. The dynamics of user aspect explained that mobile devices had been utilized for vocational learning in the development era, change, technology-based learning on vocational education in SMK. In addition to those two aspects, it turned out, that the social aspects of both teachers (81.2%) and students (78.9%) also gave responses on the importance of social aspects in the utilization of *m-learning*. The dynamics of social aspect explained that socio-cultural support would affect the development, change, shift of learning towards the utilization of *m-learning* on vocational education in SMK. Socio-cultural support became very important, so the development of *mobile* devices increasingly utilized for learning purposes, not vice versa less let alone not at all.

These three aspects of utilization emphasized the importance of content, user intention, and socio-cultural support to realize *m-learning* utilization along with the development of *mobile* devices today. Content would lead to the acquisition of learning information that was meaningful, objective, and interesting to learners. Related to content, Al-Zoubi, Jeschke, & Pfeiffer (2010) stated the lack of content is as a major factor that slows down the progress of *m-learning*. Therefore, vocational education institutions needed to provide and developed appropriate and *up-to-date* content based on to their developments and needs. User's intentions would lead to awareness and desire in utilizing *mobile* devices for learning. Socio-cultural support would provide rules in the form of policies, and facilities that would encourage *m-learning* implementation in vocational education.

The three aspects of the FRAME model were very important to be considered, in order to realize the utilization of *m-learning* as a new generation of *e-learning*; it was also the implementation of ICT-based learning for the future. The description of dynamics aspect that occurred, provided a developed model based on FRAME model with the highest level of importance and utilization of *m-learning* on vocational education in Makassar, both from teacher perception and student perception. The utilization model in Figure 6 was the recommended model towards better *m-learning* utilization and in accordance with vocational learning and training, especially in Makassar, Indonesia.



**Figure 6.** Model of *m-learning* utilization in vocational education

Figure 6 shows the model of *m-learning* utilization in vocational education (Mahande, 2017). The utilization and development of *m-learning* would be concentrated on the user's aspect with the *mobile* devices, the learning content, and the social aspects.

**On the content aspect:** relevant and interactive content, media-based content, text, and images were the most expected content even it used to be accessed by teachers and students. In addition, content that provided synchronous communication facilities, such as *video conference* was needed. Thus, *m-learning* in the future needed to improve and to consider the content aspect, especially the interactive multimedia-based content in the utilization or development of *m-learning* content in the future.

**On the user aspect:** Strong intention or self-will would promote good utilization and based on its purpose. Intention was influenced by various factors of usability, ease of use, social environment, and supporting facilities. Related to the intention, importance and highly *mobile* devices utilization related to the acquisition of relevant, interactive, contextual or environmental information where *m-learning* was utilized, in terms of flexibility and portability. Thus, user intentions prior to utilization or development became important to be traced through theories of technology acceptance. Similarly with content, providing an understanding of *mobile* devices utilization in accessing and classifying relevant and interactive information were very important to do. In addition, utilizing all the advantages of flexibility and portability were for learning purposes. It needed further attention in order to utilize and to develop future *m-learning*.

**On the social aspect:** socio-cultural support such as schools, leaders, teachers, friends, and families influenced the realization of *m-learning* utilization that had been better and had aim. In addition, the utilization ethics should receive attention, especially in using, accessing information, and communicating, collaborating, and interacting among teachers, students and instructors in the workplace. Thus, socio-cultural support, ethics of utilizing *m-learning* in communication, collaborating, and interacting became very important in the utilization and development of future *m-learning*.

### CONCLUSION AND IMPLICATIONS FOR FUTURE RESEARCH

*The content aspect* which was available on the internet and accessed by teachers were relevant to their majors, whereas students expressed less relevance to their majors, so the value and substance of utilizing *m-learning* content was still less relevant. *The user aspect* showed that teachers and students utilized *mobile* devices for vocational learning purposes, so the value and substance of learning could be still maintained. *The social m-learning aspect* showed that socio-cultural support was important in influencing *m-learning* utilization for teachers and students, so that the value and substance of *m-learning* in vocational education could be maintained.

This study provides implications for the need for increasing socio-cultural support towards the utilization of *m-learning*, especially in obtaining information on knowledge and skills through communication and collaboration with work instructors, as an effort to increase the relevance of competencies between schools and the working world. Optimizing the utilization of *m-learning* is required toward appropriate content for vocational learning.

Therefore, it is hoped that further study can use the result model and or fill the gap of each aspect of the FRAME model to illustrate the utilization and development of *m-learning* applications and content in future. The limitations of this study were the less specific review of research results with vocational education and the sample of the study came only from six vocational schools with a limited number of study respondents, so the findings of this study were still general at vocational education in Makassar, Indonesia.

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