

# Learning Through KMS Model Using Video Conference to Optimize the Absorptive Capacity of Vocational School Students During COVID-19 Pandemic

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## ABSTRACT

Knowledge Management System is a connecting tool that bridges the knowledge or skills needed for work, mainly from tacit knowledge into explicit knowledge. The study was conducted in five cities, namely Yogyakarta, Salatiga, Bangka Belitung, Manado and Pontianak. The participants of this study were vocational school students and teachers. Data were collected through interviews, questionnaires, and Focus Group Discussion (FGD). Preliminary finding before the Pandemic was that students did practical work, which then followed by direct discussion. However, the absorptive capacity of this skill-based knowledge did not result in optimum performance for most vocational school students. Thus it is necessary to develop a theoretical Knowledge Management System (KMS) model that is suitable for supporting communication of knowledge and skills that are generally tacit into explicit. One characteristic of this KMS model is the intense sharing and discussion between students and teachers, and which was a challenge to implement before the pandemic due to time constraints. During the pandemic, however, it was found that by applying online learning methods or via video conferencing, it is easier for students to conduct sharing and discussion. The result of this study is an appropriate learning model through KMS in order to optimize the Absorption Capacity of Vocational School Students during the COVID-19 Pandemic.

**Keywords:** *Knowledge Management System, absorptive capacity, pandemic, video conference*

## 1. INTRODUCTION

One of the main priorities of education development is vocational education [1]. Vocational education seeks to meet the needs for skilled workers needed by the industry [2]. In Indonesia, SMK is a type of vocational education that prepares graduates who are ready to work in various fields, either working independently or in certain industries. Vocational programs, apart from being able to improve students' employability, can also help students with disadvantaged backgrounds to be able to compete to fill job vacancies [2]. According to data from the Ministry of Education and Culture (2019), it was recorded that until the beginning of 2019, the number of SMKs in Indonesia reached 14,301 schools, consisting of 3,622 public SMKs and 10,679 private SMKs. The number of SMK students for the 2019/2020 school year under the Ministry of Education and Culture is 5,249,149 students [3].

There have been efforts to improve the quality of SMK graduates. Central Bureau of Statistics (2020) data shows that during the last three years (2018-2020), SMK graduates

make up the most of the unemployed in Indonesia, at 8.92% in February 2018, 8.63% in February 2019, and 8.49% in February 2020. SMK graduates also experience a downward trend in salaries, which is an indication of the decline in the quality of SMK graduates, leading to the unfulfillment of the skills needed in the workforce [4]. This fact is cause for concern.

In line with government efforts, this study aims to formulate a model for increasing the absorptive capacity of skills in Vocational High Schools in Indonesia. The concept of absorptive capacity is used as a support in organizational and corporate learning. Absorptive capacity is the potential for the use of external information, which is then assimilated and applied to improve organizational and corporate performance [5]. This concept is further developed by making classifications such as: (a) potential absorptive capacity and (b) realized absorptive capacity [6]. In this study, Absorptive Capacity is defined as the quantity of knowledge and skills acquisition in SMK. There are two components of Absorptive Capacity that are inseparable, namely the capacity for adoption to accept ideas from outside, and the capacity for invention that creates

something new [7]. In SMK, the capacity for adoption becomes the acceptance of knowledge and skills, and the capacity for invention becomes the creativity in utilizing available concepts and technology, as well as the discovery of new concept innovations.

In addition to Absorptive Capacity, this research initiates a study that has not been previously considered, namely the development of a theoretical model of Knowledge Management System (KMS). Knowledge is briefly defined as a fluid combination of experience, value, contextual information and expertise insight that provides a framework for evaluating and combining new experiences and information [8]. In an organization, knowledge is often incorporated, not only in documents or repositories, but also in routines, processes, practices, and organizational norms [8]. Knowledge management includes the process of production, distribution and absorption of knowledge. One of the opportunities for optimum knowledge absorption is that distribution of knowledge is ideally carried out in persuasive ways. However, no matter how ideal the persuasion is, this absorption process still depends on the absorptive capacity of the individual and the group for the messages of knowledge they receive. The KMS concept describes a continuous interaction process from tacit knowledge to explicit knowledge in the creation of organizational knowledge [9].

Nonaka (1994) argued that when knowledge is constructed by individuals, the organization plays an important role in articulating that knowledge [9]. KMS can serve as a theoretical framework that can be used as an analytical perspective, and as an important part of knowledge creation. This theoretical framework can be applied to facilitate the creation of knowledge dynamics for individuals and organizations.

2020 is a year with big challenges for learning activities in Indonesia. This is due to a COVID-19 pandemic which begun in March 2020. Pandemic is a disease that spreads throughout the country or the whole world [10]. According to WHO, a pandemic is defined as an epidemic that occurs worldwide or over a very large area, crosses international borders, and usually affects a large number of people [11]. Epidemic is a large number of cases of a particular disease occurring at the one time in a particular community [12].

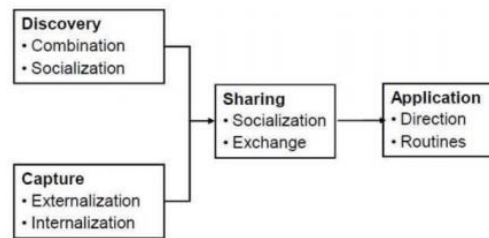
This lead to differences in learning activities before and after the pandemic period. During the pandemic, learning activities were mostly done over long distances. In this case, supporting applications are needed to help communication between students and teachers. One application that has an important role in student learning activities during the pandemic is video conference. Video conference is a learning tool that has been widely used among educators and students to encourage effective communication between students and teachers as well as students and their friends, especially when face-to-face method is not possible [13].

Based on the formulation above, this study aims to answer the question of how the use of video conferencing as a KMS model can optimize the absorptive capacity of vocational students.

## 2. LITERATURE REVIEW

### 2.1 Knowledge Management System

Knowledge Management System (KMS) is the application of a classic concept from Nonaka (2016), which is when knowledge is constructed by individuals, the organization plays an important role in articulating that knowledge [14]. KMS can serve a theoretical framework that can be used as an analytical perspective, and as an important part of knowledge creation [15]. This theoretical framework can be applied to facilitate the creation of knowledge dynamics for individuals and organizations [16]. Knowledge management system (KMS) is a system that can be used to facilitate the knowledge management process [17].



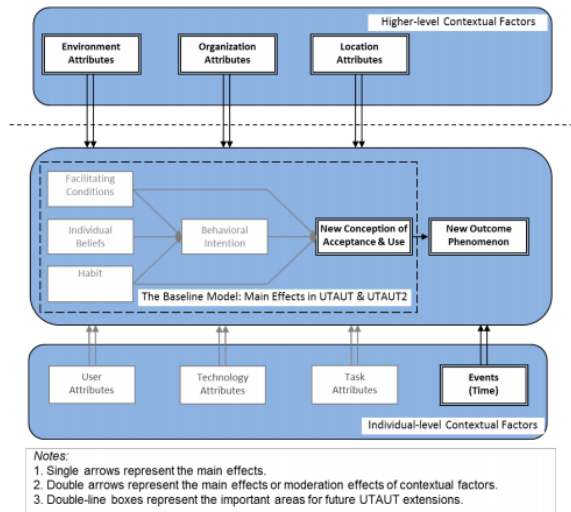
**Figure 1.** Knowledge Management System

### 2.2 Technology Acceptance Model (TAM)

The use of information technology can be explained and predicted through several theoretical models. Two of the most widely used theoretical models are the TAM (Technology Acceptance Model) developed by Davis (1986), and the refined model, that is UTAUT (Unified Theory of Acceptance and Use of Technology) by Venkatesh, Morris, Davis, and Davis (2003) [18].

Both models are based on the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen (1975). TAM explains that the links between perceived usefulness and perceived ease of use can affect the intention to use information technology, and predict the use of said information technology. The initial TAM model has been developed into the UTAUT model [18]. In line with the ongoing review of the UTAUT model in various fields, researchers have proposed several modifications of the UTAUT model (for example, Hossain, Hasan, Chan, & Ahmed, 2017).

Based on inputs from several previous studies, Venkatesh, Thong, & Xu (2016) proposed the Multi-level Framework of Technology Acceptance and Use [19]. In summary, this MFTAU Model divides the model into 3 levels: Individual Level, Baseline Level, and Higher Level of Contextual Factors [19]. This current model can be used to describe a variety of situations, including in the context of this proposed study [19].



**Figure 2.** Multi-level Framework of Technology Acceptance and Use (source: Venkatesh, Thong, & Xu, 2016, h. 347).

According to Venkatesh, Thong, & Xu (2016), the MFTAU (Multi-level Framework of Technology Acceptance and Use) model describes the factors that can influence individual behavior [19]. This condition facilitates and influences the habits and intentions of using technology. The MFTAU model can serve as a tool to predict and explain individual behavior in using technology, one of which is the Knowledge Management System. The Knowledge Management System can provide support to increase the optimal Absorptive Capacity (AC) of knowledge and skills.

**2.3 Absorptive Capacity**

The theoretical basis and model of Absorptive Capacity were developed by Cohen and Levinthal (1990). Absorptive Capacity is the potential for the use of external information, which is then assimilated and applied for organizational purposes [20]. Zahra and George (2002) then developed this concept by classifying potential absorptive capacity and realized absorptive capacity [21]. There are two components of Absorptive Capacity that are inseparable, namely the capacity for adoption to accept ideas from external sources, and the capacity for invention to create something new [22].

**2.3 Video Conference**

Video Conference is a learning tool that has been widely used among educators and students to encourage effective communication between students and teachers as well as students and their friends, especially when face-to-face meetings are not possible [13].

According to Anna Kamari (2010), video conference offers flexibility in all its usage. Furthermore, in her research, it is

explained that the need for Knowledge Management that is supported by information technology is expected to improve cognitive and metacognitive processes [22].

Based on the formulation above, it can be estimated that the use of video conferencing as one of the KMS models can increase the absorptive capacity of SMK students.

**3. METHOD**

The main participants of this study were Vocational High School (SMK) students. Participants of this study were students and teachers of Vocational High Schools (SMK) in five cities, namely Yogyakarta, Salatiga, Bangka Belitung, Manado, and Pontianak.

The method used in this research is qualitative method with an ethnographic approach. Data were collected through questionnaires, observation and interview with Vocational High School (SMK) students. The data used in this paper is dominated by observation and interview by the researchers while at the five SMKs.

**4. RESULT**

The research data obtained shows that during skills activities in the practice room, there is a phenomenon where students did not have the opportunity to ask questions to the teacher about the tacit skills being learned. Based on observation throughout several meetings, the teachers also did not have the opportunity to explicitly communicate some of the knowledge needed when students learn a skill. In fact, one way to achieve optimal skills learning outcomes is that the learning process often requires practice and verbal instruction.



**Figure 3.** Learning Process at an SMK

Based on observation made at SMKs in Yogyakarta, Salatiga, Bangka Belitung, Manado, and Pontianak, it was found that the existing facilities and infrastructure in the practice room were considered complete and should be able to support the learning of SMK students. For the purpose of

illustration, the researchers conducted observation in the kitchen room for cooking practice in one of the vocational schools. In the classroom there were about 15-20 students. Learning in the practice room began with a brief explanation from the teacher which then followed by practice by the students.

For cooking classes, the practice was done in small groups, with the teacher observing throughout the process. Based on the observations made, the teacher was seldom directly involved in the practical process in each group. Teachers in class mostly observe the practical process from the front of the class, or by walking around, and will answer students' questions. During practical activities, the discussions mostly occur within groups. Discussions between teachers and students occur less frequently, and only when students ask questions.

The visualization of the implementation of skills learning process above shows that the time for students to discuss tacit knowledge in more detail is quite limited. In one interview it was found that students sometimes did not have the opportunity to ask the teacher about the task they were asked to do.

During a pandemic, one of the most widely used online learning methods is through video conferencing. It is estimated that the use of video conferencing makes it easier for students to share and discuss. The use of video conferencing in learning activities has the potential to optimize the absorptive capacity of vocational students. This is in line with the statement of Cheng, Wu and Hu that capacity for adoption to accept ideas from outside and the capacity for invention to create something new [7]. One of the influencing factors is the interaction (sharing of knowledge) during video conference. Practice and sharing are considered to be far better in optimizing absorptive capacity, compared to reading books, or working on certain skills, alone.

In an SMK, every teacher brings different knowledge, as well as students, each of them possessing different knowledge. The interaction between teachers and students via video conferencing allows for deeper, or wider knowledge sharing. Practice and sharing can better improve learning of a skill compared to learning through reading books or practicing alone. Through the sharing process, teachers also learn about new things, both technical, as well as methods to increase the absorptive capacity of students.

The use of video conference in learning process is considered to have the potential to optimize the absorptive capacity of vocational students. This is due to the characteristics of the video conference which allows for immediate reaction among its users. Teachers and students get information from the results of discussions and sharing conducted via video conferencing. This is in line with the findings of Anna Kamari [22] in her research on video conferencing. Video conferencing offers flexibility in all its uses.

In addition, this paper explains that Knowledge Management, when supported by information technology is expected to improve cognitive and metacognitive processes [7]. Through video conferencing, a more intensive sharing process is possible. Tacit knowledge that is not expressed in the class when practice is done offline, can be expressed in the sharing process. In other words, such sharing process can improve students' absorptive capacity, including the capacity to accept ideas from outside, and the capacity to invent, or discover new things.

## 5. CONCLUSION

Based on a research conducted in several Vocational High Schools (SMK), it can be concluded that the use of Video Conference is considered to have good potential in increasing the absorptive capacity of SMK students. The result of this study is an appropriate learning model through KMS in order to optimize the Absorption Capacity of Vocational School Students during the COVID-19 Pandemic.

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