The Dissemination of Innovation through CMC in the Vocational Education

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Abstract. Technological developments change human life, including how humans communicate. One of them is by using computer media. The pandemic period makes face-to-face meetings difficult so that learning must be delivered through online media. In addition to learning materials, messages containing innovations both regarding technology that supports lessons, how to use them, and technology-related materials are also delivered through online media. This study aims to determine how the process of the diffusion of innovation through Computer-Mediated Communication in Indonesian vocational schools during the pandemic. This study uses diffusion innovation theory as the main theory of research and the interactive CMC model as a supporter. 30 principals from various vocational schools in Indonesia and 5 teachers became sources of information for this research through interview and observation techniques. The results of the study show that technological innovation is minimally distributed in every school due to various obstacles such as motivation and access to technology use. The message of innovation includes introducing new technologies for supporting teaching such as google classroom, virtual laboratory, and What's up. They also teach the use of technology to the student that related to mattery through social media. There are several important factors so that innovation can spread through computer-mediated communication, namely the cost factor, the motivation factor, and the online ecosystem preparation factor.

Keywords: Innovation Diffusion; Vocational School; Education; Computer Mediated Communication; CMC

1 Introduction

The Internet with its capabilities has various meanings and develops as an open and sustainable system. Computer science, telecommunications, and electronics as well as engineering are among the fields of study that were pioneers in the surprising development of the internet (Bouhaï & Saleh, 2017). Education is also affected by the development of technology, especially by the internet so that it develops with the mention of educational technology. According to Anglin (Akbar, 2019), Educational Technology is a combination and learning, development, management of technology applied to solve educational problems. The use of technology is becoming a necessity to support success in student learning in the era

LIONG 2021, October 19-20, Purwokerto, Indonesia

DOI 10.4108/eai.19-10-2021.2316727

of disruptive technology, especially during a pandemic. The implementation of the lockdown system in several countries has caused the education system of students by attending school in full to switch to an online system. The results of research from Cathay Li and Farah Lalani found that millions of students continued their studies through online platforms or as many as 81 percent of K12 classes in Wuhan (Li, 2020).

The use of internet data for education increased by 25-30 percent during the lockdown in India (PTI, 2020). Data from UNESCO shows that as many as 42 1,388,462 implement online systems for education in 39 countries (Kompas.com, 2020). The closure of the offline system also occurred in Indonesia due to the spread of the coronavirus, but the implementation of the learning system for each school was different due to the uneven distribution of online networks in various regions. Data from the Ministry of Education and Culture states that as many as 68 million students and 4 million teachers study from home to avoid the spread of the coronavirus (Kemdikbud, 2020). Based on a graphic from conversation.com, there is a clear difference in the percentage of children's access to learning based on the education level of the father. The higher the education level of the father, the more the application of learning uses online methods while the lower the level of education of the father, the lower the online learning method even does not get assignments from school.

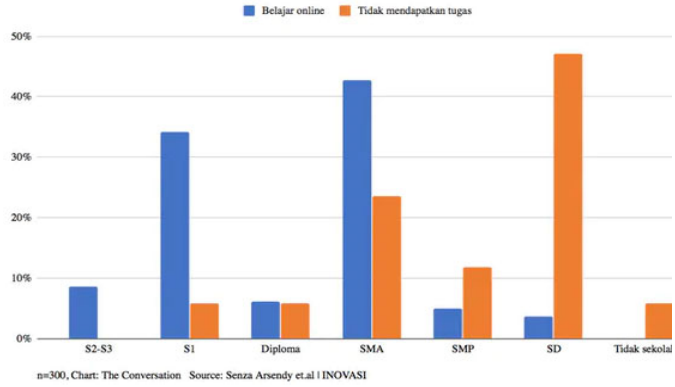

Fig. 1. percentage of children's access to learning based on father's education level (theconversation.com, 2020)

1.1 Online Media in Education

The use of online media in the world of education is something that must be carried out considering the covid 19 pandemic which requires all things to adapt to technology including the world of education, teachers or lecturers are not the only determining benchmark, this challenge also comes for parents (Jaelani, Fauzi, Aisah, & Zaqiyah, 2020). The challenge also comes from how the strategies used by the school are to design learning media as innovations by utilizing online or online media. (Aisa & Lisvita, 2020), This decision is under the decision of the Minister of Education and Culture of the Republic of Indonesia regarding Circular Letter Number 4 of 2020 concerning the Implementation of Policies in the Emergency Period for the Spread of Covid -19 (Kemdikbud, 2020).

ICT is a solution for online learning activities. Many types of information media are used by educators to conduct online learning (Aisa & Lisvita, 2020). Online learning is the implementation of online learning classes to reach a broad target group so that online learning

itself can be done and followed from anywhere for free or paid. (Bilfaqih & Qomarudin, 2015). Online media can use digital technology such as google classroom, study house, zoom, video conference, telephone or live chat, and others. The thing that must be considered in this online learning activity is the assignment of tasks through mentor monitoring by the teacher through the Whatsapp group so that students learn (Dewi, 2020). Vicky dan Putri writes (Rachmadyanti & Wicaksono, 2016) providers of online media technology in schools without putting aside the conventional learning that is carried out, this is an advantage of blended learning where two conventional and online learning methods are combined to make students feel comfortable and active in constructing their knowledge.

For the process of providing educational materials to students online to be successful, several things need to be prepared in a structured manner. This planning requires time-based on activities, resources, supporting tools, appropriate places, and supervisors who have good skills. Other things that need to be considered and important are: (a) specific objectives, (b) resource capabilities of both teachers and students in terms of using online media. Supporting tools needed for a PC or laptop with additional supporting tools such as webcams, headsets, internet connections with fast upload and download quotas, video conferencing applications. (c) supporting hardware capabilities (Pandey, 2020).

1.2 Diffusion of Technological Innovations in Society

The theory of diffusion of innovation is a combination of the two words diffusion and innovation, the diffusion of innovation itself is a special type of communication related to the spread of messages as new ideas or innovations. While the notion of communication itself is defined as a process in which there are 2 or more people who create information and exchange information with each other to gain mutual understanding. Rogers said that diffusion can be defined as where the innovation process is conveyed or communicated through certain channels over time between members of a social system (Puspitasari, 2017). The theory of diffusion of innovation explains how the process of innovation is conveyed or communicated through certain channels over time to groups of members of the social system (Setyaningsih, Abdullah, & Prihantoro, 2019).

The Diffusion Theory of Innovation emerged in 1903, by the French sociologist Gabriel Tarde who introduced the S-shaped Diffusion Curve to the public. The theory of diffusion of innovation in essence explains how a new idea and ideas are communicated in a culture or culture. That this theory focuses on how a new idea or idea can and is possible to be adopted by a particular social or cultural group. The main purpose of the diffusion of innovation is the adoption of an innovation, namely ideas, sciences, and technology, both by individuals and certain social groups. Therefore, Rogers suggests that there are 4 characteristics of innovation that can affect the level of adoption of certain individuals and social groups (Setyaningsih, Abdullah, & Prihantoro, 2019) 1).Innovation. Innovation can be interpreted as an idea, idea, or action to create something that is considered new by someone. In this discussion, innovation can be said as something new based on how people view the ideas, or actions that are new. 2). Communication Channel. Innovation can be adopted by someone if the innovation is communicated or conveyed to others. The communication channel referred to here is also adjusted to whom the innovation is intended for. If the innovation is addressed to the wider community, the channel used is of course the mass communication channel. If the intended individual, then the channel used is a personal communication channel. 3). Term Period. Time is a time dimension that starts from the innovation process that is communicated or conveyed to someone until the decision to adopt the innovation. 4). Social system. The social system is a

collection of social units that form a bond in social life. The social system consists of units that are functionally different but are bound by a common goal. This social system may be the target for innovation, and they are the ones who accept or reject an innovation.

1.3 Computer-Mediated Communication on Education

Studies on the implementation of computer-mediated communication in daily life are growing in the era of internet technology. Nowak and Fox research on the use of avatars in e-commerce, social media, and education. The results show that the use of avatars as a medium of communication can produce manipulative activities in a real environment rather than in cyberspace. However, research on the use of avatars as a communication medium has the potential to develop technology and communication theory (Nowak, & Fox, 2018). The study of media as a medium of communication has long been used as an object of research. However, since online developments have grown a variety of online media and social media, interactivity of communication between humans is connected to these media. Pang et al examined how effective online communication is from CMC theory with a focus on online interpersonal relationships to find solutions to doubts in organizations involving stakeholders in dialogue in the online world. (Pang, Shin, Lew, & Walther, 2016).

The use of computer technology as a medium for communication between teachers and students is growing in this era. This is due to the spread of the coronavirus which has caused face-to-face schools to be replaced with schools using virtual ones so that researchers are increasingly getting space to develop CMC in Education. Terner and Amato's research found that students tend to feel disconnected from their teachers when online education. To overcome this, teachers use new technology and new approaches to liven up the classroom atmosphere and connect communication between teachers and students (Tanner & Amato, 2012). While a survey of 395 undergraduate students in the USA on the CMC pattern with Quizzes resulted in the finding that the application can help teachers, trainers, and technology instructors make good choices in the development of online assessments (Dumova, 2012).

Computer-mediated communication or CMC is defined as the exchange of messages that occurs between two or more individuals using electronic devices as a medium for delivering messages (Amin, 2020). The media used as a medium of communication are email, chat rooms, online forums, social media, and so on. Greenberg explained that CMC has characteristics including being interactive, namely the involvement of two or more people in the interaction, exchanging messages, and exchanging roles, people who use CMC have full control over timing, content, actions, communication, and everything and based on text. (Juditha, 2018). Wright and Webb describe other characteristics of CMC, namely 1). Synchronization is which the message exchange rate is immediate. 2). Anonymity means personal level representation, individualizing the information sent by a channel. 3). Customization is the degree to which the mediated environment modifies itself according to the user's wishes. 4). Interaction refers to two-way communication. 5). Social presence refers to the level of social presence in the virtual world which is the same as the real world. 6) homogeneity (Wright, 2011).

Mahmoud and Auter designed a CMC model called the CMC Interactivity model. There are four elements in the interaction of computer-based media communication, namely 1). Users with roles as sender and receiver. 2). Medium (media) is a condition for the existence of media or channels to facilitate the process of interaction between users. 3) messages which are exchanged between users through the computer media used. 4) communication setting, namely the communication environment and time according to the participants' wishes because online

communication occurs in the real-time world (Juditha, 2018). Based on the explanation of the background and previous research, this study aims to find the process of diffusion of technological innovation through computer-mediated communication in Vocational High Schools during a pandemic? Three innovations are the focus of their distribution through CMC, namely innovations in the form of teaching, technological innovations that support learning, and information technology innovations related to the subject matter. The purpose of this research is to provide new findings regarding the communication process for the diffusion of innovations mediated by computers.

2 Methodology

Bachri defines qualitative descriptive as data collected in the form of words, behaviors, actions, pictures, and not numbers (Mulyandaria, Sumardjob, & Lubisc, 2010,). Neergaard says that qualitative descriptive will be more appropriate when the information needed can be obtained directly from the people involved in the thing or phenomenon under study, then time and other resources are limited or as part of the quantitative-qualitative design phase(Speakman, B., & Carey 2021). This study collected data by interviewing 10 principals of vocational schools from various schools in Indonesia and 5 teachers. The criteria for selecting these schools are vocational schools that are outside the city but apply learning through online media in their daily education. In addition, the principal was selected in 90 vocational schools that have promising progress to become CEO (kalderanews.com, 2020).

The data analysis technique in this study follows the steps of data analysis and data interpretation as described by Creswell(Creswell 2018), that is; first, processing and preparing data for analysis. This stage is to collect data. the results of observing the behavior of principals, teachers during online learning and the results of interviews with school principals. Second, read the entire data. The second step in this research is reading the interview transcripts and observing the behavior of school stakeholders. Third, start coding all the data. In this step, the researcher grouped or coded all interviews and behavior of school stakeholders according to the diffusion innovation theory as the main theory and the theory of computer-mediated communication. Fourth, apply the coding process to describe how the implementation of CMC and its innovations in online teaching. Fifth, show how the results of the analysis are presented in the report. At this stage is to present or fully describe the findings obtained about the implementation of CMC innovation. Sixth, interpretation of reports or research results. The last stage is the interpretation of research findings on the implementation of online training and linking them with previous research and the theory used to find research gaps.

3 Result and Discussion

3.1 Innovation Learning Method through CMC

The pandemic era caused schools to innovate in learning, including distance learning. Internet technology is a mainstay for schools so that meetings between teachers and students continue to run. Most teachers use internet applications as a strategy so that the provision of material continues to run to students. Several schools innovate to create their virtual system and one of them is called BKL Virtual. Virtual BKL is a virtual learning system about the

situation at the pharmacy. The system accommodates how pharmaceutical services to consumers through recordings then become students' learning so that they can interact with consumers about drugs from consumer questions to requests for certain drugs. In addition, students can learn about pharmacy administration because the transaction evidence from the pharmacy concerned can be used for learning through the real system.

"Virtual BKL means that whatever happens at the pharmacy, how students should interact with consumers, we record and then we ask for the drug transaction documents from the pharmacy to be administered by the children at home"(personal Interview). In addition to virtual BKL, several vocational schools have taken the initiative to make learning media in the form of student worksheets based on hyperlinks and codes, making it easier for teachers to send links containing questions for students to work on. In addition, the system also brings up learning videos that can be used by students as additional material. The use of mobile applications has also begun to be used by schools but is still limited to attendance. Another innovation following the development of students is games. Vocational High School students are at an age where games are still a favorite, so it needs to be developed in the form of providing subject matter.

"We already have the option of creating a virtual BKL, which means recording what happens at the pharmacy and showing how students should interact with consumers. Then we asked for the documents for the proof of the drug transactions from the pharmacy to be used as teaching materials for children's administration at home" (personal interview).

"How to stimulate children's brains to practice so that they will be honed to think about work in the real world. At least 80-90% of their experience has been brought after doing virtual learning. if directly directed to the actual practice then they can already apply it. For example, there is a navigation simulator, if there is a virtual one like this, students must see and learn it. So that when they are directed to the simulator, they must be able to do their job because it is following what is done in the virtual. Mathematics is a subject that is easy to strengthen by games in the form of online applications because the answers are objectively different from other subjects whose answers are subjective, such as social science, it will be difficult to make games because it requires reasoning and explanation in answering to allow the emergence of various answers. (personal interview)

Although schools have begun to implement various mobile applications as a means of providing material, their development is difficult due to technical limitations so that innovations are expected to overcome educational problems online are difficult to do. One of the difficulties in developing innovation is the lack of capital. Several schools took the initiative to get the idea of creating a virtual in their laboratory but were constrained by the lack of sufficient capital to pay for the technology technician.

3.2 Learning Innovation Using CMC

The discovery of an idea cannot be disseminated to groups or communities if there are no media. Various innovations from schools will not succeed if socialization to students does not use media that can accommodate and is easy to use in giving these ideas and their explanations to students. The use of conventional media such as TV and radio is becoming unpopular today. Media that involve online such as WhatsApp and google classroom become a means for schools to convey new ideas related to learning.

"for SMK thinking about distance learning, they still use the mobile platform to make films. it's still not perfect because it still needs development tools to adapt to innovation especially in April when the first innovation regarding online education took everyone by

surprise. but the teachers responded by making WhatsApp, google classroom and adaptation to other learning support technologies and making children have to analyze various things (personal interview)".

"if youtube is included in the credit package from the government while zoom does not get a government package so we prefer youtube, podcasts and other applications that are cost-effective but easy to access by students (personal interview)".

Apart from being a socialization of innovation, WhatsUp media is also used by schools as an introduction to the material, giving assignments, making discussion materials. However, the use of WA was only at the beginning of the pandemic because many schools innovated using other technologies such as telegrams or LMS to provide materials. Until now, the use of WA only serves as a communication between teachers and students in terms of discipline in working on the material. Apart from being socialization of innovation, WhatsUp media is also used by schools as an introduction to materials, giving assignments, making discussion materials. However, the use of WA was only at the beginning of the pandemic because many schools innovated using other technologies such as telegrams or LMS to provide materials. Until now, the use of WA only serves as a communication between teachers and students in terms of discipline in working on the material

Although Google Classroom and Zoom make it easier for schools to convey innovations to students, in terms of the learning system, these two online media are difficult to apply in some schools. Assignments from schools by uploading videos are an obstacle because the network in some areas is slow, making it difficult for students to upload their video assignments. Meanwhile, Zoom has problems in terms of clarity of information because the weak network makes students get information that is not clear and even gets cut off due to internet signals from both bad school areas and unsupportive student residences.

3.3 The Timing of the Spread of Innovation in the Social System

The process of spreading an innovation during a pandemic has a long time. If the innovation is related to technology, it even takes months. According to several school principals, the time required for an innovation process related to technology to be absorbed and implemented by teachers and students can take a minimum of 3 months. Even some cases, such as the implementation of virtual learning using virtual laboratories, have been hampered until now due to difficulties when the innovation was introduced to schools.

"Usually we can adapt for 2 to 3 months, although the government can provide free quotas and reduce school operational costs because the learning planning in our place is slightly different from other schools"(personal Interview).

One of the causes of these obstacles is the social system or educational environment, namely schools and their devices that are not ready to accept the spread of ideas related to online technology as a medium of communication at the time of teaching. The social system in the educational environment consists of the principal and school staff as policymakers, teachers, students, and parents. In addition, the government can also be categorized as an educational environment in implementing technological innovations in schools.

The process of distributing online technological innovations to teachers is constrained due to the quality of understanding technology that is different from everyone. Some young teachers can absorb the innovations provided by external or internal parties quickly, but some teachers who are nearing retirement age find it difficult to accept these changes. However, not all young or pre-retired teachers experience problems with technology acceptance. The main problem is low motivation in terms of learning new technologies.

“Teachers don't know how to use technology and media, even if they know how it takes a long time to adapt. Then the device also does not support it. Even if the teacher makes the video himself, it must be edited first. This technical ability is not owned by every teacher.” (Personal Interview).

The interview results from the principal felt that low motivation appeared when the teacher was learning to look for good applications to use as a supporting tool. So far, teachers have only relied on YouTube or Zoom, but few schools have relied on interactivity applications such as Padlet, Quizlet, or Quiziz. Even some new school principals know some of these learning support applications from researchers. In addition, the lack of assistance in introducing technology from the government also causes teaching abilities to become static because the majority of teachers admit that creating creativity comes from the teacher's perseverance to find the source of the application. As a result, teachers feel they have an additional task to find new technology to support learning in addition to having to find the best system to adapt to teaching in a pandemic.

"It's very complicated, not all teachers can afford it. Do what you know. It is better to teach students than nothing at all. even teachers sometimes ask for help on technological knowledge from students.” (personal interviews).

"Students' skills can already be done. For teachers, training is needed while there is a lack of training for these teachers. Incidentally at SMK 3, we have an IT team who is the coordinator of multimedia computer network engineering. He developed the exam using the android system. Assessment of the end of semester exams using the Android LAN system. They developed it 4 years ago and until now they are still implementing it” (personal Interview).

Some students have parents who earn income in the lower middle category. This has an impact on the use of technology used in the teaching system. Most schools want to use zoom as a communication tool between teachers and students. However, most students do not use Wi-Fi at home, so they rely on quotas in terms of learning. As a result, teachers only rely on applications that absorb minimal quota, such as YouTube. They admit that Zoom absorbs a large quota, so parents must prepare certain funds to buy additional quotas. Another barrier to the dissemination of innovation online to students is the lack of training. Several teachers took the initiative to take part in technology training for Education held through webinars organized by the university. However, students do not have the initiative to take part in this training. Apart from cost reasons, the lack of network quality also hinders webinar seminars, which are often held via Zoom.

3.4 Learning through Interaction Model Computer-Mediated Communication

According to Mahmoud and Auter (Juditha, 2018), the first element in the interaction in computer-mediated communication is the role of the user who can be both a sender and a receiver. The use of online media such as YouTube and Tik-Tok makes teachers not only senders of messages but also recipients of messages. When explaining innovation, the teacher sends the message of the innovation to students through the material presented on social media. For this reason, the teacher becomes the receiver, but after that, the teacher sends material from selected social media to students so that he becomes a message sender.

“Teachers often only provide links to social media related to the material, teachers give tests via Quiziz, google forms, etc., including the semester on December 13, 2021, students are given assignments and sent to YouTube, Tik Tok, etc. and link to student work to google forms that have been prepared semester committee (curriculum division)”.

When students receive the innovation message that given by the teacher through social media such as YouTube and Tik-Tok then they try the material and send the results of the experiment through the same social media. This causes students to become receivers as well as senders of messages so that user interaction between the two runs reciprocally. The second element of interaction in computer-mediated communication is the existence of media that is a forum for exchanging information on innovations that occur between teachers and students. To make it easier for the innovation process to run smoothly, the teacher also invites students' parents as innovation supervisors in the form of learning methods, supporting technology, or technology related to material that can be understood by students.

“Variation of material delivery via zoom and google meet. The main thing is that it is cheap like WhatsApp, light and easy to access.”

The third element of computer-mediated communication interaction is the message exchanged between teachers and students. Although relatively few, in general, two-way communication still emerges because teachers must be interactive in delivering their lessons online.

"Yes, although only a few, but some students are still active to ask questions about material that is difficult to understand or there is an innovation that they just got through Whatsup group channels."

In addition, teachers must continue to motivate each student so that they can follow a learning system that adapts to new technological discoveries and also the learning model itself which also adapts to the shortcomings of students.

"Teachers always motivate students and introduce innovative learning models in the pandemic era adjusted to the economic level of students who are not the same."

The fourth element is an element of a supportive environment for innovation to spread through CMC. For this reason, the school must work together not only with staff and teachers but also involve parents so that the innovations provided during learning can continue to run smoothly.

"Since the beginning of the pandemic, the school has been socializing the programs and learning models that will be implemented, by bringing the guardians of students in stages, and on a schedule for several. Each head of the skill competition creates a class group, while at the same time assigning teachers to the class group.”

In addition, teachers must be disciplined in applying the results of innovations that have been running because they involve the learning of other teachers so that they become constrained due to not being disciplined in implementing the system. The teacher manages the time well during lessons because the maximum lesson hours are only 30 minutes per lesson.

3.5 The Dissemination of Innovation through the Computer

The process of spreading innovation through online applications in the vocational learning system is still minimal considering the many innovations that have emerged in terms of technology development. The development of new ideas is only about technology to support learning systems such as the use of games or google classroom as a learning support tool during a pandemic. The problems that arise are due to the lack of information about applications that can support learning either from schools or from the government. The results of Yun Xia's research on student evaluation of online discussions found that the use of technology became very important in the student learning experience. The selection of the right technological innovation can provide comfort during discussions(Yun Xia 2012).

For the period required for system stakeholders to disseminate innovations to adapt to the

system where dissemination via computers takes a minimum of 3 months due to the many obstacles that occur both from school internal factors or school external factors.

However, the problem with the use of technological innovations in learning is the lack of information on the use of these technologies both from students and from teachers, thus hampering learning. The teacher admitted that he needed information not only on new technology but also on how to use it and that information should also be given to students so that the new technology could support learning. Technological innovations should make it easier for facilitators than just mediators of messages. As a transparent facilitator, online discussion technology should provide students with comfort rather than having to focus on the technology itself (Salam 2012). This does not appear in the use of technological innovations in vocational schools because both teachers and students study these technological innovations simultaneously, thus hampering the learning process. One of the keys for teachers in the CMC system is to act as facilitators of student interaction. This means that a teacher must be active to instill student engagement with discussion through asking questions, creating relationships, and building discussion topics. To help create student discussion bonds, the teacher optimizes the role of technology in technological innovation issues such as showing videos from YouTube regarding the information on the use of the latest technology or sending assignments from students using the latest applications.

For the CMC interactivity model to work well, teachers and students exchange roles as senders or recipients of messages by relying on online application technology such as YouTube. The selection of media as a means of facilitating the interaction process between users is also very important. The media must be able to be easily used by teachers and students or have access to information on how to use it that is easy to understand and practice. The choice of Whatsup, youtube, google classroom media has a reason because it is easy to use for both teachers and students compared to similar interactive applications in the form of games such as padlet, Mentimeter, quiziz, or Quizlet. As for the message about technological innovation, it is adjusted to the character of the media used and the interests of students. As for the communication setting, the issue of technological innovation was adjusted to the subjects of the student and the information that was popular at the time. The use of Youtube as a medium for delivering messages is because the media is currently popular among students, while for the material selected content that is appropriate to the subject, such as content editing tips for multimedia majors. There are several important aspects why an innovation, both learning support technology, learning methods, and technology that is under the material can be disseminated to students and teachers, namely 1). If an innovation has a low cost or is channeled through a medium that does not produce high costs, the innovation is quickly adapted. 2). If innovation is accompanied by motivational reasons that are accepted by students or teachers, it can accelerate the innovation used by stakeholders. 3) preparation for the formation of an environment both external and internal to the school through online communication so that any innovation can be accepted by both parties.

4 Conclusion

The process of diffusion of technological innovation through CMC in vocational schools has not run optimally. Although the interactivity model can be applied through its four characters, namely user, message, media and environment, and communication time. However, there are still some obstacles, such as the lack of new information about technology that can support learning and decreased motivation in learning new application technologies as

learning support tools from both teachers and students. Researchers suggest that research on technology acceptance and motivation to use technology continues to be developed to find solutions for reducing motivation in education stakeholders. In addition, researchers also suggest that the discovery of technological innovations also provides an easy way to use the technology through media that is easily accessible and with content that can be understood and followed by educators and students.

Limitation and Study forward

This research has limitations in terms of finding sources. It is difficult to conduct a survey because most of the teachers teach from home, so to deepen and obtain data, it is done by interviewing the resource persons. Further research is needed on what kind of motivation can make it easier for an innovation to spread to CMC.

Acknowledgment

This work is supported by Research and Technology Transfer Office, Bina Nusantara University as a part of Bina Nusantara University's International Research Grant entitled The Implementation and Communication Innovation of Online Media Training in The Corona Era for Head of Vocational School with contract number: No.018/VR.RTT/III/2021 and contract date: 22 March 2021

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