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Does Digital Readiness Influence Students' Competence?: Lesson from the Covid-19 Pandemic

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Abstract:
This study examines the relationship between digital readiness and e-learning environment through the use of ICT based on the SAMR model of the competence of Madrasah Aliyah Negeri (MAN) students in Mojokerto Regency. This research can provide solutions for ICT adoption in improving the quality of learning. Teachers can modify ICT according to learning topics and change ICT applications according to learning needs. Previous research on the use of UIS by schools has not been conducted. Because, in Indonesia, digital literacy has only been sporadically optimized during the COVID-19 pandemic. PLS-SEM was adopted to get a detailed understanding of the influence among variables. This research involved about 265 students of MAN Mojokerto. This finding shows that students' Competence in online learning is influenced by several digital readiness variables, e-learning environment, and use of ICT based on the SAMR model. In part, digital readiness impacts the formation of student competencies. Contrary to expectations, this study did not find a significant difference between digital readiness, e-learning environment, and ICT use based on the SAMR model to MAN students in Mojokerto Regency. These results imply that the condition and readiness of students in digital readiness, e-learning environment, and the application of the use of ICT based on the SAMR model can encourage the formation of student competencies.

Keywords: digital readiness, e-learning environment, use of ICT based on SAMR, student's competence.

数字准备是否会影响学生的能力？：新冠肺炎大流行的教训

摘要：
本研究通过使用基于莫约克托摄政的阿利亚内格里伊斯兰学校（人）学生能力的市场监管总局模型，通过使用信息通信技术来检验数字准备与电子学习环境之间的关系。这项研究可以为采用信息通信技术提高学习质量提供解决方案。教师可以根据学习主题修改信息通信技术，根据学习需要改变信息通信技术应用。以

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前没有进行过关于学校使用信息系统的研究。因为在印度尼西亚，数字素养只是在新冠肺炎 大流行期间得到了零星的优化。采用 PLS-扫描电镜详细了解变量之间的影响。这项研究涉及曼莫约克托的大约 265 名学生。这一发现表明，基于市场监管总局模型的学生在线学习能力受到几个数字化准备变量、电子学习环境和信息通信技术使用的影响。在某种程度上，数字化准备会影响学生能力的形成。与预期相反，本研究并未发现基于市场监管总局模型的数字化准备、电子学习环境和信息通信技术使用对莫约克托摄政的人学生有显着差异。这些结果表明，学生在数字化准备、电子学习环境中的条件和准备程度，以及基于市场监管总局模型的信息通信技术应用的应用，可以促进学生能力的形成。

关键词：数字化准备、电子学习环境、基于市场监管总局的信息通信技术使用、学生的能力。

1. Introduction

The Covid-19 pandemic that is currently endemic is a form of a health crisis that attacks every population in the world, and due to the spread of coronavirus, it causes changes in various sectors, such as social, economic, tourism, and education (Shafi et al., 2020). In the world's education sector, the emergence of the Covid-19 pandemic or outbreak made 61 countries decide to close schools from elementary to tertiary levels. According to data published by UNESCO, there are approximately 290 million students worldwide who have to carry out teaching and learning activities from home (Aristovnik et al., 2020).

UNESCO suggests creating an educational platform that can support school activities from home. Some opinions also reveal that, in principle, the spread of the Covid-19 virus accelerates changes in the way or educational process carried out for future generations by utilizing technology using virtual classes or online via the internet (Dwivedi et al., 2020). Online learning, or what became known as the distance education policy, is a technology-mediated learning process where students learn separately from one another but remain connected by involving technology with the teacher. This was also stated by Xiantian et al. (2020) that online learning could help the learning process continue during the ongoing Covid-19 outbreak.

Several obstacles must be faced in implementing distance education, namely the need for a briefing on using technology with video calls, classrooms, and other software to facilitate distance learning. In response, several countries have focused on expanding the internet network and socializing the implementation of distance education (Suryaman et al., 2020).

The learning process in schools requiring teachers to interact with students conveys learning in various ways, such as discussions, questions and answers, projects, discovery, and character-building habits. However, the face-to-face learning process in schools encountered obstacles due to the spread of the Covid-19 outbreak since early March 2020. In Indonesia, the widespread coronavirus resulted in the termination of schools' face-to-face teaching and learning process. Schools are a force to carry out online learning (online). Online learning is applied as an alternative measure to reduce the spread of the coronavirus. Although online learning has advantages that other learning strategies do not have, online learning can be done anytime and anywhere, and students can follow the teacher's learning process (Oranburg, 2020).

However, a study conducted by Hoq (2020) concluded that ICT implementation could help change student competencies, but this is not the most important thing. Because the most important things that help change student competencies are experience, class conditions, and school climate or culture. In addition, Hoq (2020) stated the opposite of the research results by Suryaman et al. (2020), according to which, in implementing ICT, the teacher first has better pedagogic Competence. At the same time, the two studies resulted in a significant influence on the implementation of ICT on learning and student achievement. In contrast to the two studies, there is no substantial evidence that ICT implementation can help change the way students learn and achieve.

However, students' Competence also influences the learning process, where they achieve good learning achievement in the educational process. Students need to have abilities in knowledge, attitudes, and skills. Better learning needs support to achieve it, and it is necessary to support an E-learning Environment.

E-Learning Environment is an ecosystem that integrates technology with teaching and learning processes as something innovative in education by optimally complementing technology (Peterson et al., 2018). In addition, E-Learning Environment is also useful for helping students by distributing learning materials, providing support for communication between teachers and students to take place well, providing facilities to form learning communities, arranging for student learning progress to run well (Borg & Alshumaimeri, 2019). Generally, the E-learning environment is measured according to two indicators, namely e-learning adoption and e-learning attitude.

The seriousness of students in influencing the achievement of successful online learning refers to the Competence of students. Students consider their efforts in influencing online learning outcomes. The application of the suitable online learning model with the SAMR model has a significant relationship with student competency achievement (Hamidi et al., 2020).

2. Literature Review

2.1. Digital Readiness (DR)

Digital Competence is the concept of digital skills that support participatory culture to create, share, and socialize (dos Santos Ferreira & Castiglione, 2018). At Rocky Research, this concept is expanded, including digital skills and skills to search for information using digital technology.

First, digital skills can be felt to help academic work, including the ability to use or awareness of digital tools, especially digital skills for access, identification, and digital information, especially courses; communication skills by sharing, interacting, participating, and collaborating between academics and other students; Problem-solving skills to identify online resources and apply technology as a tool to solve problems. Students have the digital competencies needed to apply for living and social work with the community by searching for practical information and strategies.

Digital Readiness for students is a condition in which students apply digital technology in their academic activities (Nurdin, 2021). Several studies have positively influenced students' digital skills on academic engagement, either directly or indirectly (Moeini Gharagozloo et al., 2021). Some online learning models in higher education have changed due to digital technology; for example, students are more familiar with online learning and blended learning and have direct access to educational resources via smartphone or laptop than conventional lectures (Tran et al., 2019).

Second, skills related to digital media have recently become one of the core competencies in the digital age (Aristovnik et al., 2020). For example, the OECD PISA survey contains digital literacy measures to evaluate its content and measure its credibility, reading and navigating digital content independently (Basak et al., 2018). In the European Union, DigComp is a framework of developing and understanding digital competence, especially intellectual property rights as competence (Malkoç & Mutlu, 2018).

Digital Media Awareness is a digital readiness subcomponent for academic engagement, recognizing and interpreting digital content in a digital media environment. Currently, students have become accustomed to high-skinned digital content. This is because smartphone and laptop technology is excellent and supportive of their work. With these digital skills, digitally competent students will be able to critically recognize and interpret media content and communicate effectively using digital media (Afrashteh & Seighalani, 2021).

Third, "information literacy skills" are essential to succeed in academia. Information literacy skills such as students' digital readiness expand digital competencies. Students' information literacy skills include information needs, access information, use information, and understanding ethical use for effective, efficient, and ethical academic performance (Yago et al., 2018). For example, students acquire information literacy skills and strategies in courses, presentations, assignments, exams, or other written work by browsing papers and reading and evaluating papers (Karim & Haque, 2020). Students use information-seeking skills efficiently and critically evaluate more effective and efficient search strategies (Aristovnik et al., 2020). Students acquire these skills and strategies independently, autonomously, and share the experience with their communities. Therefore, the following hypothesis is:

H1: Digital readiness (DR) has a positive and significant effect on using ICT based on the SAMR model (UIS).

H2: Digital readiness (DR) positively and significantly affects student competence (SC).

2.2. E-Learning Environment (EE)

E-Learning Environment is a situation that integrates technology with the teaching and learning process as something innovative in education by optimally equipping technology (Kim et al., 2019). In addition, the E-Learning Environment also has the goal of helping students by preparing learning needs so that students can carry out learning (Yago et al., 2018).

An e-learning environment is a web-based learning environment that has been designed, developed, and delivered on several dynamic principles, such as institutional support, development of various programs, teaching/learning models, course structure, support from students, support and implementation of evaluations (Kim et al., 2019). The students describe several technological systems that support individual and social interaction and cognitive development. Critical thinking by students is essential to help students explore and build knowledge.

These instructional applications and constructivist-based technology systems are particularly suitable for e-learning as they enhance discourse, interactivity, and communication between students and teachers. The use of web features in this case can be synchronous and asynchronous communication applications, hypertext and hypermedia-based computer programs, for example, artificial intelligence, with e-learning environments and databases, students can also work together to solve problems in real life projects, resolve conflicts of ideas, and create meaningful experiences from educational content and materials. Based on these conditions, the study presents the following hypotheses:

H3: E-learning environment (EE) has a positive and significant effect on the use of ICT based on the SAMR model (UIS).

H4: E-learning environment (EE) has a positive and significant effect on student competence (SC).

2.3. Use of ICT Based on the SAMR Model (UIS)

The use of ICT Based on the SAMR Model (UIS) is learning done using ICT can change the learning process between teachers and students. The main objective in using this technology is to improve the efficiency and effectiveness, transparency, and

accountability of learning. Indicators include: 1) ICT substitution; 2) ICT augmentation; 3) ICT modification; 4) Redefinition of ICTs. These four indicators are known as the SAMR Model. Digital media literacy is a key skill in every discipline and profession, and educators have begun limiting their students by not helping them develop and use digital media literacy skills in the curriculum (Tseng, 2019).

Similarly, there is a rise in the number of teachers who believe that web-based technologies and tools can improve critical thinking and problem-solving, collaboration and communication, global awareness, and information literacy, called "21st-century skills" — required in today's learning/work environment. This belief and realization have resulted in the widespread use of technology in the classroom, from simple uses such as online versions of textbooks to more detailed uses such as online collaboration, sharing, and publication. All of these applications can enhance learning, few of which have the potential to truly bring about the transformation in learning needed to prepare students for the 21st century. Thus, the study proposes the following hypothesis:

H5: The use of ICT based on the SAMR model (UIS) has a positive and significant effect on student competence (SC).

2.4. Student Competence (SC)

Competence can be defined as the context-specific dispositions acquired and critical success in addressing domain-specific situations and tasks (Hu & Zhang, 2017). The level of abstraction in the definition of Competence varies from broad to specific, and there is no consensus on the appropriate level of abstraction. Competency, quality criteria are specifications of components that together make up Competence. These components can be knowledge (e.g., declarative, procedural, or conditional knowledge), skills, strategies, attitudes. The component includes the definition of different competencies (Gruden & Stare, 2018). Many definitions imply at least two components: knowledge and skills (Nambiar et al., 2020). Thus, the study produced the following hypothesis:

H6: Digital Readiness (DR) has a positive and significant indirect effect through the Use of ICT Based on the SAMR Model (UIS) on Student Competence (SC).

H7: E-Learning Environment (EE) has a positive and significant indirect effect through the Use of ICT Based on the SAMR Model (UIS) on Student Competence (SC).

3. Methods

3.1. Research Design

A quantitative approach with this survey model was adopted to determine the Effect of Digital Readiness and E-Learning Environment through the Use of ICT Based on the SAMR Model on Student's Competence. This study was conducted at Madrasah Aliyah Negeri (MAN) in Mojokerto Regency, East Java, Indonesia.

3.2. Participants

The participants in this study were all students in grades 10 to 12 of Madrasah Aliyah Negeri (MAN) in Mojokerto Regency. The sample includes Madrasah Aliyah Negeri (MAN) 1 and Madrasah Aliyah Negeri (MAN) 2 which are located in the Mojokerto Regency area. The sample distribution in this study is MAN 1 as many as 136 students and MAN 2 as many as 129 students. The authors used proportional random sampling method in all classes.

3.3. Instruments

To find out respondents' responses to Students' Competence (SC), we used three instruments developed by Haerazi et al. (2020), while four indicators adopted the Use of ICT Based on the SAMR Model (UIS) from Tseng (2019). We adapted two indicators for the E-Learning Environment (EE) (Yago et al., 2018). Finally, we included six indicators in calculating Digital Readiness (DR) (Kim et al., 2019). The use of a Likert scale with a 5-point scale is found in all questionnaire questions. After the tabulating, all the data obtained were processed using Partial Least Squares (PLS).

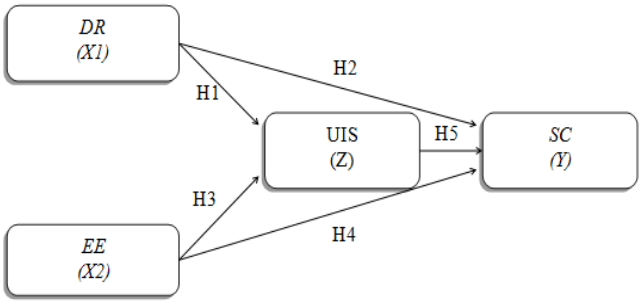

Figure 1. Research framework

4. Results and Discussion

4.1. Measurement Model (Outer Model)
Validity Test

4.1.1. Convergent Validity

According to Elfenbein and MacCann (2017), individual indicators are reliable if a loading factor value is above 0.70. However, at the scale development stage, a loading of 0.50–0.60 is still acceptable.

Table 1. Outer model

	DR	EE	SC	UIS
DR16	0,787			
DR19	0,767			
DR20	0,808			
DR21	0,743			
DR5	0,766			
DR6	0,835			
DR8	0,712			
DR9	0,830			
EE2		0,780		
EE3		0,794		
EE5		0,768		
EE6		0,778		
SC10			0,734	

Continuation of Table 1		
SC11	0,723	
SC13	0,766	
SC14	0,739	
SC16	0,730	
SC17	0,753	
SC3	0,707	
SC5	0,770	
SC6	0,766	
SC8	0,780	
UIS17		0,840
UIS19		0,866
UIS23		0,769
UIS24		0,706
UIS25		0,853
UIS26		0,859
UIS3		0,761
UIS8		0,820
UIS9		0,762

According to Figure 2, the loading factor value of each item > 0.7 indicates that the indicator is valid.

4.1.2. Discriminant Validity

Discriminant validity is a valuable cross-loading factor for knowing whether the constructed variable has an adequate discriminant by comparing the loading value on the intended construct variable, more significant than the loading value with other constructs (Permatasari et al., 2019).

Table 2. The results of digital readiness validity test using cross loading

	DR	EE	SC	UIS
DR16	0,787	0,357	0,533	0,636
DR19	0,767	0,372	0,620	0,602
DR20	0,808	0,459	0,592	0,651
DR21	0,743	0,467	0,505	0,562
DR5	0,766	0,323	0,467	0,588
DR6	0,835	0,332	0,573	0,657
DR8	0,712	0,340	0,520	0,498
DR9	0,830	0,407	0,623	0,657

Table 3. The results of e-learning environment validity test using cross loading

	DR	EE	SC	UIS
EE2	0,512	0,780	0,529	0,448
EE3	0,411	0,794	0,576	0,409
EE5	0,257	0,768	0,455	0,285
EE6	0,312	0,778	0,513	0,352

Table 4. The results of validity test of the use of ICT based on the SAMR model using cross loading

	DR	EE	SC	UIS
UIS17	0,678	0,347	0,637	0,840
UIS19	0,663	0,330	0,578	0,866
UIS23	0,562	0,389	0,569	0,769
UIS24	0,602	0,373	0,502	0,706
UIS25	0,653	0,388	0,598	0,853
UIS26	0,637	0,405	0,579	0,859
UIS3	0,621	0,398	0,588	0,761
UIS8	0,634	0,430	0,581	0,820
UIS9	0,582	0,471	0,562	0,762

Table 5. The results of students' competence validity test using cross loading

	DR	EE	SC	UIS
SC10	0,433	0,577	0,734	0,408
SC11	0,600	0,411	0,723	0,651

Continuation of Table 5				
SC13	0,513	0,493	0,766	0,546
SC14	0,509	0,559	0,739	0,494
SC16	0,560	0,498	0,730	0,555
SC17	0,598	0,361	0,753	0,616
SC3	0,440	0,478	0,707	0,445
SC5	0,555	0,527	0,770	0,548
SC6	0,541	0,609	0,766	0,553
SC8	0,549	0,483	0,780	0,523

Tables 2-5 show that each indicator in the intended variable is discriminantly valid. Each construct indicator is not highly correlated with other constructs used in measuring research.

4.2. Reliability Test

Table 6. Reliability test results

Variable	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Description
DR	0,909	0,926	0,612	Reliable
EE	0,787	0,861	0,608	Reliable
SC	0,912	0,927	0,558	Reliable
UIS	0,932	0,943	0,649	Reliable

4.2.1. Composite Reliability

According to Elfenbein and MacCann (2017), a composite reliability value greater than 0.7 indicates that the construct is reliable. Based on the values in Table 4, all values have met the requirements for Composite Reliability > 0.7, so it can be said that the variables of e-service quality, e-loyalty, and satisfaction have high reliability.

4.2.2. Average Variance Extracted (AVE)

According to Elfenbein and MacCann (2017), the value of Average Variance Extracted (AVE) is more significant than 0.5, and then the instrument can be said to be reliable. Based on the values in Table 4, all values have met the requirements of Average Variance Extracted (AVE) > 0.5, so it can be said that the variables of e-service quality, e-loyalty, and satisfaction in the evaluation of the measurement model have good discriminant validity.

4.2.3. Cronbach's Alpha

According to Elfenbein and MacCann (2017), a value that has a Cronbach's alpha more significant than 0.7 can be said to be reliable. Based on Table 4, all scores have met the requirements of Cronbach's alpha > 0.7, so it can be said that the e-service quality, e-loyalty, and e-satisfaction variables have good reliability.

4.3. Structural Model (Inner Model)

4.3.1. Coefficient of Determination (R^2)

According Elfenbein and MacCann (2017), the size of R^2 shows the influence of exogenous variables on endogenous variables. If the value of R^2 is 0.75, 0.50, and 0.25 can be concluded that the model is robust, moderate, and weak.

Table 7. R-square value

Variable	R-Square
SC	0,680
UIS	0,621

Based on Table 6, the R-square value for the Use of ICT Based on the SAMR Model (Z) variable was obtained at 0.621, indicating that 62.10% could be influenced by the Digital Readiness (X_1) and E-Learning Environment (X_2) variables while the remaining 37.90% influenced by other variables outside the study. The R-square value of the Students' Competence (Y) variable was obtained at 0.680, indicating that the Students' Competence (Y) variable can be influenced by the Digital Readiness (X_1), E-Learning Environment (X_2), and Use of ICT Based on the SAMR Model (Z) variables. The latter influence 68%, while other variables outside the studied influence the remaining 32%. The higher the R-Square value, the greater the ability of the independent variable to explain the dependent variable so that the better the structural equation.

4.3.2. Predictive Relevance (Q^2)

According to Elfenbein and MacCann (2017), predictive relevance or Q^2 measures how well the model and the estimated parameters generate the observed values. A Q^2 value greater than 0 indicates the model has predictive relevance, while a Q^2 value less than 0 indicates the model has no predictive relevance. The criteria for the strength of the model based on Q^2 are 0.35 (robust mode), 0.15 (moderate model), and 0.02 (weak model). The calculation of Q2 is as follows:

Score $Q^2 = 1 – (1 – R^2) x (1 – R^2)$
$= 1 – (1 – 0.621) x (1 – 0.680)$
$= 1 – (0.379) x (0.32)$
Score $Q^2 = 0.879$

The calculation results are that the Q2 value is 0.879, meaning that the diversity of the research data that the structural model can explain is 87.90%, while other factors outside the model explain the remaining 12.10%.

4.4. Hypothesis Test

4.4.1. Direct Effect Test

This study uses direct effect testing to test Hypotheses 1-5. This test uses path coefficients, taking into account the t-statistics value more than t-table (1.96), and the p-value < 0.05 concludes that the hypothesis is accepted; then, the direct effect is positive and significant between the two variables involved.

Table 8. Path coefficients

	Original Sample (O)	Standard Deviation (STDEV)	T-Statistics (|O/STDEV|)	P-Values
DR -> SC	0,282	0,079	3,576	0,000
DR -> UIS	0,711	0,049	14,493	0,000
EE -> SC	0,379	0,042	9,007	0,000
EE -> UIS	0,139	0,053	2,612	0,009
UIS -> SC	0,314	0,077	4,060	0,000

From Table 7, it is known that Hypotheses 1-5 show t-statistics values that are more than t-table (1.96) and p-value < 0.05, so it can conclude that Hypotheses 1-5 are accepted and have a positive effect.

4.4.2. Indirect Influence Test

The sixth and seventh hypotheses are tested as follows:

Table 9. Path coefficients

	Original Sample (O)	Standard Deviation (STDEV)	T-Statistics (|O/STDEV|)	P-Values
EE -> UIS -> SC	0,078	0,026	3,027	0,003
DR -> UIS -> SC	0,226	0,042	5,441	0,000

The results of testing the sixth and seventh hypotheses in Table 8, the relationship of the Digital Readiness (X1) variable with Students' Competence (Y) through the Use of ICT Based on the SAMR Model (Z), shows the indirect path coefficient value of 0.226 with a t value of 5.441, which is greater than 1.96, and p-value of 0.000 or less than 0.05. These results mean that the Use of ICT Based on the SAMR Model has a significant influence in mediating Digital Readiness on Students' Competence. Furthermore, the relationship between the variables of E-Learning Environment (X2) and Students' Competence (Y) through the Use of ICT Based on the SAMR Model (Z) shows the indirect path coefficient value of 0.078 with an at-count value of 3.027, which means a greater than 1.96 and the p-value is 0.003 or less than 0.05. These results mean that the Use of ICT Based on the SAMR Model has a significant influence in mediating the E-Learning Environment on Students' Competence.

5. Discussion

This study will describe the results of testing seven hypotheses that have a process through path analysis with the following explanation:

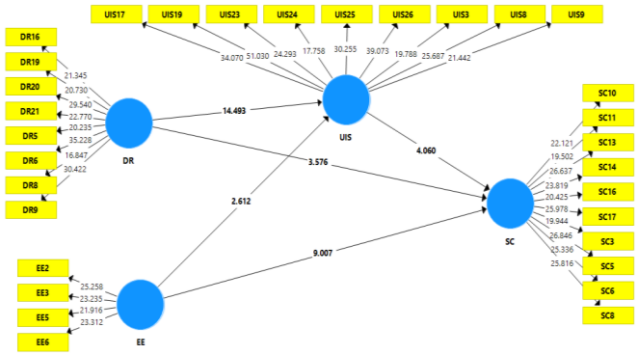

Figure 2. Structural equation modeling calculations

Table 10. Summary of the test results

Hypothesis	Correlation	Value-t	Value-P	Decision
H_1	DR → UIS	14,493	0,000	Accepted
H_2	DR → SC	3,576	0,000	Accepted
H_3	EE → UIS	2,612	0,009	Accepted
H_4	EE → SC	9,007	0,000	Accepted
H_5	UIS → SC	4,060	0,000	Accepted

Continuation of Table 10

H_6	DR → UIS → SC	3,027	0,003	Accepted
H_7	EE → UIS → SC	5,441	0,000	Accepted

5.1. The Effect of Digital Readiness on ICT Use Based on the SAMR Model (UIS)

Based on the study results, it is known that the proof of the study's first hypothesis is indicated by the Digital Readiness variable having a significant positive effect on the Use of ICT Based on the SAMR Model (UIS). These results are not in line with previous research conducted by dos Santos Ferreira and Castiglione, (2018) with the results of his research, which states that Digital Readiness does not significantly influence the Use of ICT Based on the SAMR Model (UIS). These results indicate that the better the Digital Readiness possessed by students and teachers, the better the implementation of the Use of ICT Based on the SAMR Model (UIS) in online learning. It is evident by the ease with which students access technology (according to the DR indicator) which is driven by schools with various supporting facilities such as Wi-Fi, online libraries, IMS, and so on so that the Use of ICT Based on the SAMR Model (UIS) can be implemented well in schools. Furthermore, the COVID-19 pandemic also inspires teachers and students to carry out online learning with the support of their gadgets.

5.2. The Effect of Digital Readiness on Students' Competence

Based on the results of proving the Second Hypothesis, it is known that the Digital Readiness variable has a significant positive effect on Students' Competence. These results align with previous research (Moiseienko et al., 2020), which states that Digital Readiness influences Students' Competence. These results indicate that the better the Digital Readiness possessed by students and teachers, the better-forming Students' Competence in online learning. The dominant level of the Importance shows the proof to your success indicator, which makes students more interested in online learning so that it can indirectly affect students' Competence, one of which is in utilizing the gadgets they have to be used more dominantly in the learning process, not only for playing games and communication.

5.3. The Effect of E-Learning Environment on ICT Use Based on the SAMR Model (UIS)

Based on the research results, it is known that the third hypothesis is evidenced by the E-Learning Environment variable having a significant positive effect on the Use of ICT Based on the SAMR Model (UIS). These results are in line with previous research conducted by Sargent and Casey (2020) with the results of his research, which states that the E-Learning Environment has a significant influence on the Use of ICT Based on the SAMR Model (UIS). These results indicate that the better the E-Learning Environment owned by students and teachers, the better the implementation of the Use of ICT Based on SAMR Model (UIS) in online learning. The relationship between the two variables that influence each other is shown by the high dominance of the E-Learning Adoption indicator that affects the use of ICT. Based on SAMR Model (UIS), the proof is that the teacher explains with PowerPoint media in online learning, but the teacher also provides reference material under discussion to students through YouTube media to facilitate students' understanding in learning.

5.4. The Effect of E-Learning Environment on Students' Competence

Based on the fourth hypothesis research results, the E-Learning Environment variable has a significant positive effect on Students' Competence. These results align with previous research conducted by Estriegana et al. (2019), which states that the E-Learning Environment influences Students' Competence. These results indicate that the better the readiness of the E-Learning Environment owned by students and teachers, the better forming Students' Competence in online learning. This is shown by the influence of the E-Learning Attitude indicator in using gadgets as media to support online learning to influence the attitude dimension of the student competency variable positively. The proof is that gadgets before the pandemic are only used as a media game. However, during this pandemic, it is required to use various applications of g-meet, zoom, and LMS to support online learning.

5.5. Effect of Use of ICT Based on the SAMR Model (UIS)

Based on the study results, it is known that the fifth hypothesis, namely the Use of ICT Based on SAMR Model (UIS) variable, has a significant positive effect on Students' Competence. These results align with previous research conducted by dos Santos Ferreira and Castiglione (2018), which states that the Use of ICT Based on the SAMR Model (UIS) influences Students' Competence. It is evident by the significant influence of the modification indicators that can shape student competence, especially in attitudinal Competence, in which students can take advantage of various applications used for smooth assignments during online learning, such as video editing.

5.6. The Influence of Digital Readiness on Students' Competence through the Use of ICT Based on the SAMR Model (UIS)

The sixth hypothesis test results show a significant influence between Digital Readiness, which is supported by applying a positive Use of ICT Based on SAMR Model (UIS) to create Students' Competence. It means that providing good Digital Readiness to students can increase the Use of ICT Based on the SAMR Model (UIS) and raise Students' Competence. The use of ICT Based on the SAMR Model (UIS) has an influential role as a partial mediation between Digital

Readiness and Students' Competence (Kim et al., 2019). Proof of the relationship between variables indicated by the readiness of access to technology supported by the many gadgets of students and teachers and internet network facilities in schools that impact the formation of student competence in terms of the broader dimension of knowledge, not just textbooks. There is no limit in online knowledge, so there is a need for an appropriate online learning model, namely through the Use of ICT Based on the SAMR Model (UIS).

5.7. The Influence of E-Learning Environment on Students' Competence through the Use of ICT Based on the SAMR Model (UIS)

The seventh hypothesis test results show a significant influence between the E-Learning Environment, which supports applying a positive Use of ICT Based on the SAMR Model (UIS) to create Students' Competence (Kim et al., 2018). It means that providing a good E-Learning Environment to students can increase the Use of ICT Based on the SAMR Model (UIS) and raise Students' Competence. The Use of ICT Based on the SAMR Model (UIS) has an influential role as a partial mediation between E-Learning Environment and Students' Competence. Online learning is indeed constructive in the formation of student competencies, especially knowledge competence in addition to the breadth of knowledge references, supporting discussions between students by applying the Use of ICT Based on the SAMR (UIS) learning model to shape student competence in terms of attitude for the better to compete and provide opinions during online learning.

6. Conclusion

This study elucidates the causality between DR, EE, and SC and understands the mediating role of UIS. In this study, there was a significant effect of DR, EE, and UIS on SC. This study provides clues that the use of UIS may explain the relationship between DR and EE in SC in schools. Previous research on the use of UIS by schools has not been conducted because, in Indonesia, digital literacy has only been sporadically optimized during the COVID-19 pandemic. This research can provide solutions for ICT adoption in improving the quality of learning. Teachers can modify ICT according to learning materials and change ICT applications according to learning needs. Therefore, field observations on ICT use based on the SAMR model have not been widely carried out because it is still considered complicated due to a lack of school readiness for DR. Therefore, with the outbreak of COVID-19 yesterday, schools inevitably have to adapt and apply ICT in the learning process at school.

This research has several practical implications, especially for students. This research shows that digital readiness and e-learning environment play an essential role in preparing students for online learning and shaping student competencies. For teachers, the learning process in the classroom must describe cognitive aspects and inspire students to improve Student Competencies through the use of ICT Based on the SAMR Model (UIS) and carry out intense online learning applications, which are later expected to shape student competencies.

Strengths generated by this study can explain the influence between DR, EE, and SC and understand the mediating role of UIS. After the COVID-19 pandemic, schools are expected to be capable and ready for digital technology. They are expected to improve student competencies through SAMR Model-Based ICT (UIS) and carry out intense online learning applications, later expected to shape student competencies. For schools, this research provides valuable input and measures the readiness of students and teachers in online learning and can be used as material to evaluate the readiness of teachers and students so that later they can create positive activities for smooth online learning.

The main limitation of this research is that it only focuses on understanding the educational process of developing disaster awareness, which the river school runs as a local-based educational institution. The future is digital readiness, e-learning environment, use of ICT based on the SAMR, student competence.

It was concluded that DR, EE, and UIS had a significant effect on SC. For schools, this research provides valuable input and measures the readiness of students and teachers in online learning and can be used as material to evaluate the readiness of teachers and students so that later they can create positive activities for smooth online learning. For the Ministry of Religion of Mojokerto Regency, this research can provide positive input in the maturation of online learning readiness through variables and indicators that must be met from the research results and can also use as a reference for conducting online learning maturation activities to form student competencies. A researcher can add technological pedagogical content knowledge (TPACK) variables for further research.

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Authors' Contributions

The authors were involved in conducting research, collecting and analyzing data, creating and reviewing articles under the obligations of research group members.

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