Technological Integration Factors in Parental Involvement during Distance Learning

Herwin Herwin and Shakila Che Dahalan

***Abstract*—During the pandemic, all learning activities are carried out remotely from home with the integration of technology. Teachers no longer directly interact with students so that the involvement of parents at home becomes an additional variable in student learning activities. This study aims to examine the technology integration factor on parental involvement in distance learning. This is a quantitative study using a survey design. The research subjects were elementary school students who participated in distance learning during the COVID-19 pandemic. Data were collected using a questionnaire technique. The data analysis technique used is path analysis. The research findings show that student request is the variable that has the highest effect on technology integration carried out by parents. Furthermore, technology integration is also influenced by parents' understanding of technology. The structural model shows that teacher performance and school support do not have a direct effect on technology integration by parents. However, these two variables have an indirect effect through the student requests variable.**

***Index Terms*—Distance learning, parental involvement, technological integration.**

I. Introduction

Education is one of the sectors that has had a very significant impact since the COVID-19 pandemic swept across the world [1]-[3]. The COVID-19 pandemic has put a certain pressure on educational institutions for their readiness to conduct distance learning [4]. All educational institutions must undergo changes in operations to adapt to the pandemic situation [5]-[9]. This situation also occurs in Indonesia. Through the Ministry of Education, all educational institutions the learning process must be carried out remotely with a distance learning system. This situation also occurs in Indonesia. Through the ministry of education, all educational institutions must do their work from home. In general, the existence of these conditions makes the learning process must be carried out remotely with a distance learning system [10]-[12].

Social distancing is a way to minimize the negative impact of this situation [13]. The distance learning process makes students not at school, but they are always at home to follow the learning process. This situation certainly makes students have the potential to spend their learning time with their families. Parental involvement in distance learning is very central to student learning success [14]. To obtain maximum learning outcomes in distance learning, students need parental involvement in the learning process [15]. Parental engagement has a very important role in every phase of children's learning during the pandemic and learning from home. The challenge in this situation is that not all parents are ready to follow the changing situation that has an impact on this change in the learning system [16]. This unpreparedness sometimes has a direct impact on their children to follow the learning process well.

Online learning is an alternative that is carried out by utilizing technology as the main component of learning [17]. During the learning process carried out remotely from each student's home, parents must accompany and serve student requests that cannot be reached by teachers or the school. Parents are one of the hopes that the learning process followed by students continues to run effectively even though it is carried out remotely. This has an impact on the response of parents who must adapt to a distance learning system that relies on technology assistance. This condition forces parents to also take part in applying technology in their children's learning process even though their understanding of technology varies.

Learning during the pandemic provides the widest opportunity to take advantage of digital technology assistance [18]. It has been proven previously that the integration of technology in learning during a pandemic has a good impact on the quality of learning outcomes [19]. This is of course not only for teachers, but also for parents to understand and apply at home to their children. Conditions in the field show that some parents already have a good understanding of technology, but some are still weak and lack technological knowledge. This is thought to be one of the triggers for the integration of technology carried out by parents while accompanying their children to study at home.

Furthermore, the learning process that separates the space between teachers and students makes some activities and student requests related to learning to be accompanied by parents at home. In this assistance, technology integration is needed to streamline the learning process [20]. This situation certainly creates a shocking effect for both parents and students. On the other hand, generally, students and parents are not familiar with these conditions. Online learning initially stresses both students and parents [21]. It is shown that the parents were initially unprepared for this challenge. However, there is no other way but to accompany and serve their children's requests to study at home. Parents must participate in integrating technology while accompanying their children in distance learning. This study aims to prove the factor of technology integration on parental involvement during distance learning.

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II. METHOD

This study uses a quantitative approach with a survey research design. This research focuses on the factor of technology integration in the involvement of parents when accompanying their children's learning during distance learning. The survey was conducted to reveal the involvement of parents in technology integration that occurred in the past which is still related today.

The subjects of this research are elementary school students in Indonesia who are scattered in various regions. Basically, the situation experienced by the research subjects is relatively the same, namely, they both follow the learning process during the pandemic. In addition, they also both carry out distance learning activities carried out from home. The selection of research subjects was carried out randomly by considering the distribution in each region.

The data of this study consisted of five core groups. The five are parents' understanding of technology, school support, teacher performance, student requests, and technology integration. These data were collected using a questionnaire technique with students as the main respondents. Because this research took place during the COVID-19 pandemic, the data collection was carried out while still following the health protocol rules.

The data analysis technique used in this research is path analysis. This is done to prove the factor of technology integration on parental involvement during distance learning. To test the significance of the effect between variables used t value. If the t value is greater than 1.9 then the effect is declared significant [22]. In addition, path analysis in this study was also used to develop a structural model between the five variables studied. To test the suitability of the model, the model fit criteria were used [23], [24]. These criteria are presented in Table I below.

TABLE I: MODEL FIT CRITERIA

Observed Components	Value Criteria
p-value	> 0.05
Chi-Square	< 2df
Root Mean Square Error of Approximation	< 0.08
Goodness of Fit Index	≥ 0.9
Adjusted Goodness of Fit Index	≥ 0.9

III. RESULTS

This research is focused on five variables that become the unit of analysis. The five variables are Teacher Performance (TP), School Support (SS), Parents' Understanding of Technology (PUT), Student Requests (SR), and Technology Integration (TI). Furthermore, based on the conceptual model that has been built in the initial design, two types of variable groups are obtained, namely exogenous variables and endogenous variables. Teacher Performance (TP), School Support (SS), and Parents' Understanding of Technology (PUT) were grouped as exogenous variables. Student Requests (SR), and Technology Integration (IT) were grouped as endogenous variables. The conceptual model that has been designed is presented in the conceptual diagram as follows.

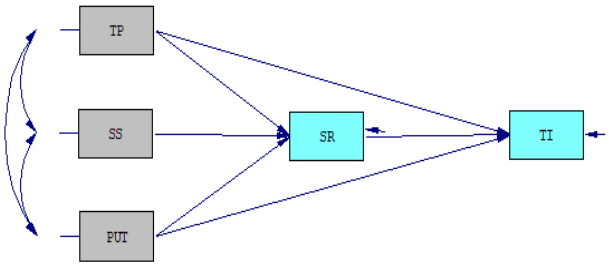

Fig. 1. Conceptual diagram.

Fig. 1 shows the distribution of positions between variables formulated based on conceptual instructions. In this figure, the path between exogenous variables and endogenous variables can be observed. This conceptual model is used as an initial model to be tested further using empirical data obtained from respondents' responses. The first test conducted was to prove the significance of the effect between variables. This is done to identify which effects are significant and which effects are not significant based on empirical data. This proof is done by analyzing the t-value based on the calculated output. The test results can be described as follows.

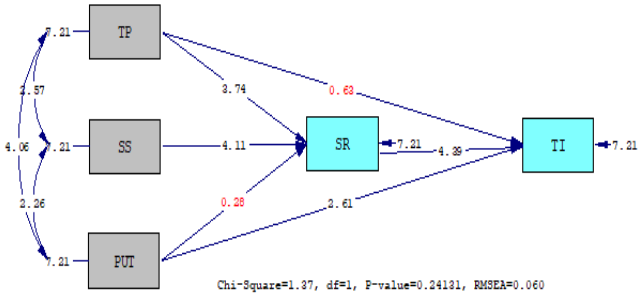

Fig. 2. Results of t-value analysis.

Fig. 2 is the result of the analysis of significance between variables. This analysis was conducted to determine the significant effect between the variables. Based on these results obtained two paths that are not significant based on empirical data (t-value less than 1.9). The first path is a direct effect between teacher performance and technology integration by parents. The second path that is not significant is the effect between parents' understanding of technology and student requests. In addition to these two paths, the other paths have been significant and the results can be used to analyze the magnitude of the effect between variables. After identifying a significant effect, the next step is to analyze the magnitude of the effect between variables. This is done by looking at the coefficient of the effect. The test results are presented in the following figure.

Fig. 3 presents a structural model of technology integration factors in parental involvement during distance learning. The structural model is formed based on empirical data found in the field. The results of the model fit test showed that the Chi-Square coefficient of 1.37 is smaller than 2df, the p-value is 0.24 which is greater than 0.05 and the RMSEA is 0.06 which is smaller than 0.08. Other information obtained is the coefficient of GFI and AGFI which is greater than 0.9. This shows that the structural model formed is fit. Other

information that can be obtained from Fig. 2 is the effect between variables. This can be observed directly from each path coefficient that connects the variables, both direct and indirect effects. To make it easier to read effect information between variables, the following is presented in more detail in Table II.

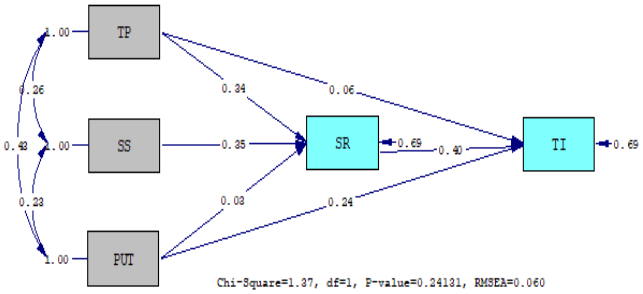

Fig. 3. Results of path analysis.

TABLE II: THE EFFECT BETWEEN VARIABLES

Variables	Effect		
	Total effect	Direct ffect	Indirect effect
TP – SR	0.34	0.34	-
SS – SR	0.35	0.35	-
PUT – SR	-	-	-
TP – TI	0.13	-	0.13
SS – TI	0.14	-	0.14
PUT – TI	0.24	0.24	-
SR – TI	0.40	0.40	-

Table II describes in more detail the effects between variables, both direct and indirect effects. Based on the information in the table, it can be explained that student requests are the variable that has the highest effect on technology integration carried out by parents. Furthermore, technology integration is also influenced by parents' understanding of technology. The structural model shows that teacher performance and school support do not have a direct effect on technology integration by parents. However, these two variables have an indirect effect through the student requests variable. In general, it can be explained that the integration of technology in parental involvement in distance learning is influenced by factors such as student requests, parents' understanding of technology, school support, and teacher performance both directly and indirectly.

IV. DISCUSSION

This study found that student requests are the strongest predictor that affects technology integration by their parents. This means that parents will do everything they can to meet their child's learning needs at home. The topic of student learning processes that are positively influenced by parental involvement has been supported by several previous findings [25]-[28]. Family relations are certainly an aspect that is very concerned and prioritized by everyone as well as in terms of education [29]. It is generally agreed that parents have an important role in the success of their children's learning [30].

If the findings of this study are found that students' requests are the variables that have the highest total effect of all variables, then the findings seem very logical and can be accepted empirically. Children will ask for everything to meet their learning needs, as well as parents will do everything for the success of their children and this has been proven significantly in empirical research [31]. Therefore, the conclusion of these findings shows that the higher the student's request, the stronger the parents' efforts to integrate technology in assisting their children during distance learning.

In addition to student requests, parents' understanding of technology is also one of the predictors that affect the integration of technology carried out by parents at home. It is undeniable that technology integration must be carried out with someone's skills related to technology. Meanwhile, to do this, one must have an understanding of technology and its development. Several previous findings state that parents have participated in promoting and implementing technology in their children's learning and this has a very positive effect [15], [32]-[35].

Understanding technology is quite important for parents. This understanding is needed to support their children's learning activities during distance learning. This is important, because parents are expected to be the main companions for children's learning at home [36], [37]. In addition, parents should ideally be invited to join and take advantage of digital sites used in online learning [38]. This needs to be realized by all parties because current learning activities have changed with the integration of information and communication technology [39]. Students who have parents who do not understand technology have the potential to experience gaps in learning progress [40]. This is what underlies the importance of understanding technology for parents.

In contrast to student requests and parents' understanding of technology, the factor of teacher performance did not significantly have a direct effect on the integration of technology by parents during distance learning. Although it does not have a direct effect, if viewed from the indirect effect, it appears that teacher performance has an effect on student requests, so that it still has an indirect effect on technology integration. Teaching activities by teachers must demonstrate the understanding and needs of students in learning [41]. This means that teacher performance plays a role in student learning needs [42], [43] and these needs are of course directly related to student requests. This is of course also worth considering because the student requests variable is the highest predictor of the technology integration variable by parents.

The same thing also happened to the school support variable. In the design of this study, this variable does not include factors that have a direct influence on technology integration by parents. However, this factor has an indirect effect through the intermediary student requests variable. Several previous findings support this situation, such as the finding showing that school support has a positive effect on students' learning motivation [44]-[46]. With this motivation, students will be encouraged to follow the learning process and have an impact on student requests in learning.

It must be realized that studies related to the involvement of parents in the education of their children have been carried out before. However, another thing that is new in this study is that this issue is carried out in a distance learning setting during the pandemic. This study is focused on when learning

is carried out remotely [47]-[51]. At that time, many complained about this situation, one of which was parents because they had to master technology suddenly [52]. This is a challenge and its own uniqueness in the implementation of the educational process.

V. Conclusion

This study has proven that the technology integration factor by parents is a significant issue in distance learning during the COVID-19 pandemic. The findings conclude that student requests are the factor with the highest contribution that has the strongest direct influence. This shows that the efforts to apply technology made by parents are strongly influenced by their children's requests and based on their children's learning needs. The higher the demand for children, the stronger the efforts of parents to integrate technology in distance learning. In addition, technology iteration also depends on parents' understanding of technology. This means that the higher parents' understanding of technology, the higher the potential for them to be able to integrate technology into their children's learning.

Another finding concluded that teacher performance and school support had an indirect effect on technology integration by parents during distance learning. Although both are indirect factors, teacher performance and school support remain a predictor that should be considered because on the other hand these two variables make a fairly positive contribution to student requests. This means that teacher performance and school support remain the trigger for technology integration in distance learning activities.

This study recommends the need for strong support for the learning process of students in distance learning. In this situation, the role of parents becomes very central. Given that distance learning relies heavily on technology integration, strengthening understanding of technology, especially for parents, is highly recommended. This is very important because it is parents who are the biggest hope in accompanying children in distance learning. If parents' understanding of technology is low, then the potential for success in distance learning is small. In addition, teacher performance and school support are still recommended to be strengthened. This is based on the fact that these two factors provide positive support for student learning activities.

This finding has a contribution in the field of educational technology that is associated with partnerships in the practice of providing education. The current idea creates a frame that the educational process should not be left entirely to the responsibility of teachers in schools, but this process requires partnership activities between various parties. One of the most important parties in this activity is the parents of the students themselves.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Herwin Herwin found the main topics, drafted proposals, collected data, analyzed data, interpreted data, verified and drew conclusions. Shakila Che Dahlan helped develop topic ideas, compile a discussion of research results and draw conclusions.

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