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Digital Learning and Teacher Motivation's Impact on Student Satisfaction and School Competitive Advantage

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STRACT

In today's rapidly evolving educational landscape, integrating digital technology into learning is essential for advancing educational quality. The case of Putera Harapan Purwokerto 3 Language School (Puhua School) highlights the challenge of maintaining adaptive, engaging, and relevant learning experiences to meet modern student demands and ensure institutional competitiveness. This study examines how digital learning and teacher motivation influence student satisfaction and contribute to educational competitive advantage. Using customer satisfaction theory, work motivation theory, Porter's competitive advantage framework, and the two-factor theory, the research demonstrates that effective digital learning, supported by strong teacher motivation, enhances learning experiences. Student satisfaction acts as a mediating variable, connecting digital learning and teacher motivation to institutional competitiveness. A mixed-methods approach was utilized, combining quantitative SEM-PLS analysis with qualitative interviews. Data from randomly sampled students and teachers were analyzed using SmartPLS and path analysis. Results show that both digital learning and teacher motivation positively affect student satisfaction, which in turn significantly boosts the school's competitive advantage. Student satisfaction also mediates the relationship between digital learning, teacher motivation, and competitive outcomes. Triangulated findings consistently highlight the strategic importance of integrating digital technology with teacher motivation initiatives to foster satisfaction and strengthen the school's position in the educational market. The study recommends ongoing development in these areas to address future educational challenges and support sustained institutional advancement.

INTRODUCTION

In an era of rapid and dynamic global change, education is no longer limited to knowledge transfer or acquisition, but is now focused on equipping young people with relevant skills, values, and competencies to face an ever-changing world (OECD, 2018; Reimers & Chung, 2016). UNESCO (2015), in *Education 2030: Incheon Declaration*, asserts that future education must be inclusive, equitable, and of high quality, providing lifelong learning opportunities for all. This underscores that education should be a universal right, not an exclusive privilege (Schleicher, 2012; Biesta, 2015). The current focus is on the quality and relevance of learning, emphasizing curriculum development and teaching methods oriented toward life skills, global citizenship, appreciation of cultural diversity, and sustainable development (Bourn, 2015; Leicht et al., 2018). Education must also foster individuals who are adaptive, creative, and able to think critically. UNESCO (2015) highlights the need for innovation, creativity, and critical thinking to empower learners as proactive agents of change. Learners today must not only master core subjects, but also be equipped with values such as tolerance, justice, and awareness of global challenges, achieved by empowering them to think, create, and collaborate (Fullan & Langworthy, 2014; Davies et al., 2017).

Additionally, technology and digital literacy have become urgent needs in education, in line with rapid technological development. UNESCO (2015) explains that information and communication technology (ICT) skills are essential to support lifelong learning and participation in a knowledge-based economy and society. Digital literacy is now seen as a fundamental skill alongside reading, writing, and arithmetic (Ng, 2012; Buckingham, 2015). Schools must ensure that students are not only technology users, but also able to understand, utilize, and even create new technologies (Voogt et al., 2013; Falloon, 2020). This shift requires a reorientation of curricula, pedagogy, and assessment to embed computational thinking, digital ethics, and creative use of ICT (Ferrari, 2013; Erstad & Voogt, 2018). Moreover, teacher competencies in digital pedagogy are critical for effective ICT integration in classrooms (Tondeur et al., 2017; Redecker, 2017), thereby providing quality education that meets contemporary needs.

In the context of school competition within the education industry, digital technology is a main factor influencing educational quality. Schools that integrate technology have greater opportunities to enhance their attractiveness to students and parents, becoming a source of competitive advantage. Disruptive technologies have changed how students learn, making education more flexible, personalized, and accessible (Christensen et al., 2008). Schools that neglect technology risk losing their relevance and competitive position.

Beyond technology, teacher quality remains a key factor in educational competitiveness. Teachers are expected to serve not only as lecturers but also as facilitators, innovators, and motivators. Darling & Hammond (2000) state that teacher quality is the main determinant of student achievement, surpassing even socioeconomic background. Thus, teachers are central to school management strategies for strengthening competitiveness. Another important aspect is the school's reputation and image; parents tend to choose schools with strong achievement records, positive environments, and values aligned with their expectations. As Hargreaves (2003) notes, student achievement, teaching quality, and school involvement shape community perceptions of school reputation.

Given these realities, schools must not only maintain quality but also continuously innovate. Those able to adapt, demonstrate competitive advantage, and provide meaningful educational experiences will survive and excel in an increasingly competitive environment.

Putera Harapan 3 Language School (*Puhua School*) is a growing private school with unique strengths, offering foreign language learning (English and Mandarin) with an international curriculum (Alenezi, 2023). As a *Cooperative Education Unit (SPK)*, formerly known as an international school, Puhua School strives to improve educational quality and provide learning experiences that foster student understanding and satisfaction, beyond just final grades. According to Interviewee (N1), chairman of the DPP of Yayasan Putera Harapan Banyumas, a school's competitive advantage is achieved through student satisfaction in understanding learning material, which is influenced by teaching methods. Thus, a school's competitiveness is closely tied to the satisfaction of students experiencing the learning process. N1 also affirms that student satisfaction and ease of understanding are the highest achievements in education.

Established in 2006 in Purwokerto, Banyumas Regency, Central Java, Puhua School continues to develop and maximize its potential to provide quality educational services and strengthen its competitive advantage as a recognized private school. Private schools play a crucial role in Indonesia's education system as alternatives to public schools, but unlike public schools that receive full government funding, private schools depend heavily on student enrollment for operational funding. This dependency directly affects sustainability and performance.

According to the Ministry of Education and Culture (MoEC, 2021), most private school income comes from *Education Development Contribution (SPP)* and other parental fees. Therefore, student enrollment growth directly determines operational sustainability, including teacher salaries, curriculum development, facilities, and educational technology investment—all key factors supporting educational quality and competitiveness. This reliance on student numbers is a major challenge for private schools. Danim (2010) states, "the number of students that continues to increase and can be maintained over a long period of time is an indicator of the success of school management and marketing strategies" (p. 134). Thus, attracting and retaining students is closely linked to educational service quality.

When enrollment grows, schools can invest in service quality improvements, such as teacher development, curriculum enhancement, facilities, and technological innovation. Conversely, declining enrollment threatens operational sustainability and service quality. In summary, student numbers reflect public trust, school image, and sustainable service quality, impacting both financial stability and competitive positioning among educational institutions.

METHOD

This study employed a mixed methods approach, specifically an exploratory sequential design. Researchers began with initial qualitative interviews, followed by the distribution of questionnaires to selected respondents for quantitative data collection, and concluded with in-depth qualitative interviews to confirm the findings. The process started with qualitative data collection and analysis to explore the research phenomenon, and insights from this phase informed the development of quantitative instruments, which were then administered to a broader sample. The final qualitative phase aimed to deepen understanding and validate the quantitative results.

In terms of reasoning, this mixed methods research integrates both deductive and inductive approaches. Deductive reasoning is applied during quantitative data analysis to test hypotheses, while inductive reasoning is used in qualitative analysis to build understanding from field findings. By combining these reasoning approaches, the research achieves a more comprehensive perspective.

The study utilizes both primary and secondary data. Primary data is collected directly from respondents through questionnaires, direct observation, or interviews. Secondary data is sourced from *LMS* usage records and feedback on digital learning training provided by third parties, supporting the research by supplementing and refining the primary data set. This approach ensures a robust and multi-faceted analysis of the research questions.

RESULTS AND DISCUSSION

Quantitative Data Results

This study uses a quantitative approach with a total of 200 respondents, consisting of junior and senior high school students at Puhua School. The sampling technique used is simple random sampling or random sampling. This technique was chosen so that each individual in the population has an equal chance of being selected as a respondent, so as to minimize bias in the data and increase the external validity of the research (Sugiyono, 2017). All respondents involved in this study are students who have followed the learning process with the same learning experience and also use the same educational facilities and infrastructure. This is important to maintain the homogeneity of the learning context, so that independent variables such as digital learning and teacher motivation can be measured more accurately on student satisfaction. This means that although the sampling was randomized, control of the learning environment was maintained so that there were no significant differences that could affect students' perceptions or

experiences of digital learning or the role of the teacher. This strategy is in line with the principle of environmental homogeneity in controlling confounding variables (Creswell, 2014). The sample was selected from the population of students in one educational institution that implements digital learning system equally and uniformly and has the same service standards in terms of infrastructure, technology access, and teacher teaching methods. The aim is that the analysis results more objectively describe the relationship between variables without being influenced by differences in facilities or learning approaches between respondents. The research instrument consists of four main constructs, namely Digital Learning (PD), Teacher Motivation (MG), Student Satisfaction (KS), and Competitive Advantage (KB) where each of the 5 variables has 5 indicators. Each indicator is measured using a 5-point Likert scale, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Data was collected through a questionnaire distributed online using google form. All questions for each variable dimension have been tested for validity and reliability.

Descriptive Analysis

Descriptive analysis in this study aims to provide an overview of the characteristics of the data obtained from respondents before inferential analysis such as Structural Equation Modeling (SEM) is carried out. The purpose of descriptive analysis is to provide an initial description of the research data, both in general and per variable. In quantitative research, this analysis can be used to determine the characteristics of the data, assess the feasibility of the data, show the response distribution pattern of each variable or indicator whether it tends to be high / low, evenly distributed or symmetrical and describe the tendency of respondents' answers to each construct studied. This is in line with what Sugiyono (2017) stated that descriptive statistical analysis can be used to describe the data that has been collected as it is with no intention of making general conclusions or generalizations.

a. Digital Learning (X1)

The results of respondents' assessment of the Digital Learning variable are shown in table 1 below.

Table 1. Results of Respondents' Assessment of Digital Learning Variables

Question Item	Measurement Scale					N	Total Score	Ideal Score	Average	Std Dev	Description
	STS	TS	Ne	S	SS						
	1	2	3	4	5						
Digital Learning (X1)											
Availability of technology facilities	4	10	65	68	53	200	752	1000	3.78	0.96	High
	2.0 %	5.0%	32.7 %	33.7 %	26.6 %	100 %	75.2 %	100%			
Quantity of technology use in learning activities	3	16	60	72	49	200	745	1000	3.74	0.97	High
	1.5 %	8.0%	29.7 %	36.2 %	24.6 %	100 %	74.5 %	100%			
Ease of access perceived by students	2	15	71	68	44	200	732	1000	3.68	0.93	High
	1.0 %	7.5%	35.7 %	34.2 %	21.6 %	100 %	73.2 %	100%			
The attractiveness of using technology in learning	3	10	46	51	90	200	810	1000	4.07	1.01	High
	1.5 %	5.0%	23.1 %	25.6 %	44.7 %	100 %	81%	100%			
Ease of communication between students and teachers	2	13	53	86	46	200	757	1000	3.8	0.90	High
	1.0 %	6.5%	26.6 %	42.7 %	23.1 %	100 %	75.7 %	100%			

through digital media					
Digital Learning Average	81%	3.81	0.95	High	

Source: Researcher Processed Data, 2025

Based on the results of distributing questionnaires to 200 student respondents, descriptive data were obtained related to the assessment or perception of digital learning variables shown through five statement indicators. The score for each item is analyzed based on the average, percentage against the ideal score, and its interpretative category. Digital learning which is the dependent variable (X1) has 4 dimensions, namely the use of technology, the level of ease of access, the level of student involvement and interactivity as measured by 5 indicators, namely the availability of technology facilities, the quantity of technology use in learning activities, the ease of access felt by students, the attractiveness of using technology in learning and the ease of student communication with teachers through digital media. Overall, the average score of respondents' assessment for digital learning variables is 3.81 or 81%, which is included in the high category. This shows that the implementation of digital learning in schools has been running quite well and is positively appreciated by students. However, aspects of ease of access and intensity of technology use can still be optimized to support more effective learning.

The most prominent dimension is the attractiveness of using technology in learning (average 4.07), indicating that students feel motivated by the digital approach applied in the learning process. Meanwhile, the dimension of technology use with indicators of the availability of technology facilities and the quantity of technology use in learning is in the high category with an average of 3.78 or 75.2% and 3.74 or 74.5% of the ideal score, respectively. This shows that the level of technology use is considered by most students to be quite good. Students have sufficient experience in using technology in learning activities. However, there is still room for improvement, especially in the aspects of consistency and frequency of technology use. The ease of communication between students and teachers through digital media also scored high, indicating that digital media adequately facilitates two-way communication between students and teachers, both in the context of direct learning and in consultations outside of class hours. The aspect of ease of access to technology scored relatively lower (3.68), indicating the need to evaluate the readiness of infrastructure or digital literacy of students equally. In general, it can be concluded that digital learning contributes positively to students' learning experience.

In addition, the mean standard deviation of 0.95 (<1.00) shows that the answers from respondents tend to be homogeneous, meaning that the majority of students have similar perceptions of the existence and effectiveness of digital learning in schools. This signifies consistency in students' experience of learning technology.

b. Teacher Motivation (X2)

The results of respondents' assessment of the Teacher Motivation variable are shown in table 4.2 below.

Table 2. Results of Respondents' Assessment of Teacher Motivation Variables

Question Item	Measurement Scale					N	Total Score	Ideal Score	Average	Std Dev	Description
	STS	TS	Ne	S	SS						
	1	2	3	4	5						
Teacher Motivation (X2)											
	6	20	75	59	40	200	702	1000	3.53	1.01	High

Teachers' enthusiasm and passion when teaching	3.0%	10.1 %	37.7 %	29.6 %	19.6 %	100 %	70.2 %	100%			
Teacher innovation in delivering material	7	24	65	62	42	200	705	1000	3.54	1.06	High
	3.5%	12.1 %	32.2 %	31.2 %	21.1 %	100 %	70.5 %	100%			
Teacher exemplary and discipline	3	12	65	68	52	200	749	1000	3.76	0.95	High
	1.5%	6.0%	32.7 %	34.2 %	25.6 %	100 %	74.9 %	100%			
Teacher support and attention to student development	4	16	70	64	46	200	728	1000	3.66	0.98	High
	2.0%	8.0%	35.2 %	31.7 %	23.1 %	100 %	72.8 %	100%			
Help from teachers to students who are having difficulties	3	18	70	56	53	200	735	1000	3.69	1.01	High
	1.5%	9.0%	34.7 %	28.1 %	26.6 %	100 %	73.5 %	100%			
Average Teacher Motivation							72.38 %		3.64	1.00	High

Source: Researcher Processed Data, 2025

Based on the questionnaire data collected from 200 respondents, information was obtained related to students' assessment and perception of teacher motivation in the learning process. This teacher motivation has 4 dimensions, namely intrinsic motivation, creativity, discipline and exemplary, which are measured through five indicators of teacher enthusiasm and enthusiasm when teaching, teacher innovation in delivering material, teacher exemplary and discipline, teacher support and attention to student development and assistance from teachers to all students who experience difficulties. All items showed a high category, with an average variable score of 3.64 (or 72.38% of the ideal score). This shows that teachers have good work motivation, characterized by discipline and exemplary behavior, support for students, and the ability to innovate. However, attention needs to be paid to the aspects of enthusiasm and innovation so that the quality of teaching remains optimal, effective and interesting for students.

Teacher motivation is in the high category, which means that teachers are considered to have enthusiasm and concern for student development. The highest score is in the indicator of exemplary and disciplinary teachers with an average of 3.76 or 74.9%, while for other indicators it is also classified as high, namely the indicator of teacher support and attention to student development which obtained an average of 3.66 or 72.8%, indicating that students feel given attention by teachers in aspects of academic and personal development. The indicator of assistance from teachers to students who are experiencing difficulties is also high, which gets a score of 3.69 or 73.5%, indicating that teachers are quite responsive and willing to help students who experience problems in learning.

These two indicators are important because they show the quality of teacher-student interpersonal relationships and play a major role in maintaining student motivation and enthusiasm. Meanwhile, the lowest rating was the indicator of teacher enthusiasm and passion when teaching, which amounted to 3.53 or 70.2%. Although still in the high category, this shows that there are still some students who feel that teachers are less enthusiastic or excited when teaching. Special attention is needed to keep teachers motivated and energized during the learning

process. This finding shows the importance of strengthening teachers' training and professional development strategies so that they are more adaptive and enthusiastic about the dynamics of digital learning.

Interpretation of the results from the calculation of the medium standard deviation with a result of 1.00, indicates that the distribution of answers falls within the limits of fairly homogeneous to medium. There is a slight variation in students' views, but it remains within a reasonable level. This indicates that most students agree that teacher motivation is quite high, but there may be differences in perceptions of teacher enthusiasm or the forms of support provided.

c. Student Satisfaction (Y)

The results of respondents' assessment of the Student Satisfaction variable are shown in table 3. below.

Table 3. Results of Respondents' Assessment of Student Satisfaction Variables

Question Item	Measurement Scale					N	Total Score	Ideal Score	Average	Std Dev	Description
	STS	TS	Ne	S	SS						
	1	2	3	4	5						
Student Satisfaction (Y)											
Satisfaction with interaction with the teacher	6	22	86	46	40	200	687	1000	3.45	1.02	High
	3.0%	11.1%	43.2%	23.1%	19.6%	100%	68.7 %	100%			
Satisfaction with the learning methods used	2	18	64	68	48	200	738	1000	3.71	0.96	High
	1.0%	9.0%	32.2%	33.7%	24.1%	100%	73.8 %	100%			
Satisfaction with the achievement of personal learning outcomes	2	13	78	75	32	200	719	1000	3.61	0.87	High
	1.0%	6.5%	38.7%	37.7%	16.1%	100%	71.9 %	100%			
Learning environment comfort	7	23	71	54	45	200	703	1000	3.53	1.07	High
	3.5%	11.6%	35.7%	26.6%	22.6%	100%	70.3 %	100%			
Level of satisfaction and pride	12	26	80	44	38	200	668	1000	3.36	1.11	High enough
	6.0%	12.6%	40.2%	22.1%	19.1%	100%	66.8 %	100%			
Average Student Satisfaction							70.3 %		3.53	1.00	High

Source: Researcher Processed Data, 2025

Based on the results of distributing questionnaires to 200 respondents, data were obtained regarding the assessment of students' perceptions of their satisfaction in the learning process as stated in table 3 above. This student satisfaction consists of dimensions including teacher-student interaction, learning methods, learning outcomes, learning environment and loyalty which are measured through five indicators, namely satisfaction with interactions with teachers, satisfaction with the learning methods used, satisfaction with achieving personal results, comfort of the learning environment and level of satisfaction and pride in the school. The measurement results of the indicators show an overall high category, with an average total score of 3.53 or 70.3% of the ideal score. This shows that in general, students are satisfied with the learning process and interactions in the school environment. However, special attention needs to be paid to improving the quality of teacher-student interactions and building students' pride and attachment to school.

Student satisfaction with learning is also in the high category, but lower than other variables. The indicator with the highest score is satisfaction with learning methods, which scored 3.71 or 73.8%, indicating a fairly effective teaching approach. However, the level of student satisfaction and pride in the school has the lowest score of 3.36 or 66.8%, indicating that there are still challenges in building students' sense of belonging and loyalty. This is important to note as it will have a direct impact on the sustainability of the school's image and competitiveness.

In addition, the variation in students' assessment and perception of satisfaction is still within reasonable limits with a moderate standard deviation of 1.00. However, some items have a higher standard deviation, such as the level of student satisfaction and pride with a Std dev value of 1.11. This indicates that the assessment and perception of pride in school is more diverse, and some students may feel less satisfied or less proud of school than other aspects.

d. Competitive Advantage (Z)

The results of respondents' assessments of competitive advantage variables are shown in table 4 below.

Table 4. Results of Respondents' Assessment of Competitive Advantage Variables

Question Item	Measurement Scale					N	Total Score	Ideal Score	Average	Std Dev	Description
	STS	TS	Ne	S	SS						
	1	2	3	4	5						
Competitive Advantage (Z)											
Perception of the school's reputation in the community	2	19	77	62	40	200	716	1000	3.60	0.95	High
	1.0 %	9.5 %	38.2 %	31.2 %	20.1 %	100 %	71.6 %	100%			
Uniqueness of the school's digital learning services	3	9	72	66	50	200	748	1000	3.76	0.93	High
	1.5 %	4.5 %	35.7 %	33.2 %	25.1 %	100 %	74.8 %	100%			
School image compared to other schools	4	18	72	47	59	200	736	1000	3.70	1.05	High
	2.0 %	9.0 %	35.7 %	23.6 %	29.6 %	100 %	73.6 %	100%			
Students' level of experience in feeling the impact of innovation	3	19	86	55	37	200	700	1000	3.52	0.95	High
	1.5 %	9.5 %	43.2 %	27.1 %	18.6 %	100 %	70%	100%			
Students' loyalty to the school	14	19	75	50	42	200	682	1000	3.43	1.13	High
	7.0 %	9.5 %	37.7 %	25.1 %	20.6 %	100 %	68.2 %	100%			
Average Competitive Advantage							71. 6%		3.60	1.00	High

Source: Researcher Processed Data, 2025

The competitive advantage variable is measured by students' perceptions of the five main indicators that reflect school competitiveness. These indicators describe the dimensions in the competitive advantage variable, namely school reputation, service innovation, excellence and loyalty. The overall average result is 3.60 or 71.6% of the ideal score, which is included in the high category. This shows that the school has an advantage in terms of reputation, uniqueness of digital services, and image in the eyes of students. However, the findings show that there needs to be more attention to strengthening student loyalty and improving innovative experiences that are felt directly by students, so that the school's competitiveness is stronger and more sustainable.

The highest indicator is the uniqueness of the school's digital services which obtained an average score of 3.76 or 74.8%, which reflects that digitalization is the school's main differentiator from competitors. However, student loyalty to the school has the lowest score of 3.43 or 68.2%, reinforcing the findings on the satisfaction variable that strengthening students' emotional attachment and identity to the school still needs to be built. The level of diversity in students' perceptions of school excellence is moderate with a score of 1.00. However, the indicator of students' loyalty to the school shows the highest std dev of 1.13, indicating that perceptions of loyalty vary greatly where some students are very loyal, but some do not feel attached to the school.

Overall, the results of descriptive analysis data show that all variables are in the high category. This shows that Putera Harapan 3 Language School has carried out digital transformation quite effectively, which is supported by good teacher motivation, as well as strong student satisfaction. However, the findings indicate two important points of attention that need to be the focus of improvement strategies are student loyalty and pride in the school, which is still relatively low compared to other indicators and improving the real experience of digital innovation, so that the school's competitive advantage can be felt more concretely by students.

Classical Assumption Test

a. Normality Test

In descriptive statistical analysis, there are two important measures used to understand data distribution: skewness and excess kurtosis. Skewness measures the degree of asymmetry of the distribution, while kurtosis indicates whether the data has a heavy tail (leptokurtic), light tail (platykurtic), or normal distribution (mesokurtic). Skewness can be interpreted if the value is close to 0, it indicates a symmetrical distribution, if the value is negative, it indicates a left-skewed distribution and if the value is positive, it indicates a right-skewed distribution. While Excess Kurtosis can be interpreted if the value = 0 then the distribution is normal (mesokurtik), the value < 0 then the distribution is flat (platykurtik) and if the value> 0 then the distribution is more pointed than normal (leptokurtik). Table 5 below shows the results of the descriptive statistical distribution (Skewness and Excess Kurtosis) of the Digital Learning Indicators, Teacher Motivation, Student Satisfaction, and Competitive Advantage.

Table 5. Skewness and Excess Kurtosis Values for Each Indicator

Name	Excess kurtosis	Skewness
PD 1	-0.230	-0.369
PD 2	-0.601	-0.290
PD 3	-0.850	-0.071
PD 4	-1.074	-0.451
PD 5	-0.747	-0.261

Name	Excess kurtosis	Skewness
MG 1	-0.556	-0.041
MG 2	-0.399	-0.295
MG 3	-0.900	-0.136
MG 4	-0.814	-0.125
MG 5	-1.053	-0.011
KS 1	-0.483	0.067
KS 2	-0.700	-0.222
KS 3	-0.373	-0.028
KS 4	-0.503	-0.244
KS 5	-0.457	-0.170
KB 1	-0.977	0.047
KB 2	0.610	-0.510
KB 3	-0.640	-0.239
KB 4	-0.689	0.040
KB 5	-0.152	-0.392

Source: SmartPLS Processed Output, 2025

Based on the results of data normality testing, it can be concluded that all research indicators show a distribution that is close to normal, with skewness and kurtosis values that are still within the tolerance limits. In general, the skewness values of all indicators are between -0.510 to 0.067, which is well below the critical limit of ±2.58 (at the 0.01 significance level), indicating that the data distribution tends to be symmetrical without significant skewness. Meanwhile, the excess kurtosis (skewness) values of most indicators are negative, ranging from -1.074 to 0.610, indicating that the data distribution is flatter (platykurtic) than the normal distribution. However, only one indicator (KB 2) has positive kurtosis (0.610), but the value is still within reasonable limits (±3.29).

Some indicators such as PD 4 (-1.074), MG 5 (-1.053), and KB 1 (-0.977) show relatively high kurtosis, but do not indicate a serious violation of the normality assumption. These results confirm that the study data qualify for further analysis using maximum likelihood estimation (MLE)-based methods, such as SEM, which are relatively robust to normality deviations as long as they are not extreme. Thus, it can be concluded that the characteristics of the data distribution in this study are not an obstacle to statistical hypothesis testing.

Multiple Linear Regression Test

a. Regression Model

Figure 1. below is the result of visualizing the regression model or structural model for all variables.

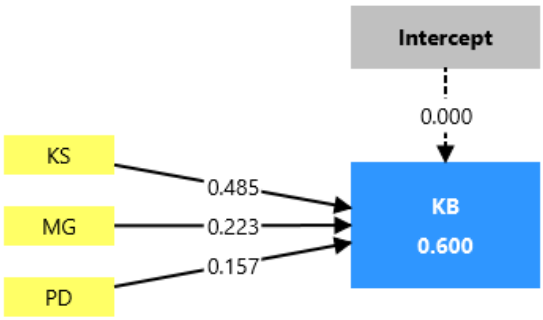

Figure 1. Regression Model
Source: SmartPLS Processed Output, 2025

Based on Figure 1 above, the coefficient value shows the magnitude of the direct effect of an independent variable on the dependent variable. All coefficients are positive, meaning that an increase in PD, MG, and KS → increases competitive advantage (KB). The largest coefficient is KS → KB (0.485), which means that student satisfaction is the main determinant of school competitive advantage in this model. So, it can be concluded that this model is valid and meaningful, because all independent variables have a positive influence on competitive advantage where student satisfaction (KS) has the strongest influence. Meanwhile, Teacher motivation (MG) and digital learning (PD) also contribute although to a lesser extent. The value of $R^2 = 0.600$ indicates this model can explain most of the variability of KB, making it a good basis for the formulation of strategies to improve school competitiveness.

b. Test T

The T test is used to determine whether each independent variable partially has a significant effect on the dependent variable. In this study, the independent variables consist of Student Satisfaction (KS), Teacher Motivation (MG), and Digital Learning (PD), while the dependent variable is School Competitive Advantage (KB). The T test results can be seen in Table 6 below:

Table 6 T Test Results of KS, MG, and PD Variables on KB

	Unstandardized coefficients	Standardized coefficients	SE	T value	P value	2.5 %	97.5 %
Intercept	2.030	0.000	1.090	1.862	0.064	-0.121	4.180
KS	0.475	0.485	0.066	7.159	0.000	0.344	0.605
MG	0.226	0.223	0.075	3.025	0.003	0.079	0.374
PD	0.179	0.157	0.074	2.417	0.017	0.033	0.324

Source: SmartPLS Processed Output, 2025

Based on the table above, the following results were obtained:

1. Student Satisfaction (KS) has a p value = 0.000 <0.05 and t-value = 7.159, so it can be concluded that KS has a significant effect on Competitive Advantage (KB). The standardized coefficient of 0.485 indicates that the influence of KS is the most dominant compared to other variables.
2. Teacher Motivation (MG) has a p value = 0.003 <0.05 and t-value = 3.025, indicating that MG has a significant effect on KB. The standardized coefficient of 0.223 shows a positive influence but not as great as KS.
3. Digital Learning (PD) has a p value = 0.017 < 0.05 and t-value = 2.417, which means that PD also has a significant influence on KB. However, the effect of PD is the smallest among the three variables.

These results indicate that all independent variables in this study have a positive and significant influence on school competitive advantage. This is in line with the theory of competitive advantage which states that quality learning, teacher motivation, and student satisfaction are part of the school's values in creating sustainable excellence (Porter, 1985; Ghozali, 2018). In particular, student satisfaction is the most dominant variable, confirming that students' positive perceptions of their learning experience are a key determinant of school excellence. This is in line with previous research which states that satisfied students tend to show loyalty and spread a positive image of the school to other prospective students (Kotler & Fox, 1995).

a. Test F

The F test is used to determine whether all independent variables together (simultaneously) have a significant effect on the dependent variable. In this study, the independent variables consist of Student Satisfaction (KS), Teacher Motivation (MG), and Digital Learning (PD), while the dependent variable is School Competitive Advantage (KB). Table 7 below shows the T test results for all variable constructs.

Table 7. F Test Results of the Effect of KS, MG, and PD on School Competitive Advantage (KB)

	Sum square	df	Mean square	F	P value
Total	2804.059	187	0.000	0.000	0.000
Error	1121.947	184	6.098	0.000	0.000
Regression	1682.111	3	560.704	91.956	0.000

Source: SmartPLS Processed Output, 2025

The results of the ANOVA analysis conducted show that the regression model as a whole is significant in predicting the dependent variable. This can be seen from the F-statistic value of 91,956 with a significance level of 0.000 (p < 0.05), which indicates that at least one independent variable has a significant effect on the dependent variable. The sum of squares regression value of 1,682.111 with 3 degrees of freedom indicates the amount of variation explained by the model, while the sum of squares error of 1,121.947 with 184 degrees of freedom represents the variation that cannot be explained by the model. The comparison between the mean square regression (560,704) and the mean square error (6,098) produces a large F value, which further strengthens the evidence that the model used has good predictive ability. These results are consistent with previous findings that show the significance of each independent variable, while confirming that the overall model is feasible to use for further analysis. These results support Porter's (1985) theory

of competitive advantage, which states that internal resources and the added value of educational services perceived by students become strategic resources that determine competitive advantage. Full support from motivated teachers and effective implementation of digital learning strengthen student satisfaction which ultimately contributes to the perception of overall school excellence.

Data Analysis with PLS-SEM

In this study, data analysis techniques were carried out using Partial Least Squares Structural Equation Modeling (PLS-SEM) run through SmartPLS 4 software.

a. Outer Model Evaluation (Measurement Model)

The results of data input into SmartPLS 4 are shown in Figure 2 below. Figure 3 presents the research model analyzed with the help of SmartPLS 4 software. This model consists of reflective constructs measured through several indicators. Model evaluation begins with testing the measurement model (outer model) which includes four main stages, namely indicator reliability test, internal consistency test, convergent validity test, and discriminant validity test. The model estimation process is carried out using the PLS algorithm, with indicator reliability assessed based on the outer loading value of each indicator on its construct.

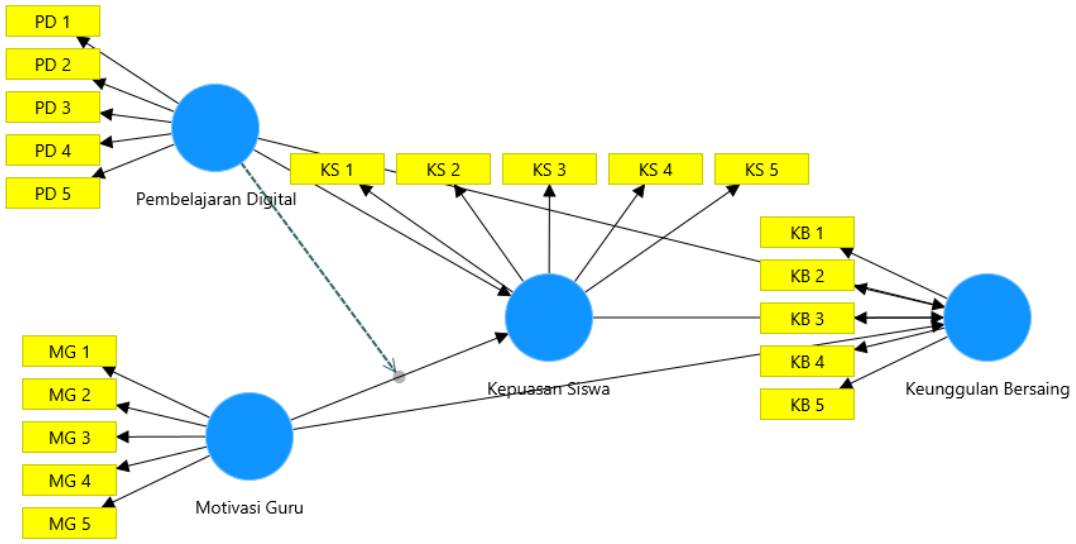

Figure 2. PLS-SEM Evaluation Model
Source: SmartPLS Processed Output, 2025

Convergent Validity (Outer Loading)

In Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis, outer loading shows how strongly indicators (questions in the questionnaire) represent the construct or latent variable being measured. A high outer loading value indicates that the indicator is a good representation of the construct. According to Hair et al. (2019), the outer loading value should meet the following criteria:

- ≥ 0.7: the indicator is considered reliable and can be retained.
- 0.4-0.7: may be considered for deletion if the Average Variance Extracted (AVE) value and construct reliability can be significantly improved.
- < 0.4: the indicator should be removed because its contribution to the construct is very low.

Table 8 shows the outer loading results from the data output generated from the SmartPLS 4 application. This table shows the outer loading value for each indicator on its construct. This value will be used to measure the validity of indicators in the reflective measurement model.

Table 8. Outer Loading Results for Each Indicator

Item	Student Satisfaction	Competitive Advantage	Teacher Motivation	Digital Learning	Digital Learning x Teacher Motivation
KB 1		0.767			
KB 2		0.862			
KB 3		0.767			
KB 4		0.794			
KB 5		0.783			
KS 1	0.832				
KS 2	0.761				
KS 3	0.830				
KS 4	0.774				
KS 5	0.844				
MG 1			0.828		
MG 2			0.848		
MG 3			0.884		
MG 4			0.786		
MG 5			0.844		
PD 1				0.753	
PD 2				0.748	
PD 3				0.793	
PD 4				0.742	
PD 5				0.762	
Pembelajaran Digital x Motivasi Guru					1.000

Source: SmartPLS Processed Output, 2025

Based on the results of data processing using SmartPLS 4 above, all indicators in this research model show a fairly good outer loading value on their respective constructs. In general, the outer loading value used to assess indicator reliability is considered qualified if it is above 0.70. The Competitive Advantage construct with indicator items KB 1 to KB 5 has an outer loading value of 0.767 - 0.862. The Student Satisfaction construct with indicator items KS 1 to KS 5 has an outer loading value of 0.761 - 0.844. The Teacher Motivation construct with indicator items MG 1 to MG 5 has an outer loading value of 0.786 - 0.884, and Digital Learning with indicator items PD 1 to PD 5 has an outer loading value of 0.742 - 0.793. All constructs are proven to be reliable with a loading factor that meets more than 0.70. As for the interaction result of digital learning x teacher motivation, there is only one value of 1.000, which indicates that this variable is a construct product (interaction variable resulting from the multiplication of the previous two constructs). The value of 1.000 is common because it is the result of direct calculation (in the form of mean-centered multiplication or other interaction methods) and not measured from several indicators. Since all constructs show an outer loading value > 0.70, it can be concluded that none need to be eliminated because all of them are statistically valid.

Discussion

This study employed a mixed-methods approach combining SEM-PLS quantitative analysis with qualitative interviews to examine the relationships between digital learning, teacher motivation, student satisfaction, and competitive advantage at Puhua School. The quantitative results demonstrated strong reliability across all constructs (Digital Learning, Teacher Motivation, Student Satisfaction, and Competitive Advantage), with outer loading values consistently exceeding 0.70, while qualitative interviews provided contextual depth, revealing that digital tools like the Sokrates platform enhanced engagement through interactive features and flexible learning. Both methods converged to show that digital learning (β=0.188, p=0.015) and teacher motivation (β=0.591, p=0.000) significantly boost student satisfaction, which in turn strongly predicts competitive advantage (β=0.495, p=0.000), with students and teachers consistently emphasizing how motivated instructors and technology integration create more dynamic, satisfying learning experiences that elevate the school's reputation.

The analysis further revealed critical mediation effects, as student satisfaction significantly bridged the impact of both digital learning (indirect β=0.093, p=0.041) and teacher motivation (indirect β=0.293, p=0.000) on competitive advantage, supported by interview narratives highlighting how satisfied students become advocates for the school. Triangulation confirmed these findings, with teachers noting that recognition and professional development sustain their motivation, directly improving classroom dynamics, while students associated teacher enthusiasm and digital tools with higher satisfaction and institutional pride. These results align with theoretical frameworks like Herzberg's Two-Factor Theory and Porter's competitive advantage, demonstrating that the synergy of technological innovation and teacher motivation not only enhances learning outcomes but also strategically positions the school as a modern, adaptive institution in a competitive educational landscape.

CONCLUSION

Based on SEM-PLS quantitative analysis supported by qualitative interview data, student satisfaction with digital learning at SMP-SMA Puhua Purwokerto is primarily influenced by easy access to materials, interactive content, and clear learning flow, particularly through platforms such as *Sokrates*. High teacher motivation in integrating digital technology—driven by consistent training and evaluation—significantly enhances students' enthusiasm for learning, with the synergy between digital interactivity and active teacher involvement emerging as the most dominant factor in student satisfaction. This satisfaction directly contributes to the school's competitive advantage by increasing loyalty, positive recommendations, and academic achievement. Practically, schools should continue developing digital platforms and incentivizing innovative teachers, teachers are encouraged to be creative in technology-based instruction, and students should be proactive and independent in their learning. For future research, it is recommended to include additional variables and adopt a longitudinal approach to gain a deeper and more comprehensive understanding of the factors influencing student satisfaction and school competitiveness.

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