



Teacher Attendance and Numeracy Learning Satisfaction: Evidence from ClassPoint-Assisted Learning in Rural Papua

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Abstract

Understanding students' satisfaction with technology-assisted numeracy learning remains challenging in underserved rural communities, where limited educational resources and inconsistent teacher attendance may constrain learning experiences. Although previous studies have emphasized students' internal learning factors, the interplay between teacher attendance, learning readiness, and satisfaction in rural digital learning contexts remains underexplored. This study examined the relationships among learning experiences, learning patterns, teacher attendance, learning readiness, and numeracy learning satisfaction in ClassPoint-assisted learning in rural Papua, Indonesia. A quantitative survey involving 240 students was conducted, and the proposed structural model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings revealed that learning experiences and learning patterns were positively associated with students' learning readiness. Teacher attendance demonstrated a significant positive relationship with numeracy learning satisfaction, whereas learning readiness showed no significant direct relationship with satisfaction. Furthermore, learning readiness did not mediate the relationships between learning experiences, learning patterns, and learning satisfaction. These findings highlight the importance of teacher presence in technology-assisted numeracy learning, suggesting that students' readiness alone may be insufficient to explain learning satisfaction in educationally disadvantaged settings. This study extends the understanding of digital learning satisfaction by integrating student-related and instructional factors, offering practical implications for sustaining teacher engagement alongside technology integration in rural education.

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INTRODUCTION

Numeracy ability is a basic competency that determines the quality of human resources in facing real-life challenges. Numeracy includes not only basic arithmetic ability, but also logical reasoning and the ability to interpret quantitative information critically (Ball et al., 2014; Evans, 2017; Getenet, 2022). However, the results of national assessments in Indonesia show that most students still have difficulty solving numeracy-based contextual problems (Setiyani et al., 2024). This condition indicates that numeracy learning still faces serious challenges, especially in areas with limited access and educational support. The challenges in numeracy learning become increasingly complex when viewed in the context of education in rural Papua. These rural areas are classified as outermost, most backward, and most isolated (OIU), characterized by difficult to access terrain and poor security conditions. Data from Central Statistics Indonesia (CSI) indicate that educational participation rates in rural Papua remain far below the national average, with limited infrastructure,

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low economic levels, and challenging geography serving as primary obstacles (Badan Pusat Statistik, 2024). These regions are accessible only by air, with schedules that are often unpredictable due to weather and unstable security conditions (Perdana et al., 2019). Furthermore, the presence of numerous tribes such as the Yali, Hubla, Kimyal, and Momuna creates conditions ripe for friction, frequently leading to tribal warfare. Inter-tribal conflict can trigger aggressive behavior, driving individuals to commit destructive acts such as damaging schools and other public facilities thereby disrupting the continuity of education (Nursanti & Pudjibudojo, 2021; Reza, 2018). Consequently, many schools are forced to close due to sustaining minor or severe damage. This situation directly results in low teacher attendance, undermines the consistency of students' learning patterns, and limits their educational experiences, ultimately diminishing both their learning readiness and satisfaction.

Student learning satisfaction reflects the quality of the learning process, indicating the extent to which students' learning needs are met (van den Bogerd et al., 2020). According to Suhandiah et al. (2022), the determinants of learning satisfaction include learning experiences, learning patterns, and learning readiness. Learning experiences represent the accumulation of student interactions during the learning process whether conventional or technology assisted which play a role in shaping students' cognitive readiness (Chung et al., 2020; Yilmaz, 2017). Meanwhile, learning patterns comprising learning strategies, habits, and motivation (Vermunt & Donche, 2017) serve as determinants of students' readiness to receive instructional material (Bouilheres et al., 2020; Bryson & Andres, 2020). In rural areas, learning readiness has the potential to act as a mediator bridging the relationship between experience, learning patterns, and learning satisfaction a dynamic that has not yet been explicitly examined in the context of numeracy (Cooper, 1990).

A person's readiness to learn reflects their individual's ability to learn and receive learnings. Cicekci & Sadik, (2019) suggest that a person's readiness to learn mathematics is supported by their numeracy abilities. For example, how students can flexibly use mathematical knowledge (Suwanti et al., 2024). Furthermore, readiness to learn is a factor influenced by students' learning experiences (Chung et al., 2020; Yilmaz, 2017). Besides being influenced by their experiences, students' readiness to learn also depends on family support, which shapes a person's learning habits. Agustin et al. (2023) stated that family support has a positive effect on students' learning readiness. Daily study habits at specific times shape a person's learning patterns. Learning patterns are how students identify collaborative problem solving strategies and internalize detailed problem solving procedures (Hero & Lindfors, 2019; Wijaya et al., 2022). Effectively developing student' learning patterns, both offline and online, aims to adapt learning experiences, thus influencing learning readiness (Bryson & Andres, 2020). Regularity in learning management will shape learning patterns that influence student' learning readiness (Bouilheres et al., 2020). Therefore, it can be concluded that learning readiness is influenced by students' learning experiences in identifying problems in detail and effectively developing learning patterns to find solutions.

Another factor influencing student' learning satisfaction is the intensity of teacher attendance in class. Based on school attendance data, most teachers appear to be infrequently present at school to teach. Teacher attendance is crucial for organizing learning, providing academic support, building motivation, and creating a conducive learning environment. This means that consistent teacher attendance enables students to experience continuous and quality learning. This is in line with research by Pham et al. (2021), which found that teacher attendance in class and online significantly impacts student' learning satisfaction in Vietnam. Furthermore, Importance Performance Map Analysis (IPMA) shows that student learning satisfaction is influenced by three factors: teacher quality, service technique quality, and service quality (Jiménez-Bucarey et al., 2021). Teacher attendance is included in the service quality of the learning process that occurs in the classroom. However, 54.3% of students still felt that teacher attendance was not optimal, resulting in low student' learning satisfaction (Surahman & Sulthoni, 2020).

Amidst the learning constraints faced in rural areas of Papua, ClassPoint emerges as a technological solution; it serves not merely as a digital overlay but is substantially expected to enhance student learning satisfaction. This is because ClassPoint functions as a classroom response system that enables active student engagement such as through the provision of formative feedback and allows for more flexible management of instructional materials (Abdelrady & Akram, 2022; Mazlan, et al., 2023). When students engage through interactive features like ClassPoint, their needs

for competence and relatedness are met, fostering the intrinsic motivation that drives learning satisfaction (Ryan & Deci, 2000). Moreover, ClassPoint is suitable for any learning topic and supports both online and offline operation (Yusi, 2022). The use of ClassPoint addresses the challenges of limited learning opportunities in Papua. Thus, utilizing ClassPoint is not merely a technical solution but part of a pedagogical system with the potential to provide novel learning experiences, strengthen learning patterns, and foster greater learning readiness (Akram & Abdelrady, 2023; Bong & Chatterjee, 2022).

Understanding the determinants of student' learning satisfaction, particularly in rural Papuan learning with ClassPoint, requires a multi-level theoretical framework. This framework connects internal factors (student learning experiences, learning patterns, and student learning readiness) and external factors (teacher attendance) with student' learning satisfaction. A number of previous studies have established a relevant empirical foundation, albeit within varying scopes and contexts. Abdelrady & Akram (2022), demonstrated the effectiveness of ClassPoint in enhancing the satisfaction and engagement of EFL university students. Siron et al., (2020) and Suhandiah et al., (2022) identified content engagement as a driver of online learning satisfaction in Indonesian higher education, while Yilmaz, (2017) found e-learning readiness to be a predictor of satisfaction in flipped classrooms. Although these findings are close to the importance of determining learning satisfaction, almost all of them come from urban and higher education contexts, which are certainly far different from the reality of education in rural Papua. Furthermore, Pham et al., (2021) and Jiménez-Bucarey et al., (2021) revealed the reality of the role teacher attendance plays in learning satisfaction without integrating students' internal factors into a single causal model. It appears that previous studies have not consistently considered rural areas, have not examined the mediating role of learning readiness, and have not integrated teacher attendance with students' internal factors within a unified framework. These gaps create an opportunity to test a more complex and comprehensive model.

Theoretically, this gap warrants investigation through a study proposing a structural model to examine the effects of learning experiences, learning patterns, and teacher attendance on satisfaction with ClassPoint-assisted numeracy learning, with learning readiness serving as a potential mediator. This is because most prior studies have been conducted in urban or higher education settings where basic learning conditions are already met. Structural Equation Modeling and Partial Least Squares (SEM-PLS) was selected to test the model, given its ability to handle multiple causal relationships and mediating variables. The SEM-PLS approach allows for the estimation of direct and indirect paths without requiring data normality testing (Hair et al., 2019). This study aims to examine the influence of students' learning experiences and study patterns on learning readiness, the impact of teacher attendance and learning readiness on student learning satisfaction, and the mediating role of learning readiness in the relationship between learning experiences, study patterns, and learning satisfaction. Theoretically, this research expands the understanding of student learning satisfaction within the context of education in rural areas a topic that has previously received little attention. Practically, the findings can serve as an evidence-based guide for educators to design and develop contextual, effective, and sustainable numeracy instruction in Papua.

METHOD

Research design

This study employs a quantitative approach with a causal survey design, utilizing data obtained through questionnaires. This approach was selected due to its alignment with the research objective of examining the direction of relationships between variables via hypothesis testing (Creswell & Creswell, 2018). The quantitative approach enables the analysis of a causal model involving student learning experience (SE), student learning patterns (LP), teacher attendance (TP), student learning readiness (LR), and student learning satisfaction (LS) using structural equation modeling, with the aim of assessing the influence of each latent variable (Memon et al., 2025). A survey design was selected because it enables data collection from a sample spanning various educational levels (elementary through high school) within the respondents' natural settings, thereby providing a representative picture of the situation on the ground. The selection of rural Papua as the research site was based on the fact that the region faces geographical challenges and disparities in access to

learning technologies. These conditions render the study relevant and allow it to contribute to addressing gaps in the literature regarding technology-based learning in rural areas.

Instrument

The data collection instrument used in this study was a questionnaire developed through an adaptive process tailored to field conditions and grounded in a review of relevant literature and prior research. The development process involved three stages: 1) determining indicators based on the formulated theoretical framework; 2) structuring statement items in a dichotomous format; and 3) validation. Expert validation was conducted by specialists in mathematics education, who assessed the alignment between the questionnaire items and the variables under study. After the questionnaire was revised based on the expert validator's suggestions, validity and reliability testing was conducted using IBM SPSS Statistics 25 software. The testing was performed on 30 students outside the study sample to obtain validity and reliability data. According to Boateng et al. (2018), Rajalahti & Kvalheim (2011), dan Taber (2018), an instrument is said to be valid and reliable if the calculated r value is $> r$ table and the Cronbach's Alpha (α) value is > 0.6 .

Questionnaires were distributed through a teacher network, covering variables such as student learning experience (SE), student learning patterns (LP), teacher attendance (TP), student learning readiness (LR), and student satisfaction with numeracy learning (LS). Respondents were asked to answer questions regarding personal characteristics such as gender, education level, school status, and ethnicity to obtain a demographic profile and the percentage distribution of each characteristic. All questionnaire items utilize a dichotomous scale (yes/no). Given the heterogeneity of the respondents' educational levels, the dichotomous scale was selected to simplify the decision-making process for students and minimize potential response errors arising from the ambiguity often associated with Likert scales (Meade & Craig, 2012). Furthermore, employing a dichotomous scale can enhance response consistency and mitigate acquiescence bias by polarizing respondents' answers through the elimination of neutral or undecided options (Mathew et al., 2022; Oh et al., 2023). Within the SEM-PLS analysis framework, data derived from dichotomous scales can be processed because the method is non-parametric meaning it does not require the data to follow a normal distribution (Hair et al., 2019). In this context, the use of dichotomous scales can be justified based on population characteristics (Vetter, 2017), even though it limits the distributional variance available for SEM-PLS estimation. The following is an overview of the variables and statement items presented in Table 1.

Table 1. Questionnaire

Variabel		Indicator Items
Student Experience (SE)		Students' interest in using ClassPoint in numeracy learnings
		Student learning experience with adding numbers
		Student learning experience with subtracting numbers
		Student learning experience with multiplying numbers
		Students' learning experience with dividing numbers
Learning Pattern (LP)		Skilled in using calculators, fingers and mobile phones
		Skilled in counting without tools
		Study routine every day
		Students learn only if given homework (homework) by the teacher
Teacher Attendance (TP)		Teachers' intensity in assigning numeracy assignments in class using ClassPoint
		Teachers' intensity of attention to student progress.
		Teachers' enthusiasm in delivering numeracy material using ClassPoint
		Teachers' enthusiasm in actively engaging students in learning using ClassPoint.
		Teacher's intensity of teaching
Learning Readiness (LR)		Student preparation using ClassPoint
		Student preparation with numeracy practice problems
		Students without preparation

Variabel		Indicator Items
Learning (LS)	Satisfaction	Student satisfaction with the discussion time given
		Student satisfaction with the time given to ask numeracy questions
		Student satisfaction with the corrected homework

Data Analysis

Respondent data obtained from questionnaire distribution was then processed quantitatively using data analysis techniques, namely descriptive analysis and SEM analysis. Descriptive analysis aims to obtain demographic descriptions or personal characteristics of respondents in the form of percentages. Descriptive analysis serves to classify the objects under study. Meanwhile, SEM analysis serves to observe the influence of each latent variable on the dependent variable. According to Sholihin & Ratmono (2021) and Wang & Rhemtulla (2021), SEM analysis is appropriate for detecting the influence of any latent variable. Furthermore, Wang & Rhemtulla (2021) confirmed that data from 240 respondents will provide sufficient statistical power to detect path coefficients at a significance level of $\alpha = 0.05$ derived from four predictor variables. SEM analysis calculations can be performed using the SmartPLS 4 program.

Population and Sample

The population in this study comprises students across various educational levels ranging from elementary to high school located in rural areas of Papua. A purposive sampling technique was employed, based on the criteria that students participated in numeracy instruction and their schools were situated in rural regions. Wu et al., (2025) explain that purposive sampling is a sampling technique conducted with a specific purpose in mind. This type of sampling offers advantages regarding time and cost efficiency (Hair et al., 2019; Stratton, 2024). The integration of students from various educational levels into the SEM model is grounded in scientific reasoning. Theoretically, the research variables (SE, LP, TP, LR, and LS) represent psychological and pedagogical experiences that are universal in nature and independent of students' cognitive levels at any specific educational stage (Bandura, 1986; Vygotsky, 1980). Previously, Pham et al., (2021) employed a cross-level sampling strategy in a rural region of Vietnam. Furthermore, from a methodological standpoint, SEM-PLS analysis does not require group homogeneity; consequently, variations in educational levels are treated as population heterogeneity during model estimation (Hair et al., 2019). This is because the study's objective is not to compare differences across educational levels, but rather to map the relationships between variables in a general sense within the context of education in rural areas.

RESULTS AND DISCUSSION

Validity

Before the questionnaire was distributed, the instrument was validated by an expert validator. Next, a feasibility test was conducted on 30 respondents to determine its validity and reliability. An instrument item is considered valid if the calculated r value is greater than the table r (Boateng et al., 2018) and if the Cronbach's Alpha (α) value is greater than 0.6, the item is considered reliable (Rajalahti & Kvalheim, 2011; Taber, 2018). The results of the questionnaire instrument feasibility test are presented in Table 2.

Table 2. Feasibility Test Result

Variable	Item	Product Moment (r Table 0,361)	Cronbach Alpha	Information
SE	SE1	0.744	0.937	Valid
	SE2	0.529	0.941	Valid
	SE3	0.840	0.935	Valid
	SE4	0.744	0.937	Valid
	SE5	0.387	0.944	Valid
LP	LP1	0.529	0.941	Valid
	LP2	0.744	0.937	Valid
	LP3	0.840	0.935	Valid
	LP4	0.744	0.937	Valid

Variable	Item	Product Moment (<i>r Table 0,361</i>)	Crobach Alpha	Information
TP	TP1	0.529	0.941	Valid
	TP2	0.529	0.941	Valid
	TP3	0.840	0.935	Valid
	TP4	0.744	0.937	Valid
	TP5	0.744	0.937	Valid
LR	LR1	0.840	0.935	Valid
	LR2	0.324	0.945	Not valid
	LR3	0.840	0.935	Valid
LS	LS1	0.840	0.935	Valid
	LS2	0.529	0.941	Valid
	LS3	0.840	0.935	Valid

Based on Table 2, item LR2 part of the student learning readiness variable failed to meet the validity criteria, showing a validity value of 0.324. This item consisted of a statement regarding students completing numeracy practice questions before attending school. Based on the Pearson product-moment validity test, the calculated *r* value of 0.324 is lower than the *r* table value of 0.361. Consequently, this item could not be used in the study as it did not meet the instrument's validity standards. Meanwhile, the other items met the validity criteria, with values exceeding the critical *r* value of 0.361 (*n* = 30), thereby confirming the instrument's reliability.

Demographics

After passing the feasibility test, the questionnaire was distributed to students as respondents. The distribution was carried out with the assistance of a network of teachers in rural areas of Papua. Based on the distribution of questionnaires, responses were obtained from 240 respondents across several categories. An overview of the respondents' demographic characteristics, along with the percentage for each category, is presented in Table 3.

Table 3. Demographics of respondent characteristics

Component	Category	Total "N=240"	Percentage %
Gender	Male	122	50.83%
	Female	118	49.17%
Ladder Education	Elementary School	97	40.42%
	Junior High School	135	56.25%
	Senior High School	8	3.33%
School Status	State	110	45.83%
	Private (Foundation)	130	54.17%
Tribal Origin	Y	103	42.92%
	H	39	16.25%
	K	32	13.33%
	M	17	7.08%
	Others	49	20.42%

Table 3 reveals a nearly balanced gender distribution among respondents, comprising male (50.83%; *n*=122) and female (49.17%; *n*=118) students, with a difference of only 1.67%. Empirically, this proportional balance suggests that access to education in rural Papua has achieved gender parity, aligning with UNESCO (2020) findings that show gender parity indices across various educational levels approaching equilibrium between males and females. However, these findings must be interpreted within their specific context; extreme geographical conditions and sociocultural norms such as long distances to school and customary practices restrict female mobility, thereby exacerbating dropout rates among girls (Perdana et al., 2019). The female proportion approaching 50% likely reflects a group of girls who have successfully overcome these barriers and remained in school.

The distribution of respondent schools shows that the majority came from based private schools (54.17%; $n=130$) compared to state schools (45.83%; $n=110$). Historically, this reflects the central role of religious mission-based educational institutions in building and maintaining educational infrastructure in the rural of Papua (Reza, 2018). It appears that the government faces limited reach of public services to inland areas where private institutions under the foundation are more adaptive in filling the gaps in dealing with geographical challenges. Badan Pusat Statistik (2024) notes that the ratio of private schools is higher than public schools based on the national average. According to DiMaggio & Powell (1983) institutional theory, the dominance of private schools indicates that the institutional norms, values and practices brought by the organization have become the main framework for the local education system in shaping the learning culture, teacher-student interaction patterns and school management structures in the region.

The distribution of respondents by tribal group indicates that the Yali tribe constitutes the largest group (42.92%; $n=103$), followed by the Hubla (16.25%; $n=39$), Kimyal (13.33%; $n=32$), and Momuna (7.08%; $n=17$) tribes, with other tribal groups comprising the remainder (20.42%; $n=49$). The Yali is the most populous tribal group inhabiting the rural regions of Papua (Badan Pusat Statistik, 2024). (Reza, 2018) explains that tribal differences in Papua are not merely cultural rather, they encompass variations in language, customary values, and the nature of the relationship between individuals and their learning environments. Vygotsky (1980) theorized that the construction of student knowledge is heavily determined by the sociocultural context in which students develop. Thus, tribal diversity reinforces the argument that findings regarding numeracy learning patterns and satisfaction cannot be generalized; instead, they must be interpreted from a conditional perspective that considers ethnocultural factors as potential mediating aspects.

Structural Model

The next data analysis is to use SEM analysis to determine the structural model specifications of the relationships between variables. SEM analysis in this research uses the help of the SmartPLS 4.0 software application to simplify data processing (Harahap, 2020). In this research, the latent variables and dependent variables are presented in the structural model as follows.

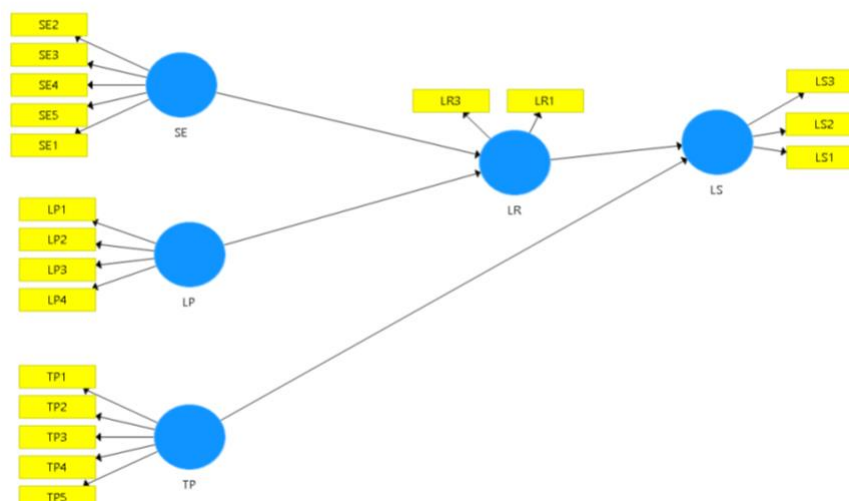


Figure 1. Model Structural

Based on Figure 1, the research's structural model depicts three primary paths of influence. SE and LP influence LR acting as a mediating construct and while TP directly influences LS. This structural model is built on the premise that learning readiness serves as a cognitive and motivational prerequisite linking students' learning experiences and learning patterns to their learning satisfaction (Suhandiah et al., 2022; Yilmaz, 2017). The role of LR as a mediator reflects the view that learning experiences do not directly enhance satisfaction; rather, they must first foster adequate learning readiness. Conversely, teacher attendance is directly linked to learning satisfaction, as the physical attendance of teachers in rural Papua plays an irreplaceable role in fulfilling students' basic learning needs (Ryan & Deci, 2000). Subsequently, an outer model analysis

was conducted to determine the strength of the relationship between the latent variables and the dependent variable using path coefficient values. The overall results of the outer model analysis are presented in Figure 2.

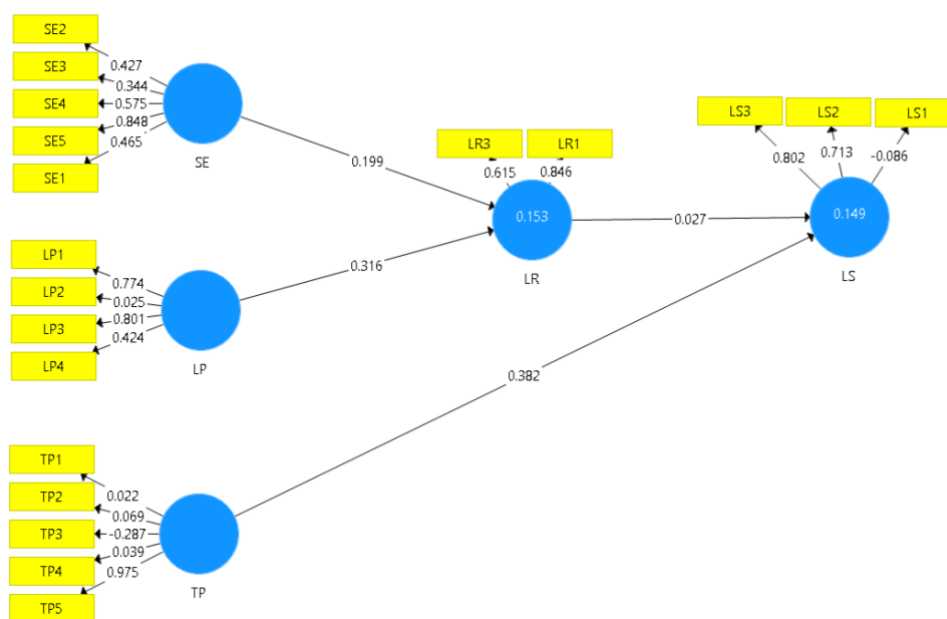


Figure 2. Overall Outer Model Testing

Based on Figure 2, the path coefficient value for the effect of SE on LR is 0.199, indicating that learning experience influences student learning readiness by 19.9%. This finding aligns with Yilmaz (2017), who revealed that learning experience positively affects student readiness by enhancing self-efficacy and reducing uncertainty during technology-mediated learning interactions. Students with experience in technology-based learning are better prepared to use ClassPoint interactively during lessons and are capable of providing immediate responses via the available features. Suhandiah et al., (2022) posited that students' experience with independent learning is a determinant of their learning readiness. The accumulated learning experiences of students can serve as a meaningful foundation for their learning readiness when using ClassPoint. Consequently, students can flexibly apply their mathematical knowledge and communication skills to solve problems (Sumaji et al., 2020; Suwanti et al., 2024). With adequate learning readiness, students will naturally find it easier to comprehend various materials and discover diverse solutions (Shakeel et al., 2023). The practical implications of ClassPoint impact on student readiness can develop progressively through the positive experiences gained during lessons utilizing the platform.

The value of path coefficient for the relationship between LP and LR is 0.316, meaning that there is an influence of 31.6% for the students' learning pattern affecting the learning readiness of the students. This shows that learning pattern is the strongest predictor of learning readiness and is consistent with the theoretical background of the learning pattern perspective (Vermunt & Donche, 2017). Students who are used to applying self-learning approaches show higher cognitive readiness in engaging in the learning process. As stated by Ryan & Deci (2000), students who have structured learning patterns usually have higher self-motivation and competence in learning. In numeracy learnings, students who are used to organizing their calculation method themselves and engage in ClassPoint-based learning will be able to foster their learning readiness. The involvement of the students in ClassPoint needs active responses rather than passive ones (Bong & Chatterjee, 2022; Mazlan et al., 2023). In practice, the teachers in the rural areas of Papua can build learning patterns through daily activities, good study habits and peer learning which will highly build the students' learning readiness in ClassPoint.

The value of the path coefficient between TP and LS is 0.382, meaning that teacher attendance has an influence on the students' satisfaction with the numeracy learning by 38.2%. The result is in line with findings by Jiménez-Bucarey et al. (2021), who showed that teacher attendance was the

most prominent predictor of students' learning satisfaction at different educational levels. The role of teacher attendance and performance as predictors of the quality of the learning process is also confirmed by Alwi and Mumtahana (2023). Research by Pham et al. (2021) conducted among students in rural Vietnam found that teacher attendance was a stronger predictor of satisfaction than other teaching quality variables. From the theoretical point of view, teacher attendance is a vital component that should be considered in any learning process. It is because the teacher attendance makes possible the satisfaction of students' basic needs such as a need to be noticed, appreciated and supported (Erez & Judge, 2001; Sockalingam, 2013). It is a necessary condition for motivation and positive experiences in learning that lead to satisfaction with the learning process (Ryan & Deci, 2000). Learning satisfaction is associated with academic performance (Ko & Chung, 2014; Maki et al., 2000). Furthermore, the effectiveness of using ClassPoint in instruction depends on the availability of school infrastructure. This is because the application requires students to use smartphones or computers to participate by entering a class code and creating a username (Bong & Chatterjee, 2022). To maximize the impact of ClassPoint, schools must prioritize the teacher's attendance as a central element of technology-enhanced learning, as their physical presence in the classroom is irreplaceable (Amirudin et al., 2024).

The value of path coefficient relating learning readiness (LR) and learning satisfaction (LS) is 0.027, showing that the impact of learning readiness on the learning satisfaction of students is just 2.7 percent. This extremely low value signifies that learning readiness fails to predict learning satisfaction. This is possibly the most important outcome of the research, since it shows that learning readiness does not act as a mediator between learning experiences and learning patterns and learning satisfaction of the learners. This is against the predictions of most models of learning satisfaction, whether traditional or e-learning. Previous studies have identified learning readiness as a positive predictor of learning satisfaction (Suhandiah et al., 2022; Yilmaz, 2017). From a methodological perspective, the use of a dichotomous scale in the study contributed to the weak SEM estimate for this path. Dichotomous scales limit the variation in score distributions, thereby restricting the covariance between learning readiness and learning satisfaction and tending to reduce the path coefficient (Vetter, 2017). Limitations in measurement accuracy should be taken into account when interpreting this very small path coefficient value.

Following the outer model assessment, the structural model was tested to determine whether the hypotheses were significant or not significant (Sulistiani et al., 2023). The overall results of the structural model assessment are presented in Figure 3.

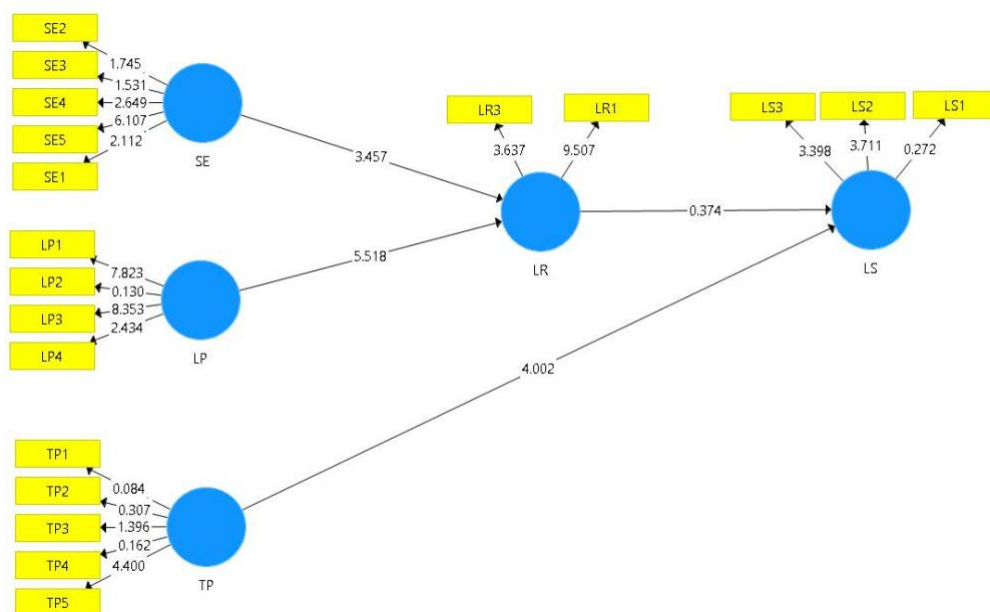


Figure 3. Overall Model Structural Testing

Based on the structural model in Figure 3, the four proposed hypotheses were tested, involving SE, LP, TP, and LR as latent variables, and LR and LS as dependent variables. The hypothesis test results are presented in Table 4.

Table 4. Hypothesis Test Result

Hypothesis	T-Values	P-Values	Decision
SE -> LR	3.457	0.002	Significant
LP -> LR	5.518	0.000	Significant
TP -> LS	4.002	0.000	Significant
LR -> LS	0.374	0.705	Not significant

Based on Table 4, four hypotheses were proposed three were Significant, and one was not significant. The test results for H1 show a t-value of 3.457 for the relationship between SE and LR, exceeding the 1.96 threshold, thereby leading to the acceptance of H1. This indicates a significant influence of learning experience on the learning readiness of students across various educational levels. These findings align with the earlier study by Ramadan et al. (2024), which identified a correlation between online learning readiness and student learning experience. Based on cognitive accumulation theory, students with extensive learning experience both in terms of conceptual mastery and the use of ClassPoint develop robust cognitive schemas, thereby reducing psychological barriers when facing new tasks Suhandiah et al., (2022). Furthermore, positive learning experiences bolster students' self-confidence, time management skills, and learning autonomy, all of which are components of learning readiness (Ali, 2016; Amka & Dalle, 2021; Chung et al., 2020; Suhandiah et al., 2022).

The results of the H2 test indicate that the t-value between LP and LR is 5.518 exceeding the 1.96 threshold thereby leading to the acceptance of H2. These findings confirm that students' study patterns significantly influence their learning readiness across various educational levels. The magnitude of this influence suggests that study patterns are a stronger predictor of learning readiness than prior learning experiences. Structured study patterns such as daily study routines, frequent practice of calculations using specific tools, and independence in completing assignments shape an individual's cognitive and affective patterns, directly supporting students' readiness to engage with new learning material (Junaedi et al., 2023; Vermunt & Donche, 2017). This aligns with Wahyuningrum & Fitriyah (2023), who suggest that students' learning patterns depend on directed instruction and the study practices they employ. Most students in rural areas of Papua tend to learn through rote memorization, though these patterns may shift over time due to environmental or social changes (Marambe et al., 2012; Song & Vermunt, 2021).

The results of the H3 test indicate that the t-value between TP and LS is 4.002 exceeding the 1.96 threshold meaning H3 is Significant. This demonstrates that teacher attendance significantly influences student satisfaction with numeracy learning using ClassPoint across various educational levels. Teacher attendance emerges as the strongest predictor of learning satisfaction in this model. In an educational setting, instructors such as teachers or lecturers play a pivotal role as presenters of instructional material and as role models when making assessments and professional decisions (Fitria & Suminah, 2020; Gui et al., 2020; Le et al., 2023; Marschall, 2022). A teacher's physical attendance helps meet students' basic needs, a prerequisite for the development of learning satisfaction (Erez & Judge, 2001; Ryan & Deci, 2000). In the rural of Papua, inter-tribal conflicts frequently occur, leading to inconsistent teacher attendance as many schools are closed for security reasons (Reza, 2018; Nursanti & Pudjibudojo, 2021). This situation is clearly detrimental to students, for whom teacher attendance is an indispensable prerequisite and a key benchmark for learning satisfaction.

In contrast the three previous hypotheses, the test results for H4 show that the t-value for the relationship between LR and LS is 0.374 below the 1.96 threshold leading to the rejection of the hypothesis. This indicates that student learning readiness does not significantly influence satisfaction with numeracy learning using ClassPoint across various educational levels. This finding contradicts theoretical predictions in online learning satisfaction literature, which identify learning readiness as a predictor of satisfaction (Siron et al., 2020; Suhandiah et al., 2022). This result may be attributed to a specific contextual factor: when teacher attendance is included in the model, its

contribution is dominant, overshadowing the variance that would otherwise be explained by learning readiness. Especially in rural areas, the uncertainty regarding teacher attendance is so high that student readiness becomes less relevant; this is because the opportunity to trigger the positive impact of learning satisfaction is lost due to the use of a dichotomous scale. Vetter (2017) notes that the use of a dichotomous scale can limit the covariance between learning readiness and student numeracy learning satisfaction, potentially preventing the optimal detection of theoretically existing relationships. Furthermore, learning readiness depends on family learning support, which shapes students' learning patterns (Agustin et al., 2023) these patterns are in turn used to identify collaborative problem-solving (Hero & Lindfors, 2019; Wijaya et al., 2022). These results naturally influence the role of LR as a mediator linking the latent variable to the dependent variable. Based on Figure 3, two hypotheses involve LR as a mediator, and the results of the hypothesis testing are presented in Table 5.

Table 5. Indirect effect result

Hypothesis	T-Values	P-Values	Decision
SE -> LR -> LS	0.314	0.754	Not significant
LP -> LR -> LS	0.351	0.725	Not significant

Based on Table 5, two hypotheses involving LR as a mediator were tested, and both were not significant because the t-values were below 1.96. This indicates that LR does not mediate the effect of SE on LS or the effect of LP on LS. These findings differ from previous studies that reported a correlation between online learning readiness and student learning satisfaction (Siron et al., 2020; Suhandiah et al., 2022). The underlying reason for the rejection of LR as a mediator is that the teacher's attendance in the structural model makes a dominant contribution, thereby overshadowing the variance that would otherwise be explained by learning readiness. In the case of Papua, the uncertainty about teachers' presence makes the student's readiness irrelevant because it means that one cannot benefit from the effects of readiness on learning satisfaction in any way. Additionally, using a dichotomous scale in the study affects the distribution and thus reduces covariance between the variables of readiness and learning satisfaction (Vetter, 2017). However, despite the mentioned limitations, the test results, which are shown in Table 4, prove the influence of SE on LR and LP on LR. The results of the research have important implications for practitioners of education in Papua because improving students' satisfaction with numeracy learning requires teachers' regular presence. Teacher professional development programs in rural areas require the support of security policies and adequate incentives to ensure greater consistency in teacher attendance. Furthermore, students' learning experiences and study habits need to be strengthened, as these factors shape learning readiness a cognitive prerequisite even though such readiness does not directly drive satisfaction with numeracy learning. Furthermore, it is recommended to develop research instruments using a Likert scale to optimize the sensitivity of SEM-PLS in detecting relationships between variables in rural areas.

LIMITATIONS

This study focuses on the analysis of learning experiences, student learning patterns, teacher attendance, and learning readiness that influence students' numeracy learning satisfaction using ClassPoint. Future instrument development is needed, prioritizing the design of TP, LS, LP, and SE indicators using a simplified Likert scale specifically for rural students before conducting further SEM analysis. The research subjects were limited to students in one of the rural areas of Papua. A broader geographic scope is needed, including East Nusa Tenggara, Maluku, and the rural of Kalimantan, to generalize these findings. Furthermore, this study focused on student satisfaction with numeracy learning and did not directly analyze student learning outcomes or numeracy abilities. This is because the research findings only represent student perceptions and experiences based on the answers provided to the questionnaire used as the research instrument. Therefore, future research should complement self-reports with teacher attendance records, direct observation records, and objective numeracy assessment scores.

CONCLUSION

This study aims to examine the influence of student learning experience, learning patterns, teacher attendance, and student learning readiness on student satisfaction with numeracy learning using ClassPoint in rural Papua. It can be seen that student learning experience and learning pattern were found to have a significant relationship with learning readiness, whereas teacher attendance had a significant relationship with learning satisfaction. On the other hand, there was no significant relationship between learning readiness and learning satisfaction, nor did learning readiness act as a mediator for the relationship between student learning experience or learning pattern and learning satisfaction. It can be concluded from the above findings that teacher attendance was a significant contextual variable affecting the students' satisfaction towards their numeracy learning process, whereas learning readiness could not always guarantee increased levels of satisfaction. However, these findings need to be taken with caution due to the fact that some of the constructs had poor outer loadings on the measurement model.

AUTHOR CONTRIBUTIONS

The main contributions from RY and CS involved formulating the research, devising methodology, and conducting analysis. Resources for conducting research have been provided by both RY and CS. EH and IMS helped in presenting the data, whereas CS supervised the whole research work. Manuscript writing was mainly done by RY with input from CS, EH, and IMS.

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