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Integration of ICT in Teaching for Pupils' Learning Engagement

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ABSTRACT

This study was conducted to determine the integration of ICT in teaching for pupils' learning engagement. Complete enumeration sampling was used in the study to obtain the total of 137 Grade IV teachers from Antipas District, Arakan East, Arakan North, Arakan West, Magpet West District, Magpet East, President Roxas Central District, President Roxas South and President Roxas North as teacher and pupils-respondents. Mean and weighted mean were used to determine the influence of integration of ICT in teaching on pupils' learning engagement. The study utilized Pearson correlation coefficient and multiple linear regression analysis to test the hypotheses.

There is a significant relationship between the integration of ICT and pupils' learning engagement in terms of active participation, self-regulation, attentiveness and proactive learning. There is also a significant influence on ICT integration in terms of planning, classroom instruction, test construction, assessment evaluation and reporting and the pupils' learning engagement in terms of active participation, self-regulation, attentiveness and proactive learning.

Based on the study's findings, it is recommended that educational institutions strengthen the integration of ICT in the curriculum, support teacher training for effective ICT use in instruction, and provide students with access to digital resources to enhance engagement and self-directed learning. Additionally, ongoing professional development in ICT-based assessment tools is encouraged to improve evaluation practices and learning outcomes.

Keywords: ICT-based Assessment, Integration of ICT, Pupils' Learning Engagement

INTRODUCTION

Integrating ICT in teaching improves students' learning engagement. Therefore, the use of ICT in the classroom can increase students' motivation and engagement in the learning process when correctly used considering the learners' skills in learning with ICT support, Janosz, Boulerice, and Morin (2019) noted that half of teenagers engage in learning. As a result, this observation is an essential aspect of understanding pupils' level of engagement and learning performance. Additionally, Bagamba and Ayebare (2021) found poor learning engagement and knowledge retention. Moreover, the children in the elementary level in the Philippines struggle with ICT use because of insufficient classroom ICT resources. This situation contributes to low learning and information retention.

Particularly, the scarcity of modern teaching tools and technology adversely affects students' engagement in learning to enhance their knowledge and skills (Dalton & Smyth, 2018). Generally, limited ICT teaching resources affect the teachers' way of facilitating learning in the classroom. The limited access to resources contributes to a low learning engagement of pupils.

Many studies have been conducted to determine the impact of ICT on student learning outcomes, engagement, and knowledge retention. However, there are still some research gaps such as teachers and learners' capabilities in utilizing ICT in the classroom that needs to be addressed (Ahmad & Othman, 2020). Hence, this study will be conducted to determine the level of pupils learning engagement through the integration of ICT in teaching and learning.

Theoretical Framework

The theory of Robot-Enhanced Learning supports the integration of ICT in teaching for pupils' learning engagement. This theory posits that the use of robots or other interactive technologies in the classroom can increase students' motivation, engagement, and overall learning outcomes. Technology has rapidly advanced in recent years and has become an integral part of our daily lives. As a result, it has also become increasingly important to incorporate technology in educational settings to enhance learning and prepare students for the future. One approach to achieve this is through the use of robots as tools for teaching and learning. The integration of Information and Communication Technology (ICT) through the use of robots, known as Robot-Enhanced Learning (REL), has gained attention in educational research as a means to engage students in learning (Ertel, 2019).

Robot-Enhanced Learning is defined as the integration of robots and technology in educational settings to enhance learning experiences. This approach combines the use of traditional teaching methods with technology to create a more interactive and engaging learning environment. It aims to increase students' participation, motivation, and understanding of complex concepts by providing them with hands-on experience(Smith, 2020).

METHODOLOGY

This chapter presents the research design, locale of the study, respondents of the study, research instrument, sampling procedure, data gathering procedure and statistical tool of the study.

Research Design

This study employed a descriptive-correlational research design. A descriptive-correlational study looks into the relationship between two or more variables. It comprises using statistics to identify relationships between variables. Descriptive-correlational research can aid in the prediction of behavior by identifying the degree and direction of correlations that can influence decisions and policies. It is classified as a descriptive study because it reported the degrees of instructional method practices and students' reading comprehension. The Spearman Rho and multiple linear regression analysis will be used to evaluate the study's hypotheses. Because the research questions are generated based on patterns in the study site, a descriptive-correlational research approach is applied. Creswell (2016) emphasized that this method is employed when a researcher wants to select a study subject based on a field pattern or explain why something happens.

Locale of the Study

This study was conducted in Antipas District, Arakan East, Arakan North, Arakan West, Magpet West District, Magpet East, Prsesident Roxas Central District, President Roxas South and President Roxas North.

Respondents of the Study

The respondents were the Grade four (4) elementary school teachers from Antipas, Arakan East, Arakan West, Arakan North, President Roxas Central, President Roxas North, President Roxas South, Magpet West, Magpet North and Magpet East District, Cotabato.

Data Distribution of the Respondents of the Study

District	No. of Teachers	No. of Teachers Respondents
Antipas	186	21
Arakan East	110	11
Arakan West	88	12
Arakan North	123	24
Magpet East	167	24
Magpet West	173	24
President Roxas Central	100	14
President Roxas North	115	18
President Roxas South	134	13
Total	**1196**	**161**

Sampling Procedure

This study used the complete enumeration sampling. The respondents were purposively chosen to include all the teachers in each school. Complete Enumeration in its entirety a form of purposive sampling approach in which the researchers examine the entire population with a specific set of characteristics is known as sampling. When employing full enumeration, these units are almost always individuals.

Research Instruments

The data were gathered through the used of survey questionnaires. The researchers utilized self-structured survey questionnaire patterned from varied resources such as journal, related studies, and internet subjected for validation in determining the reliability indicator using the Cronbach Alpha. Internal consistency, or how tightly a set of objects are related, is measured by Cronbach's alpha. It is used to determine the scale's reliability. The questionnaire undergone reliability test using an alpha value of 0.899 and validated by experts in the field, the pilot test conducted to the 20% of the respondents of the study.

Part 1 designed for data collection on the level of ICT integration in terms of planning, classroom instruction, test construction, assessment evaluation and reporting. Using the likert Scale: 5- Highly Practiced, 4 Practiced, 3- Moderately Practiced, 2-less practiced and 1- least practiced.

Likert Scale of the level of ICT Integration

Level	***Qualitative Description***	***Qualitative Interpretation***	***Percentage***
5	Highly Practiced	The respondent strongly agree the item described from 81%-100% level.	*81 -100%*
4	Practiced	The respondent agree the item described from 61%-80% level.	*61 - 80%.*
3	Moderately Practiced	The respondent moderately agree the item described from 41%-60% level.	*41- 60%.*
2	Less Practiced	The respondent disagree the item described from 21%-40% level.	*21- 40%*
1	Least Practiced	The respondent was strongly disagree the item described.	*1 - 20%*

Part II was designed to determine the level of pupils' learning engagement in terms of active participation, self-regulation, attentiveness and proactive learning using the likert scale of 5.

Likert Scale of Pupils' Learning Engagement

Level	***Qualitative Description***	***Qualitative Interpretation***	***Percentage***
5	*Highly engaged*	*The activity is experienced at a very extensive level from*	*81 -100%*
4	*Engaged*	*The activity is experienced at an extensive level only from*	*61 - 80%.*
3	*Moderately Engaged*	*The activity is experienced at a moderate level from*	*41- 60%.*
2	*Less Engaged*	*The activity is rarely experienced from*	*21- 40%*
1	*Least Engaged*	*The activity is never experienced or at a limited level from*	*1 - 20%*

Data Gathering Procedure

The researchers conducted the data collection procedure. Before the data collection, the researchers requested permission to conduct the study. This request was forwarded to the Cotabato Division Schools Superintendent for approval. After approval, the researchers sent copies of the authorized message to the relevant Public-school district supervisors and school heads for their records and provided suitable direction to the researchers and the study's target respondents.

The questionnaire pre-test were thoroughly produced by the researchers, and covered topics such as locations, dates, test formats, responder-recruitments, and participant counts. Then, decided who took the pre-test and looked for people who met the study's inclusion criteria. The researchers also administered a shortened version of the questionnaire to participants in order to identify any areas for improvement or misinterpretation.

The researchers personally presented the questionnaires to the target-respondents after a briefing on how to fill out the survey-questionnaires. The health protocol were followed during the study survey. Finally, after the respondents have completed the questionnaires, the researchers personally retrieved. The information/data were compiled and statistically analyzed.

Statistical Analysis

The following statistical tests were used in data interpretation and analysis. The level of ICT integration and pupils' learning engagement were determined using the Weighted Mean method. A weighted average is a calculation that takes into account the relative value of the integers in a data set. When computing a weighted average, each value in the data set is multiplied by a preset weight before the final computation.

The Pearson correlation coefficient was used to test the study's hypotheses. The Pearson coefficient is a measure of the strength and direction of the linear relationship between two variables that makes no assumptions about causality to ascertain the existence of a substantial relationship between the study's independent and dependent variables (Terrell, Schultheis, & Steinhorn, 2017).

Multiple linear regression analysis was used to identify the significant influence of the components indicated in the study. Use a correlation or a simple linear regression analysis to determine whether two numerical variables are significantly linearly related. A correlation analysis evaluates the strength and direction of a linear link between two variables (Marques, 2019).

DISCUSSION

Levels of ICT Integration

Table 1 presents the data to answer research problem number one. The data indicate that ICT integration was highly practiced in schools. The report is supported by the indicated weighted means and the derived overall mean (4.41)

This implies that the teachers strongly adhere to the utilization of advanced technology in the classrooms.

Table 1. Summary of the Levels of **ICT Integration**

	ICT Integration	Weighted Mean	Description
1	Planning	4.41	Highly Practiced
2	Classroom Instruction	4.32	Highly Practiced
3	Test Construction	4.28	Highly Practiced
4	Assessment and Evaluation	4.53	Highly Practiced
5	Reporting	4.53	Highly Practiced
	Overall Weighted Mean	**4.41**	**Highly Practiced**

Level of Pupils' Learning Engagement

This section answers the second research question. The first part focused on the level of pupils' learning engagement, which includes active participation, self-regulation, attentiveness, and proactive learning.

Active Participation

The data in Table 2 reveal that the level of pupils' learning engagement as to active participation had a weighted mean of 4.41 showing a highly engaged action to learning. The respondents-initiated class activities and discussions and presented analysis through concept mapping. Some respondents asked questions to gain confidence in sharing ideas and being involved in class discussions and activities.

Moreover, the data in Table 2 emphasize that fostering an interactive learning environment can significantly enhance students' confidence in sharing ideas in collaborative discussions and develop critical thinking skills for academic success. They also encourage students to interrogate based on the presented lesson to build self-confidence and underscore the importance of a supportive educational atmosphere that values inquiry and dialogue.

The discussed results in Table 2 align with current educational theories emphasizing student-centered learning approaches, which advocate for active engagement to enhance learning outcomes. Therefore, there is a need to implement strategies that encourage student participation and collaboration, thereby cultivating a classroom culture that prioritizes knowledge sharing and collective learning (Almarza & García, 2019).

Table 2. Level of Pupils' Learning Engagement in terms of Active Participation

	A. Active Participation	Mean	Description
1.	Involvement in class discussions and activities.	4.39	Highly Engaged
2.	Asking questions to gain confidence in sharing ideas.	4.40	Highly Engaged
3.	Relating lessons to their prior knowledge.	4.36	Highly Engaged
4.	Working well in group activities and projects.	4.42	Highly Engaged
5.	Initiating class activities and discussions.	4.45	Highly Engaged
6.	Presentation of analysis through concept mapping.	4.45	Highly Engaged

MEAN			**4.41**	**Highly Engaged**
Level	Range	Description		
5	4.21-5.00	Highly Engaged		
4	3.41-4.20	Engaged		
3	2.61-3.40	Moderately Engaged		
2	1.81-2.60	Less Engaged		
1	1.00-1.80	Least Engaged		

Insert discussion here for table 3

Table 3. **Pupils' Learning Engagement**

	ICT Integration	**Weighted Mean**	**Description**
1	Active Participation	**4.41**	Highly Engaged
2	Self-Regulation	**4.40**	Highly Engaged
3	Attentiveness	**4.07**	Engaged
4	Proactive Learning	**4.41**	Highly Engaged
	Overall Mean	**4.32**	Highly Engaged

Significant Relationship of ICT Integration and Pupils'

Learning Engagement

The third research problem focused on finding the significant relationship between ICT integration and pupils' learning engagement. The Pearson Correlation Analysis was used to test the stated hypotheses (Table 14).

ICT Integration and Planning

Table 14 discloses the relationship between ICT integration and pupils' learning engagement. The correlation matrix shows that ICT integration and pupils' learning engagement in terms of planning had a significant relationship with the parameters used to measure the active participation (r=**0.60**** with p-value=0.00), self-regulation (r=**0.52**** and p-value=0.00), attentiveness (r=**0.46**** and p=0.00), and proactive learning (r=**0.56**** and p=0.00).

The result means that ICT integration and pupil learning engagement had a significant relationship with active participation, self-regulation, attentiveness, and proactive learning. The presented probability values that are less than the set 5% significance level show that the hypothesis on this aspect of the study is rejected. Therefore, there is a significant relationship between ICT integration in planning and pupil learning engagement.

Further analysis of the results suggests that ICT in educational planning is linked to increased student active participation, enhanced interaction, and collaboration. This integration also implies the development of self-regulation skills, allowing students to manage their learning independently. Using digital tools also enhances attentiveness and fosters students' ability to maintain focus during lesson presentations and discussions. The engaging nature of multimedia and interactive content in ICT-based planning enhances learners' concentration.

Furthermore, there is a strong correlation between ICT integration and proactive learning. This indicates further that the students take initiative in learning, seek out additional information, ask questions, and explore topics independently.

Technology facilitates collaborative learning opportunities that enhance participation and overall engagement. Self-regulation is essential for effective learning, allowing students to set goals, self-monitor, and reflect on their performance. Interactive technologies can sustain students' attention and interest in the subject matter (Wang & Wu 2019).

ICT Integration and Classroom Instruction

The relationship between ICT integration and pupils' learning engagement is illustrated in the table. The correlation matrix shows that ICT integration and pupils' learning engagement in terms of classroom instruction has a significant relationship with the parameters used to measure the active participation (r=**0.50**** - p=**0.00**), self-regulation (r=**0.44**** - p=**0.00**), attentiveness (r=**0.47**** - p=**0.00**), proactive learning (r=**0.55**** - p=**0.00**). These results indicate a moderate positive correlation, suggesting that as ICT integration increases, so do the levels of pupils' engagement in these dimensions.

It implies that utilizing digital tools can enhance student engagement by facilitating collaborative learning experiences. Students who leverage ICT tools tend to develop better self-regulatory skills, enabling them to set goals, monitor their progress, and adjust their learning strategies. Interactive technologies can capture students' attention more effectively than traditional teaching methods. Technology facilitates access to resources, enabling students to seek information independently and engage in deeper learning.

Blikstein and Worsley (2018) emphasize that interactive digital tools can foster more active and self-regulated learning behaviors. ICT-enhanced instruction improves attentiveness and engagement by providing personalized and dynamic learning experiences. Technology-supported learning environments encourage independent exploration and critical thinking.

ICT Integration and Test Construction

The data in table 14 depict the relationship between ICT integration and pupils' learning engagement. The correlation matrix shows that ICT integration and pupils' learning engagement in terms of test construction had a significant relationship with the parameters used to measure the active participation (pr=0.59**, probability=0.00) self-regulation (pr=0.51**, probability=0.00), attentiveness (pr=0.65**, probability=0.00), and proactive learning (pr=0.57**, probability=0.00)

It implies that the integration of ICT enhances key elements of student engagement. Particularly, it is observed in fostering attentive, self-regulated, and proactive learning behaviors, aligning with the literature on ICT's impact on educational outcomes.

Vrasidas (2020) affirms that the incorporation of technology in education significantly enhances student motivation, active learning, and engagement. ICT tools, by supporting interactive and individualized learning experiences, contribute to the development of essential skills such as attentiveness and self-regulation.

ICT Integration/Assessment and Evaluation

Table 14 depicts the relationship between ICT integration and pupils' learning engagement. The correlation matrix shows that ICT integration and pupils' learning engagement in terms of assessment and evaluation has a significant relationship with the parameters used to measure active participation (pr=0. 0.68**, probability=0.00) self-regulation (pr=0.63**, probability=0.00), attentiveness (pr=0.53**, probability=0.00), and proactive learning (pr=0.68**, probability=0.00).

It implies that the high positive correlation values for active participation and proactive learning suggest that when ICT tools are effectively integrated into assessment practices, students are more likely to engage actively and take the initiative in their learning processes. Self-regulation also shows a strong correlation, indicating that students who use ICT tools in assessments are better at managing their learning strategies and tracking their progress.

Johnson and Smith (2019) emphasized that ICT tools foster greater attentiveness in students by providing interactive and engaging assessment methods. The current results contribute to this body of knowledge by demonstrating that the specific parameters of learning engagement are positively influenced by ICT integration during assessments.

ICT Integration and Reporting

Table 14 illustrates the relationship between ICT integration and pupils' learning engagement. The correlation matrix shows that ICT integration and pupils' learning engagement in terms of reporting has a significant relationship with the parameters used to measure active participation (pr=0. 0.71**, probability=0.00) self-regulation (pr=0.62**, probability=0.00), attentiveness (pr=0.57**, probability=0.00), and proactive learning (pr=0.66**, probability=0.00). All factors exhibit statistically significant correlations with ICT integration, as evidenced by the probability values (p=0.00). These findings indicate that the more ICT is integrated into reporting processes, the higher the levels of engagement across these parameters.

The findings imply that the strong positive correlations suggest that ICT integration in reporting enhances pupils' ability to engage actively in learning tasks. This is aligned with findings from recent literature, which show that ICT tools foster real-time feedback, interactive learning environments, and collaborative opportunities that promote active learning. Further, the interpretation signifies that as the ICT integration in the classroom increases, the learning engagement of pupils also tends to increase.

ICT facilitates self-regulation, providing students with tools to monitor their progress, set goals, and adjust learning strategies. Tools like learning management systems allow students to access resources at their own pace, promoting self-regulation and attentiveness. The literature further supports that the use of digital tools like quizzes and assignments enhances attentiveness by maintaining students' focus through engaging formats. Lastly, proactive learning is nurtured as students are encouraged to take initiative and explore topics independently, often supported by adaptive technologies (Miller & Bartlett, 2020).

Table 14. Correlation Matrix Showing the Relationship between ICT integration and pupils' learning engagement

ICT Integration		Active Participation	Self-Regulation	Attentiveness	Proactive Learning
Planning	Pearson r	**0.60****	**0.52****	**0.46****	**0.56****
	Probability	0.00	0.00	0.00	0.00

	N	206	206	206	206
	Pearson r	**0.50****	**0.44****	**0.47****	**0.55****
Classroom Instruction	Probability	0.00	0.00	0.00	0.00
	N	206	206	206	206
	Pearson r	**0.59****	**0.51****	**0.65****	**0.57****
Test Construction	Probability	0.00	0.00	0.00	0.00
	N	206	206	206	206
	Pearson r	**0.68****	**0.63****	**0.53****	**0.68****
Assessment and Evaluation	Probability	0.00	0.00	0.00	0.00
	N	206	206	206	206
	Pearson r	**0.71****	**0.62****	**0.57****	**0.66****
Reporting	Probability	0.00	0.00	0.00	0.00
	N	206	206	206	206

**= highly significant

Significant Influence of ICT Integration on Pupils' Learning Engagement

The fourth research problem focused on determining the significant influence of ICT integration on pupils' learning engagement. The study used regression analysis to derive answers.

Influence of ICT Integration on Active Participation

Table 15 discloses the combined effect of ICT integration, which manifests a significant influence on pupils' learning engagement (F=49.901 with p=0.000**). The derived probability value (0.000**) is less than the set 1% level of significance. Therefore, the hypothesis in this aspect of the study was rejected.

Moreover, the regression coefficient R^2 = 0.555 exemplifies that ICT integration accounted for only 55.50% of the determinants on pupils' learning engagement. The remaining 44.50% is attributed to other factors not included in the model used in this study.

Furthermore, active participation and planning (t-value=2.13 with p=0.03*), test construction (t=2.63 with r=0.01**), test construction, and reporting (t=-3.41 and r=0.000**) emerged as vital predictors of pupils' learning engagement in terms of active participation, which implies that creating more engaging and interactive lesson plans that cater individual needs by Incorporating technology into the teaching and learning processes more likely students can engage in learning resulting in a better performance in class participation. Additionally, the findings imply that increased ICT integration in all class sessions as well as collaborative planning involving the technology specialist increase the pupils' learning engagement.

Finally, the findings in this aspect of the study confirm the claim of Dang and Zhun (2019) that the integration of ICT in lesson planning can enhance the quality of lessons and enable teachers to create more learner-centered activities. As the teachers use ICT tools in their lesson planning process, more likely, they can focus on creating lessons that promote higher-order thinking skills, student collaboration, and active learning, which suggests that the use of ICT in the planning is vital.

Table 15. Influence of ICT integration on pupils' learning engagement in terms of active participation

	Coef. B	**Std. Error**	**t – value**	**Probability**
Teachers' Burnout				
(Constant)	0.68	0.25	2.73	0.01
Planning	0.16	0.07	2.13	0.03*
Classroom Instruction	0.05	0.04	1.23	0.22^{ns}
Test Construction	0.14	0.05	2.63	0.01**
Assessment and Evaluation	-0.18	0.19	-0.97	0.34^{ns}
Reporting	0.67	0.20	3.41	0.00**

R^2 = *0.555* * = *significant*

Probability = 0.000 *** = highly significant*

F – Value = 49.901 *ns = not significant*

Self-Regulation

The coefficient matrix in Table 16 discloses that pupils' learning engagement in terms of self-regulation and assessment and evaluation (P=.03*, t value=-2.26) has a significant influence. Therefore, the hypothesis of the study was rejected, since the computed probability value (0.000**) is less than the set 1% level of significance.

It implies that self-regulation, a critical component of effective learning, is often linked to students' ability to manage their time, attention, and learning strategies. The results indicate that when assessment and evaluation methods encourage self-regulation, they positively impact engagement. These findings align with Pintrich (2018) model of self-regulated learning, which emphasizes the role of metacognitive control in academic success. Self-regulation is a critical factor in students' ability to engage effectively in learning tasks, including assessments.

Table 16. Influence of ICT integration on pupils' learning engagement in terms of self-regulation

	Coef. B	**Std. Error**	**t – value**	**Probability**
Teachers' Burnout				
(Constant)	0.90	0.30	2.99	0.00
Planning	0.11	0.09	1.27	0.20ns
Classroom Instruction	0.06	0.05	1.11	0.27ns
Test Construction	0.12	0.06	1.86	0.06ns
Assessment and Evaluation	0.52	0.23	2.26	0.03*
Reporting	-0.03	0.24	-0.11	0.91ns

R^2 = 0.429 * = significant

Probability = 0.000** ns = significant

F – Value = 29.996

Attentiveness

The coefficient matrix in Table 17 discloses the combined contribution of ICT integration on pupils' learning engagement in terms of attentiveness and classroom instruction (P=.05*, t value=-1.96), test construction (P=0.00**, t-value=6.44), and reporting (P=0.01** and t-value=2.75) has significant influence. Therefore, the hypothesis of the study was rejected, since the computed probability value (0.000**) is less than the set 1% level of significance.

Table 17. Influence of ICT integration on pupils' learning engagement in terms of attentiveness

	Coef. B	**Std. Error**	**t – value**	**Probability**
Teachers' Burnout				
(Constant)	-1.30	0.50	-2.60	0.01
Planning	-0.04	0.15	-0.29	0.77ns
Classroom Instruction	0.17	0.09	1.96	0.05*
Test Construction	0.69	0.11	6.44	0.00**
Assessment and Evaluation	-0.67	0.38	-1.77	0.08ns
Reporting	1.08	0.39	2.75	0.01**

R^2 = 0.478 ** = significant*

Probability = 0.000 *** = highly significant*

F – Value = 36.685 *ns = not significant*

Proactive Learning

The coefficient matrix in Table 18 discloses that pupils' learning engagement in terms of proactive learning and classroom instruction (P=0.00**, t value=-3.10), test construction (P=0.01**, t-value=2.57), and assessment and evaluation (P=0.01**, t-value=2.61) has significant influence. Therefore, the hypothesis of the study was rejected, since the computed probability value (0.000**) is less than the set 1% level of significance.

Table 18. Influence of ICT integration on pupils' learning engagement in terms of proactive learning

	Coef. B	**Std. Error**	**t – value**	**Probability**
Teachers' Burnout				
(Constant)	0.77	0.27	2.91	0.00
Planning	0.08	0.08	0.97	0.33^{ns}
Classroom Instruction	0.15	0.05	3.10	0.00**
Test Construction	0.15	0.06	2.57	0.01**
Assessment and Evaluation	0.53	0.20	2.61	0.01**
Reporting	-0.08	0.21	-0.37	0.71^{ns}

R^2 = 0.524 *** = highly significant*

Probability = 0.000 *ns = not significant*

F – Value = 43.953

The discussed data in Table 16 implies that proactive learning is significantly influenced by the quality and approach of classroom instruction, test construction, and assessment and evaluation practices. The negative relationship with classroom instruction may indicate that current instructional strategies could be inhibiting proactive learning, suggesting a potential need for more student-centered or interactive instructional methods. In contrast, the positive correlation with test construction and assessment implies that structured and well-formulated tests, along with effective evaluation methods, foster proactive learning behavior among pupils.

Alhumaid (2019) emphasizes the role of digital tools in fostering active student participation through dynamic assessments. Technology-enhanced learning environments increase students' engagement and ownership of their learning processes. Transformative potential of ICT tools in developing learners' critical thinking and self-regulation.

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