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ROLES OF INSTRUCTIONAL QUALITY, COGNITIVE FLEXIBILITY AND ENGAGEMENT ON INTERMEDIATE LEARNERS' VIEWING SKILLS

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ABSTRACT

Viewing skills are essential to learners' ability to interpret visual information, derive meaning from visual elements, and evaluate cultural appropriateness; however, limited research has examined how instructional quality, cognitive flexibility, and pupils' engagement relate to these skills among elementary learners. This study examined these variables as predictors of Viewing Skills among Grade 6 learners in Kalilangan West District during School Year 2026–2027. Using a predictive-correlational research design, the study involved 142 participants selected through stratified-proportional random sampling. Data were collected through adapted instruments measuring Instructional Quality, Cognitive Flexibility, and Pupils' Engagement, along with a researcher-made 19-item Viewing Skills Test. Descriptive statistics, canonical correlation, and multiple regression analyses were employed. The findings showed that the participants assessed Instructional Quality as High and demonstrated High levels of Cognitive Flexibility and Pupils' Engagement. Their overall Viewing Skills were rated Very High. Canonical correlation analysis revealed significant associations between Instructional Quality and Viewing Skills and between Pupils' Engagement and Viewing Skills. Cognitive Flexibility did not show a significant association when examined separately. The regression model was significant, with Instructional Quality emerging as a significant positive predictor. Cognitive Flexibility showed a significant negative regression coefficient after the other predictors were controlled, whereas Pupils' Engagement did not make a significant unique contribution. The study recommends that future researchers conduct longitudinal and mixed-methods studies with larger and more diverse samples to clarify the complex roles of cognitive flexibility and pupils' engagement in developing viewing skills across varied instructional and learning contexts.

Keywords: *instructional quality, cognitive flexibility, pupils' engagement, viewing skills, Grade 6 learners, predictive-correlational research*

INTRODUCTION

In today's digital and media-rich society, viewing has become an important literacy skill that helps learners understand the large amount of visual information they encounter each day. Viewing is recognized as the fifth macro-skill of language, which involves perceiving, examining, interpreting, and constructing meaning from visual images and other multimodal texts. According to Huri (2021), it involves making meaning from what is seen, heard, and read. In the Philippines, the development of Viewing Skills is important as the K-12 curriculum includes competencies that respond to the demands of the digital age. In Grade 6, Viewing Skills include Deriving Meaning from Visual Elements and Evaluating Cultural Appropriateness. These competencies help learners interpret visual messages while becoming more aware of the cultural meanings found in visual materials.

Learners' Viewing Skills may be associated with classroom-related and learner-related factors. Studies have shown that high-quality teacher–learner interactions enhance motivation, deepen information processing, and encourage active participation (Li et al., 2022; Endedijk et al., 2022). Similarly, Barrella et al. (2021) highlighted the relevance of flexible thinking in complex problem-solving, suggesting that Cognitive Flexibility enables learners to adjust their thinking and consider different perspectives when processing challenging information. Furthermore, Erdoğdu and Çakıroğlu (2021) found that engaging instructional strategies significantly enhance learners' behavioral, emotional, and cognitive engagement. Specifically, supportive instruction may guide learners in interpreting visual materials, cognitive flexibility may help them connect visual clues and consider alternative meanings, and engagement may encourage them to analyze and evaluate viewed content actively.

Although viewing is increasingly relevant to classroom learning and everyday communication, fewer studies have focused specifically on Viewing Skills than on other language and literacy competencies. This limited research attention creates a need to examine the factors associated with the development of viewing among intermediate learners, particularly in the Philippine setting. The present study therefore examines the roles of Instructional Quality, Cognitive Flexibility, and Pupils' Engagement on Grade 6 learners' Viewing Skills. Its findings may provide useful information for teachers, school administrators, curriculum developers, and other education stakeholders in designing learning activities that strengthen visual literacy.

Research Questions

This study aimed to determine whether Instructional Quality, Cognitive Flexibility, and Pupils' Engagement significantly predicted the Viewing Skills of Grade 6 learners.

Specifically, the study sought to answer the following questions:

1. What is the participants' assessment of their teachers' Instructional Quality?
2. What is the participants' level of Cognitive Flexibility?
3. What is the participants' level of Engagement in terms of:
    3.1 Behavioral Engagement;
    3.2 Emotional Engagement; and
    3.3 Cognitive Engagement?
4. What is the participants' level of Viewing Skills in terms of:
    4.1 Deriving Meaning from Visual Elements; and
    4.2 Evaluating Cultural Appropriateness?
5. Are the participants' assessments of Instructional Quality, Cognitive Flexibility, and engagement significantly associated with viewing skills?
6. Do Instructional Quality, Cognitive Flexibility, and Pupils' Engagement significantly predict the participants' Viewing Skills?

METHODOLOGY

Research Design

This study employed a quantitative predictive-correlational research design to examine whether Instructional Quality, Cognitive Flexibility, and Pupils' Engagement significantly predicted the Viewing Skills of Grade 6 learners. The design was appropriate since it allowed the study to examine statistical relationships among variables and determine the unique and collective predictive contributions of several independent variables to one dependent variable. Correlational research allows relationships among variables to be examined without manipulating the conditions experienced by the participants (Gall et al., 2007; Warner, 2016).

Locale of the Study

The research was conducted in ten (10) public elementary schools in Kalilangan, Bukidnon, Philippines. Sampling was carried out to represent the Grade 6 learner population of the area, ensuring voluntary participation and confidentiality.

Respondents and Sampling Method

The study involved 142 Grade 6 learners enrolled during School Year 2026–2027 in ten public elementary schools in Bukidnon. The participants were selected using stratified proportional random sampling to ensure that each school was represented according to its Grade 6 population. The sample size was determined using the Taro Yamane formula, with a 5% margin of error.

Teachers were not involved in persuading, compelling, rewarding, or penalizing learners to participate. The learners were informed that participation or nonparticipation would not affect their grades, class standing, school services, or relationship with their teachers. Parent or guardian consent and learner assent were obtained before the

administration of the research instruments. Learners who were on long-term absence, those without the required consent or assent, and those who could not complete the instruments meaningfully were excluded from the study.

Research Instruments

The study used adapted survey instruments to measure the predictor variables. Instructional Quality was measured using the 11-item adapted version of Student Evaluation of Educational Quality (Marsh, 1982), Cognitive Flexibility using the 13-item Cognitive Flexibility Scale (Martin & Rubin, 1995), and Pupils' Engagement using the 15-item adapted Student Engagement in Schools Questionnaire (Hart et al., 2011). The items under these three predictor variables were answered using a five-point Likert scale, from Always (5) to Never (1).

Viewing Skills was measured through a researcher-made 19-item multiple choice test based on the Grade 6 viewing competencies in the Philippine Department of Education K-12 Curriculum Guide. Nine (9) items measured Deriving Meaning from Visual Elements, while ten (10) items measured Evaluating Cultural Appropriateness. The test used visual materials such as graphs, symbols, posters, advertisements, infographics, and illustrations so that learners were required to interpret and evaluate visual information rather than rely only on written statements.

Validity and Reliability

The modified questionnaires went through content validation by experts in the field. Following content validation, the adapted scales were pilot-tested with 30 Grade 6 learners from a school that was not included in the actual study. The pilot test was used to examine the administration process and the internal consistency of the Instructional Quality, Cognitive Flexibility, and Pupils' Engagement scales. Cronbach's alpha was used to estimate internal consistency, and a coefficient of .70 or higher was treated as acceptable (George & Mallery, 2016). The pilot-test responses were also checked for completeness and values outside the prescribed response range before the instruments were finalized.

Data Gathering Procedure

Ethical clearance was obtained prior to data collection. The researcher sought the necessary endorsement and approval from the Office of the Schools Division Superintendent, followed by permission from the District Office and the respective school heads of the participating schools. These approvals were secured before the researcher approached the selected learners and their parents or legal guardians.

The participants were informed that their participation was voluntary in nature. They had the right to refuse to participate in the study. Also, the participants' informed assent was sought. Confidentiality and anonymity of responses were strictly maintained throughout the research process.

Data was collected from ten (10) public elementary schools in the Division of Bukidnon. Survey questionnaires were used, and the responses were tallied. The results were analyzed and explained using the data in the table.

Data Analysis

Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to address research problems 1 to 4. Meanwhile, Canonical correlation analysis was used to address problem 5. This was used as a supporting multivariate analysis to examine the associations between the predictor variables and the dimensions of Viewing Skills. Separate canonical analyses were used to examine Instructional Quality, Cognitive Flexibility, and Pupils' Engagement in relation to Deriving Meaning from Visual Elements and Evaluating Cultural Appropriateness.

For Problem 6, multiple linear regression was then used to determine whether Instructional Quality, Cognitive Flexibility, and Pupils' Engagement significantly predicted the overall Viewing Skills score when the predictors were considered together. The regression analysis reported R, R squared, adjusted R-squared, unstandardized and standardized coefficients, t values, F-value, confidence intervals, and p-values. The assumptions of linearity, normality of residuals, homoscedasticity, independence of errors, multicollinearity, outliers, and influential cases were examined before interpreting the model. Since the study used a predictive-correlational design, the findings were interpreted as statistical associations and predictions rather than as causal effects.

Scope and Limitations

The study was further delimited to Grade 6 learners since the dependent variable was aligned with the Grade 6 viewing competencies, particularly Deriving Meaning from Visual Elements and Evaluating Cultural Appropriateness. The study examined only the variables included in the conceptual framework and did not cover other possible factors such as socioeconomic status, parental involvement, prior achievement, language proficiency, or learning habits. The findings reflected the responses and test performance of the selected participants during the period of data collection. Thus, the results should be interpreted within the context of Kalilangan West District and should not be treated as automatically representative of learners in other settings.

RESULTS AND DISCUSSION

This section presents the descriptive and inferential results according to the research problems.

Participants' assessment of their teachers' Instructional Quality

Table 1 presents the descriptive statistics for instructional quality. The findings show that the participants assessed the instructional quality as high, as indicated by the

overall mean of 4.44 and a standard deviation of 0.42. It implies that teachers are providing clear explanations, timely feedback, engaging activities, and opportunities for students to participate in interpreting visual materials.

Table 1. Descriptive Statistics for Instructional Quality

Range	Description	Interpretation	Frequency	Percentage
4.51 – 5.00	Always	Very High	68	47.89
3.51 – 4.50	Often	High	69	48.59
2.51 – 3.50	Sometimes	Average	5	3.52
1.51 – 2.50	Rarely	Low	0	0.00
1.00 – 1.50	Never	Very Low	0	0.00
		Total	**142**	**100.00**
		Mean	**4.44**	
		SD	**0.42**	
		Interpretation	**High**	

The small standard deviation also shows that the responses were generally close to the mean, which indicates that the participants had similar views regarding the instructional practices used when working with visual materials.

Participants' level of Cognitive Flexibility

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Table 2 presents the descriptive statistics for cognitive flexibility. The findings show that the participants assessed their cognitive flexibility as High, as indicated by the overall mean of 4.20 and a standard deviation of 0.50. This means that half of the participants generally demonstrated a strong ability to adapt their thinking when faced with different situations, perspectives, or types of visual information.

Table 2. Descriptive Statistics for Cognitive Flexibility

Range	Description	Interpretation	Frequency	Percentage
4.51 – 5.00	Always	Very High	50	35.21
3.51 – 4.50	Often	High	74	52.11
2.51 – 3.50	Sometimes	Average	18	12.68
1.51 – 2.50	Rarely	Low	0	0.00
1.00 – 1.50	Never	Very Low	0	0.00
		Total	**142**	**100.00**
		Mean	**4.20**	
		SD	**0.50**	
		Interpretation	**High**	

The high level of cognitive flexibility indicates that the participants were generally able to adapt their thinking when interpreting visual materials. They demonstrated a willingness to examine different visual clues, draw on prior knowledge, consider alternative perspectives, and revise their interpretations when presented with new evidence. This finding highlights the importance of cognitive flexibility in learning, as it

enables students to evaluate information from different perspectives and develop more appropriate interpretations of visual materials.

Participants' level of Pupils' Engagement in terms of: Behavioral Engagement, Emotional Engagement, and Cognitive Engagement

Table 3 presents the summary of the participants' level of engagement in terms of behavioral engagement, emotional engagement, and cognitive engagement. The findings show that pupils' engagement is High, as indicated by the overall mean of 4.45 and a standard deviation of 0.42. This means that the learners frequently demonstrated strong involvement and active participation during the learning activities. Behavioral engagement obtained the highest mean of 4.49 with a standard deviation of 0.44, while emotional engagement and cognitive engagement both obtained a mean of 4.43, with standard deviations of 0.52 and 0.51, respectively. All three dimensions were interpreted as High, indicating that the pupils consistently showed substantial effort and persistence, positive feelings and enthusiasm, and meaningful mental investment and strategic thinking during the learning activities included in the study.

Table 3. Summary Table of the Participants' Level of Engagement

Pupils' Engagement	Mean	SD	Interpretation
Behavioral Engagement	4.49	0.44	High
Emotional Engagement	4.43	0.52	High
Cognitive Engagement	4.43	0.51	High
Overall	**4.45**	**0.42**	**High**

Note: 1.00-1.50=Very Low, 1.51-2.50= Low, 2.51-3.50=Average, 3.51-4.50=High, and 4.51-5.00=Very High.

The slightly higher mean for behavioral engagement indicates that the pupils showed the strongest engagement through actions such as participating, completing tasks, paying attention, and continuing to work during learning activities. Tang and Hew (2022) explained that student engagement is multidimensional, which includes behavioral, emotional, and cognitive engagement, and this study showed that these dimensions may develop differently depending on the learning activities and forms of interaction provided to students.

Participants' level of Viewing Skills in terms of Deriving Meaning from Visual Element, and Evaluating Cultural Appropriateness

Table 4 presents the descriptive statistics for viewing skills. The findings show that the participants' viewing skills are Very High, with a mean of 15.87 and a standard deviation of 2.46. This means that the participants had Very High viewing skills, indicating that they were generally able to examine visual information and form meaning from the different elements that they encountered.

Table 4. Summary Table of the Participants' Level of Viewing Skills

Range	Interpretation	Frequency	Percentage
15.20 – 19.00	Very High	90	63.38
11.40 – 15.19	High	43	30.28
7.60 – 11.39	Average	9	6.34
3.80 – 7.59	Low	0	0.00
0.00 – 3.79	Very Low	0	0.00
	Total	**142**	**100.00**
	Mean	**15.87**	
	SD	**2.46**	
	Interpretation	**Very High**	

The very high level of viewing skills suggests that participants were generally able to examine visual information, connect visual clues, written information, symbols, and other elements, and interpret the meanings they convey. This finding is consistent with Pantaleo (2021), who found that explicit instruction in visual meaning-making helped Grade 4 students perceive, describe, and interpret visual elements such as color, point of view, typography, framing, and line. Similarly, Nuhoglu Kibar (2023) found that the use of simple and complex visuals influenced learners' perception, interpretation, and attention. These findings support the importance of carefully examining visual elements to understand the messages conveyed by visual materials. Allowing learners to analyze visual clues, explain their meanings, and connect them to the overall message may further strengthen their viewing skills.

Canonical Correlation Analysis Between Instructional Quality, Cognitive Flexibility, and Pupils' Engagement and Viewing Skills

Table 5 shows the canonical correlation analysis between Viewing Skills and Instructional Quality. The result revealed that there is a significant positive Average canonical correlation between Viewing Skills and Instructional Quality, $F(2, 139) = 13.335$, $p < .001$, $Rc = 0.40$, $Rc^2 = 0.16$. The p-value being less than the .05 significance level indicates strong evidence against the null hypothesis, confirming a statistically significant positive association between the variables. Thus, the null hypothesis is rejected. It indicates that approximately 16 percent of the variability of Viewing Skills is explained by Instructional Quality.

Table 5. Canonical Correlation Analysis Between Viewing Skills and Instructional Quality

Variable	Cross loading	R_c	R_c^2	F(2,139)	p
Instructional Quality	-0.40				
Viewing Skills					
Deriving Meaning From Visual Elements	-0.40	0.40	0.16	13.335	<.001
Evaluating Cultural Appropriateness	-0.19				

**Significant at 0.05 two-tailed alpha level.*

A closer examination of the canonical loadings shows that Deriving Meaning from Visual Elements (loading = -0.40) and Evaluating Cultural Appropriateness (loading = -0.19) exhibited the strongest contributions to the relationship between the two variable sets. Although the loadings are negative, their magnitudes indicate that these dimensions contribute most substantially to the observed association. This finding suggests that instructional quality is associated with pupils' ability to interpret visual information and critically evaluate cultural messages conveyed through visual texts.

Table 6 shows the canonical correlation analysis between Viewing Skills and Cognitive Flexibility. The result revealed that there was no significant canonical correlation between Viewing Skills and Cognitive Flexibility, $F(2, 139) = 2.270$, $p = 0.107$, $Rc = 0.18$, and $Rc^2 = 0.03$. The canonical correlation of 0.18 indicates a weak association, while the squared canonical correlation shows that the two variable sets shared only about 3 percent of their variability. Thus, the null hypothesis is not rejected. The result therefore indicates that Cognitive Flexibility did not show sufficient multivariate evidence of association with Viewing Skills in the present sample.

Table 6. Canonical Correlation Analysis Between Viewing Skills and Cognitive Flexibility

Variable	Cross loading	R_c	R_c^2	F(2,139)	p
Cognitive Flexibility	-0.18				
Viewing Skills					
Deriving Meaning from Visual Elements	-0.18	0.18	0.03	2.270	0.107
Evaluating Cultural Appropriateness	-0.08				

**Significant at 0.05 two-tailed alpha level.*

The cross loadings also show weak contributions to the canonical relationship. Cognitive Flexibility obtained a cross loading of -0.18, while Deriving Meaning from Visual Elements obtained -0.18 and Evaluating Cultural Appropriateness obtained -0.08. These values suggest that none of the variables had a strong connection with the canonical function. The negative values reflect the direction of the canonical solution and do not indicate that greater cognitive flexibility leads to poorer viewing skills, as the relationship was not statistically significant. It aligns with Kahl et al. (2022), who found varied relationships among executive functions, visual-spatial skills, and academic achievement, suggesting that these abilities depend on the task and learning context.

Table 7 shows the canonical correlation analysis between Viewing Skills and Pupils' Engagement. The result revealed a significant canonical correlation between the two variable sets, $F(6, 274) = 5.250$, $p < .001$, $Rc = 0.37$, and $Rc^2 = 0.14$. The canonical correlation indicates a weak relationship, while the squared canonical correlation shows that the canonical variates of Viewing Skills and Pupils' Engagement shared about 14 percent of their variance. Since the p-value is less than the standard significance level of $.05$, the null hypothesis is rejected. This indicates that Pupils' Engagement was

significantly associated with Viewing Skills when the dimensions of both variables were considered together.

Table 7. Canonical Correlation Analysis Between Viewing Skills and Pupils' Engagement

Variable	Cross loading	R_c	R_c^2	F(6,274)	p
Pupils' Engagement					
Behavioral Engagement	-0.30				
Emotional Engagement	-0.33				
Cognitive Engagement	-0.18	0.37	0.14	5.250	<.001
Viewing Skills					
Deriving Meaning from Visual Elements	-0.37				
Evaluating Cultural Appropriateness	-0.18				

**Significant at 0.05 two-tailed alpha level.*

The cross loadings show that Emotional Engagement had the strongest contribution within Pupils' Engagement, with a cross loading of -0.33, followed by Behavioral Engagement at -0.30 and Cognitive Engagement at -0.18. On the Viewing Skills side, Deriving Meaning from Visual Elements had the stronger cross loading of -0.37, while Evaluating Cultural Appropriateness obtained -0.18. The negative signs do not indicate that higher engagement is associated with lower viewing skills, as canonical weights and loadings may reverse direction without changing the relationship's strength. The more important part of the result is the size of the loadings, which shows that Emotional Engagement, Behavioral Engagement, and Deriving Meaning from Visual Elements contributed more strongly to the significant canonical function.

Predictive Significance of Instructional Quality, Cognitive Flexibility, and Pupils' Engagement on Viewing Skills

Table 8 presents the regression analysis of Instructional Quality, Cognitive Flexibility, and Pupils' Engagement on Viewing Skills. The regression model was statistically significant, $F(3, 138) = 7.537$, $p < .001$, with $R = .375$, $R^2 = .141$, and adjusted $R^2 = .122$. The null hypothesis stating that Instructional Quality, Cognitive Flexibility, and Pupils' Engagement are not significantly associated with Viewing Skills is rejected, indicating that Instructional Quality, Cognitive Flexibility, and Pupils' Engagement t, when considered collectively, are significantly associated with Viewing Skills and contribute to explaining variations in pupils' viewing performance.

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Table 8. Regression Analysis of Instructional Quality, Cognitive Flexibility and Pupils' Engagement on Viewing Skills

Predictor	Unstandardized Coefficients		β	95% CI		t	p
	B	SE		Lower	Upper		
Constant	6.21	2.18		1.94	10.49	2.767	0.006

Predictor	Unstandardized Coefficients		β	95% CI		t	p
	B	SE		Lower	Upper		
Instructional Quality	1.99	0.76	0.337	0.55	3.53	2.917	0.004
Cognitive Flexibility	-1.50	0.64	-0.307	-2.82	-0.30	-2.258	0.026
Pupils' Engagement	1.60	0.83	0.275	-0.06	3.23	1.933	0.055
Model Summary							
$R=0.375$ $R^2=0.141$ Adj $R^2=0.122$ $F(3,138)=7.537$ $p<.001$							

Note. B = unstandardized beta coefficient, SE = standard error, β = standardized beta coefficient, 95% CI = 95% confidence interval, t = t statistic, p = probability value.

Model Equation: VS = 1.99IQ - 1.50CF + 6.21

Legend: VS = Viewing Skills, IQ = Instructional Quality, CF = Cognitive Flexibility

Instructional Quality emerged as a significant positive predictor of Viewing Skills, B = 1.99, β = .337, t = 2.917, p = .004, 95% CI [0.55, 3.53], indicating that higher instructional quality was associated with better viewing skills when Cognitive Flexibility and Pupils' Engagement were controlled. It also had the strongest positive standardized coefficient among the predictors. This finding is supported by Nuhoglu Kibar (2023) and Brown (2022), who emphasized that visual materials and explicit critical visual literacy instruction help learners interpret visual information and understand meaning. In contrast, Cognitive Flexibility was also a significant predictor, but its coefficient was negative, B = -1.50, β = -.307, t = -2.258, p = .026, 95% CI [-2.82, -0.30]. The result indicates that higher Cognitive Flexibility was associated with lower Viewing Skills after Instructional Quality and Pupils' Engagement were statistically controlled.

Pupils' Engagement obtained a positive coefficient, B = 1.60, β = .275, but it did not reach the .05 level of statistical significance, t = 1.933, p = .055, 95% CI [-0.06, 3.23]. The confidence interval also includes zero, which supports the non-significant result. This means that Pupils' Engagement did not provide sufficient unique evidence for predicting Viewing Skills after Instructional Quality and Cognitive Flexibility were included in the same regression model. This does not mean that Pupils' Engagement has no relationship with Viewing Skills, since Table 7 showed a significant canonical association between the two variable sets.

The negative coefficient for Cognitive Flexibility should be interpreted cautiously because it represents its association with Viewing Skills after controlling for the other predictors and does not necessarily mean that flexibility weakens viewing skills. This result differs from Hund et al. (2023) and Xu et al. (2024), who reported positive relationships between cognitive flexibility and reading comprehension, although their studies examined a different outcome.

Overall, the findings highlight Instructional Quality as the clearest positive predictor of Viewing Skills, suggesting the importance of providing meaningful visual materials, guidance, feedback, and opportunities to interpret visual information. Although

Pupils' Engagement did not significantly predict Viewing Skills independently, it may still be educationally relevant, as its contribution may overlap with the other predictors. This interpretation requires further examination of the regression diagnostics, including correlations, tolerance values, and variance inflation factors, particularly to clarify the negative coefficient for Cognitive Flexibility. The findings also indicate that Instructional Quality, Cognitive Flexibility, and Pupils' Engagement explain only part of the differences in pupils' Viewing Skills, suggesting that other factors, such as prior knowledge, visual literacy, multimedia exposure, and comprehension strategies, may also contribute.

Conclusions

The study's analysis revealed several noteworthy findings regarding the development of viewing skills among intermediate learners. Firstly, the learners demonstrated high levels of Instructional Quality, Cognitive Flexibility, and Pupils' Engagement, while their overall Viewing Skills were rated as very high. This indicates that supportive and engaging classroom environments, along with flexible thinking abilities, are associated with enhanced visual literacy. Importantly, the results identified Instructional Quality as the strongest positive predictor of Viewing Skills. This underscores the critical role of quality instructional practices—such as clear guidance, constructive feedback, and meaningful activities—in fostering learners' ability to interpret and evaluate visual information effectively, aligning with the theoretical framework emphasizing high-quality teacher-learner interactions.

However, the relationship between Cognitive Flexibility and viewing skills proved to be more complex. While cognitive flexibility was initially expected to promote better visual interpretation, the analysis showed that it served as a significant but negative predictor when combined with other factors, suggesting a nuanced interaction. This counterintuitive outcome indicates that higher cognitive flexibility, in certain contexts, may not straightforwardly translate into stronger viewing skills, possibly due to the influence of shared variance with other variables or the nature of the cognitive processes involved. Lastly, although Pupils' Engagement was correlated with viewing skills, it did not significantly predict these skills when Instructional Quality and Cognitive Flexibility were statistically controlled. This suggests that engagement alone might not be sufficient to enhance viewing skills without the support of effective instructional practices or cognitive adaptability.

Overall, findings confirm the initial assumption that learners' viewing skills are shaped by instructional, cognitive, and motivational factors. The strong influence of Instructional Quality affirms its pivotal role, consistent with the Teaching Through Interactions Framework, which emphasizes high-quality classroom interactions as essential for literacy development. Meanwhile, the complex and sometimes contradictory role of Cognitive Flexibility and Pupils' Engagement highlights the need for further investigation into how these factors interact dynamically to influence visual literacy. The results suggest that fostering viewing skills among intermediate learners involves more nuanced pathways than initially hypothesized, emphasizing the importance of an

integrated approach that considers how instructional support, cognitive adaptability, and learner motivation work together in complex ways

Recommendations

Drawing from the study's findings and conclusions, several recommendations are proposed for school administrators, parents and guardians, education program coordinators, and future researchers. For School administrators, they should integrate effective teaching strategies for visual interpretation into School Learning Action Cell (SLAC) sessions. They may encourage teachers to share best practices during these monthly sessions, focusing on strategies that enhance visual literacy and higher-order thinking skills.

Likewise, parents and guardians should strengthen their children's viewing skills by engaging them in simple conversations about picture books, posters, advertisements, signs, news images, videos, and other visual materials encountered at home and in daily life. These activities can be easily incorporated into everyday family conversations. In addition, Education Program Coordinators should promote the use of structured discussion strategies, such as small-group visual analysis, peer sharing, and collaborative learning activities. Finally, future researchers should examine other variables associated with viewing skills, such as language proficiency, prior exposure to visual materials, media literacy, socioeconomic conditions, parental involvement, and access to digital learning resources. They should also investigate the negative regression coefficient of cognitive flexibility by examining zero-order correlations, multicollinearity, shared variance among predictors, and other possible statistical explanations. They should also explore pupils' engagement using alternative models to better understand how behavioral, emotional, and cognitive engagement are related to viewing skills. Finally, researchers should employ longitudinal, experimental, or mixed-method research designs to gain a deeper understanding of how instructional and learner-related factors are associated with the development of viewing skills.

Compliance with Ethical Standards

The study observed the ethical principles of respect for person, beneficence, and justice described in the Belmont framework (Amdur & Bankert, 2018). Respect for person was observed through consent, assent, voluntary participation, and the right to withdraw. Beneficence was observed through the effort to minimize risk and protect confidentiality, while justice was observed through fair participant selection and equal treatment during the research process

The principle of respect for autonomy dictates that participants be treated with dignity while recognizing their independence in deciding whether to participate (Munhall, 2012; Scott, 2013). The study ensured that all procedures were conducted ethically and with full regard for individual self-determination.

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