

Instructional Mode, Student Engagement, and Limited Learning Methods of High School Students in Davao City

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Abstract

As education increasingly embraces diverse learning modalities, the effectiveness of traditional and remote teaching methods in engaging students has come under scrutiny. This study used a quantitative method with a descriptive correlational design to measure the level of instructional mode, student engagement, and limited learning method among high school students. The study involved 150 high school students in Davao City. Further, the study was anchored on the Theory of Learning Preferences (Dunn & Dunn, 1975), which refers to individual's elements that contribute to mastering academic skills such as environmental and emotional. In the context of this study, this theory helps understand how these elements interact and is influential in enhancing learning experiences in high school students focused on Physical Education. A researcher-made survey was conducted for data collection, achieving a reliability score of .92 Cronbach's alpha. The study utilized the mean to analyze instructional modes and student engagement among high school students, with Pearson's *r* assessing their relationship. Multiple linear regression was employed to determine the most effective instructional methods for improving learning outcomes. This study recommends reverting to full face-to-face instruction in Physical Education for high school students, as online classes hinder proactivity and first-hand experience. Additionally, securing a spacious area and equipment is advised to enhance learning and motivation, along with further investigation into additional predictors not covered in this study.

Keywords: instructional mode; student engagement; limited learning methods; high school students; physical education

Introduction

As education increasingly embraces diverse learning modalities, the effectiveness of traditional and remote teaching methods in engaging students has come under scrutiny (Bădău & Bădău, 2020). Also, Dorđević et al. (2020) found that students prefer hybrid courses, which combine both learning methods but also address issues. However, many current teaching methods, relying on traditional face-to-face and online formats, do not engage all learners and these methods have limitations that impact engagement and success, as fewer face-to-face meetings can hinder understanding, while online classes often result in learning loss due to reduced interaction and support (Suprianto et al., 2022).

In Australia, Sullivan and Lonsdale (2021) conducted a systematic review that revealed remote learning substantially reduced student participation in physical education. This decline resulted in lower overall

physical activity levels among children, highlighting the challenges of delivering effective PE remotely. In addition, a study by Kirk (2020) highlighted logistical challenges faced by students in Physical Education online which hindered skill development.

In Davao City, challenges such as limited resources and outdated teaching practices restrict effective learning experiences (Santos & Reyes, 2020). Additionally, sudden changes in the physical education curriculum have posed difficulties, particularly because physical education subjects focus on performance (The National Academy of Sciences, 2021). Furthermore, a study in the Davao Region indicates that limited face-to-face interaction may hinder student participation (Aves et al., 2023).

The research gap identified in this study highlights several issues in the literature focusing on limited learning methods, including the impact of remote learning on student participation, logistical challenges, and limited face-to-face interaction and online classes. There is limited research on exploration specifically focused on understanding how limited learning methods impact different instructional modes and student engagement. Therefore, there is an urgent need for further investigation into the impact of different learning methods on student engagement. Thus, this study is conducted.

The purpose of this study was to determine the influence of instructional mode and student engagement on limited learning methods in the physical education of high school students.

Statement of the Problem

The purpose of this study was to determine the influence of instructional mode and student engagement on limited learning methods in the physical education of high school students. Specifically, it answered the following objectives:

1. What is the level of instructional mode of high school students in terms of:
 - 1.1 Face-to-face classes; and
 - 1.2 Online class?
2. What is the level of student engagement of high school students in terms of:
 - 2.1 Behavioral; and
 - 2.2 Emotional?
3. What is the level of limited learning methods in physical education in terms of:
 - 3.1 Lack of access to technology; and
 - 3.2 Limited space and equipment?
4. Is there a significant relationship of high school students between:
 - 4.1 Instructional mode and limited learning methods; and
 - 4.2 Student engagement and limited learning methods?
5. Is there a significant influence of instructional mode and student engagement on limited learning methods in the physical education of high school students?

Theoretical/Conceptual Framework

The theory of learning preferences by Dunn and Dunn in 1975 posits that each stimulus contains individual elements that contribute to mastering academic skills. There are two elements concerned such as environmental and emotional; the environmental variable consists of the elements sound, light, temperature, and design while the emotional variable consists of motivation, persistence, responsibility, and structure.

The Theory of Learning Preferences applies to this study by highlighting how elements like instructional mode and facilities affect students' learning experiences and academic performance. In the context of the study, environmental factors (such as the mode of instruction—face-to-face or online class) and emotional variables (such as student engagement—behavioral or emotional) play a significant role in shaping learning outcomes. In this study, integrating face-to-face and online classes, along with addressing limitations in technology, space, and equipment, can impact students' engagement and performance. Therefore, understanding how these elements interact is influential in enhancing learning experiences in high school students.

Methodology

This quantitative research utilizes a descriptive correlational design, which examines the association between two or more variables without implying causation (Bloomfield & Fisher, 2019). By employing this approach, the study aims to validate quantitative results, offering a deeper understanding of the contexts in which instructional mode and student engagement influence students' limited learning methods in Physical Education.

Locale of the study

This study is conducted among high school students in Davao City, a city in the Mindanao region of the Philippines. The researchers specifically selected high schools in Davao City due to their limited learning modality in teaching Physical Education. These schools operate under different instructional modes, and students' engagement in Physical Education varies based on these modes.

Research Respondents

This study includes 150 student respondents selected through a combination of purposive and random sampling techniques. This method allows the researchers to identify suitable participants who can provide significant insights relevant to the study (Rai & Thapa, 2015). The study specifically targets high school students who are enrolled in Physical Education classes during the academic year 2024-2025.

Research Instrument

The study utilizes a researcher-made survey questionnaire to collect data on the independent variable, instructional mode. The questionnaire consists of 10 items focusing on two key indicators: face-to-face classes and online classes. Respondents will assess their instructional mode using a five-point Likert scale: 5 as strongly agree, 4 as agree, 3 as neutral, 2 as disagree, and 1 as strongly disagree.

The Likert scale below was used to analyze the result.

Range of Means	Description	Interpretation
4.20 – 5.00	Very High	This means that the students are in excellent instructional

		mode.
3.40 – 4.19	High	This means that the students are in good instructional mode.
2.60 – 3.39	Moderate	This means that the students are in a fair instructional mode.
1.80 – 2.59	Low	This means that the students are in poor instructional mode.
1.00 – 1.79	Very Low	This means that the students are in bad instructional mode.

To gather results for the second independent variable, student engagement, the researchers used a researcher-made survey questionnaire. It was a 10-item instrument with the following indicators: behavioral and emotional. In evaluating students' engagement, the respondents used the following rating: 5 as strongly agree, 4 as agree, 3 as neutral, 2 as disagree, and 1 as strongly disagree.

For the analysis of the result, the Likert Scale below was used:

Range of Means	Description	Interpretation
4.20 – 5.00	Very High	This means that the students have excellent engagement.
3.40 – 4.19	High	This means that the students have good engagement.
2.60 – 3.39	Moderate	This means that the students have fair engagement.
1.80 – 2.59	Low	This means that the students are poor engagement.
1.00 – 1.79	Very Low	This means that the students are bad at engagement.

For the dependent variable, Limited Learning Methods in Physical Education, the researchers also used a researcher-made survey questionnaire. It was a 10-item instrument with the following indicators: lack of access to technology and lack of space and equipment. Like the independent variable, each indicator of the dependent variable had a total of 5 items, making the questionnaire 10 items in total. The respondents answered the questionnaire using the following scale: 5 as strongly agree, 4 as agree, 3 as neutral, 2 as disagree, and 1 as strongly disagree.

The Likert Scale below was used to analyze the result:

Range of Means	Description	Interpretation
4.20 – 5.00	Very High	This means that the students have very limited learning methods.
3.40 – 4.19	High	This means that the students have limited learning methods.
2.60 – 3.39	Moderate	This means that the students have an average limited learning method.
1.80 – 2.59	Low	This means that the students have minimal limited learning methods.
1.00 – 1.79	Very Low	This means that the students have no learning methods.

In summary, the research instrument had a total of 30 items. Part 1 for the first independent variable had 10 items, Part 2 for the second independent variable had 10 items, and Part 3 for the dependent variable had

another 10 items. The research-made survey questionnaire passed through reliability testing using Cronbach's Alpha, which resulted in a .92 Cronbach's alpha, indicating excellent reliability.

Data Gathering Procedure

To proceed with gathering the necessary quantitative data, the researchers requested authorization directly from the school administration. The intended quantitative data was elicited using a survey instrument, which included researcher-made questionnaires specifically designed to evaluate the independent variables: instructional mode and student engagement. These variables were investigated as determinants affecting the dependent variable, namely, the limited learning modality of high school students.

Respondent selection strictly adhered to the inclusion criteria, considering only those who provided informed consent containing comprehensive study details. After receiving written approval, the researchers requested permission to conduct the research from the parents of the students since they were considered minors. The researchers ensured the confidentiality of respondent identities and securely collected and safeguarded questionnaires containing significant data. Following data retrieval, meticulous encoding with proper labeling procedures was diligently conducted.

Data Analysis

To analyze the quantitative data, statistical tools were employed to depict the levels of and relationships between instructional mode, student engagement, and limited learning modality among high school students. To facilitate a clearer interpretation and analysis of the quantitative data, the following statistical treatments were used:

The mean was utilized to characterize the levels of instructional mode and student engagement among high school students, aiding in understanding the attributes of data sets. The mean was calculated by dividing the total sum of measurements by the number of measurements, providing an average value. Moreover, to examine the relationship between instructional mode and student engagement, Pearson's r was used. Lastly, to determine which instructional methods or aspects of student engagement had a more significant impact on learning methods in high school, multiple linear regression analysis was utilized.

Results and Discussion

This chapter presented a thorough analysis and discussion of the results obtained from the data collected during the research study. To address the issues raised in Chapter 1, the gathered data was subjected to statistical analysis, and the findings were discussed categorically based on the sequence of the problem statements. Throughout the analysis, relevant literature was consulted to support the findings and provide additional insights into the research problem.

Level of Instructional Mode of High School Students

This study focused on the instructional mode of high school athletes, including sub-indicators such as face-to-face and online classes. The use of mean and descriptive levels was presented in the following table.

The subsequent tables provided a detailed discussion of every indicator and its corresponding items. The implications of each were substantiated by relevant literature and studies. Within each sub-indicator, the highest and lowest items were examined, clearly representing the respondents' responses in the survey. These items also elaborated on their implications, potentially providing valuable insights to readers and beneficiaries. Furthermore, supporting global literature and studies validated or presented contrasting perspectives to the results.

Table 1. Summary of the level of instructional mode of high school students

Indicators	Mean	Description
Face-to-face class	4.31	Very High
Online Class	3.11	Moderate
Overall	3.71	High

Among the two indicators under the instructional mode of high school students, a face-to-face class emerged as the highest mean score of 4.31 and was interpreted as *Very High*. This indicates that the instructional mode of high school students in terms of face-to-face classes is excellent. Very high face-to-face classes can be more effective for student learning compared to online or hybrid classes. The results above support the findings of Garrison and Akyol (2021) that traditional classroom settings led to higher student achievement compared to online or hybrid formats. Their research emphasizes that the immediacy of in-person interactions enhances understanding and retention, which aligns with the mean score of 4.31 in our study.

The lowest indicator under the instructional mode of high school students is online class, with a mean score of 3.11 and, interpreted as *Moderate*. This indicates that the instructional mode of high school students in terms of online classes is fair. The results show that students experience technical issues, such as poor internet connectivity, that disrupt their online learning experience. Adnan and Anwar (2020) conducted a survey that revealed many students faced significant technical issues, including poor internet connectivity and software glitches, which negatively impacted their learning experiences. This supports the moderate mean score of 3.11 in our findings, indicating that online classes are perceived as fair but less effective than face-to-face instruction.

Level of Student Engagement of High School Students

This study focused on the second independent variable, which was the student engagement of high school students. This included sub-indicators such as behavioral and emotional engagement. The use of mean and descriptive levels was presented in the following table.

The subsequent tables provided a detailed discussion of every indicator and its corresponding items. The implications of each were substantiated by relevant literature and studies. Within each sub-indicator, the highest and lowest items were examined, clearly representing the respondents' responses in the survey. These items also elaborated on their implications, potentially providing valuable insights to readers and beneficiaries. Furthermore, supporting global literature and studies validated or presented contrasting perspectives to the results.

Table 2. Summary of the level of student engagement of high school students

Indicators	Mean	Description
Behavioral	3.84	High
Emotional	3.83	High
Overall	3.84	High

Among the two indicators under student engagement of high school students, behavior emerged as the highest mean score of 3.84 and interpreted as *High*. This indicates that the student engagement of high school students in terms of behavioral sub-indicator is a good engagement. High behavioral in high school students completed and submitted their assignments by the given deadlines and engaged themselves in all the activities provided. The result above supports the findings of Quin (2017), who mentioned that student engagement is affected by the relationships between teachers and students, the quality of teaching, and environmental factors. Good relationships and effective teaching improve students' academic performance, attendance, and emotional involvement in their learning.

Finally, the lowest mean score of 3.83 belongs to emotional, interpreted as *High*. This indicates that the student engagement of high school students in terms of emotional have a good engagement. High emotion in high school students felt motivated and determined to overcome the challenges in our lessons. According to Noyes and Leupold (2015), emotions play a big role in how engaged students are in academic service-learning. Positive emotions boost motivation, while negative emotions encourage students to rethink their approach, both of which affect their overall academic performance.

The overall results for student engagement of high schools scored mean score of 3.84 and interpreted as *High*. This indicates that the student engagement of high school students has good engagement. This indicates that high school students demonstrate strong behavioral and emotional engagement in their learning and school activities, reflecting a positive learning environment and the effectiveness of current engagement strategies. This result affirms the claim of Yilin (2024), explains that different academic emotions affect how students learn. Positive emotions can improve performance, while negative emotions can make learning and staying engaged more difficult.

Level of Limited Learning Methods of High School Students

This study focused on the dependent variable, which was the limited learning methods of high school students. This included sub-indicators such as lack of access to technology and limited space and equipment. The use of mean and descriptive levels was presented in the following table.

The subsequent tables provided a detailed discussion of every indicator and its corresponding items. The implications of each were substantiated by relevant literature and studies. Within each sub-indicator, the highest and lowest items were examined, clearly representing the respondents' responses in the survey. These items also elaborated on their implications, potentially providing valuable insights to readers and beneficiaries. Furthermore, supporting global literature and studies validated or presented contrasting perspectives to the results.

Table 3. Summary of the Level of Limited Learning Methods of High School Students

Indicators	Mean	Description
Lack of Access in Technology	3.20	Moderate
Limited Space and Equipment	3.45	High
Overall	3.32	Moderate

Among the two indicators under limited learning methods of high school students, limited space and equipment emerged as the highest mean score of 3.45 and interpreted as *High*. This indicates that the learning methods of high school students in terms of space and equipment have limited learning methods. Limited learning methods in high school students mean that the lack of proper equipment affects the effectiveness of physical education lessons. The results above support the findings of the National Center for Education Statistics (2018), which indicate that schools with limited resources struggle to create effective learning environments, impacting student motivation and achievement. This shows that inadequate facilities hinder student engagement and performance.

Finally, the lowest mean score of 3.20 belongs to lack of access in technology, interpreted as *Moderate*. This indicates that the learning method of high school students in terms of lack of access in technology have an average learning method. In an average level of learning methods in high school students believe that limited availability of technological resources negatively impacts the quality of physical education. According to Hohlfeld et al. (2017), Without the necessary tools, students struggle to participate fully in modern instructional methods, which increasingly rely on digital resources. This inequity can lead to a disparity in educational outcomes, further reinforcing existing educational gaps.

The overall results for the learning method of high school students scored a mean score of 3.32 and were interpreted as *Moderate*. This indicates that the learning method of high school students has an average learning method. This indicates that high school students can be considered average, highlighting the need for improvements in space, equipment, and access to technology. This result affirms the claim of Miller (2021), who explains that students who lack access to necessary technological tools and proper classroom facilities face challenges that can hinder their learning outcomes.

Correlational Analysis

Table 4. Significance of the Relationship of high school students between instructional mode, student engagement, and limited learning methods

Limited learning methods			
	r	p-value	Remarks
Instructional mode	.51	<.001	Significant
Student engagement	.38	<.001	Significant

Table 4 shows that instructional mode has a moderate positive relationship with limited learning methods, with an R-value of .51. Also, it reflects a p-value of <.001, which is less than the alpha set at .05 (two-tailed), supporting a statistically significant relationship between instructional mode and limited learning methods. It means that as the level of instructional mode increases, the level of limited learning methods among high school students in Davao City also significantly increases. In a similar manner, the independent variable, student engagement reveals a weak to moderate positive relationship with limited learning methods ($r = .38$ $p < .001$). It means that as the level of student engagement increases, the level of limited learning methods also significantly increases, but with a weaker relationship compared to instructional mode.

The result aligns with Barr (2017) findings which expressed that limited learning methods can hinder student engagement, as they may not accommodate diverse learning styles or promote active participation, ultimately affecting comprehension and overall learning outcomes. In addition, strong teacher-student relationships are essential for enhancing student involvement and improving learning outcomes (Halm, 2015). Furthermore, in the relationship between instructional mode and limited learning methods of high school students in Region XI, the results of the study supported by Coca et. al (2021) show that the transition to virtual education in Physical Education has highlighted limited learning methods, as practical activities are challenging to implement, affecting the overall teaching-learning process. However, response methods significantly influence student engagement and learning, with clickers enhancing participation and comprehension more effectively than traditional hand-raising, fostering a more interactive learning environment.

Regression Analysis

Table 5. Significance of the Influence of Instructional Mode and Student Engagement towards Limited Learning Methods in Physical Education

		Limited Learning Methods				
Individual Influence of Predictors		Standardized Coefficient	t	p-value	Remarks	
Instructional Mode		.45	4.99	.001	Significant	
Student Engagement		.09	1.03	.31	Not Significant	
Combined Influence of Predictors						
R	.52					
R ²	.27					
F	27.1					
P	<.001				Significant	

Table 5 shows the results of the multiple regression analysis, which is set at a level of significance of $\alpha = 0.05$ (two-tailed). Results revealed that the standardized beta coefficient of instructional mode is 0.45, with t-statistics of 4.99 and $p = .001$, which is less than the .05 level of significance. This indicates that, in terms of

face-to-face classes and online classes, instructional mode is a significant predictor of the limited learning methods of high school students in the Davao Region. It means that for every unit increase in instructional mode, there is a significant increase in the learning methods employed by high school students in the Davao Region, indicating that the type of instruction—whether face-to-face or online—plays an important role in shaping their learning experiences.

On the other hand, the standardized beta coefficient of student engagement is .09, with a t-statistic of 1.03 and $p = .31$, which is greater than .05 level of significance. This result indicates that student engagement is not significant predictor of limited learning methods. It means that for every unit increase in student engagement, there is no correspondingly significant increase in the limited learning methods of high school students in the Davao Region.

Also, the F-ratio in Table 5 shows if the overall regression model is a good fit for the data in this study. This model is made up of the effects of instructional mode and student engagement as predictors of limited learning methods. The results reveal that instructional mode and student engagement significantly predicts limited learning methods of high school students, as shown in the result of F-statistic of 27.1, $p < .001$. Therefore, the regression model adequately captures the relationships within the data effectively. According to the report, the R-square value is .27, which means that the predictors, instructional mode and student engagement, and limited learning methods. It reveals that 27% of the variance in limited learning methods can be explained by the predictors which indicates that while these predictors contribute to understanding the limited learning methods, 73% of the variance remains unexplained and may be influenced by other factors not considered in this research.

Conclusion

The following conclusions were drawn:

In terms of the instructional mode of high school students, a face-to-face class emerged as the highest mean score of 4.31 and was interpreted as *Very High* while an online class resulted as Moderate with a mean score of 3.11.

In the level of student engagement in high school students, behavior emerged as the highest mean score of 3.84 and was interpreted as *High* while the lowest mean score of 3.83 belongs to emotional and was interpreted as *High*.

In the level of limited learning methods in physical education, limited space and equipment emerged as the highest mean score of 3.45 interpreted as High while the lowest mean score of 3.20 belongs to lack of access to technology, interpreted as Moderate.

In determining the significant relationship between instructional mode and limited learning methods among high school students, instructional mode has a moderate positive relationship with limited learning methods, with an R-value of .51. Additionally, it reflects a p-value of $< .001$, which is less than the alpha set at .05 (two-tailed), supporting a significant relationship between instructional mode and limited learning methods. This means that as the level of instructional mode increases, the level of limited learning methods among high school students in Region XI also significantly increases. Similarly, the independent variable, student engagement, reveals a significant, positive, and weak relationship with limited learning methods ($r =$

.38, $p < .001$), indicating that as the level of student engagement increases, the level of limited learning methods among high school students in Davao City significantly increases.

The findings from this study support the application of Dunn and Dunn's theory, indicating that instructional mode is a significant predictor of the limited learning methods employed by high school students in the Davao Region. This suggests that for every unit increase in instructional mode, there is a corresponding significant increase in the learning methods utilized by students. This aligns with the theory's emphasis on environmental factors impacting learning outcomes. Conversely, the study found that student engagement is not a significant predictor of limited learning methods, indicating that for every unit increase in student engagement, there is no correspondingly significant increase in the limited learning methods of high school students.

Therefore, while the assertion of the theory was accepted in the context of the study—highlighting the critical role of instructional mode in shaping learning experiences—it also suggested that emotional factors, as outlined in the theory, needed further exploration to fully understand their impact on student engagement and academic success.

Recommendations

Based on the findings of the study, it was recommended to revert to full face-to-face instruction in Physical Education for high school students, as online classes presented challenges that hindered students' proactivity and limited their ability to gain first-hand experience. This aligned with the Theory of Learning Preferences, which emphasized the importance of environmental factors, such as instructional mode, in shaping effective learning experiences.

Furthermore, the procurement of a spacious area and appropriate equipment was highly recommended to enhance students' learning and motivation, as these environmental elements were crucial for facilitating engagement and performance. Lastly, the researchers suggested further investigation into additional predictors not included in this study, as understanding these factors could provide deeper insights into how different elements interacted to influence student engagement and academic success, in line with the emotional variables highlighted in Dunn and Dunn's theory.

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APPENDIX A: Survey Questionnaire

PART I. To determine the level of instructional mode of senior high school students in terms of face-to-face class and online class

INSTRUCTIONAL MODE					
A. Face to Face Class	5	4	3	2	1
1. I feel that face-to-face classes are more effective for my learning compared to online or hybrid classes.					
2. I am more engaged and participate more actively in face-to-face classes than in online classes.					
3. I feel that face-to-face classes help me better understand and retain the course material compared to other instructional modes.					
4. I find it easier to ask questions and get immediate feedback from my teacher during face-to-face classes.					
5. I believe that the social interactions and group activities in face-to-face classes enhance my overall learning experience.					
B. Online Class					
1. I find online classes to be convenient and flexible for managing my study schedule.					
2. I feel that the online class environment supports my learning needs as effectively as face-to-face classes.					
3. I often experience technical issues, such as poor internet connectivity, that disrupt my online learning experience.					
4. I find that online classes provide fewer opportunities for interaction with teachers and peers compared to face-to-face classes.					
5. I can stay focused and motivated during online classes without the physical presence of a teacher.					

PART II. To determine the level of student engagement of senior high school students in terms of Behavioral and Emotional

STUDENT ENGAGEMENT					
A. Behavioral	5	4	3	2	1
1. I actively participate in class discussion during online class.					
2. I consistently attend my classes on time.					
3. I complete and submit my assignments by the given deadlines.					
4. I engage myself in all the activities given.					
5. I seek help from my teacher when I have difficulties in understanding the activities.					
B. Emotional					
1. I feel enthusiastic and interested in my lessons.					
2. I feel that I belong to my school community.					
3. I feel emotionally invested in school events and activities.					
4. I find a sense of personal satisfaction and achievement from my schoolwork.					
5. I feel motivated and determined to overcome the challenges in our lessons.					

PART III. To determine the level of limited learning methods in physical education in terms of access in technology and space and equipment

LEARNING METHODS IN PHYSICAL EDUCATION					
A. Lack of Access in Technology	5	4	3	2	1
1. I am unable to fully engage in physical education because of limited access to technology.					
2. I feel that the absence of digital tools and resources limits the learning methods in physical education.					
3. I find that a lack of access to technology makes physical education lessons less diverse and interactive.					
4. I believe that the limited availability of technological resources negatively impacts the quality of physical education.					
5. I feel that my learning experiences in physical education are restricted because of the unavailability of technology-based learning aids.					
B. Lack of Space and Equipment					
1. I think not having enough space limits the variety of activities in physical education.					
2. I find that the lack of proper equipment affects the effectiveness of physical education lessons.					
3. I believe that limited access to facilities negatively impacts my physical education experience.					
4. I am unable to participate in many physical education activities due to insufficient space and equipment.					
5. I feel that the absence of necessary sports equipment reduces the variety of learning methods in physical education.					

APPENDIX B: DATA ANALYSIS (Using Jamovi and PSPP Application)

Correlation Matrix

		Instructional Mode	Student Engagement	Limited Learning Methods
Instructional Mode	Pearson's r	—		
	df	—		
	p-value	—		
Student Engagement	Pearson's r	0.633	—	
	df	148	—	
	p-value	<.001	—	
Limited Learning Methods	Pearson's r	0.514	0.381	—
	df	148	148	—
	p-value	<.001	<.001	—

Model Fit Measures

Model	R	R²	Overall Model Test			
			F	df1	df2	p
1	0.519	0.269	27.1	2	147	<.001

Model Coefficients - Limited Learning Methods

Predictor	Estimate	SE	95% Confidence Interval		t	p	Stand. Estimate
			Lower	Upper			

Correlation Matrix

			Instructional Mode	Student Engagement	Limited Learning Methods		
Intercept	0.9562	0.3300	0.3040	1.608	2.90	0.004	
Instructional Mode	0.5423	0.1086	0.3276	0.757	4.99	< .001	0.4546
Student Engagement	0.0934	0.0910	-0.0864	0.273	1.03	0.307	0.0935

PSPP Analysis (Correlation and Regression Analysis)

Correlations

		InstMode	StudEnga	LearMeth
InstMode	Pearson Correlation	1.000	.633 _a	.514 _a
	Sig. (2-tailed)		.000	.000
	N	150	150	150
StudEnga	Pearson Correlation	.633 _a	1.000	.381 _a
	Sig. (2-tailed)	.000		.000
	N	150	150	150
LearMeth	Pearson Correlation	.514 _a	.381 _a	1.000
	Sig. (2-tailed)	.000	.000	
	N	150	150	150

a. Significant at .05 level

Model Summary (LearMeth)

R	R Square	Adjusted R Square	Std. Error of the Estimate
.52	.27	.26	.65

ANOVA (LearMeth)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	23.01	2	11.50	27.07	.000
Residual	62.47	147	.42		
Total	85.48	149			

Coefficients (LearMeth)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.96	.33	.00	2.90	.004
InstMode	.54	.11	.45	4.99	.000
StudEnga	.09	.09	.09	1.03	.307

Case Processing Summary

Cases	N	Percent
Valid	150	100.0%
Excluded	0	.0%
Total	150	100.0%

Reliability Statistics

Cronbach's Alpha	N of Items
.92	30