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Blended and guided discovery learning strategy correlates with students' academic performance in Unity Secondary Schools, South East, Nigeria

Strategi pembelajaran penemuan terpadu dan terbimbing berkorelasi dengan prestasi akademik siswa di Sekolah Menengah Unity, Wilayah Tenggara, Nigeria

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ABSTRAK

Pembelajaran campuran dan penemuan terpandu mengarahkan siswa untuk menemukan keterampilan, pengetahuan, dan konsep baru. Proses pembelajaran ini mendorong siswa untuk berpikir dan menganalisis secara mandiri, sehingga mereka dapat mengidentifikasi konsep berdasarkan materi atau data yang telah disediakan. Hal ini membuat keragaman dalam pendekatan pembelajaran berkontribusi pada peningkatan pemahaman dan retensi informasi. Tujuan penelitian ini adalah untuk mengetahui sejauh mana hubungan antara strategi pembelajaran campuran dan penemuan terpandu dengan prestasi akademik siswa di sekolah menengah negeri di wilayah Tenggara, Nigeria. Pendekatan penelitian kuantitatif digunakan dengan fokus pada desain korelasi. Populasi penelitian terdiri dari 934 siswa kelas dua sekolah menengah atas di wilayah Tenggara, Nigeria. Ukuran sampel sebanyak 280 siswa sekolah menengah atas. Kuesioner Strategi Pembelajaran Campuran dan Penemuan Terbimbing (BGDLSQ) dan Kuesioner Prestasi Akademik Siswa (SAPQ) digunakan untuk pengumpulan data. Data yang dikumpulkan di lapangan dianalisis menggunakan Koefisien Korelasi Produk-Momen Pearson untuk menjawab pertanyaan penelitian, sementara analisis regresi (ANOVA) digunakan untuk menguji hipotesis nol yang dirumuskan pada tingkat signifikansi 0,05. Penelitian ini menyimpulkan bahwa strategi pembelajaran campuran memiliki hubungan yang sangat signifikan dengan prestasi akademik siswa di Sekolah Menengah Unity di Nigeria Tenggara. Koefisien determinasi sebesar 0,781 menunjukkan bahwa 78,1% variasi yang diamati pada prestasi akademik siswa di Sekolah Menengah Unity di Nigeria Tenggara dapat dikaitkan dengan strategi pembelajaran campuran. Jika diterapkan di sekolah menengah, strategi pembelajaran campuran kemungkinan besar akan meningkatkan prestasi akademik siswa.

ABSTRACT

Blended and guided discovery learning directs students towards discovery of new skills, knowledge and concepts. This learning process encourages students to think and analyse independently, so that they can identify concepts based on the material or data that has been provided. This makes diversity in teaching and learning approaches contribute to improved comprehension and retention of information. The purpose of this study is to determine the extent of the relationship between blended and guided discovery learning strategies and students' academic performance in public secondary schools in South East, Nigeria. Quantitative research approach was used with a focus on correlational design. A population of 934 senior secondary two students in South East, Nigeria. A sample size of 280 senior secondary school students. Blended and Guided Discovery Learning Strategies Questionnaire (BGDLSQ) and Students Academic Performance Questionnaire (SAPQ) were used for data collection. Data collected from the field were analysed using the Pearson Product-Moment Correlation Coefficient to answer the research questions, while regression (ANOVA) was used to test the formulated null hypotheses at a 0.05 level of significance. The study concluded that the blended learning strategy significantly relates to a very great extent to students' academic performance in Unity Secondary Schools in Southeast Nigeria. The coefficient of determination of 0.781 indicates that 78.1% of the variance observed in the students' academic performance in Unity secondary schools in Southeast could be attributed to the blended learning strategy. When adopted in secondary schools, a blended learning strategy is likely to enhance students' academic performance.

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INTRODUCTION

Blended Learning is a modern and versatile educational approach that combines traditional classroom teaching with digital technology and online resources. It's a hybrid model that seeks to leverage the best of both in-person and online learning experiences to enhance the educational process. Typically, students attend in-person classes where they receive direct instruction, engage in discussions, and collaborate with their peers. This classroom time provides the opportunity for immediate feedback, hands-on activities, and social interaction, all of which are valuable components of the learning process. Ordóñez et al. (2023) noted that in a blended learning environment, students engage in a combination of face-to-face instruction and online learning activities. This approach offers flexibility and adaptability, allowing educators to customise the curriculum to suit the needs of individual learners and the subject matter being taught. Simultaneously, students access digital resources, such as video lectures, online assignments, and interactive simulations, through a learning management system or other online platforms. These resources enable self-paced learning, providing students with the flexibility to review content at their own speed and convenience. Sistek-Chandler (2019) claimed that one of the significant advantages of blended learning is its ability to cater to diverse learning styles and preferences. Some students may thrive in a traditional classroom setting, while others may benefit from the self-directed nature of online learning. Blended learning bridges the gap between these preferences, offering a well-rounded educational experience.

Blended learning is a flexible and innovative educational approach that combines the benefits of in-person and online learning. It caters to diverse learners, enhances engagement, and promotes self-directed study, making it a valuable tool for modern education in various settings. As technology continues to advance, blended learning is likely to play an increasingly important role in the educational landscape. Ordóñez et al. (2023) posited that blended learning is also known for its adaptability to various educational levels and subjects. It is used in K-12 education, higher education, corporate training, and professional development. In addition, it's especially valuable in situations where students have different learning paces and needs. Educators play a critical role in designing and implementing effective blended learning experiences. They select appropriate digital tools and resources, create engaging online content, and structure classroom time to maximise interaction and hands-on learning.

Guided discovery looks at assisting and helping learners to discover certain information and facts about a given problem. Learners most often depend on their teachers to provide all the answers they need. Guided discovery also involves an inquiry method that stimulates learners' interest in seeking information about ideas and concepts by asking questions. Modebelu and Duvie (2012) defined guided discovery learning as active participation, teamwork, cooperation and tolerance among learners. Guided discovery drills learners and enables them to search for knowledge in a systematic and logical way. Guided discovery promotes independent reasoning and self-reliance while the teacher guides, directs and redirects, which can lead the learner to the answers. Morerso, David (2019) noted that guided discovery is time-consuming and expensive but helps learners to develop skills of observation, exploration and questioning. Therefore, learners are guided to avoid misconceptions that cause poor achievement in examinations. Misconceptions arise when learners are left to discover facts on their own and without help; learners often become lost and frustrated. Kariper (2001) noted that throughout the literature, misconceptions have been documented, and studies investigating misconceptions and difficulties in learning and understanding mathematical concepts have been reported. Yet, teaching strategies to overcome such difficulties are less investigated. Oghenevwede (2010), in his study on the effectiveness of guided discovery teaching strategy and gender sensitivity on students' academic achievement, concluded that guided discovery has a comparative advantage in enhancing students' academic achievement over the conventional strategy.

In guided discovery learning, students are directed to discover new skills, knowledge and concepts. In this learning process, students are encouraged to think and analyse themselves, so that they can find concepts based on the material or data that has been provided. Thus, this model is very suitable to be applied in learning physics, so as to improve the understanding of concepts and the learning motivation of students. Pardede et al. (2016) noted that guided discovery learning is a learning approach that trains and guides students to learn, gain knowledge, and build concepts that they find for themselves. To Maulidar et. al. (2016), guided discovery learning is a model that is used to build the understanding of concepts of students under the supervision of a teacher, which is a cognitive learning model that requires the teacher to be more creative in creating situations that can make students active in discovering their own knowledge, so that they solve complicated and abstract concepts. Kasmiana et al. (2020) and Batubara (2020) are in agreement that there was a significant difference in concept understanding between students who were taught with guided discovery models and those who were taught through non-guided discovery learning on heat material.

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Statement of the problem. The student's academic performance in diverse subject content remains a key factor in instructional strategy in such subject areas. Whether a student views themselves as a strong or weak person in a specific subject area may be an important factor in their academic performance. Despite the relevance of blended and guided discovery learning strategies among secondary school students in South East Nigeria, there is an observation that most secondary school students' results in both external and internal examinations seem to be poor in their outcomes. The rate of failure in both internal and external examinations among secondary school students these days is quite alarming (Tachie et al., 2013). The failure rate deteriorates from year to year (WAEC, 2015). Ideally, there is a need for teachers' involvement in incorporating students into collaborative learning skills that comprise a blended and guided discovery learning strategy in order to enhance their learning ability as well as to ensure a high academic performance rate among students of secondary schools in the South East, Nigeria. However, the researchers observed that there is rapid increase on the poor performance of secondary school students on their academic performance as a result of poor student engagement that results to poor communication skills, lack of interpersonal relations and inability to apply knowledge to real world problems, lack of critical thinking and poor attitude towards divergent learning strategies which tend to decrease student academic performance (Moreira et al., 2018). Currently, poor orientation and encouragement by teachers towards students' attitude in adopting and engaging in blended and guided discovery learning has actually led to the problem of students not being able to develop problem-solving skills, a lack of professional competencies, and the inability of the students to apply learned content to real-life situations, which affects students' performance negatively in both external and internal examinations. It was on this basis that the researcher tends to fill in the gap in knowledge through this present research work. The problem of this study is put in question form: to what extent do blended and guided discovery learning strategies relate to students' academic performance in Unity Secondary Schools in South East, Nigeria?

The following research questions guided the study. They are; 1. To what extent does a blended learning strategy relate to students' academic performance in public secondary schools in South-East Nigeria? 2. What is the extent of the relationship between the guided discovery learning strategy and students' academic performance in public secondary schools in South-East Nigeria?

The following null hypotheses guided the study at a 0.05 level of significance : H01: There is no significant relationship between blended learning strategy and students' academic performance in public secondary schools in South-East Nigeria. H02: There is no significant relationship between the guided discovery learning strategy and students' academic performance in public secondary schools in South-East Nigeria.

RESEARCH METHODOLOGY

The study employed a quantitative approach to research and adopted a correlational research design. A correlational research design is carried out to determine the nature or strength of the relationship between two or more variables. Khatoon, Daud, and Amjad (2024) aver that correlational research design refers to a non-experimental research method that studies the relationship between two variables with the help of statistical analysis. Furthermore, a correlational design reflects the strength and/or direction of the relationship between two or more variables. This study was carried out in the South East, Nigeria. The targeted population for this study is 934 senior secondary two students from the ten (10) Federal Government Colleges in South East, Nigeria, of which five (5) were FGC and five (5) were FGGC.

The figure 934 students comprises of 77 students from FGC Nise, 124 students from FGC Enugu, 78 students from FGC Ohafia, 96 students from FGC Okigwe, 79 students from FGC Okposi, 124 students from FGGC Onitsha, 71 students from FGGC Leija, 91 students from FGGC Umuahia, 116 students from FGGC Owerri and 78 students from FGGC Ezzamgbo. The justification for using this population is that the researcher does not want to disfranchise or exempt any students with a major in blended and guided discovery learning skills from the study. The sample of this study is 280 students from the 10 Federal Government Colleges in the South-East, Nigeria. The figure 280 was determined using Taro Yamane's mathematical estimation model. This comprises 23 students from FGC Nise, 37 students from FGC Enugu, 23 students from FGC Ohafia, 30 students from FGC Okigwe, 24 students from FGC Okposi, 37 students from FGGC Onitsha, 21 students from FGGC Leija, 27 students from FGGC Umuahia, 35 students from FGGC Owerri and 723 students from FGGC Ezzamgbo. All ten (10) Federal Government colleges, which comprise five (5) FGC and five (5) FGGC from the five states of South-East Nigeria, were sampled and used for the study. Blended and Guided Discovery Learning Strategies Questionnaire (BGDLSQ) and Students Academic Performance Questionnaire (SAPQ) were used for data collection.

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Two experts from the Department of Educational Management and one expert from the Department of Science Education validated the instruments. Cronbach's alpha method was used to determine the reliability of the instrument, which yielded an index of 0.85 for BGDLSQ and .81 for SAPQ. Data collected from the field were analysed using the Pearson Product-Moment Correlation Coefficient to answer the research questions, while regression (ANOVA) was used to test the formulated null hypotheses at a 0.05 level of significance. Decision Rule: The decision rule, either negative or positive are; 0.00=no relationship, 0.01-0.20=very low relationship, 0.21-0.40=low relationship, 0.41-0.60=moderate relationship, 0.61-0.80=high relationship, 0.81-0.99=very high relationship and 1.00=perfect relationship. The ethical process of application for data collection was in line with the Nigerian system. Respondents were fully informed about the purpose, scope, and procedures of the study. A clear and concise informed consent letter was provided, and participation only proceeds once voluntary, written consent is obtained from all individuals. All researchers ensured that the study would not cause any psychological, emotional, or reputational harm to respondents. In addition, respondents were informed in advance that their participation is entirely voluntary, and they may withdraw from the study at any time without any consequences. Lastly, the results of the study will be reported honestly, accurately, and without manipulation. Information privacy was ensured, and they were treated with utmost confidentiality.

RESULTS AND DISCUSSION

The researcher carried out data cleansing in order to determine the percentage of returned instruments and the percentage of instrument mortality using a simple percentage. Out of 280 copies of the questionnaire administered to the respondents, 267 copies were adequately filled and returned, giving 95.4% of the returned questionnaires, while 13 copies of the questionnaire were not returned from the field, giving 4.6% mortality rate. Therefore, the analyses of this study were based on the 267 copies of the questionnaire returned from the field.

Research Question One

To what extent does a blended learning strategy relate to students' academic performance in public secondary schools in South-East Nigeria?

Table 1: Correlation Matrix between blended learning strategy and students' academic performance in Unity Secondary Schools in South East, Nigeria

		BLS	**SAP**
BLS	Pearson	1	.884
	Sig (2-tailed)		.000
	N	267	267
	R^2	(0.781)	
		78.1%	
SAP	Pearson	.884	1
	Sig. (2-tailed)	.000	
	N	267	267

BLS= Blended learning strategy, SAP= Students' Academic Performance

Table 1 indicates a correlation coefficient (r) of .884 which is positive and within the coefficient limit of ±0.80 and above, indicating a strong, positive and very high extent of relationship. This implies that the blended learning strategy has a strong positive and a very high extent relationship with the students' academic performance in government students in unity secondary schools in South East. The coefficient of determination (R^2) of 0.781 indicates that 78.1% of the variance observed in the students' academic performance in Unity secondary schools in Southeast could be attributed to the blended learning strategy.

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Hypothesis One

There is no significant relationship between blended learning strategy and students' academic performance in public secondary schools in South-East Nigeria.

Table 2: Linear Regression Analysis of the Relationship between blended learning strategy and students' academic performance in Unity Secondary Schools in Southeast, Nigeria

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	3205.211	1	3205.211	90.295	.000[b]
	Residual	9442.306	266	35.497		
	Total	12647.517	267			

Df = degree of freedom, F = F-calculated, Correlation is significant at the 0.05 level (2-tailed)

Table 2 showed a probability (P) value of 0.000, which is less than the alpha value of 0.05. Since the P-value is less than the 0.05 alpha value, the hypothesis of no significant relationship was rejected, and the alternative upheld. Therefore, there is a significant relationship between blended learning strategy and students' academic performance in government unity secondary schools in South East, Nigeria.

Research Question Two

What is the extent of the relationship between the guided discovery learning strategy and students' academic performance in public secondary schools in South-East Nigeria?

Table 3: Correlation Matrix between guided discovery learning strategy and students' academic performance in Unity Secondary Schools in Southeast, Nigeria

		GDLS	SAP
GDLS	Pearson	1	.658
	Sig (2-tailed)		.001
	N	267	267
	R^2	(0.433)	
		43.3%	
SAP	Pearson	.658	1
	Sig. (2-tailed)	.001	
	N	267	267

GDLS= Guided Discovery Learning Strategy, SAP= Students' Academic Performance

Table 3 indicates a correlation coefficient (r) of .658 which is positive and within the coefficient limit of ±0.6- 0.80, indicating a strong, positive and to a great extent relationship. This implies that the guided discovery learning strategy has a strong, positive and to a great extent, relationship with the students' academic performance in Unity Secondary Schools in South East. The coefficient of determination (R^2) of 0.433 indicates that 43.3% of the variance observed in the students' academic performance in Unity secondary schools in the South East was attributed to the guided discovery learning strategy.

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Hypothesis Two

There is no significant relationship between the guided discovery learning strategy and students' academic performance in public secondary schools in South-East Nigeria.

Table 4: Linear Regression Analysis of the Relationship between guided discovery learning strategy and students' academic performance in Unity Secondary Schools in Southeast, Nigeria

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4005.199	1	4005.199	96.367	.001[b]
Residual	9393.007	266	41.562		
Total	13398.206	267			

Df = degree of freedom, F = F-calculated, Correlation is significant at the 0.05 level (2-tailed)

The results in Table 4 indicated a P- value of 0.000, which is less than the alpha value of 0.05. Since the P-value is less than the 0.05 alpha value, it implies that the null hypothesis stated was rejected. Therefore, there is a significant relationship between the guided discovery learning strategy and students' academic performance in Unity Secondary Schools in Southeast Nigeria.

Discussion of the Findings

The findings of the study were discussed according to the research questions and the major findings of the study. It was found in the study that the blended learning strategy significantly relates to a very great extent to students' academic performance in Unity Secondary Schools in the South East, Nigeria. The results imply that the use of blended learning significantly enhances students' academic performances. The result of this findings is in alignment with the study of Duong et al. (2022) on effectiveness of blended learning on students' academic achievement, self-study skills and learning attitudes: A quasi-experiment study in teaching the conventions for coordinates in the plane which finds out that blended learning positively impacts students' academic achievement in the experimental class compared with the control class as demonstrated by the outcomes of the independent t-test analysis of the two groups in the post-test phase. They further argued that observations and student opinion surveys indicated that blended learning increased student interactions with teachers and improved students' academic achievement, self-study abilities and learning attitudes. The blended learning approach thus helps in streamlining instructional activities and learning skills, thereby enhancing the students' academic performance. Blended learning also supports students' engagement in critical inquiry as well as offers students a sense of relevance within the subject context. This present study signifies that the coefficient of determination variance observed in the students' academic performance in Unity secondary schools in Southeast could be attributed to the blended learning strategy; such a blended learning strategy, when adopted in secondary schools as a learning strategy, may likely enhance students' academic performance. The results also showed that the guided discovery learning strategy significantly contributed to a great extent to students' academic performance in Unity Secondary Schools in Southeast Nigeria. Students are guided to avoid misconceptions that can cause poor performance in examinations. Misconceptions arise when students are left to discover facts on their own and without help. Students often become lost and frustrated. The findings of this study corroborated with the findings of the study of Kasmiana et al. (2020), which found that significant differences in increasing of understanding concepts between classes taught guided discovery and those taught with a non-guided discovery model. The application of the guided discovery model improves student learning outcomes, especially in understanding the concept. David (2019) in his study findings that there is no significant difference in mean achievement scores of students taught mathematics using the Guided-discovery teaching method and those taught with the lecture method. Guided discovery learning strategy promotes independent reasoning and self-reliance amongst students as the teacher guides, directs and redirects students' learning activities. This present study signifies that the coefficient of determination indicates that the variance observed in the students' academic performance in Unity Secondary Schools in South East was attributed to the guided discovery learning strategy.

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CONCLUSION

The study concluded that the blended learning strategy significantly relates to a very great extent to students' academic performance in Unity Secondary Schools in Southeast Nigeria. The coefficient of determination indicates that the variance observed in the students' academic performance in Unity secondary schools in Southeast could be attributed to the blended learning strategy. It also reveals a significant relationship between blended learning strategy and students' academic performance in government unity secondary schools in South East, Nigeria. Also, guided discovery learning strategy significantly contributed to a great extent to students' academic performance in Unity Secondary Schools in South East, Nigeria. The variance observed in the students' academic performance in Unity Secondary Schools in South East was attributed to the guided discovery learning strategy. The study also indicates that a significant relationship exists between the guided discovery learning strategy and students' academic performance in Unity Secondary Schools in Southeast Nigeria.

Recommendations : There is a need to prioritise and optimise blended learning strategies in secondary schools, thereby ensuring a quality learning management system and other pedagogical approaches. There is a need for educators to integrate a guided discovery learning strategy in secondary schools towards enhancing independent problem-solving skills and internalisation of knowledge amongst students.

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