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Effects of Andragogical Inquiry Strategy (AIS), Analogy Strategy (AS) and Lecture Strategy (LS) on Students' Retention in Economics in Delta State

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Abstract: *The study investigated how Delta State students' retention in economics was impacted by AIS, AS, and LS. A planned variation design with a 3x2 factorial pretest and posttest was used. The population of the study consisted of 30,813 SSII students enrolled in Delta State public senior secondary schools and taking Economics. The sample for the study consisted of 258 SSII students across 9 full classes. Utilising the Economics Achievement Test (EAT), data were acquired. The authenticity of EAT's face, construct, and content were established. The instrument's reliability was assessed using the Kuder-Richardson formula 21, which provided a coefficient index of 0.83. The data were analysed using the t-test, Scheffe's test, and ANOVA, and it was found that there was a significant difference in the mean retention scores for economics among students who were taught using AIS, AS, and LS, with AIS students receiving higher marks than AS and LS students, respectively. Therefore, it was suggested that AIS be used by economics teachers when teaching economics at the secondary school level of education as it guarantees students' active classroom participation, simple concept understanding, high retention of learned material, self-discovery of knowledge, and interaction with the learning materials during instruction.*

Keywords: Andragogical Inquiry Strategy, Analogy Strategy, Lecture Strategy, Retention

Introduction

Economics is a subject taught in secondary schools in Nigeria as part of the social science curriculum. It is considered a core subject and students usually start studying it from SS1 (Senior Secondary 1) through to SS3. The subject aims to give students a fundamental grasp of how economic systems operate as well as an introduction to the core ideas of economics. Economics education equips students with the knowledge and skills to understand the functioning of the economy. This includes understanding concepts such as production, consumption, savings, inflation, employment, and economic growth. It enables students to comprehend the economic issues faced by individuals, businesses, and the country as a whole. Learning Economics helps students develop critical financial literacy skills necessary for personal financial management. They can learn about budgeting, saving, investing, and making informed decisions relating to personal finance, ultimately enhancing their financial well-being in the future. Economics education prepares students for the job market by providing them with skills that are highly valued by employers. It equips them with analytical and problem-solving skills, an understanding of market dynamics, and the ability to make informed decisions based on economic principles (Aduba, Ezeofor & Okoro, 2010). These skills can enhance employability prospects in various sectors, including finance, business, public administration, and consulting.

Economics education fosters responsible citizenship by making students aware of their role and responsibilities in the economic development of Nigeria. It helps them understand the relationship between government policies, economic outcomes, and societal welfare. It enables students to critically evaluate economic policies, make informed voting decisions, and actively participate in shaping the country's economic future. Teaching Economics encourages entrepreneurial thinking among students. It exposes them to concepts such as opportunity cost, risk-taking, innovation, and market analysis. With this knowledge, students may be motivated to explore entrepreneurship as a career option, ultimately supporting economic growth and job creation in Nigeria. Economics education enables students to understand the global economic context and Nigeria's place within it. It helps students comprehend international trade, foreign exchange, global competition, and economic interdependencies. This knowledge is vital in an increasingly interconnected world, as it prepares students to navigate global economic challenges and opportunities. Overall, teaching economics in secondary schools in Nigeria is crucial to equip students with the skills they need to make informed financial decisions, support the nation's economic growth, and prosper in a fast-paced, fiercely competitive global economy (Aduba, Ezeofor, & Okoro, 2010).

In secondary schools in Nigeria, the effectiveness of the teacher's instruction has a big influence on how well the students do and comprehension of the significance of economics. Teachers who adopt engaging and interactive teaching methods, such as group discussions, case studies, and real-life examples, can help students better comprehend the significance of economics. By making the subject relatable and practical, students are more likely to grasp its importance in real-world scenarios. Teachers who promote critical thinking and problem-solving skills in economics lessons enable students to analyze economic issues, explore different perspectives, and propose solutions. This approach fosters independent thinking and allows students to recognize economics as a tool for addressing societal challenges and promoting growth. In summary, teachers' methodology greatly influences students' understanding and recognition of the importance of economics in Nigerian secondary schools. Therefore, one the problem facing Economics teachers is the choice teaching method for Economics instruction.

Over the years, the lecture strategy (LS) has remained the widely used teaching strategy in Nigerian secondary schools. The LS is a traditional instructional approach where the instructor presents information to learners through a spoken presentation (Agboghoroma, 2015). In this strategy, the instructor takes on the role of an expert, delivering a structured lecture to convey knowledge, explanations, or demonstrations to the learners. The LS typically involves the instructor standing in front of the learners and delivering information in a one-way communication format. The instructor often uses visual aids, such as slides or presentations, to support their talk and provide visual illustrations of key points. The LS has both advantages and limitations. On the one hand, lectures can efficiently deliver a large amount of information to a large group of learners. They provide a structured format that allows for the sequential presentation of ideas and concepts. Lectures can serve as a foundation or introductory overview of a topic, providing learners with a broad understanding of a subject. However, the LS also has its limitations. It is often a passive form of learning, with learners playing a more passive role compared to other teaching methods. There is limited opportunity for active participation, critical thinking, and immediate feedback. To improve student involvement and critical thinking, different teaching methods like the AIS and AS may be employed. This study was designed to assess how effectively students retained economics whether it was taught using AIS, AS, and LS.

The AIS is a teaching approach that is specifically designed for adult learners. However, this study focused on senior secondary school students. The andragogy theory of adult learning, created by Malcolm Knowles, serves as its foundation (Chan, 2010). Andragogy recognizes that adults have unique characteristics and motivations that affect how they learn. In the AIS, the emphasis is placed on engaging students as active participants in the learning process. The instructor acts as a facilitator rather than a mere provider of information. The strategy involves using open-ended questions to stimulate critical thinking and self-reflection among the learners. In order to construct meaning and apply what they have learned to real-life circumstances, these questions urge students to investigate their own experiences, attitudes, and knowledge (Christopher, 2015). This instructional strategy also incorporates problem-solving and collaborative learning activities. Students are encouraged to work in groups, share their insights, and engage in discussions. This encourages an environment of active involvement where students can benefit from one another's knowledge and get a deeper comprehension of the subject. Overall, the AIS aims to promote independent and self-directed learning among adults. It recognizes that adults bring their prior experiences, interests, and goals into the learning process, and emphasizes the importance of relevance and practical application. By actively engaging adults in the learning process, this strategy enhances their motivation, critical thinking skills, and ability to transfer knowledge to their everyday lives. Studies has shown AIS promotes students' retention of knowledge (Adebola, 2018; Jiya, 2011). However, the effectiveness of AIS on students' retention of economics has not been compared with that of AS.

AS is a teaching approach that leverages analogies to enhance learning and understanding (Chinyere & Madu, 2014). An analogy is a comparison between two things that share some similarities but are otherwise different. By using analogies, instructors can help learners connect new information or concepts with something familiar that they already know. The AS involves the deliberate use of analogies to facilitate learning and comprehension. Instructors use analogies to explain complex or abstract ideas by relating them to more concrete or easily understandable concepts. This helps learners make connections and transfer their knowledge from the known to the unknown. Analogies can be presented in various formats, such as verbal or visual. Verbal analogies involve explaining a new concept or idea by relating it to something familiar using words or descriptions. Visual analogies, on the other hand, use images or diagrams to illustrate the similarities and differences between the new and familiar concepts. This study used both verbal and visual analogies. This instructional strategy has several benefits. Analogies make learning more engaging and relatable as they tap into prior knowledge and experiences (Chinyere & Madu, 2014). They provide a bridge between the known and the unknown, helping learners grasp new ideas more quickly. Analogies also encourage critical thinking skills as learners are prompted to analyze and compare different elements. Additionally, analogies can facilitate long-term retention as learners are more likely to remember information that is linked to familiar concepts. Analogy instructional strategies has been shown to have positive effect on students' retention (Djudin & Grapragasen, 2019)

Student retention of knowledge refers to the extent to which students are able to remember and apply what they have learned over time (Valderama & Oligo, 2021). It measures how well students can retain and recall information, concepts, and skills beyond the initial learning period. Higher retention of knowledge indicates that students have a greater ability to remember and apply what they have learned in various contexts and situations. It is influenced by factors such as the effectiveness of teaching methods among others. The teaching methods used in the classroom can have a significant impact on students' retention of knowledge. Teaching methods that encourage active learning, such as group discussions, problem-solving activities, and hands-on experiments, can enhance retention. Active engagement helps students process and internalize information more effectively than passive learning. Connecting classroom lessons to real-world contexts and practical applications can improve students' retention. Students are more likely to retain material when they can apply what they are learning to their lives or potential jobs.

Again, teaching methods may have different effects on male and female students' retention. Males and females may have different preferred learning styles. For example, research suggests that females tend to be more auditory and verbal learners, while males may be more visual and spatial learners. Therefore, teaching methods that cater to these different learning styles can affect the retention of information differently. Sex norms and societal expectations can play a role in how males and females perceive and engage with education. Traditional sex roles and expectations may impact their motivation, self-beliefs, and interests, influencing

their retention of knowledge based on the teaching methods employed. This study sought to determine whether or not AIS, AS, and LS were biased towards male or female students and how they affected students' retention of economics information.

Statement of the Problem

Enhancing students' knowledge acquisition and retention is the main goal of education. The effects of AIS, AS and LS on students' knowledge retention must be looked at and understood in the context of teaching economics in Delta State secondary schools. In this study, retention refers to students' capacity to hold onto and use newly learned information over a prolonged period of time. The effectiveness of AIS, AS and LS on students' retention in economics at Delta State has not been thoroughly studied, despite the fact that research on teaching strategies has been undertaken widely in a variety of educational environments. In order to inform instructional practises and encourage effective teaching and learning in the economics classroom, it is vital to understand the effects of these strategies.

Engaging students in active learning techniques including problem-solving, critical thinking, and collaborative learning is part of the AIS teaching strategy. Meanwhile, the use of AS provides students with relatable examples that facilitate connections between abstract economic concepts and real-life scenarios. Additionally, LS is commonly employed in traditional classroom settings, aiming to deliver content effectively. However, the effectiveness of these strategies in enhancing students' long-term retention of economic concepts remains largely unexplored in the Delta State context. Therefore, the research's main issue is how AIS, AS, and LS affect Delta State students' retention of economics.

Purpose of the Study

The aim of this study was to investigate the effects of AIS, AS and LS on students' retention of economics knowledge in Delta State. Specifically, the study sought to compare:

1. the difference between students who were taught using AIS, AS, and LS in terms of their mean retention scores in economics;
2. the difference between the mean retention scores of male and female students who were taught with AIS, AS, and LS.

Hypotheses

The study was guided by two hypotheses:

1. There is no discernible difference between students who were taught using AIS, AS, and LS in terms of their mean retention scores in economics.
2. There is no discernible difference between the mean retention scores of male and female students who were taught with AIS, AS, and LS.

Research Method and Procedure

A 3x2 factorial planned variation was employed for the pretest and posttest in this quasi-experimental investigation. The population of the study consisted of 30,813 SSII economics students enrolled in public senior secondary schools in Delta State. The sample for the study included 258 SSII students in 9 full classes. To acquire information, the Economics Achievement Test (EAT) was used. The face, concept, and content validity of the EAT were created. Kuder Richardson formula 21 was used to determine the reliability of the EAT (0.83).

Students were divided into groups for AIS, As and LS as the first step in the treatment process. Students in the three groups received the identical economics lessons but teaching strategies. The three groups received pretests before to treatment. After six weeks of treatment, students in the three groups retook the EAT with the items in a different order. Furthermore, four weeks after the end of the six weeks treatment, EAT was administered with re-arrangement both in the question number and answer options to the three group's students as retention test. The results were examined using t-test and analysis of variance.

Results

- There is no discernible difference between students who were taught using AIS, AS, and LS in terms of their mean retention scores in economics.

Table 1
ANOVA Summary Table on Difference Between the Economics Retention Scores of Students Taught AIS, AS and LS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10935.976	2	5467.988	73.101	.000
Within Groups	19074.210	255	74.801		
Total	30010.186	257			

As can be shown in Table 1 ($F(2,255) = 73.101$, $P(0.000) < 0.05$), the mean retention scores among students taught economics using IAS, AS, and LS varied significantly. Thus, the null hypothesis is refuted. Students that learned economics via AIS, AS, and LS demonstrated considerably different mean retention ratings as a result. The direction of the difference was determined using a Scheffe's Post-Hoc test, as shown in table 2.

Table 2
Scheffe's Post-Hoc Test on Economics Retention

(I) Teaching Strategy	(J) Teaching Strategy	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
AIS	AS	3.531*	1.357	.035	.19	6.87
	LS	15.045*	1.326	.000	11.78	18.31
AS	AIS	-3.531*	1.357	.035	-6.87	-.19
	LS	11.514*	1.287	.000	8.34	14.68
LS	AIS	-15.045*	1.326	.000	-18.31	-11.78
	AS	-11.514*	1.287	.000	-14.68	-8.34

In accordance with Table 2, there is a significant difference between the mean economics retention scores of students taught using AIS and AS, AIS and LS, and AS and LS, respectively. This exemplifies the change in relevance from AIS, AS to LS.

- There is no discernible difference between the mean retention scores of male and female students who were taught with AIS, AS, and LS.

Table 3
Independent Sample t-test Summary Table on Difference Between the Economics Mean Retention Scores of Male and Female Students Taught with AIS, AS and LS

Strategy	Sex	N	Mean	SD	df	t-cal	Sig.(2-tailed)
AIS	Male	38	60.79	8.44	75	2.914	0.005
	Female	39	55.64	7.02			
AS	Male	41	55.22	9.01	84	2.659	0.007
	Female	45	58.58	9.70			
LM	Male	41	44.88	6.78	93	1.876	0.061
	Female	54	41.81	7.97			

Table 3 shows that male and female AIS economics students had significantly different retention scores ($t = 2.914$, $P(0.005) < 0.05$). Disproving the null hypothesis. Thus, male AIS students have higher mean retention scores than female ones. Table 3 shows that male and female AS economics students had significantly different retention scores, $t = 2.659$, $P(0.007) < 0.05$. Disproving the null hypothesis. Thus, AS-taught female students have much higher mean retention scores than male students. Table 3 shows that male and female LS-taught economics students had similar mean retention scores, $t = 1.876$, $P(0.061) > 0.05$. The null hypothesis remains. Thus, male and female LS students had similar mean retention scores.

Discussion

AIS, followed by AS, surpassed LS in mean retention scores for economics students, the study found. AIS and AS students retained economics concepts longer than LS students. This may be because AIS and AS made classroom instruction more realistic. Since the concepts were tangible to students, their understanding improved and lasted longer. Students couldn't remember such topics because they were taught in lectures. This may explain the lecture group's low retention rates. Adebola (2018) showed that the problem-solving strategy improves students' achievement and retention in Further Mathematics. Jiya (2011) found that analogies help students remember more than lectures. Jiya's findings support teaching via analogies.

AIS-taught male students had much higher mean retention scores than female students. AIS may have retained male students better than female students. Male-female student participation may explain the big disparity. This contradicts Akpoghol, Samba, and Asemave (2013), who found that AIS-taught girls retained more than boys. Girls excelled at observation, inference, prediction, hypothesising, operational definition, and data interpretation. The study also found that AS-taught female students had significantly higher mean retention scores than male students. AS may have affected how boys and girls remembered economics. Female students participated more in class than male students, which may explain this conclusion. Female students were more involved in class, which may have caused the retention disparity. This finding disproves Jiya (2011)'s claim that analogies benefit male students over female students. The study found a non-significant difference in mean retention ratings between male and female LS economics students. One explanation is that both sexes are inactive during education. Jiya (2011) found no difference in male and female students' mean retention scores.

Conclusion

The following conclusions were drawn based on the findings of this study: The use of AIS, AS and LS positively influenced students' retention of economics, with AIS being most effective, followed by AIS and LS respectively. AIS enhance the mean retention scores of males more than female students, whereas AS improve female students' mean retention scores than male.

Recommendations

1. Economics teachers should use AIS and AS to teach the subject at the secondary school level because they ensure student engagement, conceptual clarity, high levels of retention, self-discovery of knowledge, and interaction with the teaching materials.
2. When employing AIS and AS in the classroom, economics teachers should make sure that both male and female students actively engage.

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