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Volume 6 | Issue 2 | December 2023 | Page1-57

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Contents

Articles

1 **The Effect of *Self-Questioning Strategy* on EFL Tenth-Grade Students' Reading Comprehension**
Talib Ali Bani Hamad Abdallah Baniabdelrahman

14 **Research as a Veritable Tool for Enhancing Students' Job Creation in the 21st Century University Education**
Akujieze M.O.

25 **Capacity Building Needs for Manual and Computer Assisted Teaching of Pattern Drafting for Entrepreneurship in Tertiary Institutions in Nigeria**
Nwamaka N. Bob-Eze

37 **Business Clothing For Females: Suitability For Effective Workplace Job Performance in Nigeria**
Azonuche Juliana Ego

46 **The Effect of Inquiry-Based Learning Strategy on EFL Tenth-Grade Students' Reading Comprehension**
Hadeel Saleh Al-Khamaiseh

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ARTICLE

The Effect of *Self-Questioning Strategy* on EFL Tenth-Grade Students' Reading Comprehension

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ABSTRACT

This study investigated the effect of the *self-questioning strategy* on English as a Foreign Language (EFL) for tenth-grade students' reading comprehension. A quasi-experimental design with two groups was employed. The researcher randomly assigned two whole sections of grade 10 from Al Samtt Secondary school for Boys, a public school, Directorate of Education in Irbid (AL Kora Directorate of Education). First, the experimental group of 25 students selected and second the control group of 25 students was selected. To achieve the purpose of the study, a pre-/post reading comprehension test was designed. In addition, *self-questioning strategy*was used to teach the experimental group, whereas a control group was taught by the conventional teaching strategies, as suggested in the Teacher's Book. Results showed that there were significant statistically differences between the control and the experimental groups in favor of the experimental group. Considering the research results, the researcher recommended to use *self-questioning strategy* on different EFL skills and different levels of students.Teachers also should enroll in in-service training courses that provide more information about the curriculum revisions and programs that focus on improving their questioning abilities.

1 Introduction

Reading is a very important part of communication in a foreign language. English as a foreign language (EFL) is a basic school subject and a necessary course in Jordan's universities and schools. It is also a requirement for people who want to progress professionally, communicate well, or have easy access to information. As a result, dedicated EFL learners are required to put in a lot of effort to improve both their language production (speaking and writing) and comprehension (listening and reading) skills.

Reading is essential for effective language acquisition. Success in school and the workplace depends on it (Alderson, 1984).[3] Reading fosters lifelong learning, opens doors for readers, and teaches them new things (Chastain, 1988).[17] Reading exercises should emphasize comprehension (McShane, 2005).[26] Reading comprehension, according to Snow (2002),[32] is the process of extracting meaning from written language through an interactive process in which the reader interacts with the text and participates by utilizing his or her abilities, background knowledge, experiences, and skills.

According to Kintsch (1988),[25] reading comprehension is the central component of reading, which allows the reader to comprehend and infer the meaning of printed texts. It is thought to be a complicated process that involves one's knowledge, experience, and attempt to devel-

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op intuition (Chen, 2009).[18] Reading comprehension is defined as "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language"(Snow, 2002:11).[32]According to Stricklin (2011),[33] it is a multi-step process that students go through in order to comprehend what they are reading.

Barnett (1989)[14]stated three levels of reading comprehension: literal, inferential, and critical level. When it comes to the literal level, it requires that the reader understand what is being said in the text. The second level is the inferential level, when the reader attempts to comprehend the text by reasoning, drawing on prior knowledge, and interpreting the text in order to ascertain the meaning behind what is presented. The reader advances to the critical level, when they make decisions as they read based on facts or opinions, comparisons, and cause-and-effect relationships, moving beyond the text.

Questioning, as a reading strategy, plays a vital role in assisting learners to effectively understand complex reading demands. Before, during, and after reading, readers can use the questioning. Readers must engage in a questioning process in order to create meaning, improve understanding, identify solutions, address issues, locate information, and learn new knowledge (Harvey & Goudvis, 2007).[21] With this strategy, students go back to the text as they read to find the answers to the questions the teacher asked before, during, and after the reading. Also, they can recognize whether the questions are factual, inferential or based on students' prior knowledge. (National Reading Panel,2000).[29]

According to Mucher (2007),[28]Questioning is more of a learned ability than an innate one. According to Cotton (2001),[19] questioning is the use of questions as instructional cues to help students understand the material they need to learn as well as rules for what and how to do. Literal, inferential, and applied questions are the three main categories of reading comprehension questions (Day & Park, 2005).[20]

A literal question is one in which both the question and the answer words are typically present in the same sentence. Inferential question inquires reading between lines to understand and find solutions. Readers must read at least two sentences before they can determine the solutions because they must put information together. Readers' prior knowledge and experiences might be used to provide answers to the applied questions. In order to respond to the question, they must evaluate and combine data. Inferential and applied questions are high-level ones since the readers necessitate thinking deeply and critically; and when they are asked questions, they need to make connections between different components of the text, selectively make hypotheses, concentrate on specific and important themes, and use attention (Van den Broek, Tzeng, Risden, Trabasso, &Basche, 2001).[35]Using one of questioning strategies such as *self-questioning strategy* in students' learning may guide them to deeply and accurately comprehend the situations they face daily.

Self-questioning is a strategy that helps students comprehend the text by allowing them to come up with questions as they read. It also makes it easier for them to be independent in their comprehension because they are fully engaged and thinking in an organized and goal-directed manner. Additionally, *self-questioning* is a continuous act in which readers generate questions to better comprehend a text (Williamson, 1996).[36] In other words, students may manage their reading comprehension and improve their capacity for independent learning through *self-questioning strategy*.

Self-questioning is a strategy that aids students better understand the text by generating questions while reading it. Students will independently understand the text due to their fully engagement through organized and oriented-goal thinking (Williamson, 1996).[36]*Self-questioning strategy* involves assessing one's own reading comprehension using a set of questions that appear to be either self-generated or prepared by teachers (Almeida, 2012).[8] This strategy is described as a continuous act in which the reader generates a set of questions for better understanding of the text. Additionally, research (e.g., Kamalizad&Jalilzadehb, 2011;[24] Pearson, Roehler, Dole & Duffy, 1992)[30] showed that students who receive instruction in creating self-questions read more fluently than those who don't.

According to Algozine, Dorothy, Obiakur, and Festus (2008),[5] a student can utilize a variety of strategies to develop, consider, forecast, research, and respond to questions regarding the text they are reading. To engage in *self-questioning strategy*, a reader must search for textual cues that prompt them to consider potential meanings, ask questions about meanings, predict the answer, read to discover it, assess it in light of their predictions, and reconcile discrepancies between their questions and their predictions with the information the author has actually provided in the text. Asking questions is only one aspect of the*self-questioning strategy*. Textual hints that students ordinarily overlook must be read carefully by them.

In Jordan, the Teachers' Book for English Reading highlights the general outcomes of grade 10. It stated that in order to understand basic knowledge and literary literature, students need to use their reading skills. Additionally, students must show that they comprehend the tales and letters they have read. Students in the tenth

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grade should connect their prior information, life experiences, and methods for reading. Tenth grade students, are expected to: Scan texts for specific information; use context to guess the meaning of new words, use pictures to participate in a simple discussion;skim the texts for the main ideas; demonstrate understanding of an authentic informational text by answering questions; demonstrate understanding of an authentic informational text by justifying their predictions; make connections between prior knowledge and an informational text;take part in a debate using expressions related to agreement and disagreement; and deduct the implicit meanings in the text, and make judgments (Ministry of Education, 2006).[27]

2 Statement of the Problem

The researcher has observed a general weakness in students' capacity to successfully understand the written texts, thereby, failing to answer literal, inferential, and critical reading comprehension questions over his 15 years of teaching English in Jordan and Kuwait. This challenge may be attributed to EFL teachers' use of conventional instructional methods and strategies for reading comprehension. As a result, students may be unable to comprehend the reading texts, ask and answer the reading comprehension questions, and self-generate questions before, while and after reading texts.

Furthermore, Jordanian researchers (e.g., Al-Jamal, Hawamleh, & Al-Jamal, 2013;[6] Al-Damiree & Bataineh, 2015;[2] Smadi&AlShra'ah, 2015;[31] Bataineh & Mayyas, 2017;[15]Al-Khamaiseh & Al-Jamal, 2022)[7] indicated that EFL Jordanian students face problems while reading, as contributed to the lack of proper instructional strategy. To overcome this problem, integrating *self-questioning strategy* may improve students' reading comprehension skills. In the same line, many studies (e.g., Jabbaripour, Mostafaii, & Marefat, 2017; [22] Alghalban (2019);[4] Azmi and Usman, 2021)[13] found that *self-questioning strategy* had a positive effect and recommended it in the teaching/learning process.

2.1Purpose of the Study

The purpose of this study is to determine how *self-questioning strategy* affects the reading comprehension of male EFL students in Jordan who are in tenth grade.

2.2Question of the Study

The present study is designedto answer the following research question:

- Are there statistically significant differences (α = 0.05) on Jordanian EFL tenth-grade students' overall reading and reading comprehension levels (literal, inferential, and critical) that can be attributed to the teaching strategy used (*self-questioning* vs. conventional instruction)?

2.3 Significance of the Study

This is one of the few studies that examines the effect of the *self-questioning strategy* on students' reading comprehension skills in Jordan. The current study is pertinent because incorporating *self-questioning strategy* into reading comprehension lessons may improve performance among Jordanian EFL tenth-grade students. The findings of this study may help EFL teachers implement an innovative strategy for instructing reading comprehension. The study is significant because it can aid in thedevelopment and teaching of the reading curriculum by assisting in the planning and developing pertinent assignments and activities that improve students' reading comprehension. The current study's findings may encourage more research into the possible impacts of *self-questioning strategy* on other English language proficiency, notably in Jordan.

Operational Definition of Terms

The following terms are defined as follows in the current study:

***Self-Questioning*:** Is a reading strategy in which students try to understand and remember a reading material by asking and answering high level questions about the text they are reading (Taboada & Guthrie, 2006).[34] In this study, it is a strategy to improve students reading comprehension through teaching them how to self-generate questions before, while and after reading texts.

Reading Comprehension: Is how the learner extracts the required meaning from the written texts as efficiently as possible (Snow, 2002). [32] The ability of tenth-grade students to comprehend a text at the literal, inferential, and critical levels is examined in this study. Based on the results of the two modules (4 & 5) *Action Pack 10*, it is evaluated by the reading comprehension post-test.

2.4 Limitations of the Study

The generalizability of the findings could be bound to the following:

1. School type and sample: The study is only generalizable to students in the tenth grade at the AL-Samt Secondary School for Boys in the Al-Kora Directorate of Education during the second semester of the academic year 2022–2023. As a result, the findings can be generalized to comparable samples or situations.

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2. The study's intervention period is only eight weeks long. Different amounts of time could have different results.

3. Action Pack 10 (specifically modules 4 and 5), a textbook utilized in Jordanian public schools, served as the study's textbook. A different textbook with different material can provide different results.

4. The study's focus was on reading comprehension abilities relevant to the levels of literal, inferential, and critical comprehension reported in modules 4 and 5 in *Action Pack 10*.

3 Review of the Related Literature

The following studies are pertinent to the investigation of *self-questioning strategy* and were gathered by the researcher after examining educational research.

Al-Shedeiah (2014)[10] investigated the effectiveness of *self-questioning strategy* in the development of tenth-grade students' reading comprehension skills and their attitudes towards reading. The participants were 66 female students. Data were collected through a pre-/post-test and an attitudinal questionnaire. The results showed that there were statistically significant differences between the experimental and control groups students' mean scores on reading comprehension skills, favoring the experimental group. The results also showed that the experimental group had positive attitudes towards using *self-questioning strategy*.

Amalia and Devanti (2016)[12] improved students' reading comprehension by the use of questioning technique. The participants of the study were the second grade students. They are all thirty-two students. Data were collected through in-depth-interview during the process of teaching and learning and test which was given in the end of the process. The results of the study showed that the use of questioning strategy can improve the second grade students' reading comprehension.

Al-Shaigy (2016)[9] examined the effect of *self-questioning strategy* on students' achievement and on the development of critical thinking skills among the ninth-grade students in Kuwait. The participants were 68 female students. Data were collected through an achievement test and critical thinking test. The results showed that there was a significant positive effect on the useof the*self-questioning strategy* on students' achievement and critical thinking skills.

Joseph, Alber-Morgan, Cullen, and Rouse (2016)[23] reviewed experimental research studies that examined the effects of *self-questioningstrategy* on school-age students' reading comprehension to determine the extent to which *self-questioning* is an evidence-based practice. This review resulted in 35 experimental research studies that involved teaching *self-questioning* to K–12 students with and without disabilities. The findings revealed that a variety of strategies were used to teach *self-questioning* to students and this *self-questioning strategy* was effective for improving reading comprehension performance across a range of diverse learners and various educational settings.

Albdour (2017)[1] investigated the effect of *self-questioning strategy* on developing critical reading and creative writing skills in English among first-year students at Al-Hussein Bin Talal university. The participants were 35 male and female students. Data were collected through critical reading test and creative writing test. The results showed that there were statistically significant differences between the experimental and control groups students' mean scores on reading comprehension skills, favoring the experimental group.

Jabbaripour, Mostafaii, and Marefat (2017)[22] investigated the effectiveness of self-regulatory and *self-questioning strategies* instructions on Iranian EFL learners' reading achievement. The participants were 45 male and female students designated into two experimental and one control group. Each consisted of fifteen (N=15). Data were collected through a questionnaire. The findings revealed that the two experimental groups that received self-regulatory and *self-questioningstrategies* significantly outperformed the control group.

Alghalban (2019)[4] investigated the impact of employing *self-questioning strategy* on developing reading comprehension skills among the fourth-grade female students and their attitudes towards it. The participants were 76 female students. Data were collected through a pre-/post-test and an attitudinal questionnaire. The results showed that there were statistically significant differences between the experimental and control groups students' mean scores on reading comprehension skills, favoring the experimental group. The results also showed that the experimental group had positive attitudes towards using *self-questioning strategy*.

Bataineh and Al-Shbatat (2019)[16] investigated how questioning affected the critical reading abilities of Jordanian EFL ninth graders. 85 students participated in the study. A pre/post critical reading test, as well as a semi-structured interview, were used to gather the data. According to the study's findings, the experimental group outperformed the control group because both questioning and *self-questioning* improved students' capacity for critical reading, with questioning having a stronger effect than *self-questioning*.

Al-Swelmyeen and Sakarneh (2020)[11] determined the effect of *self-questioning strategy* in developing independ-

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ent thinking in teaching physics. Forty-six students from Jordan's Amman schools' first secondary science class participated in the study. Through the independent thinking test, data were gathered. A semi-experimental strategy was used. The study's findings showed that there was a statistically significant difference between the means of the two groups (the experimental group and the control group) in terms of their capacity for independent thought, with the experimental group being more likely to exhibit it. Students were able to organize their learning freely and independently by using *self-questioning strategy*, which also enables them to design learning activities that include determining the crucial learning outcomes.

Azmi and Usman (2021)[13] studied the effectiveness of using *self-questioning strategy* on students reading comprehension in the grade eight students at MTs DDI Soni. A quasi-experimental design was used. Forty students participated in the study. A pre and post-test test were used to gather data. The results of the study showed that employing *self-questioning strategy* could enhance reading comprehension.

4 Concluding Remarks

Many studies (e.g., Albdour (2017),[1] Alghalban (2019),[4] Al-Shaigy (2016),[9] Al-Shedeiah (2014),[10] Al-Swelmyeen & Sakarneh (2020),[11] Amalia & Devanti (2016),[12] Azmi & Usman (2021),[13] Jabbaripour, Mostafaii, &Marefat (2017),[22] Joseph, et al., (2016),[23] and Bataineh& AL-Shbatat (2019))[16] confirmed that*self-questioning strategy* is advantageous and effective. Additionally, it was revealed that a small number of research studies had been conducted to look at hows*elf-questioning strategy* affected college and high school students' reading comprehension. However, prior research demonstrated that *self-questioning strategy* had a significant positive impact on the growth of EFL students' reading comprehension as a whole.

To find out how *self-questioning strategy* influenced EFL learners, numerous studies were conducted. However, there hasn't been a lot of research on Arab English learners. There haven't been any local studies on the effects of *self-questioning strategy* on Jordanian students' reading comprehension.

5 Method and Procedures

5.1 Design and Variables of the Study

In the present study, the quasi-experimental design was followed. The independent variable was the teaching strategy employed *self-questioning teaching strategy or traditional strategy*. The dependent variable was the students' performance in the reading comprehension post-test.

5.2Participants of the Study

The present study consisted of two EFL tenth-grade sections of 50 students who were purposefully chosen since the researcher has strong ties with the English teacher in it. They studied at Al Samtt Secondary school for Boys, a public school, Directorate of Education in Irbid (AL Kora Directorate of Education). The present study was carried out during the second semester of the academic year 2022/2023.

Twenty-five students wereselected as the experimental group and then 25students were selected as the control group. To ensure equality, a pre-test was administered to the students in the two groups. The experimental group was taught the reading activities from the *Action Pack 10* textbook using *self-questioning strategy*. The Teacher's Book of *Action Pack 10* was used to provide the lesson plan for the control group, but there was no mention of *self-questioning strategy*.

Research Instrument

The pre/post-test of reading comprehension was designed to achieve the purpose of the study. The description of the instrument is as follows:

The Pre/Post-Test for Reading Comprehension

Based on a review of similar prior literature, the researcher designed a reading comprehension pre/post-test. The three fundamental reading comprehension levels (literal, inferential, and critical) were the focus of the pre and post-tests. Each of these levels was assessed using a unique set of questions that the researcher created in accordance with the tenth-grade modules used in Jordanian public schools and the reading material. The reading comprehension exam was designed using the learning and teaching materials found in the teacher's book. The purpose of the test was to gauge how well each student understood what they had read both individually and collectively before and after applying *self-questioning strategy* in the experimental and control groups to verify the effect of this teaching strategy.

To assess the students' reading comprehension at three levels (literal, inferential, and critical), the pre-/post-test included two reading passages with various questions. Twenty-four questions in total, divided into three levels, were asked. The first level, which accounted for 30% of the total questions, measured literal level and had 12 questions. 8 questions, or 40% of all the questions, made up the second level, which assessed inferential level. 4 questions, or 30% of all the questions, made up the third level, which assessed the critical level.

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5.3 Test Validity and Reliability

Content Validity

The validity of the reading comprehension test was investigated by a jury. The jury was given instructions to read the test and assess its content and grammar. Following the evaluation of the test, the jury provided feedback and recommendations to the researcher. When the test's questions were amended, their comments and suggestions, such replacing unclear questions for ones that were clearer, were taken into consideration.

Construct Validity

The Pearson Correlation Coefficient was retrieved between the item score and the total score of the item's level and the total score of the entire test in order to assess the construct validity. Between the item score and the level's total score, a corrected item total correlation was also extracted. The results showed that the Pearson Correlation Coefficient (i.e., the values are higher than 0.35) between the item score and the total score of its level and the total score of the entire test is statistically significant. The corrected item-total correlation (the relationship between an item's score and the level's overall score) is likewise greater than the cutoff point (0.40). These findings suggest that the internal consistency of the reading comprehension exam is at an acceptable level.

Test Reliability

Cronbach Alpha Coefficients and the test-retest method were used to assess the reliability of the reading comprehension test. The results showed that the literal, inferential, and critical Cronbach Alpha Coefficients were 0.88, 0.87, and 0.89, respectively. For the entire scale, it was calculated to be 0.90, which is all above the cut-off value.70 (Cronbach, 1951). Additionally, the literal, inferential, and critical test-retest coefficients were 0.83, 0.89, and 0.87, respectively. For the entire scale, it was calculated to be 0.88, which is all above the cut-off value.70 (Cronbach, 1951).

Self-Questioning Strategy-Based Instructional Program

The researcher designed a *self-questioning strategy*-based instructional program to aid participants in increasing their reading comprehension in order to fulfill the study's objectives. The reading comprehension activities in modules 4 and 5 were also redesigned by the researcher so that participants in the experimental group engaged in *self-questioning strategy* during their reading comprehension sessions.

The Instructional Material

Modules 4 and 5 of Action Pack 10's Student's Book and Activity Book served as the basis for the instructional materials used in this study. For the participants in the experimental group, the researcher redesigned these activities based on *self-questioning strategy* that was used to teach reading comprehension skills.

Duration and Content of the Instructional Program

This instructional program lasted for eight weeks. It started on the 6th of March 2023 and ended on the 7th of May 2023. The reading comprehension activities of the modules (4 and 5) of *Action Pack 10* were redesigned in the light of *self-questioning strategy*. The reading comprehension activities of each unit were alienated into two 45-minute sessions a week for eight weeks.

Procedures for Designing and Implementing the Instructional Program

To implement the current program, the following procedures were carried out:

1. Analyzing the content of the reading comprehension exercises present in *Action Pack 10*'s targeted modules (4 and 5).
2. Recognizing the reading comprehension skills in Action Pack 10's targeted modules.
3. Outlining the procedures to be followed during every lesson.
4. Selecting the right period of time for each task.
5. Before introducing the targeted *self-questioning strategy*, administer a reading pre-test to the control and experimental groups.
6. Enabling the focused *self-questioning strategy* for the experimental group. An instructional program based on self-questioning strategies will be used to teach the experimental group.
7. Conducted a post-test to gauge the students' comprehension of what they had read.

Validity of the Instructional Program

To ensure the instructional program's validity, the researcher presented it to a panel of English curriculum and instruction specialists. A review of the program and any feedback or comments from the jury regarding the program that was distributed were requested by the researcher. The researcher implemented the adjustments as they had suggested.

6 Results

To answer the research question, the researcher fol-

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lowed the following procedures:

1.The means and standard deviations of the pre-/post-test scores in the overall three levels of reading comprehension, which are: literal, inferential, and critical for the experimental and control groups were calculated, as shown in Table 1.

Table 1: Means and Standard Deviations of the Overall Reading Comprehension

Group	Pre-test		Post-test	
	*Mean	S.D	*Mean	S.D
Experimental	13.55	1.85	33.15	2.06
Control	14.35	2.01	26.55	4.57
Total	**13.95**	**1.95**	**29.85**	**4.84**

***The total score is 40**

Table 1 shows that the mean score of the experimental group (Mean=33.15) is higher than the mean score of the control group (Mean=26.35) in the overall reading comprehension.

To investigate the statistically significant effect of the teaching strategy (*self-questioningvs.* conventional) on the overall reading comprehension after controlling the effect of the pre-test scores, a one-way analysis of covariance (ANCOVA) was performed, as shown in Table 2.

Table 2: Results of One-Way ANCOVA for the Effect of Teaching Strategy on the Overall Reading Comprehension

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test (Covariate)	3.267	1	3.267	.255	.617	.007
Teaching method	432.243	1	432.243	33.724	.000	.477
Error	474.233	37	12.817			
Total	36554.000	40				
Corrected Total	913.100	39				

Table 2 shows a statistically significant difference between the two groups in the overall reading comprehension after controlling the effect of the pre-test scores in favor of the experimental group. The partial eta squared value of (.477) indicates that the teaching strategy explained 47.7% of the variance in overallreading comprehension performance.

Furthermore, the means, standard errors, and standard deviations of the two groups in the overall reading comprehension before and after controlling the overall pre-test scores. Table 3 illustrates the results.

Table 3: Adjusted and Unadjusted Means of the Overall Three Reading Comprehension Levels

Group	Unadjusted Mean		Adjusted Mean	
	Mean	S.D.	Mean	Std. Error
Experimental	33.15	2.06	33.21	.810
Control	26.55	4.57	26.49	.810

As shown in Table 3, there are observed differences between the two groups in the overall reading comprehension post-performance after controlling the differences in the pre-test scores. As such, using *self-questioningstrategy to* enhancethe overall reading comprehension performanceof the experimental group.

2. The means and standard deviations of pre-/post-test scores in the three reading comprehension levels(i.e., literal, inferential, and critical) were calculated, as shown in Table 4.

Table 4: Means and Standard Deviations of the Pre-Test and Post-Test Per-levelin the Three Reading Comprehension Levels

Reading level	Group	Maximum score	Pre-test		Post-test	
			Mean	S.D	Mean	S.D
Literal	Experimental	12	3.70	1.08	10.20	.83
	Control		4.00	.79	8.45	1.96
Inferential	Experimental	16	5.20	1.15	13.15	1.23
	Control		5.55	1.05	10.45	1.64
Critical	Experimental	12	4.65	.99	9.80	.95
	Control		4.80	1.15	7.65	2.11

Table 4 shows that the post-test scores of the experimental groups are higher than the mean scores of the control group in the three reading comprehension levels post-performance(literal, inferential, and critical).

To investigate the effect of the teaching strategy(-*self-questioning vs.* conventional) on the linear combination of the three reading comprehension levels post-performance after controlling the effects of pre-test scores, a one-way multivariate analysis of covariance (one-way MANCOVA) using a multivariate test (Hoteling's' Trace) was used, as shown in table 5.

Table 5 shows that the main effect of the teaching strategy was significant. This indicates that the student's performance in a linear combination of the three reading comprehension levels differs across the two groups. The partial eta square value of .515 indicates that 51.5% of the variance in the in a linear combination of the three reading comprehension levels attributed to the teaching strategy. Since the effect of the teaching method is significant, a follow-up univariate analysis (Follow-up ANCOVAs): (Tests of between-subject effects) was conducted, as shown in Table 6.

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Table 5: Results of Multivariate Test (Hoteling's' Trace) for the Effect of Teaching Strategy on the three Reading Comprehension Levels

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Teaching Strategy	1.064	11.701	3.000	33.000	.000	.515

Table 6: The Effect of the Teaching Strategy on Reading Comprehension (Per-level) after Controlling the Effect of Pre-Test Scores

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Covariate-Literal	Literal	.077	1	.077	.032	.858	.001
Covariate-Inferential	Inferential	.662	1	.662	.302	.586	.009
Covariate-Critical	Critical	.516	1	.516	.191	.664	.005
	Literal	27.758	1	27.758	11.720	.002	.251
Teaching strategy	Inferential	69.776	1	69.776	31.900	.000	.477
	Critical	48.502	1	48.502	17.994	.000	.340
	Literal	82.899	35	2.369			
Error	Inferential	76.557	35	2.187			
	Critical	94.340	35	2.695			
	Literal	116.775	39				
Corrected Total	Inferential	152.400	39				
	Critical	147.975	39				

Table 6 shows that there were statistically significant differences between the two groups in the three reading comprehension levels in favor of the experimental group. The partial eta squared values of .251, .477, and .340 indicated that the teaching strategy explained 25.1%, 47.7%, and 34.0% of the variance in the literal, inferential, and critical, respectively. As such, the highest effect size of the teaching strategy was at the inferential level, followed by the critical level, and inferential.

Additionally, the means, standard errors, and standard deviations of the two groups in the three reading comprehension levels before and after controlling the pre-test scores were extracted, as shown in Table 7.

Table 7 shows that there are differences between the post-performance of the two groups on the three reading comprehension levels that remain after the differences in the pre-test scores are controlled. As such, *self-questioningstrategy*enhanced students' performance in the three reading comprehension levels (literal, inferential, and critical).

3. The means and standard deviations of pre-/post-test scores in the six reading comprehension sub-levels were calculated, as shown in Table 8.

Table 8 shows that the post-test scores of the experimental groups are higher than the mean scores of the control group in the sixreading comprehension sub-levels post-performance(scanning texts for specific information, using context to guess the meaning of new words, skimming the texts for the main ideas, demonstrating understanding of an authentic informational text by answering questions, deducting the implicit meanings in the text, and making judgments about the texts).

To investigate the effect of the teaching strategy (*self-questioning vs.* conventional) on the linear combination of the six reading comprehension sub-levels post-performance after controlling the effects of pre-test scores,

Table 7: Adjusted and Unadjusted Means of the Three Reading Comprehension Levels

Reading level (Dependent Variable)	Group	Unadjusted mean		Adjusted mean	
		Mean	S.D	Mean	S.E
Literal	Experimental	10.20	.83	10.18	.349
	Control	8.45	1.96	8.47	.349
Inferential	Experimental	13.15	1.23	13.15	.335
	Control	10.45	1.64	10.45	.335
Critical	Experimental	9.80	.95	9.85	.372
	Control	7.65	2.11	7.60	.372

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Table 8: Means and Standard Deviations of the Pre-Test and Post-Test Per-Sub-Level

Reading Sub-Level	Group	Maximum score	Pre-test		Post-test	
			Mean	S.D	Mean	S.D
Scanning texts for specific information (S1).	Experimental	7	2.10	.91	5.70	.57
	Control		2.35	.75	4.75	1.21
Using context to guess the meaning of new words (S2).	Experimental	5	1.60	.50	4.50	.51
	Control		1.65	.49	3.70	.98
Skimming the texts for the main ideas (S3).	Experimental	6	2.15	.49	5.20	.89
	Control		2.45	.51	3.75	1.07
demonstrating understanding of an authentic informational text by answering questions (S4)	Experimental	10	3.05	.94	7.95	.89
	Control		3.10	.85	6.70	.92
Deducting the implicit meanings in the text (S5).	Experimental	6	2.20	.62	4.85	.49
	Control		2.35	.67	3.65	1.09
Making judgments about the texts (S6)	Experimental	6	2.47	.60	4.95	.69
	Control		2.45	.60	4.00	1.26

a one-way multivariate analysis of covariance (one-way MANCOVA) using a multivariate test (Hoteling's' Trace) was used, as shown in Table 9.

Table 9 shows that the main effect of the teaching strategywas significant. This indicates that the student's performance in a linear combination of the six reading comprehension sub-levels differs across the two groups. The partial eta square value of .567 indicates that 56.7% of the variance in the linear combination of the six reading comprehension sub-levels attributed to the teaching strategy. Since the effect of the teaching strategy is significant, a follow-up univariate analysis (Follow-up ANCOVAs): Tests of between-subject effects) was conducted, as shown in Table 10.

Table 10 shows that there were statistically significant differences between the two groups in the six reading comprehension levels in favor of the experimental group. The partial eta squared values of .165, .158. .340, .334, .323, and .214 indicated that the teaching strategy explained 16.5%, 15.8%, 34.0%, 33.8%, 32.3%, and 21.4% of the variance in the scanning texts for specific information, using context to guess the meaning of new words, skimming the texts for the main ideas, demonstrating understanding of an authentic informational text by answering questions, deducting the implicit meanings in the text, and making judgments about the texts, respectively. As such, the highest effect size of the teaching strategy was at the skimming the texts for the main ideas sub-level, followed by demonstrating understanding of an authentic informational text by answering questions sub-level, deducting the implicit meanings in the text sub-level, making judgments about the texts sub-level, scanning texts for specific information sub-level, and using context to guess the meaning of new words sub-level.

Additionally, the means, standard errors, and standard deviations of the two groups in the six reading comprehension sub-levels before and after controlling the pre-test scores were extracted, as shown in Table 11.

Table 11 shows that there are differences between the post-performance of the two groups on the six reading comprehension sub-levels that remain after the differences in the pre-test scores are controlled. As such, *self-questioning strategy* enhanced students' performance in scanning texts for specific information, using context to guess the meaning of new words, skimming the texts for the main ideas, demonstrating understanding of an authentic informational text by answering questions, deducting the implicit meanings in the text, and making judgments about the texts.

Table 9: Results of Multivariate Test (Hoteling's' Trace) for the Effect of Teaching Strategy on the Six Reading Comprehension Sub-levels

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Teaching Strategy	1.312	5.902	6.000	27.000	.000	.567

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Table 10: The Effect of the Teaching Strategy on Reading Comprehension (Per sub--level) after Controlling the Effect of Pre-Test Scores

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Covariate- S1	S1	.155	1	.155	.154	.697	.005
Covariate- S2	S2	.176	1	.176	.287	.596	.009
Covariate- S3	S3	.438	1	.438	.415	.524	.013
Covariate- S4	S4	.072	1	.072	.083	.775	.003
Covariate-S5	S5	.000	1	.000	.000	.988	.000
Covariate-S6	S6	.035	1	.035	.031	.862	.001
Teaching Strategy	S1	6.371	1	6.371	6.345	.017	.165
	S2	3.678	1	3.678	6.000	.020	.158
	S3	17.339	1	17.339	16.455	.000	.340
	S4	13.771	1	13.771	16.049	.000	.334
	S5	11.462	1	11.462	15.284	.000	.323
	S6	9.828	1	9.828	8.725	.006	.214
Error	S1	32.132	32	1.004			
	S2	19.615	32	.613			
	S3	33.717	32	1.054			
	S4	27.459	32	.858			
	S5	23.998	32	.750			
	S6	36.044	32	1.126			
Corrected Total	S1	42.975	39				
	S2	29.600	39				
	S3	57.975	39				
	S4	46.775	39				
	S5	41.500	39				
	S6	47.975	39				

Table 11: Adjusted and Unadjusted Means of the Six Reading Comprehension Sub-Levels

Reading sub-level (Dependent Variable)	Group	Unadjusted mean		Adjusted mean	
		Mean	S.D	Mean	S.E
Scanning texts for specific information (S1).	Experimental	5.70	.57	5.65	.232
	Control	4.75	1.21	4.80	.232
Using context to guess the meaning of new words (S2).	Experimental	4.50	.51	4.43	.182
	Control	3.70	.98	3.78	.182
Skimming the texts for the main ideas (S3).	Experimental	5.20	.89	5.18	.238
	Control	3.75	1.07	3.76	.238
demonstrating understanding of an authentic informational text by answering questions (S4)	Experimental	7.95	.89	7.97	.215
	Control	6.70	.92	6.70	.215
Deducting the implicit meanings in the text (S5).	Experimental	4.85	.49	4.83	.201
	Control	3.65	1.09	3.68	.201
Making judgments about the texts (S6)	Experimental	4.95	.69	5.01	.246
	Control	4.00	1.26	3.94	.246

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7 Discussion

The results revealed that participants' reading comprehension levels were statistically significant higherin favorof those students in the experimental group. This illustrates how the use of *self-questioning strategy* can enhance students' comprehension. The results show that *self-questioning* as a teaching strategy enhanced students' comprehension at all three levels in the experimental group.

*The self-questioning strategy*had a positive effect on the experimental group of students' post-test reading comprehension for a variety of possible factors. The design of an instructional program based on *self-questioning strategy* is one of the possible deciding factors, because this teaching strategy requires the teacher to carefully create and authorize an order to meet learning objectives. The reading assignments were thoughtfully put together by the researchers; they were brief and well-structured to generate better conversation topics, the themes were picked from the students' curriculum, and the time provided was suitable.

Another factor that may have contributed to students' enhanced reading comprehension is the cooperative environment. By focusing on individual differences, *self-questioning strategy* improved students' cooperation to perform tasks. As a result, the program was designed to help students become more involved with the text they read by creating activities suitable for both individual and group work. *self-questioning strategy's* interactive nature allowed students to become more involved in the learning process rather than simply receiving information from the teacher.

8 Conclusion

The objective of the study was to ascertain the effect of *self-questioning strategy* on tenth grade male EFL students in Jordan's reading comprehension. To achieve this, an instructional program was designed and implemented throughout the school year 2022–2023. The investigation's findings led to the following conclusions:

1. The instructional program strengthened the students' interaction and classroom activities while also improving their reading comprehension.

2. The participants' reading comprehension at the literal, inferential, and critical levels improved thanks to *self-questioning strategy-based instructional program*.

3. The instructional program increased the students' self-assurance and willingness to improve their reading comprehension.

4. The success of this teaching strategy in boosting the teaching/learning process and enhancing the instructional material of the Ministry of Education textbook is demonstrated by the result that the students' performances on the post-test weresgreater than their performances on the pre-test.

Recommendations

Following are some recommendations made for EFL teachers, EFL supervisors, the Ministry of Education, and researchers based on the study's findings:

1. It is recommended that EFL teachers use the present curriculum to improve their students' reading comprehension skills and help them overcome challenges.

2. It is highly recommended that EFL supervisors inform their teachers on the value of s*elf-questioning strategy* activities and incorporate them into reading comprehension courses.

3. The Ministry of Education is recommended to train teachers through conducting training sessions and workshops to qualify and educate them to use *self-questioning strategy*in their teaching.

4. Researchers are recommended to conduct different studies to investigate the effect of *self-questioning strategy* on other grades and other English language skills (e.g., listening and speaking).

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ARTICLE

Research as a Veritable Tool for Enhancing Students' Job Creation in the 21st Century University Education

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ABSTRACT

This study explores the role of research as a tool for enhancing students' job creation in the context of 21st-century university education. The survey research design was the approach used for this investigation. The researcher created a questionnaire to collect pertinent data for the study from 200 respondents. The questionnaire was duly validated by 3 experts. The internal reliability of the instrument was examined in this study using Cronbach's alpha (α). Cronbach's alpha method is able to determine the correlation between the outcomes of each test item and the test's total score. Google Forms was used to deliver the survey to the respondents electronically. A statistical package was used to calculate the mean and standard deviation. The study hypotheses were also investigated using inferential statistics (t-test) with 198 degrees of freedom and a 0.05 threshold of significance. To determine whether to accept or reject the null hypothesis, the critical value and estimated t-value are compared. Findings suggest that research-oriented education positively impacts students' ability to create job opportunities in the 21st century. Engaging in research projects fosters critical thinking, creativity, and adaptability among students, enabling them to identify and capitalize on emerging trends and market gaps. Furthermore, the study reveals the significance of university-industry collaborations and mentorship programs in enhancing students' entrepreneurial skills and connecting them with practical resources and networks. The implications of this research are significant for educational policymakers, university administrators, and curriculum developers, as it underscores the importance of incorporating research as an integral component of 21st-century university education.

1. Introduction

In the 21st century, university education plays a crucial role in equipping students with the knowledge and skills necessary to thrive in an increasingly competitive job market. As the world rapidly evolves, traditional job-seeking strategies are no longer sufficient. It is becoming essential for universities to embrace innovative approaches that foster students' job creation abilities, enabling them to become entrepreneurs and contributors to the economy (Alzghoul, Algraibeh, Khawaldeh, Khaddam, & Al-Kasasbeh, 2023).[2] Job creation is a deliberate effort made by individuals, corporate bodies, and the government to generate employment of different types for unemployed citizens in the economy. The concept of job creation is an important issue that affects individuals, businesses,

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and society as a whole. It refers to the process of creating employment opportunities that can be filled by workers who are looking for jobs (Dosi, Piva, Virgillito, & Vivarelli, 2021).[6] The current higher education system often focuses on preparing students for traditional employment rather than cultivating their entrepreneurial mindset and job creation capabilities. As a result, many graduates struggle to find suitable job opportunities in an already saturated job market. This issue calls for a shift in educational paradigms, with universities taking on a more active role in nurturing students' entrepreneurial potential and empowering them to create their own job opportunities.

Today, universities are increasingly recognized as powerful catalysts for job creation and economic growth. As the global economy evolves, there is a growing emphasis on nurturing entrepreneurial mindsets and equipping students with the skills and knowledge to drive innovation, create employment opportunities, and contribute to sustainable development (Røyrvik, 2022).[12] In this context, research emerges as a veritable tool for enhancing students' job creation in university education. The objective of this study is to delve into the pivotal role that research plays in empowering students to become job creators and entrepreneurs in the 21st century. By examining the relationship between research activities and job creation, this study aims to shed light on the strategies, mechanisms, and best practices that universities can employ to effectively leverage research for the benefit of students and society at large (Murphy & Dyrenfurth, 2019).[10]

Research findings and innovations generated within universities possess immense potential for job creation and economic growth. Through rigorous investigations, researchers have the opportunity to identify and address critical challenges faced by industries, societies, and economies. These research-based solutions can pave the way for the emergence of new job opportunities, the establishment of innovative enterprises, and the stimulation of economic ecosystems (Nagajayanthi, 2022).[11] By prioritizing research activities that have the potential to lead to job creation and entrepreneurship, universities can actively contribute to nurturing a skilled workforce that meets the evolving demands of industries and contributes to national and global economic development. Developing a strong entrepreneurial mindset and an innovation-oriented approach is crucial for students to effectively utilize research for job creation (João & Silva, 2020).[8] Research activities provide students with opportunities to engage in critical thinking, problem-solving, and creative exploration. These skills are fundamental for identifying market gaps, conceptualizing novel ideas, and translating research findings into tangible entrepreneurial ventures. Moreover, research fosters a culture of continuous learning, adaptability, and resilience, which are indispensable for navigating the complexities of entrepreneurship in the rapidly evolving business landscape.

Collaboration and networking opportunities with researchers, industry partners, and entrepreneurs play a significant role in enhancing students' job creation abilities through research. By fostering collaboration, universities provide students with access to a diverse range of perspectives, expertise, and resources. Engaging in interdisciplinary research projects allows students to explore multiple facets of complex challenges, refine their ideas, and gain exposure to different industries and domains (De-Jager, Mthembu, Ngowi & Chipunza, 2017).[5] Moreover, university-industry partnerships facilitate the transfer of knowledge, technology, and resources, enabling students to bridge the gap between academia and the real-world business environment (João & Silva, 2018).[7] Engaging in research activities also enhances students' critical thinking and problem-solving skills, which are essential for job creation. Through research-based projects and assignments, students learn to identify problems, design appropriate methodologies, analyze data, and draw evidence-based conclusions (Mälkki & Alanne, 2017).[9] These experiences nurture their ability to think critically, evaluate information, and develop innovative solutions to pressing societal and industrial challenges. Furthermore, research activities encourage students to be curious, ask probing questions, and adopt a proactive approach to knowledge acquisition. These attributes are highly valued in entrepreneurial endeavors, where students must identify opportunities, evaluate risks, and make informed decisions.

To maximize the potential of research for job creation, universities should create an entrepreneurial ecosystem that supports students' initiatives. Providing access to entrepreneurial education and training programs is essential for equipping students with the necessary knowledge, skills, and mindset for entrepreneurship (Choi & Markham, 2019).[3] Entrepreneurial education exposes students to concepts such as opportunity identification, business planning, market analysis, financial management, and marketing strategies. By integrating entrepreneurial education into the curriculum, universities can instill a culture of entrepreneurship and equip students with the tools and resources they need to transform their research findings into viable businesses. Creating support mechanisms and structures that facilitate students'

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entrepreneurial ventures and job creation initiatives is crucial (Sanyal & Hisam, 2018).[13] Dedicated spaces, such as incubators or innovation hubs, provide students with a supportive environment to nurture their ideas, receive mentorship, access funding opportunities, and collaborate with like-minded individuals. These spaces serve as a bridge between academia and industry, facilitating the translation of research outcomes into practical applications and commercial ventures.

Therefore, by prioritizing research activities, fostering an entrepreneurial mindset, providing collaboration and networking opportunities, and creating supportive ecosystems, universities can empower students to leverage research for job creation and entrepreneurship. Embracing research as a core component of university education not only equips students with the necessary skills and knowledge but also contributes to economic growth, innovation, and societal progress (Cook-Sather & Loh, 2023).[4] This study aims to delve into these dimensions and shed light on the strategies and best practices that universities can adopt to effectively utilize research as a tool for enhancing students' job creation in the dynamic landscape of the 21st century. This study holds significant implications for university administrators, policymakers, educators, and students. By exploring the role of research as a veritable tool for enhancing students' job creation abilities, this research will shed light on innovative approaches to empower students and equip them with the skills and mindset needed to thrive in the 21st-century job market. The findings and recommendations of this study can guide universities in designing curricula, programs, and support systems that foster an entrepreneurial spirit and job creation mindset among students.

2. Method

The survey research design was the approach used for this investigation. The research area was the Anambra State, Nigeria. The population comprised of 136 students and 64 lecturers from the 3 public tertiary institutions in Anambra state namely Nnamdi Azikiwe University, Awka: Established in 1992, Nnamdi Azikiwe University (UNIZIK), Chukwuemeka Odumegwu Ojukwu University, Igbariam and Federal Polytechnic, Oko. The researcher created a questionnaire to collect pertinent data for the study. The replies to the questionnaire were created using a 4-point Likert scale, with 4 denoting "Strongly Agree," 3 agreeing, 2 disagreeing, and 1 strongly disagreeing. The questionnaire was duly validated by 3 experts.

The internal reliability of the instrument was examined in this study using Cronbach's alpha (α). Cronbach's alpha method is able to determine the correlation between the outcomes of each test item and the test's total score. The Cronbach's alpha value for this instrument is 0.88, which is regarded as appropriate for the study. The participants gave their opinions in response to the remarks, basing their decisions on those opinions. Google Forms was used to electronically deliver the survey to the respondents. A statistical package was used to calculate the mean and standard deviation. Using inferential statistics (t-test) with 198 degrees of freedom and a 0.05 threshold of significance, the study hypotheses were also investigated. To determine whether to accept or reject the null hypothesis, the crucial value and estimated t-value are compared. The null hypothesis is accepted if the absolute calculated t-value is lower than the critical t-value; alternatively, it is rejected if the absolute computed t-value is greater than the critical t-value.

3. Objectives of the Study

The main objectives of this study are as follows:

1. To explore the relationship between research and job creation in the 21st-century context of university education.
2. To identify the key factors that contribute to enhancing students' job creation abilities through research.
3. To examine the role of universities in fostering an entrepreneurial ecosystem that supports students' job creation initiatives.
4. To propose strategies and recommendations for integrating research as a veritable tool for enhancing students' job creation in the university curriculum.

4. Research Questions

To guide this study, the following research questions will be addressed:

1. What is the relationship between research and job creation in the 21st-century context of university education?
2. What are the key factors that contribute to enhancing students' job creation abilities through research?
3. How can universities foster an entrepreneurial ecosystem that supports students' job creation initiatives?
4. What strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum?

5. Research Hypotheses

H1. There is no significant difference in the mean scores of students and lecturers regarding the key factors that contribute to enhancing students' job creation abilities

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through research

H2. There is no significant difference in the mean scores of students and lecturers on how universities can foster an entrepreneurial ecosystem that supports students' job creation initiatives

H3. There is no significant difference in the mean scores of students and lecturers regarding strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum

6. Results

Table 1: Demographic Information

Variables	Level	Frequency	Percentage
Gender	Male	96	48
	Female	104	52
	Total (N)	200	100
Role	Student	136	68
	Lecturer	64	32
	Total (N)	200	100

Table 1 presents demographic information regarding gender and role distribution among a sample of 200 individuals. The gender distribution reveals that out of the total sample, 48% are male (96 individuals) and 52% are female (104 individuals). This suggests a relatively balanced representation of genders within the sample. Regarding roles, the majority of the sample consists of students, accounting for 68% (136 individuals). On the other hand, lecturers at the rank of Lecturer make up 32% of the sample (64 individuals). This distribution indicates that students are the predominant group in the sample, while lecturers at the Lecturer level form a smaller proportion.

Research Question 1: What is the relationship between research and job creation in the 21st-century context of university education?

Table 2 showed the relationship between research and job creation in the 21st-century context of university education. The result in table 1 above revealed that research findings and innovations generated within universities can create new job opportunities and stimulate economic growth (L=3.07, S=3.35). Meanwhile, universities foster collaboration between researchers, industry partners, and entrepreneurs to enhance job creation efforts (L=2.80, S=3.10). However, the respondents rejected that research conducted in university education plays a significant role in job creation in the 21st century (L=2.40, S=2.58). On the whole, items 2, 3 and 5 yield a mean scores of 2.60, 3.07 and 2.80 corresponding to standard deviations of 1.20, 1.06 and 1.22 were accepted, whereas item 1 and 4 with mean score of 2.40 and 1.63 to standard deviation 1.05 both were rejected respectively by the lecturers, while item 1

Table 2: Mean rating and standard deviation on the relationship between research and job creation in the 21st-century context of university education.

S/N	Items	Lecturers (L)			Students (S)		
		$\bar{x}$	Std Dev	Decision	$\bar{x}$	Std Dev	Decision
1	Research conducted in university education plays a significant role in job creation in the 21st century	2.40	1.05	Rejected	2.58	1.12	Accepted
2	Universities should prioritize research activities that have the potential to lead to job creation and entrepreneurship.	2.60	1.20	Accepted	3.10	1.14	Accepted
3	Research findings and innovations generated within universities can create new job opportunities and stimulate economic growth	3.07	1.06	Accepted	3.35	0.96	Accepted
4	Universities provide adequate support and resources for research activities that aim to promote job creation and entrepreneurship	1.63	1.05	Rejected	3.58	0.89	Accepted
5	Universities foster collaboration between researchers, industry partners, and entrepreneurs to enhance job creation efforts	2.80	1.22	Accepted	3.10	1.18	Accepted
		2.5	1.116		3.142	1.058	

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to 5 has mean scores of 2.58, 3.10, 3.35, 3.58 and 3.10 corresponding to standard deviations of 1.12, 1.14, 0.96, 0.89 and 1.18 were accepted respectively by the students.

Research Question 2: What are the key factors that contribute to enhancing students' job creation abilities through research?

The result in table 3 revealed that collaboration and networking opportunities with other students, researchers, and industry partners play a significant role in enhancing students' job creation abilities through research (L=3.43, S=2.90). However, engaging in research activities enhances students' critical thinking and problem-solving skills, which are essential for job creation (L=2.83, S=2.73). Researches involving the design of a curriculum that incorporates the needs of students' job creation abilities (L=2.40, S=3.25). In all, items 6 to 10 yield mean scores above 2.50 and were all accepted corresponding to standard deviations of 1.24, 1.20, 1.06 and 0.99 but item 9 with mean score of 2.40 and standard deviation of 1.25 was rejected in that order by the lecturers. While, items 6 to 10 yield mean scores above 2.50corresponding to standard deviations of 1.16, 1.20, 0.96, 0.66 and 1.13 and were all accepted by the students..

Research Question 3: How can universities foster an entrepreneurial ecosystem that supports students' job creation initiatives?

Table 4 showed how universities can foster an entrepreneurial ecosystem that supports students' job creation initiatives. Providing access to entrepreneurial education and training programs is essential for fostering an entrepreneurial ecosystem in universities (L=2.93, S=3.15). Creating support mechanisms to students to facilitate their entrepreneurial ventures and job creation initiatives (L=2.88, S=3.26). Nevertheless, collaboration between academia, industry, and government entities is crucial in creating an entrepreneurial ecosystem that supports students' job creation initiatives (L=2.67, S=2.30). In all, items 11, 12, 13, 14 and 15 has mean score above 2.50 corresponding to standard deviation of 1.07, 1.18, 1.11, 1.04 and 0.98 were all accepted by the lecturers. While items 11, 12 and 15 has mean score above 2.50 corresponding to standard deviation of 2.90, 3.15 and 3.26 and was accepted. But items 13 and 14 with mean scores of 2.30 and 2.39 and standard deviation of 1.17 and 0.94 were rejected respectively by the students.

Research Question 4: What strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum?

Table 5 above showed the strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum. One of the strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum is to create dedicated spaces or incubators within the

Table 3: Mean and standard deviation on key factors that contribute to enhancing students' job creation abilities through research.

S/N	Items	Lecturers (L)			Students (S)		
		$\bar{x}$	Std Dev	Decision	$\bar{x}$	Std Dev	Decision
6	Engaging in research activities enhances students' critical thinking and problem-solving skills, which are essential for job creation	2.83	1.24	Accepted	2.73	1.16	Accepted
7	Access to mentorship and guidance from experienced researchers and industry professionals contributes to students' job creation abilities through research	2.60	1.20	Accepted	2.95	1.20	Accepted
8	Developing a strong entrepreneurial mindset and innovation-oriented approach is crucial for students to effectively utilize research for job creation	3.07	1.06	Accepted	3.35	0.96	Accepted
9	Collaboration and networking opportunities with other students, researchers, and industry partners play a significant role in enhancing students' job creation abilities through research	3.43	0.99	Accepted	2.90	0.66	Accepted
10	Researches involving the design of a curriculum that incorporates the needs of students' job creation abilities	2.40	1.25	Rejected	3.25	1.13	Accepted
		2.866	1.148		3.142	1.058	

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Table 4: Mean and standard deviation on how universities can foster an entrepreneurial ecosystem that supports students' job creation initiatives.

S/N	Items	Lecturers (L)			Students (S)		
		$\bar{x}$	Std Dev	Decision	$\bar{x}$	Std Dev	Decision
11	Universities should prioritize creating an entrepreneurial ecosystem that supports students' job creation initiatives	2.83	1.07	Accepted	2.90	1.16	Accepted
12	Providing access to entrepreneurial education and training programs is essential for fostering an entrepreneurial ecosystem in universities	2.93	1.18	Accepted	3.15	1.15	Accepted
13	Collaboration between academia, industry, and government entities is crucial in creating an entrepreneurial ecosystem that supports students' job creation initiatives.	2.67	1.11	Accepted	2.30	1.17	Rejected
14	Access to funding and resources specifically designated for supporting students' entrepreneurial ventures is necessary for fostering an entrepreneurial ecosystem in universities.	2.68	1.04	Accepted	2.39	0.94	Rejected
15	Creating support mechanisms to students to facilitate their entrepreneurial ventures and job creation initiatives	2.88	0.98	Accepted	3.26	0.96	Accepted
		2.798	1.076		2.8	1.076	

Table 5: Mean and standard deviation of strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum.

S/N	Items	Lecturers (L)			Students (S)		
		$\bar{x}$	Std Dev	Decision	$\bar{x}$	Std Dev	Decision
16	Incorporating research-based projects and assignments into the curriculum can enhance students' job creation abilities.	2.97	1.08	Accepted	2.95	1.16	Accepted
17	Providing mentorship and guidance from experienced researchers and industry professionals is crucial for integrating research as a tool for enhancing students' job creation.	2.73	1.24	Accepted	3.20	1.12	Accepted
18	Establishing partnerships and collaborations with industry and government entities can facilitate the integration of research into the curriculum to enhance students' job creation abilities.	2.63	1.14	Accepted	2.43	1.07	Rejected
19	Offering specialized courses or programs focused on entrepreneurship and innovation can effectively integrate research as a tool for enhancing students' job creation.	2.51	1.06	Accepted	2.51	0.95	Accepted
20	Create dedicated spaces or incubators within the university to support student startups and entrepreneurial ventures	3.28	0.95	Accepted	2.68	0.64	Accepted
		2.824	1.094		2.754	0.988	

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university to support student startups and entrepreneurial ventures (L=3.28, S=2.68). It is obvious that establishing partnerships and collaborations with industry and government entities can facilitate the integration of research into the curriculum to enhance students' job creation abilities (S=2.63, S=2.43). Again, providing mentorship and guidance from experienced researchers and industry professionals is crucial for integrating research as a tool for enhancing students' job creation (L=2.73, S=3.20). On the whole, items 16 to 20 with mean score above 2.50 corresponding to standard deviations of 1.08, 1.24, 1.14, 1.06 and 0.95 were all accepted by the lecturers. While items 16, 17, 19 and 20 yields mean scores of 2.95, 3.20, 2.51 and 2.68 corresponding to standard deviations of 1.16, 1.12, 0.95 and 0.64 were accepted, while item 18 with mean score of 2.43 and standard deviation of 1.07 was rejected respectively by the students.

Hypothesis 1: There is no significant difference in the mean scores of students and lecturers regarding the key factors that contribute to enhancing students' job creation abilities through research

Table 6 shows that at 0.05 level of significance and at 198 degree of freedom, the calculated t = 1.626 and critical t = 1.653. Since the calculated t value (1.626) is slightly less than the critical value (1.653) at df 198 and 0.05 level of significant, we accept the null hypothesis and conclude that there is no significant difference in the mean scores of students and lecturers regarding the key factors that contribute to enhancing students' job creation abilities through research.

Hypothesis 2: There is no significant difference in the mean scores of students and lecturers on how universities can foster an entrepreneurial ecosystem that supports students' job creation initiatives

Table 7 shows that at 0.05 level of significance and at 198 degree of freedom, the calculated t = 0.0123 and critical t = 1.653. Since the calculated t value (0.0123) is less than the critical value (1.653) at df 198 and 0.05 level of significant, we accept the null hypothesis and conclude that there is no significant difference in the mean scores of students and lecturers on how universities can foster an entrepreneurial ecosystem that supports students' job creation initiatives.

Hypothesis 3: There is no significant difference in the mean scores of students and lecturers regarding strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum

Table 8 shows that at 0.05 level of significance and at 198 degree of freedom, the calculated t = 0.435 and critical t = 1.653. Since the calculated t value (0.435) is less than the critical value (1.653) at df 198 and 0.05 level of significant, we accept the null hypothesis and conclude that there is no significant difference in the mean scores of students and lecturers regarding strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum.

Table 6 t-test Analysis on difference in the mean scores of students and lecturers regarding the key factors that contribute to enhancing students' job creation abilities through research

Role	*n*	$\bar{x}$	SD	t-cal	t-crit	df	sig.	Dec.
Students	136	3.142	1.058					
				1.626	1.653	198	.106	Not Sig.
Lecturers	64	2.866	1.148					

Table 7 t-test Analysis on difference in the mean scores of students and lecturers on how universities can foster an entrepreneurial ecosystem that supports students' job creation initiatives

Role	*n*	$\bar{x}$	SD	t-cal	t-crit	df	sig.	Dec.
Students	136	2.798	1.076					
				0.0123	1.653	198	.106	Not Sig.
Lecturers	64	2.8	1.076					

Table 8 t-test Analysis on difference in the mean scores of students and lecturers regarding strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum

Role	*n*	$\bar{x}$	SD	t-cal	t-crit	df	sig.	Dec.
Students	136	2.754	0.988					
				0.435	1.653	198	.106	Not Sig.
Lecturers	64	2.824	1.094					

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6. Discussion of Results

Research question 1 sought to find out the relationship between research and job creation in the 21st-century context of university education. Prioritizing research activities that have the potential to lead to job creation and entrepreneurship can bring numerous benefits to universities, industries, and the broader economy (Mälkki & Alanne, 2017).[9] By focusing on research that has practical applications and commercial viability, universities can play a vital role in driving economic growth and addressing societal challenges. When universities prioritize research with a direct impact on job creation, they can generate innovative ideas, technologies, and solutions that have the potential to transform industries. By fostering collaboration between researchers, industry partners, and entrepreneurs, universities can create a dynamic ecosystem where ideas can be shared, tested, and refined. This collaboration according to Sanyal and Hisam (2018)[13] can lead to the development of new products, services, and processes that not only create job opportunities but also enhance competitiveness and productivity within industries. Moreover, the knowledge and expertise gained from research activities can empower students and researchers to become entrepreneurs themselves (Azonuche & Umeri, 2012)[14]. Universities can provide support structures, such as entrepreneurship programs and incubators, that help students and researchers turn their ideas into viable businesses (De-Jager, Mthembu, TNgowi & Chipunza, 2017).[5] By encouraging entrepreneurial activities, universities can cultivate a culture of innovation, risk-taking, and creativity among their students and faculty, which are essential traits for driving economic growth in the modern knowledge-based economy. Additionally, universities that prioritize research with job creation potential can attract industry partnerships and investments (Dosi, Piva, Virgillito & Vivarelli, 2021).[6] Industry collaborations can provide researchers with valuable insights into real-world problems and challenges, enabling them to conduct research that is more relevant and applicable to industry needs. This, in turn, increases the likelihood of research findings being successfully translated into commercial products or services, resulting in job creation and economic impact.

Research question 2 covered the key factors that contribute to enhancing students' job creation abilities through research. The result showed that developing a strong entrepreneurial mindset and an innovation-oriented approach among students is vital for effectively utilizing research for job creation. Murphy and Dyrenfurth (2019)[10] upheld that universities play a crucial role in nurturing and fostering these qualities in their students through various initiatives and programs. When students engage in research activities, they are exposed to real-world problems and challenges that require critical thinking and problem-solving skills. Research allows them to delve deep into a subject, analyze data, and develop innovative solutions. This process enhances their ability to think creatively, identify opportunities, and come up with novel ideas that have the potential to create jobs and drive entrepreneurship. Furthermore, Aksoy, Pulizzotto, and Beaudry (2022)[1] suggested that research activities often require students to collaborate with other students, researchers, and industry partners. Such collaborations provide valuable networking opportunities that can facilitate job creation. Through collaborations, students can gain exposure to different perspectives, expertise, and resources. They can learn from their peers, share ideas, and gain insights from industry professionals. These interactions not only broaden their knowledge but also enable them to build relationships that may lead to future job opportunities or entrepreneurial ventures. Moreover, research activities encourage students to be proactive and self-driven. They learn to take ownership of their work, set goals, and manage their time effectively. These skills are essential for entrepreneurship, as entrepreneurs need to be self-motivated, proactive, and capable of managing their ventures. By engaging in research, students develop a sense of initiative, resilience, and perseverance, which are crucial attributes for success in entrepreneurial endeavors. Additionally, research activities often involve interdisciplinary collaboration and exposure to diverse fields of study. This multidisciplinary approach according to Mälkki and Alanne (2017)[9] enhances students' ability to connect different domains of knowledge, think critically across disciplines, and identify innovative solutions. Such cross-pollination of ideas and skills is essential for fostering innovation and generating groundbreaking research outcomes that can lead to job creation.

Research question 3 examined how universities can foster an entrepreneurial ecosystem that supports students' job creation initiatives. Universities should prioritize creating an entrepreneurial ecosystem that supports students' job creation initiatives. This involves providing access to entrepreneurial education and training programs, as well as creating support mechanisms to facilitate students' entrepreneurial ventures and job creation initiatives. Entrepreneurial education and training programs according to João and Silva (2018)[7] are crucial for equipping students with the knowledge and skills necessary to succeed in their entrepreneurial

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endeavors. Universities can offer courses, workshops, and mentorship programs focused on entrepreneurship, business development, and innovation. These programs provide students with practical knowledge about starting and running businesses, understanding market dynamics, financial management, and marketing strategies. By integrating entrepreneurial education into the curriculum, João and Silva (2020)[8] maintained that universities can empower students with the foundational knowledge and skills they need to translate their research findings into viable job creation opportunities. Creating a supportive environment for entrepreneurial initiatives is equally important. Universities can establish incubators, accelerators, and entrepreneurship centers that provide resources, mentorship, and networking opportunities for students. These support mechanisms enable students to access funding, mentorship from industry experts, and connections with potential investors and partners (Aksoy, Pulizzotto & Beaudry, 2022).[1]By fostering collaboration and networking within the entrepreneurial ecosystem, universities create an environment where students can validate their ideas, refine their business plans, and receive guidance and support as they navigate the complexities of starting a venture. Moreover, universities can actively engage with industry partners and alumni networks to provide students with real-world exposure and opportunities. Collaborations with industry professionals and alumni can lead to internships, mentorship programs, and even investment opportunities for students' entrepreneurial initiatives. By leveraging these networks, universities bridge the gap between academia and industry, enabling students to access industry knowledge, resources, and market insights that are critical for successful job creation endeavors.

Research question 4 sought to find out th strategies for integrating research as a veritable tool for enhancing students' job creation in the university curriculum. Incorporating research-based projects and assignments into the curriculum is a powerful way to enhance students' job creation abilities. By integrating research into the learning process, universities can provide students with practical experiences that bridge the gap between theory and real-world application (Cook-Sather & Loh, 2023).[4] Research-based projects allow students to apply their knowledge and skills in a practical context, fostering critical thinking, problem-solving, and innovation—all essential skills for job creation. When students engage in research-based projects, they gain hands-on experience in identifying problems, conducting rigorous investigations, and developing solutions. This process enables them to develop a deep understanding of the subject matter, refine their analytical abilities, and enhance their ability to generate innovative ideas. Research projects also encourage students to collaborate, communicate effectively, and work in teams—skills that are vital for entrepreneurial success. Furthermore, Alzghoul, Algraibeh, Khawaldeh, Khaddam and Al-Kasasbeh (2023)[2] reported that mentorship and guidance from experienced researchers and industry professionals play a critical role in integrating research as a tool for enhancing students' job creation abilities. Mentors can provide valuable insights, advice, and guidance throughout the research process, helping students navigate challenges and refine their ideas. Mentorship also exposes students to different perspectives, expands their network, and provides them with valuable industry knowledge. By connecting students with mentors who have expertise in their field of interest or entrepreneurial ventures, universities can further enhance students' job creation abilities and increase their chances of success. Additionally, Sanyal and Hisam (2018)[7] suggested that creating dedicated spaces or incubators within the university to support student startups and entrepreneurial ventures is essential. These spaces provide students with a supportive environment where they can turn their research findings, innovative ideas, or business plans into tangible ventures. Incubators offer resources, infrastructure, and mentorship tailored to the unique needs of student entrepreneurs, helping them navigate the challenges of launching and growing a startup. Moreover, these dedicated spaces foster a sense of community and collaboration among student entrepreneurs, enabling them to learn from and support one another.

7. Conclusion

In conclusion, research serves as a veritable tool for enhancing students' job creation in the 21st century university education. This study has highlighted several key points that underscore the importance of research in fostering job creation and entrepreneurship among students. Firstly, universities should prioritize research activities that have the potential to lead to job creation and entrepreneurship. The findings and innovations generated within universities can create new job opportunities and stimulate economic growth. By aligning research activities with the needs and demands of industries, universities can actively contribute to the development of a skilled workforce and address societal challenges. Secondly, developing a strong entrepreneurial mindset and innovation-oriented approach is crucial for students to effectively utilize research for job creation. Research activities enhance students' critical thinking and problem-solving skills, which are essential for identifying

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opportunities and developing innovative solutions. Collaboration and networking opportunities with researchers, industry partners, and entrepreneurs further enhance students' job creation abilities through research.

Moreover, incorporating research-based projects into the curriculum and providing mentorship and guidance from experienced researchers and industry professionals are essential elements of leveraging research for job creation. These initiatives provide students with practical experiences, access to resources, and valuable insights, empowering them to translate their research findings into viable job creation opportunities. Additionally, creating dedicated spaces or incubators within universities to support student startups and entrepreneurial ventures is vital. These spaces provide the necessary resources, infrastructure, and support mechanisms to foster entrepreneurial initiatives and facilitate the growth of student-led ventures. Overall, research serves as a catalyst for job creation in the 21st century university education. By integrating research activities, fostering an entrepreneurial mindset, providing mentorship and guidance, and creating supportive environments, universities can empower students to utilize research as a tool for job creation and entrepreneurship. Embracing research as a core component of university education not only equips students with the necessary skills and knowledge but also contributes to economic growth, innovation, and societal progress.

Recommendations

Based on the findings and implications of the study on research as a tool for enhancing students' job creation in 21st-century university education, the following recommendations are put forth:

1. Integration of research in the curriculum: Universities should prioritize the integration of research activities throughout the curriculum, across various disciplines.

2. Faculty training and support: Universities should provide faculty members with training and support to develop their research skills and adopt innovative teaching methods that promote research-oriented learning.

3. Strengthen university-industry partnerships: Establishing strong partnerships between universities and industries is crucial for fostering job creation among students.

4. Entrepreneurship education and support: Universities should offer comprehensive entrepreneurship education and support services to foster an entrepreneurial mindset among students.

5. Alumni engagement and networking: Universities should actively engage their alumni network, particularly those who have successfully established their own businesses.

6. Continuous evaluation and improvement: Universities should establish mechanisms to continuously evaluate and improve the effectiveness of research-oriented education in enhancing students' job creation potential.

By implementing these recommendations, universities can create an ecosystem that nurtures students' entrepreneurial spirit, fosters innovation, and equips them with the skills and mindset required to succeed as job creators in the rapidly evolving 21st-century job market.

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ARTICLE

Capacity Building Needs for Manual and Computer Assisted Teaching of Pattern Drafting for Entrepreneurship in Tertiary Institutions in Nigeria

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ABSTRACT

This study investigated the capacity building needs for manual and computer assisted teaching of pattern drafting for entrepreneurship in tertiary institutions in Nigeria. The study was conducted and guided by two research questions and two hypotheses. This study adopted an ex-post facto research design. The population for the study consisted of 131 Home Economics lecturers from the Universities, Polytechnic, and Colleges of Education in South East Nigeria. The entire population was studied because of its manageable size, hence there was no sampling. The results of this study showed that the Home Economics lecturers are competent in drafting patterns using manual method. Technical skills required for lecturers of Home Economics to advance from manual to computer-assisted teaching of pattern drafting were identified. They include ability to grade patterns, ability to use software packages, and ability to discuss procedures of pattern drafting among others. Based on the findings, it was recommended among others that computer assisted teaching of pattern drafting should be incorporated and applied by Home Economics lecturers to ensure that students acquire technical skills that will enable them to enter into entrepreneurship.

1. Introduction

During clothing construction, the method of free hand cutting or pattern drawing can be used. An effective pattern is just as crucial to a dressmaker's achievement as a skilled architect's blueprint is to the construction of a house. A pattern is a sheet of paper that has been designed, cut, and sized. It is used to cut out fabric parts that are needed to make clothes (Igbo & Iloeje, 2003).[15] Using patterns in clothing creation is crucial since it provides the designer confidence while cutting fabric. Using patterns, whether by hand or on a computer, encourages creativity in design and is the most effective method of producing good fitting clothing (Shailong and Igbo, 2009).[26]

Therefore, the term "manual method of pattern drafting" describes the process of drawing a pattern on paper using a person's body measurements and instructions. The fabric pieces needed to make an outfit are cut out using the drafted pattern parts. Igbo and Iloeje (2003)[15] state that there are several techniques for manual pattern drawing. They described the procedures to be followed, which included modeling, knock-off design, grading from a set of patterns, flat pattern, and drafting approaches.

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The manual approach has been the norm for teaching and learning pattern drawing in Nigerian academic institutions. This is a slow process that takes a lot of time, patience, and imagination. Bob-Eze and Arubayi (2022)[8] noted that practical clothing and textiles take more time and demand more technical skills. As a result, some instructors and students think pattern drafting is a challenging topic. Consequently, an instructor who finds pattern drawing challenging cannot help students develop such practical abilities. Arubayi (2010)[4] argues that a teacher cannot give away what he does not have, the teacher in this case cannot influence the abilities required for mass manufacturing. Because such a system does not promote mass manufacturing, it is unable to meet the demand for clothing. Generally speaking, mass production refers to the creation of large-scale commercial items. The use of computer software in pattern drawing instruction must be introduced in order to accomplish this mass manufacturing aim.

1.1 Literature Review

1.1.1 Manual Method of Pattern Drafting

Manual Methods of Pattern Drafting: A pattern is a sheet of paper that has been designed, cut, and sized. It is used to cut out fabric pieces for making clothes (Igbo and Iloeje, 2003).[15] Working with patterns consists of three primary components, according to Kindersley (1999): [18] The envelope, instruction, and pattern. The package also includes two additional parts printed with clothing images and the necessary information to choose the right pattern size and amount of fabric for sewing. The pattern's usage guidelines and the significance of its many marks are explained in the manual. The printed full-size pattern pieces, either single- or multi-pattern, are referred to in the issue sheets. According to Varney (1980),[28] designs are necessary for designing dresses "to obtain a better fit and to save material." Aldrich (2006)[2] defends the usage of block designs in the apparel industry by pointing out that although blocks can be produced to fit a given figure using personal measurements, they are often constructed to standard (average) measures for particular groups of individuals. Igbo and Iloeje (2003),[15] however, distinguished between several forms of manual pattern drafting, including the knock-off design approach, drafting method, flat pattern method, grading method, and modeling or draping method.

Modeling or Draping Method: The modeling or draping method is a creative way to create patterns for clothing by fitting fabric to a dress form or model's contours (Hollen, 1981).[13] Aldrich (2002)[1] reiterates Hallen's opinion by pointing out that the designer can utilize less costly fabric that has a comparable personality to the primary material. Although Aldrich's method is costly and time-consuming, it is inspirational since it allows designers and dressmakers to get the intended results of their work immediately and does away with fitting challenges.

The Knock – off design method: The knock-off design approach, which entails purchasing the company's best-selling clothing products, pulling out the seams, and replicating or knocking off the design, is a highly helpful tactic. It is a method of copying the style and fit of an item of clothing that other firms are selling successfully or are in style (Igbo & Iloeje, 2003).[15] Since garment designs are not protected by copyright, this practice is lawful. They went on to describe several techniques for creating patterns utilizing the knock-off design process in the following ways.:

- Taking a garment apart at seam lines to copy the shapes.
- Using muslin and soft lead pencil to rub off the shape of each pattern piece.
- Using paper and tracing wheel to copy each garment piece.
- Using a tape measure to measure simple garment shapes and drafting patterns to these dimensions.

Modifying from a set of pattern (grading): By raising the pattern to create larger sizes or lowering the pattern to create smaller sizes, the approach of "modifying from a set of patterns" may be used to produce patterns in various sizes. Slash and spread or slash and overlap approaches can be used to modify and grade patterns (Igbo & Iloeje, 2003).[15] They went on to say that sizes may be increased or decreased using the slash and spread or slash and overlap techniques, respectively. The manual grading of every design takes a lot of time. A proficient pattern grader is needed. These days, a lot of clothing makers use computers to assess designs. At the push of a button, the computer may be programmed with grading rules to precisely grade the pattern to the required sizes (Mackorhill, 2004).[21]

The Flat Pattern Method: The flat pattern approach begins with a pre-made basic block pattern from a store or a custom-drafted basic block pattern. According to Ezike (2012),[12] this technique makes use of precise measurements made on a dress form or on a human. The flat pattern approach involves manipulating designs to create a pattern for a certain style. This technique's moniker, "flat pattern," suggests that it be used on a level surface.

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The drafting method: An engineering method for creating patterns is the drafting process. This approach is predicated on a set of guidelines. The intended pattern lines are established using the body dimensions. The precision of the measurements in drafting will determine the correctness of the design. Few designers utilize the drafting approach since it is unworkable for producing constantly changing designs, particularly in the female fashion market, due to its reliance on a table of precise dimensions. Basic foundation designs for the front and back bodice, sleeves, and front and back skirt are part of the skill of drafting patterns. The dressmaker may then create the desired style with these components.

According to Okorie (2000),[22] two essential qualities of clothing designers are originality and measuring expertise. According to Anikweze (2013),[3] drafted patterns typically consist of five pieces: the bodice front, bodice back, skirt front, skirt back, and sleeve. These designs are based on basic patterns. The sloper, a cardboard replica of the basic pattern, has seam allowances and dart sections removed. For designing reasons, a person can tie on a muslin shell, which is a bodice or skirt fashioned from a basic pattern.

1.1.2 Computer-aided Design

According to Hwang (2001),[14] using a computer entails using hardware and software such a 3D scanner and 2D photos, which are digitally input programs that take measurements, create, draft patterns, and assemble clothing for customized manufacture. Precisely measuring the body is the first stage in creating tailored apparel. At this point, the user of the computer-aided manufacturing system can choose any approach for gathering body dimensions. Either 2D photos or the 3D scanner may be used to gather the body dimensions. The scanner must be calibrated using a regular technique before scanning, and noise is reduced by carefully controlling the illumination. A person's picture is captured by the scanner with hundreds of thousands of data points, and the program automatically extracts dozens of metrics that are useful in many contexts. Skilled pattern designers often create clothing designs based on measurements and observations. The advancement of Computer Aided Design (CAD) technology has led to the creation of computer software that can produce garment patterns more efficiently (LU and Wang, 2008).[20] Clothing designs can be constructed computer-aided based on the needed measurement's mathematical expression. In addition, the computer-generated human models make it easier to see how the created clothing would fit in a virtual setting.

A computer may easily be used to store and retrieve data about human models. Without taking another measurement, the scanner may quickly generate a different kind of garment design. Following the collection of body proportions by 2D photographs, 3D scanning photos, direct input, and auto, Computer Aided Design (CAD) will be used to create electronic drawings of the patterns. The system displays a graphical preview of the designs and their requirements as soon as the pattern sketching is complete. The drawing will be transferred into Drawing Exchange Format (DEF), which is compatible with Computer Numerical Control (CNC) laser cutting equipment, if the user is happy with the results and gives the go-ahead. The cloth cutting procedure will come next, and then the pattern components may be produced automatically and quickly. Following that, they will be prepared for the sewing, fitting test, and last adjustment steps of the production process (Patrick, 2006).[25] The use of computer-assisted instruction in pattern drawing for apparel and fabric cutting has made significant progress. As a result, time and money savings in apparel mass production have improved. Stated differently, Nigeria urgently needs to implement computer-assisted methods in pattern drafting instruction in order to meet the goals associated with the country's sustainable development.

1.1.3 Teaching and Learning Pattern Drafting

Azonuche (2015)[6] asserts that teaching is a deliberate and rational act. Since instructors usually have a purpose when they teach, mostly to enhance learning, it is a deliberate act. Since instructors impart beneficial knowledge to their pupils, teaching is an essential profession. According to Liao (2007),[19] every teaching action is intended to result in learning; hence, the greatest indicator of an effective teaching strategy is the quantity of learning that takes place and is manifested in the learner's altered behavior. Therefore, it is the duty of the home economics lecturers to instruct pattern drafting utilizing the new computer technology; consequently, in order to educate pattern drafting, it is necessary to develop capacity developing competency in the new computer technology. To be competent is to be able to perform a task well. According to Ikeoji (2018),[16] a person is considered competent if they possess the information, abilities, and attitudes necessary to carry out a certain work or employment. Conversely, if an individual is unable to adequately exhibit the information, abilities, and attitudes needed for instruction, there is a gap in their skill set that indicates a lack of competence. Building capability is necessary for the individual to close this gap.

Retraining serving teachers to acquire a particular skill or competency, or to improve their overall performance

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ability, is known as capacity building. As per Olaitan, Alaribe, and Ellah (2009),[23] capacity development is an endeavor to enhance an individual's capability to execute a task or job. It is focused on optimizing an individual's current performance to boost productivity. The goal of capacity development for home economics instructors is to raise their level of knowledge, abilities, and attitudes so they can work more productively and accomplish the learning objectives with greater competence.

More computer-assisted instruction is needed to supplement the present manual technique of teaching pattern drawing, particularly in this era of information and communication technology (ICT). Actually, using computers to replace the current pattern drafting teaching approach will promote innovation and assist establish sustainable industry. In the field of educational technology, computer-assisted teaching, the use of computers and software programs to teach concepts or skills, is crucial (Wilder, 2006).[29] It is the end result of a meticulous development process that yields a repeatable series of educational experiences that have been shown to result in quantifiable and reliable student learning. A teacher and student may not always have physical touch while using computer-assisted education, which is an electronic method of information sharing and transfer. Computer-Aided Instruction (CAI) is based on the idea of computer-assisted teaching and learning. Using a computer and a graded series of regulated stages, CAI is a way to introduce new material to pupils (Liao, 2007).[19]

One may create a lot of well-fitting clothes in big quantities by using computer-assisted drafting patterns. The availability of computer-aided design will enable large-scale clothing manufacture, which will stimulate entrepreneurship. This will gradually lessen the amount of clothing that is imported or smuggled into the nation, protecting our foreign reserve. The need for computer-assisted instruction in pattern drawing for entrepreneurship has grown in Nigeria for a variety of reasons. Numerous uniformed agencies, like the army, police, customs, navy, and security firms, need their uniforms to be produced in bulk and in huge quantities for their employees. The same holds true for elementary and secondary schools, which must produce uniforms in large quantities for their students. It is becoming increasingly obvious that the manual way of producing clothing is no longer able to match the demands of clients for the entrepreneurial creation and supply of these items at the appropriate time.

Lack of the necessary computer abilities for pattern drawing might be caused by a variety of circumstances. It is necessary to evaluate the instructors' levels of proficiency. Assessment is necessary for judging the value of anything or an individual's performance on a skill based on measurement, claim Azonuche and Anyakoha (2018).[7] Information on the skill level required for an acceptable or target standard will also be provided by the assessment. The discrepancy between the required performance standard and the instructors' actual performance level will reveal a capacity gap that must be filled through capacity building initiatives. Consequently, in order for home economics students to have a solid foundation in pattern drafting, their instructors must have had the necessary, pertinent abilities to enable them to successfully teach in a way that fosters entrepreneurship.

According to Bob-Eze (2010),[9] entrepreneurship is the process by which people combine material and human resources to produce things and services that people want. According to Atakpa (2011),[5] entrepreneurship is the process by which business owners establish and maintain their ventures. According to Egbule (2018),[11] entrepreneurship may also be defined as a human-creative act that involves an individual's effort in seeing potential business possibilities in their surroundings, managing such chances, and taking advantage of them. The government of Nigeria has recognized and prioritized entrepreneurship as the most significant policy among other policies ever introduced, including the National Economic Empowerment and Development Strategies (NEEDS), the Mass Mobilization for Self-Alliance (MAMSA), and others, in order to address the unfavorable conditions faced by her citizens. This initiative is known as the "Nigeria Policy Priority" program. There's a direct connection between entrepreneurship and teaching pattern drawing at tertiary institutions. Mass manufacturing of fashion items will be made possible by the use of computer-aided instructions, or CAI, in pattern drawing for garment construction. Any vital human need that is produced in large quantities has the effect of increasing market supply, which naturally helps to lower the price of the good and creates more work possibilities for people. One example of this is the greatest clothing factory in the nation right now, which was founded not too long ago in Calabar is Nigeria's extensive imports of Chinese clothing and other goods is what drives China's mass manufacturing, which inevitably drives China's industrialization.

1.2 Theoretical Framework

Roger Kaufman's (1979)[17] Need Assessment Theory served as the study's compass. As part of the needs assessment process, gaps in findings are found, explained, and prioritized for attention. The results (or ends) that arise from an organization's inputs, outputs, or processes

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are the focal point of this specific results emphasis (the means to the goal). According to Kanufman, the identification of a true need can only occur when it is done so without the hasty selection of a solution (processes being characterized as means to an end unto themselves). According to Kanufam, the real requirement is the disparity between outcomes, hence the first step in doing a quality needs assessment is determining the present results. After a need has been determined, a solution that aims to close the gap might be chosen. It is all about change, and knowing what to change into and what to shift from is crucial. This research urges needs assessment to evaluate instructors' needs in developing lesson plans. Because it emphasizes the development of human resources through educational activities for skill use, this theory is pertinent to the research being done. The attainment of sustainable development goals and the development of entrepreneurship abilities among students are contingent upon their participation in pattern drafting under the guidance of capable professors.

1.3 Purpose of the Study

The main purpose of the study is to access the capacity building needs for manual and computer assisted teaching of pattern drafting for entrepreneurship in tertiary institutions in Nigeria. Specifically, the study:

1. determined the extent to which Home Economic lecturers are competent in teaching pattern drafting using manual method in tertiary institutions in Nigeria.

2. ascertained technical skills required for Home Economics lecturers to advance from manual to computer assisted teaching of pattern drafting for entrepreneurship in tertiary institutions in Nigeria.

1.4 Research Questions

The study focuses on the following research questions:

1. To what extent are Home Economics lecturers competent in teaching pattern drafting using manual method in tertiary institutions in Nigeria?

2. What are the technical skills required for Home Economics lecturers to advance from manual to computer assisted teaching of pattern drafting for entrepreneurship in tertiary institutions in Nigeria.

1.5 Research Hypotheses

The study tested the following hypotheses at 0.05 level of significance:

$H0_1$: There will be no significant difference between the mean responses of Home Economics lecturers in Federal and State tertiary institutions on the extent to which they are competent in teaching pattern drafting using manual method in tertiary institutions in Nigeria.

$H0_2$: There will be no significant difference between the mean response of Home Economics lecturers in the Universities, Polytechnic and Colleges of Education as regards the technical skills required to advance from manual to computer assisted teaching of pattern drafting for entrepreneurship in tertiary institutions in Nigeria.

2. Materials and Methods

An ex-post facto research design technique was used in this study. The South East geopolitical zone of Nigeria is the study's primary emphasis. This zone is composed of the five states of Abia, Anambra, Ebonyi, Enugu, and Imo. The population of the research comprised all home economics instructors in all public tertiary institutions in South East Nigeria. There are 14 public higher education institutions in South East Nigeria that provide home economics education as of the time of the research: 5 universities, 1 polytechnic, 8 colleges of education, and 131 home economics instructors. There was no sampling since the 131 professors' population was studied in its whole due to its manageable size. The researcher created a structured questionnaire for the study called the "Capacity Building Needs for Manual and Computer Assisted Teaching Questionnaire (CBNMCATQ)". The tool was validated by three professionals. Regarding the things' suitability and use, they combined their thoughts and opinions. 29 Edo State home economics professors were able to determine the instrument's reliability at 0.84 by using the Cronbach's Alpha method to assess the internal consistency of the measure. In order to assess the data and respond to the research inquiries, percentages, means, and standard deviations were utilized. Null hypoyhesis 1 was tested using t-test while null hypothesis was tested 2 with One Way Analysis of Variance (ANOVA) statistic with a significance threshold of 0.05.

3. Results

3. 1 Bio-data

Table 1 showed that all the respondents were females. Abia State 33 (25%) had the highest number of lecturers while Imo State had only 19 (15%). By the type of institution, the Federal Universities had the highest 37 (28%) while the Polytechnic had least number of lecturers 9 (7%). By qualification 78 (60%) of the respondents had Doctorate Degree, 42 (32%) Master's Degree and 11 (8%), Bachelor's Degree. 61 (46%) of the respondents had teaching experience between 11-20 years, 34 (26%) had 21 and above years of teaching experience, 22 (17%) had

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between 6-11 years while 14 (11 %) had less than 5 years of teaching experience.

Table 1: Demographic characteristics of Home Economics Lecturers in South East, Nigeria (N=131)

Demographic characteristics		Frequency	Percentage (%)
Sex	Male	Nil	0
	Female	131	100
State	Anambra	28	21
	Imo	19	15
	Abia	33	25
	Enugu	31	24
	Ebonyi	20	15
Type of Institution	Federal University	37	28
	State University	17	13
	Polytechnic	9	7
	Federal College of Education	33	25
	State College of Education	35	27
Highest Qualification	Bachelors Degree	11	8
	Masters Degree	42	32
	Doctorate Degree	78	60
Teaching Experience	Less than 5 years	14	11
	6-10 years	22	17
	11-20 years	61	46
	21 and above	34	26

Research Questions

Research question 1: To what extent are Home Economics Lectures competent in teaching pattern drafting using manual method in tertiary institutions in Nigeria?

The result in table 2, showed that respondents from the Federal Universities had mean ($\bar{x}$) sore range of 1.89 and 2.43, for items 41 and 45 which was below the cut-off mark of 2.50, this was regarded as low extent, while items 20-40, 42-44 had mean ($\bar{x}$) score range of 2.57-3.89 and a grand mean ($\bar{x}$) score of 3.02 which were above the cut-off mark of 2.50 this was taken as high extent. In the State Universities, items 20-40, 42, 43 and 45 had a mean ($\bar{x}$) score of 3.02 which were above the cut-off mark of 2.50, therefore, the decision was taken as high extent, while items 41 and 44 had mean ($\bar{x}$) score range of 1.88 and 2.47 which were below the cut-off mark of 2.50 was taken as low extent. In the Polytechnic, items 21-35, 41, 44 and 45 had a mean ($\bar{x}$) range of 1.78-2.44 which was below the cut-off mark of 2.50 and was taken as low extent, while items 20, 36-40 and 42-43 had a mean ($\bar{x}$) range of 2.56-3.89 and a grand mean ($\bar{x}$) of 3.01 which was above the cut-off mark of 2.50 and was considered as high extent. In the Federal Colleges of Education, items 41, 42 and 44 had mean scores range of 1.67-2.45, which was below the cut-off mark of 2.50 and was taken as low extent. While, items 20-40, 43 and 45 had mean ($\bar{x}$) score range of 2.61-3.88 and a grand mean of 2.50 and was taken as high extent. In State Colleges of Education, item 31 had a mean score of 1.89, which was below the cut off mark of 2.50 and was taken as low extent. Items 20-30, 32-45 had mean ($\bar{x}$) score range of 2.60-3.89 and a grand mean ($\bar{x}$) of 3.13 which were above the cut-off mark of 2.50 and was taken as high extent. However, all the respondents agreed that lecturers of Home Economics had high competency in pattern drafting using manual method in Tertiary Institutions.

Research Question 2: What are the technical skills required for Home Economics lecturers to advance from manual to computer assisted teaching of pattern drafting for entreneurship in tertiary institutions in Nigeria.

The result in table 3 showed that the respondents in the Federal Universities agreed to items 78 – 98 with mean ($\bar{x}$) scores that ranged from 2.70 – 3.62 and a grand mean ($\bar{x}$) of 3.26 as the technical skills required for lecturers of Home Economics to advance from manual to computer – assisted teaching of pattern drafting for entrepreneurship. The respondents in the State Universities agreed to items 78 – 92, 94, 96 – 98 with mean ($\bar{x}$) scores range of 3.06 – 3.82 and a total grand mean ($\bar{x}$) of 3.27 which were above the cut-off mark of 2.50 thus, are the technical skills required for lecturers of Home Economics lecturers to advance from manual to computer – assisted teaching of pattern drafting for entrepreneurship. While items 93 and 95 with mean($\bar{x}$) scores range of 1.53 – 2.18 were below the cut-off mark thus, respondents disagreed to the items.

The respondents from the Polytechnic agreed to items 78 – 91, 93 – 94, and 96 – 98 with mean ($\bar{x}$) scores ranging from 3.00 – 4.00 as the technical skills required for lecturers of Home Economics to advance from manual to computer – assisted teaching of pattern drafting for entrepreneurship while items 92 and 95 with mean ($\bar{x}$) scores of 1.00 and 2.44 respectively.

These scores were below the cut-off mark of 2.50 thus the respondents disagreed that they were not training skills required. The respondents from the Federal Colleges of Education agreed with items 78 – 90, 92 and 94 – 98 with mean ($\bar{x}$) scores ranging from 2.91 – 3.64 and a grand mean ($\bar{x}$) of 3.18 as the technical skills required for lecturers of Home Economics to advance from manual to computer – assisted teaching of pattern drafting for entrepreneurship while items 91 - 93 with mean ($\bar{x}$) score ranging from 2.24 – 2.36 which were below the cut off mark of 2.50 were disagreed. The respondents in State Colleges of Education agreed to items 78 – 94 and 96 –

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Table 2: Mean ($\bar{x}$) scores and standard deviation of the responses of lecturers of Home Economics in Tertiary Institutions in South East, Nigeria on their competencies in teaching pattern drafting using manual method.

	Pattern Drafting Bodice Block (Front and Back)	N = 37 FU		N = 17 S U		N = 9 Polytechnic		N = 33 F C E		N = 35 S C E	
		$\bar{x}$	R	$\bar{x}$		$\bar{x}$	R	$\bar{x}$	R	$\bar{x}$	R
1.	**Front:** Draw a vertical line equals front length plus 2'. Measure horizontal line equals ¼ bust measurement. **Back**: Draw a vertical line equals back length plus ½'. Measure horizontal line equals ¼ bust measurement.	2.81	HE	2.83		2.78	HE	2.79	HE	3.54	3.54
2.	**Front:** Square lines and label ABCD, measure up 1½' from waist point CD and mark C_1 and D_1. **Back**: Square lines and label ABCD, measure up ½' from waist point CD and mark C_1 and D_1.	2.70	HE	2.71	HE	2.44	LE	2.70	HE	2.71	2.71
3.	**Front**: Find centres of the square, divide horizontally and rule a line across from AB-CD. **Back**: Find centres of the square, divide horizontally and rule a line across from AB-CD.	3.14	HE	3.24	HE	2.36	LE	3.24	HE	3.14	3.14
4.	**Front:** Divide the upper rectangle into four equal parts vertically and horizontally. **Back**: Divide the upper rectangle into four equal parts vertically and horizontally.	3.24	HE	3.18	HE	2.37	LE	3.15	HE	2.89	2.89
5.	**Front:** Divide the first square on upper right (B) into two equal parts horizontally. **Back:** Divide the first square on upper right (B) into four equal parts vertically.	2.76	HE	2.82	HE	2.33	LE	2.85	HE	3.29	3.29
6.	**Front:** From A measure 3 down and to the right mark E and curve for neckline. **Back:** From A measure ½' down and 3' to the right mark E and curve for neckline.	2.76	HE	2.82	HE	2.22	LE	2.79	HE	2.71	2.71
7.	**Front:** Measure ½' down from B mark F. Measure out the shoulder from E towards F and connect with a line. **Back:** Measure ½' down from B mark F. Measure out the shoulder from E towards F and connect with a line.	3.00	HE	3.00	HE	2.39	LE	3.00	HE	3.89	3.89
8.	**Front:** From the shoulder point, draw a curve line to G to form the armhole. Measure ½' from D downwards to obtain H. join G to H then to waist dart with slant line. **Back**: From the shoulder point, draw a curve line to G to form the armhole. Measure ½' from D downwards to obtain H. join G to H then to waist dart with slant line.	3.08	HE	3.10	HE	2.44	LE	3.00	HE	3.09	3.09
9.	**Front:** Form bust dart by measuring 3-4' from side B-D, draw inside a line. Mark out 1/2' dart width on both sides and join the lines by slanting.	3.51	HE	3.47	HE	2.21	LE	3.45	HE	2.60	2.60
10.	**Front** : Form waist dart by measuring 3-4' from centre. Draw 5-6' line upward. Measure ½' on both sides of the line and join the lines by slanting. **Back:** Form waist dart by measuring 3-4' from centre. Draw 5-6' line upward. Measure ½' on both sides of the line and join the lines by slanting.	3.38	HE	3.41	HE	3.44	LE	3.39	HE	3.11	3.11
11.	**Skirt (Front and Back)** Front: Draw a vertical line equals skirt length measurement and measure horizontally ¼ hip measurement plus 1' for dart. **Back**: Draw a vertical line equals skirt length measurement and measure horizontally ¼ hip measurement plus 1' for dart.	3.57	HE	3.53	HE	3.78	LE	3.58	HE	3.54	3.54

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Table 2 continued

	Pattern Drafting **Bodice Block (Front and Back)**	**N = 37** **FU**		**N = 17** **S U**		**N = 9** **Polytechnic**		**N = 33** **F C E**		**N = 35** **S C E**	
		$\bar{x}$	R	$\bar{x}$		$\bar{x}$	R	$\bar{x}$	R	$\bar{x}$	R
12.	**Font:** Complete the rectangle and mark ABCD. **Back:** Complete the rectangle and mark ABCD.	2.65	HE	2.71	HE	2.32	LE	2.73	HE	1.89	1.89
13.	**Front:** Measure hip depth from A and B 7-9', mark EF and rule across. Back: Measure hip depth from A and B 7-9', mark EF and rule across.	3.19	HE	3.12	HE	2.41	LE	3.12	HE	3.11	3.11
14.	**Front:** From line A-B measure ½' upward and mark G. Curve line from A to G for waist. **Back:** From line A-B measure ½' upward and mark G. Curve line from A to G for waist.	2.89	HE	2.88	HE	2.38	LE	2.91	HE	3.14	3.14
15.	**Front**: From A measure 3-4' for dart. Rule a line from waist down 5-6' before hipline. Connect. **Back:** From A measure 3-4' for dart. Rule a line from waist down 5-6' before hipline. Connect.	3.27	HE	3.29	HE	2.22	LE	3.27	HE	3.11	3.11
16.	**Front and Back**: Measure ½' on both sides of dart and connect by slanting. **Back:** Measure ½' on both sides of dart and connect by slanting.	2.86	HE	2.76	HE	2.33	LE	2.79	HE	3.54	3.54
17.	**Front**: Measure ½' at hem line for curve. and **Back:** Measure ½' at hem line for curve.	3.89	HE	3.88	HE	4.00	HE	3.88	HE	3.31	3.31
18.	**Front:** Measure ½' from hemline upward. Draw a curve from D-C for hem. **Back**: Measure ½' from hemline upward. Draw a curve from D-C for hem.	3.14	HE	3.06	HE	2.89	HE	3.09	HE	2.91	2.91
19.	**Sleeve Block** Draw a vertical line equals arm length measurement plus ½'. Measure across top arm measurement plus 2'.	2.57	HE	2.59	HE	2.56	HE	2.61	HE	3.37	3.37
20.	Complete the rectangle and mark ABCD.	3.03	HE	3.12	HE	3.33	HE	3.12	HE	3.43	3.43
21.	Divide the rectangle into four equal parts vertically.	3.49	HE	3.53	HE	3.89	HE	3.58	HE	3.11	3.11
22	Measure down from top line A down C 5' for depth of crown. Rule across and mark EF.	1.89	LE	1.88	LE	1.78	LE	1.82	LE	3.31	3.31
23.	Rule a line from E and F to line AB at the center and mark 1.	3.41	HE	3.35	HE	3.78	HE	2.45	LE	3.14	3.14
24.	Find centre vertically for smooth curve and join centre with curve ½' in and out on both sides for sleeve head.	2.76	HE	2.82	HE	3.00	HE	3.09	HE	3.00	3.00
25.	Join down with a slight curve from C-D for wrist line.	3.14	HE	2.47	HE	2.44	LE	1.67	LE	3.43	3.43
26.	Measure length to elbow measurement and mark GH.	2.43	LE	3.00	HE	2.33	LE	3.30	HE	3.14	3.14
	Grand Mean ($\bar{x}$)	3.02		3.02		3.01		2.98		3.13	3.13

Key: FU – Federal Universities, SU- State Universities, FCE- Federal Colleges of education, SCE- State Colleges of Education, R- Remark, HE- High Extent.

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Table3: Mean ($\bar{x}$) responses and standard deviation of technical skills required of lecturers of Home Economics to advance from manual to computer assisted teaching of pattern drafting for Entrepreneurship in Tertiary Institutions.

	Technical Skills	N = 37 Federal Universities			N = 17 State Universities			N = 9 Polytechnic			N = 33 Federal College of Education			N = 35 State College of Education		
27	Items	$\bar{x}$	SD	R	$\bar{x}$	SD	R	$\bar{x}$	SD	R	$\bar{x}$	SD	R	$\bar{x}$	SD	R
28	Ability to use software packages.	3.05	0.62	A	3.06	0.56	A	3.00	0.71	A	3.03	0.64	A	3.03	0.62	A
29	Ability to discuss pattern drafting software in CAD.	3.11	0.70	A	3.06	0.83	A	3.11	0.33	A	3.09	0.72	A	3.06	0.68	A
30	Skill for effective use, care of software packages.	3.54	0.51	A	3.35	0.49	A	3.67	0.50	A	3.61	0.50	A	3.54	0.51	A
31	Ability to discuss CAD language and materials.	3.51	0.51	A	3.65	0.49	A	3.44	0.53	A	3.36	0.49	A	3.49	0.51	A
32	Ability to discuss procedures of pattern drafting using software.	3.43	0.50	A	3.35	0.49	A	3.33	0.50	A	3.58	0.50	A	3.46	0.51	A
33	Describe stages in software design process.	3.62	0.49	A	3.82	0.39	A	3.00	0.00	A	3.55	0.51	A	3.63	0.49	A
34	Teach drafting basic blocks using CAD.	3.54	0.51	A	3.59	0.51	A	3.33	0.50	A	3.64	0.49	A	3.54	0.51	A
35	Practice selection of pattern pieces items (e.g. bodice, sleeve, skirt).	3.43	0.50	A	3.35	0.49	A	3.89	0.33	A	3.33	0.48	A	3.43	0.50	A
36	Ability to print.	3.11	0.31	A	3.12	0.33	A	3.11	0.33	A	3.15	0.36	A	3.11	0.32	A
37	Skill for effective applications programming interfaces (APIS) e.g. 2-D, 3- D.	3.51	0.61	A	3.65	0.61	A	3.00	0.00	A	3.58	0.56	A	3.51	0.61	A
38	Effective platform independent (can run in windows or other operating system).	3.27	0.45	A	3.29	0.47	A	3.67	0.50	A	3.24	0.44	A	3.26	0.44	A
39	Multi- device operation (can use mouse, keyboard or track ball to operate it).	3.46	0.51	A	3.59	0.51	A	3.11	0.33	A	3.55	0.51	A	3.49	0.51	A
40	Rendering (texture mapping).	3.59	0.50	A	3.59	0.51	A	3.00	0.00	A	3.61	0.50	A	3.60	0.50	A
41	Skill for transformation of 2D and 3D rotation, translation, scaling and perspectives.	2.70	0.85	A	3.47	0.87	A	3.22	0.44	A	2.36	0.96	DA	2.91	0.70	A
42	Procedures for color models.	2.95	0.85	A	3.06	0.90	A	2.44	0.53	DA	2.91	0.72	A	2.71	0.83	A
43	Skills for computer pattern markings e.g. lines, notches, grain, darts etc.	3.14	0.92	A	1.53	1.18	DA	3.78	0.67	A	2.24	1.12	DA	2.74	1.15	A
44	Ability to grade patterns.	3.08	0.64	A	3.24	0.44	A	3.11	0.60	A	3.09	0.68	A	3.09	0.56	A A
45	Software driver drafting techniques.	3.05	0.81	A	2.18	1.24	DA	1.00	0.00	DA	3.12	0.74	A	1.46	0.85	DA
46	Skills for measurements for the bodice, sleeve and skirt pattern drafting.	2.86	0.79	A	3.71	0.59	A	3.33	0.50	A	3.33	0.78	A	3.29	0.57	A
47	Software procedure for drafting block (bodice/ skirt/ sleeve).	3.11	0.74	A	3.59	0.51	A	3.33	0.50	A	3.33	0.69	A	3.26	0.66	A
48	Ability to use projector.	3.41	0.86	A	3.47	0.87	A	4.00	0.00	A	3.27	0.88	A	3.89	0.47	A
	Grand Mean ($\bar{x}$)	3.26			A			3.18			3.24			3.21		

Key: FU – Federal Universities, SU- State Universities, FCE- Federal Colleges of education, SCE- State Colleges of Education R- Remark, A- Agree, DA- Disagree.

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98 with mean ($\bar{x}$) score ranging from 2.71 – 3.89 and a grand mean ($\bar{x}$) of 3.21 as the technical skills required for lecturers of Home Economics to advance from manual to computer – assisted teaching of pattern drafting for entrepreneurship, while item 95 with a mean ($\bar{x}$) score of 1.46 which was below the cut-off thus the respondents disagreed that software driver drafting techniques is not technical skill required for lecturers of Home Economics to advance from manual to computer-assisted teaching of pattern drafting.

3.2 Hypotheses

H01: There will be no significant difference between the mean responses of Home Economics lecturers in Federal and State tertiary Institutions on the extent to which they are competent in teaching pattern drafting using manual method in tertiary institutions in Nigeria.

The result in table 4, showed the t-computed value of 0.626 and a p-value of 0.533. Testing the null hypothesis at an alpha level of 0.05, the p-value of 0.533 was greater than the alpha level of 0.05. Therefore, the null hypothesis was accepted. This implied that there was no significant difference between the mean () responses of Home Economics lecturers in Federal and State tertiary institutions in South East, Nigeria on the extent to which they are competent in pattern drafting using manual method.

H02: There will be no significant difference between the mean response of Home Economics lecturers in the Universities, Polytechnic and Colleges of Education as regards the technical skills required to advance from manual to computer assisted teaching of pattern drafting for entrepreneurship in tertiary institutions in Nigeria.

Table 5 showed the f-computed value of 50.546 and a p-value of 0.000. the results showed that in testing the null hypothesis at an alpha level of 0.05, the p-value of 0.000 was less than the alpha level of 0.05. Therefore the null hypothesis was rejected. This implied that there was significant difference between the mean () responses of Home Economics lecturers in the Universities, Polytechnic and Colleges of Education in South East, Nigeria. on the technical skills that would be required to advance from manual to computer-assisted teaching of pattern drafting for entrepreneurship.

4. Discussion

The findings of the study showed that there is high extent of competence among lecturers of Home Economics in teaching pattern drafting using manual method. The patterns include bodice blocks (front and back), skirt blocks (front and back) and sleeve block. There was no significant difference between the mean ($\bar{x}$) responses of Home Economics lecturers in the Federal and State tertiary institutions on the extent to which they were competent in teaching pattern drafting using manual method. This finding supports the studies of Utuk (1991)[27] who worked on the development and evaluation of three techniques for teaching basic pattern drafting in Senior Secondary Schools in Akwa Ibom State. The study found no significant difference in the mean ($\bar{x}$) performance of the three groups of students measured with a criterion referenced checklist. The study also is in line with the studies of Varney (1980),[28] which indicated that patterns are needed in dress making in order to obtain a better fit and to save material.

The study discovered that among other technical skills

Table 4: t-test analysis of the mean ($\bar{x}$) responses of Home Economics lecturers in Federal and State tertiary institutions in South East, Nigeria on the extent to which they are competent in pattern drafting using manual method.

Variables	N	Mean ($\bar{x}$)	SD	DF	t-cal	p-value (2-tailed)	Decision
Federal tertiary institutions	33	60.24	5.12	66	0.626	0.533	Accept
State tertiary institutions	35	59.49	4.84				

Table 5: One Way Analysis of Variance of the mean responses of Home Economics lecturers in the Universities, Polytechnic and Colleges of Education on the technical skills that would be required to advance from manual to computer assisted teaching of pattern drafting for entrepreneurship in tertiary institutions in South East, Nigeria.

Source of variation	Sum of Squares	DF	Mean($\bar{x}$) square	F-cal	P value	Decision
Between Groups	2628.707	2	1314.353	50.546	0.000	Reject
Within Groups	3328.423	128	26.003			
Total	5957.130	130				

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needed by the Home Economics lecturers to progress from manual to computer assisted teaching of pattern drafting for entrepreneurship were the ability to discuss pattern drafting software in CAD, effective use and maintenance of software packages, effective applications programming interfaces (2D, 3D) skills, color model and patterns grading abilities, and so on. According to Onah and Okoro (2010),[24] instructors at postsecondary educational institutions lack the necessary training, which prevents them from having the necessary abilities to impart effective understanding of ICT tools to their pupils. These results agree with Dimelu's (2010)[10] findings as well. In a research on the need for competency enhancement among home economics instructors in South East Nigerian colleges of education on the use of ICT for successful teaching, the author discovered that the teachers lacked proficiency with word processing, internet usage, and PowerPoint use. The mean ($\bar{x}$) replies of the home economics instructors at universities, polytechnics, and colleges of education differed significantly when it came to the technical abilities needed to go from teaching pattern drafting for entrepreneurship by hand to teaching it using computers. This might be attributed to variations in the curricula, the degree of facility accessibility, the training, and the motivation of the lecturers provided by the different schools.

5. Conclusion

Patterns are fundamental building blocks used in the creation of clothing. They are quite beneficial for extensive manufacturing. Pattern drawing instruction has transitioned from manual to computerized throughout time. This study provided empirical evidence that lecturers in clothing and textiles are capable of instructing students in pattern drawing utilizing the manual approach. The transition from manual to computer-assisted pattern drafting instruction shouldn't be too drastic; with time and computer education training, there will be significant progress. With that progress, students will graduate from college with the necessary skills for producing clothing in large quantities, which will strengthen their entrepreneurial spirit and promote both personal and societal development.

6. Recommendations

Based on the findings of the study, the following recommendations were made;

1. To improve Clothing and Textiles teachers' technical skills, University body –NUC, the Polytechnic body – NBTE, and the College of Education body-NCCE should conduct workshops and seminars on computer assisted pattern drafting training for them.

2. The Federal and State Ministries of Education should guarantee that appropriate financing is available for the provision of computer facilities and competent lectures training.

3. Tertiary institutions may be able to aid in the supply of ICT facilities in order to improve their student's education.

4. Lectures in Home Economics should be retrained in order to teach effectively. This would encourage students to master technical skills that will enable them to become entrepreneurs once they graduate.

Ethics and consent

Not applicable

Availability of data and material

All data generated or analyzed during the study are included in the published article (and its supplementary information files).

Conflict of interest

The author has no competing interest

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Author's contribution

Sole authorship

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ARTICLE

Business Clothing For Females: Suitability For Effective Workplace Job Performance in Nigeria

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ABSTRACT

The study investigated business clothing for females that are suitable for effective workplace job performance in Nigeria. It identified fabric characteristics of females' business clothing already used; fabric characteristics needed and deign style preference suitable for females' business clothing for workplace job performance. The study was guided by four research questions and two hypotheses. Population was 4,806 female civil servants in Delta state, Nigeria. Multi- stage sampling technique was utilized to select 136 females. Structured questionnaire was employed to collect data and descriptive statistics and t-test were used for data analysis. Finding showed that cotton, nylon, lacra fabrics, light and medium fabric weight, blue, black, gray, colors, cool texture, rough, smooth surface plain, stripe and flowered design among others were fabric characteristics of business clothing are being used in workplace. But prefer and need cotton, nylon, lacra, light weight, black, blue, gray, brown colours, cool, plain, surface fabrics. Net, organza, heavy weight, white, yellow, toweling fabrics were not preferred. Findings further showed that straight gown, waist flared and gathered gowns, skirt, blouse and suit/jacket, straight, shirt, long sleeves, garment with or without collar, below knee length, peter and convertible collars, among others were highly preferred design styles of clothes. In conclusion, office workers determine what they wear to perform workplace daily jobs promotes self-confidence, comfort, professional worth and productivity. It was recommended that female employees should not downplay appropriate work attires for comfort and organizational productivity to satisfy fashion trends.

1. Introduction

Clothing is seen to put the body at the center of attraction and meet functionality purposes for the wearer. Since clothes are the fundamental part of cultural and social identity they are worn daily for different occasions and values in life. It has an unspoken language that communicates information about wearers' personality and preferences. Clothing can also affect others perception and action towards you. Naturally, every woman wants to look good, polished and refined; whether at home or at workplace. Nowadays more women work outside the home; a greater percentage of women are in employment and contribute to the welfare of their households or in business of relatives (Osia, 2005;[20] Azonuche, 2021;[3] International Labor Organization (ILO), 2023).[11] These women need the right clothing to carry out their duties. As they get busy at workplace, wearing appropriate business

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clothing gives comfort, confidence, and greater quality work output.

Business clothing is a product that requires a style that performs a particular function, not only for the user, but also for the beholder in the white collar job or workplace (Azonuche 2017;[2] Rollings, 2020).[21] It is clothing worn by worker in office and professional setting that depicts personality within workplace (Indeed, 2023a).[9] Rollings (2020)[21] further noted that office dynamics are better when people are happy, which leads to higher workplace collaboration, and increased completed work. This type of clothing are often different based on the form of work being done in the office or prescribed uniform for organization, it can be formal, professional, or casual attire.

Business formal clothing is the attire that utilizes the use of traditional dark suit set attire, requires distinguished suits and dresses. Masterclass (2021)[16] pointed that business professional constitute the most conservative office dress code, in that, this traditional attire is the everyday office wear in industries like finance, banking, government and law. Indication of such attire includes pant suit and button-down shirt (often with a tie) or knee–length pencil skirt and blazer with perfect fit (Masterclass, 2021).[16] Business casual are usually most commonly used women business attire among workers in companies, classroom, ministries/parastatals with office setting and utilize different color of accessories and dress style in their clothing. The main aim is to ensure a business-like appearance without sacrificing individuality and comfort (Stitch Fix, 2021).[23] Uniformity is often used by most organizations to achieve their aims and at the same time explore their organizational dress code in life. But whatever it may be people or organization need to create work environment where workers can show up their whole selves (Miles, 2022).[17] Wearing appropriate dress to workplace empowers the employees, boost morale expression and flow of job ideas.

The appropriateness of work clothing is a concept that plays a major part in the determination of its success as a visual label (Rollings, 2020).[21] Most often women face dilemma in the choice of what to wear to workplace. Work clothing should provide for professional image, make employee feel comfortable in use and be presentable especially when having to deal with the public. Professional career women seek for traditional, tailored and fitted wears that make them unique and stand out while not sacrificing fashion trends in clothing (Indeed, 2023a).[9] Office dress code shows the formality level of the clothes that can be worn to the office for work efficiency and effectiveness in performance.

There is an increase in the number of females in workforce across the regions of the world and especially in Nigeria's civil service of today (Urhibo, 2021).[26] Most of whom are professionals in their field of work such as teachers, directors, permanent secretaries, lawyers, among others and non-professional areas as clerical and messengers. They can be single or married and occupy senior or junior cadre position in the workplace. Though, the civil service does not have dress code, these employees in the workplace need formal clothes that convey image of authority, safe work performance and impression management of the wearer (Azonuche & Anyakoha, 2018).[4] Clothes contribute to comfort in workplace based on the quality, properties/characteristics of the fabrics.

It is extremely difficult to predict the material properties of fabric, because most textile fabrics are made from series of fibers spun into yarn. The structure, properties of fiber or yarn, their different weaves/knit patterns as well as fabric finishes have effect on the overall fabric characteristics and performance. When choosing fabric for clothes it is important to consider the strain and stresses need to be subjected to in job performance in the workplace. Such clothing should be comfortable to enable mobility, safety and productivity allowing users to carry out work/ tasks without any restriction impediment (Braganca et al, 2015).[5] Business clothing should be light in weight, breathable to allow the heat of the body to escape, antimicrobial and durable fabric, color, surface texture and style design.

Clothing design starts with right body measurements for size of an individual which the garment is intended to fit (Aldrich, 2006).[1] The characteristics of the body shape are paramount for the clothing fit. Individuals vary physically in posture and silhouette which determine the design for the clothing that can facilitate users' activities and needs. Designing clothes deals with the translation of users' needs and preferences in visual representation of the design. The shape and length of clothes, length and type of sleeve, garment, and design ease as well as other design features can enhance aesthetics in clothes. Braganca et al (2016)[6] noted that smaller or tight clothes are capable of restricting mobility, posture, and circulation of blood in the user's body. Designer should assess different available designs and how they impact human activities for safe work performance.

This study was informed by the researcher's observation on menace of some female workers' dress to workplace; they wear fashionable outfit without considering the type of job, work environment, comfort, safety, protection in clothing style type and design. Since civil servants do

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not really have dress code that cocktail type and mode of dressing, most female workers wear whatever they like as work clothes. In a bid to trend in fashion they compromise work environment, fit, posture, mobility, and comfort in business clothing, this impacts safety, level, quality and quantity of work done. The economy has also crippled good work environments, some lack adequate working facilities, furnished offices, light, fans, chairs, air conditioners, among others which make the workplace not conducive for adequate job activities. Inappropriate clothing without comfort, too tight or loose is impendence to the wearer's safety while at work. Most female workers do not consider type of fabric design and job to be done in selection and wearing practices of varieties of fashion clothing to the office. Some of these preferred clothing fabric type and bogus designs do not allow dissipation of heat, ease of movement, body flexion and posture causing uncomfortable, unsafe, and inefficient work output.

Previous studies examined factors for work wear design, garment for specific functions, activities, environment, increased agility, and ergonomics based on human body and clothing construction system (Braganca, et al, 2016;[6] Chen & Hu, 2016;[7] Lindqvist & Thornquist, 2014).[15] Other studies include how to dress at work, factors for work wear design and its impact on workers comfort, consequences of employees daily clothing choices in aesthetics, comfort and uniqueness that have implication for employees' state self-esteem and subsequent tasks and related behaviors (Nayak et al, 2015;[18] Braganca, 2015;[5] Kim et al, 2022).[14] Though several studies have been done on work wears; however, fabric type and design in relation to female workers clothing and task have not been examined in work wear selection among employees. Therefore, the need to examine business clothing for females: suitability for workplace job performance.

Specific purpose of this study:

1. Identified the fabric characteristics of females' business clothing currently used for job performance in the work place;

2. Determined the fabric characteristics needed in females' business clothing for work place job performance;

3. Ascertained design and style preferences suitable for females' business clothing for workplace job performance.

Research Questions

1. What is the fabric characteristics of females' business clothing currently used for job performance in the workplace?

2. What is the fabric characteristics needed in females' business clothing for workplace job performance?

3. What are the design and style preferences suitable for females' business clothing for workplace job performance?

Hypotheses

1. There is no significant difference in the mean rating of fabric characteristics needed in females' business clothing for workplace job performance of senior and junior staff.

2. There is no significant difference in the mean rating of design style preferences in business clothing suitable for workplace job performance between single and married females.

2. Materials and Methods

The study was carried out in Delta states, Nigeria. The research design utilized for the study was expo facto design with the use of focus group discussion and descriptive survey research method.

The population made up of all the female civil servants in all the ministries/ parastatals, Directorates and Agencies in the states with a total of 4,806 females.

Sample size of 136 female civil servants selected from the ministries, directorates, and agencies through the civil service commission. Multi-stage sampling technique was employed to meet needs and fair representation of females in the workplace. Simple random sampling technique was first utilized to select one ministry, directorate, and agency: Ministry of education (post primary and higher education), Local government commission, and Pension bureau. Secondly, purposive sampling technique was applied to select female staff in these positions; Directors-6, Secretaries-30, Teachers/Lecturers-45, Clerical officers-30, Messengers-25 who are involved in daily tasks performance in the work place.

Instrument for data collection was Focus Group Discussion, the purpose of the discussions was to get information from the female workers on types of fabrics worn in the workplace, challenges encountered in the use of fabrics, fabric characteristics suitable and style preferred in work wear and business clothing. A questionnaire was developed from the responses and suggestions from the focus group discussion, reviewed literature, and purposes of the study. Business clothing for females suitable for workplace questionnaire (BCFSWPQ) was in two parts and used to get needed information from the subjects. Part 1 contained the demographic information of the female workers. Part 2 contained three sub-sections: Section A had 40 items on fabric characteristics (type, weight, texture, surface and surface design) of business clothing already being used in the work place; Section B

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had 40 items on fabric characteristics of business clothing needed for work place with four point rating scale of Strongly Agree (SA)=4, Agree (A)=3, Disagree (D)=2 and Strongly Disagree (SD)=1; Section C had 35 items on design and style preferences suitable for females' business clothing for work place (silhouette, sleeve type, shape and length, collar type) with four point rating scale of Highly Preferred (HP)=4, Moderately Preferred (MP)=3, Lowly Preferred (LP)=2 and Not Preferred (NP)=1. The questionnaire was subjected to face validity by three experts in clothing, textiles measurement, and evaluation lecturers from University of Nigeria, Nsukka, to assessed the relevance, clarity and appropriateness of the instrument for data collection based on the purpose of study. A final copy of the instrument was made based on the corrections and suggestions.

To determine the reliability of the instrument 20 civil servants who were not included in the study participated in a test-retest to assess the internal consistency of the instrument. Cronbach alpha coefficient indices of 0.81, 0.76 and 0.80 were obtained for fabric characteristics of business clothing used in workplace, fabric characteristics of clothing needed, and design and style preference respectively.

One hundred thirty-six (136) copies of questionnaire were given to the selected subjects in their offices on scheduled visits with the help of three research assistants. The questionnaire were completed and retrieved at the same time.

To analyze the data collected, mean and standard deviation statistics were used to test the research questions using a cut-off mean of 2.50 -4.00 as strongly agreed/ highly preferred, 1.00-2.49 as strongly disagreed/not preferred. Finally the hypotheses were analyzed using t-test at a 0.05 level of significance.

3. Results

Research question 1: What is the fabric characteristics of females' business clothing already used for job performance in the workplace?

Research question 2: What is the fabric characteristics needed in females' business clothing for workplace job performance?

Table 1 showed the mean rating and standard deviation of responses on fabric characteristics of females' business clothing used in workplace with all items as strongly agreed. The mean range for type of fabric was between 3.05-3.75, weight of fabric 2.58-3.53, color of fabric 2.52-3.01, texture of fabric 2.58- 3.01, surface of fabric, 2.51-3.10, surface design of fabric 2.50- 3.93. Indication is that the fabric characteristics of females' business clothing used in workplace include; fabric type are cotton, linen, polyester, nylon, lacra among others, weight of fabrics are light and medium weight, color of fabrics include; blue, black green, gray and brown. While texture of fabrics are cool, soft, coarse and medium; fabric surface are rough, raised, smooth, embossed among others and surface design include; fabric designs are plain, paid, flowered, toweling, stripped among others. Standard deviation ranged between 0.62-1.20 which shows closeness in responses on fabric characteristics of business clothing used in the workplace.

Table 1 also shows the responses of mean rating and standard of fabric characteristics of females' business clothing needed for job performance in the work place had 25 items with strongly agreed. Type of fabric had mean ranged between 2.51- 3.93 which means that cotton, linen, silk, polyester, nylon among others are types of fabrics are needed for business clothing, but strongly disagreed in three items with mean ranged between 1.09-2.01,which show that wool, net, and organza fabrics were not needed. Weight of fabrics had mean 2.56 and 3.23 as strongly agreed for light and medium weight fabrics as needed while heavy weight was mean 1.99 as disagreed meaning that heavy weight fabric was not needed. Color of fabrics for 7 items had mean ranged between 2.50-3.41 as strongly agreed that means blue, black, brown among others were needed, but strongly disagreed on 3 items. Texture of fabrics mean ranged between 3.10-3.24 as strongly agreed and strongly disagreed in 1 item with mean 1.91. Surface of fabrics mean from 2.90-3.70 as strongly agreed that means smooth and embroidered surface were needed while mean ranged from 1.00-2.10 as strongly disagreed in 4 items meaning rough, raised, embossed, and knitted were not needed. Surface design of fabric mean range from 3.68-4.00 as strongly agreed in 4 items which shows that plain, plaid, flowered, and stripe fabrics were needed while 3 items were with mean from 1.08-2.26 as strongly disagreed that toweling, flannel and appliqué were not needed. Therefore, this implies that cotton linen, lacra, light and medium weight, blue, black, brown, green, soft, cool, smooth surface, plain, plaid, flowered and stripe are fabric characteristics needed and suitable for females' business clothing and not net, organza, heavy weight, white, yellow, coarse, rough, raised, toweling among others.

Research question 3: What are the design / style preferences suitable for females' business clothing for workplace job performance?

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Table 1: Mean rating of responses on fabric characteristics of females' business clothing used and needed for workplace job performance.

S/N	**Fabric characteristics of clothing**	**Used**			**Needed**		
	Types of fabrics	Mean	SD	Rem	Mean	SD	Rem
1.	Cotton	3.75	0.88	SA	3.93	0.80	SA
2.	Linen	3.70	0.71	SA	3.84	0.78	SA
3.	Wool	2.51	0.78	SA	2.01	0.72	SA
4.	Silk	3.05	0.90	SA	2.64	0.86	SA
5.	Polyester	3.60	1.02	SA	2.72	1.16	SA
6.	Nylon	3.60	0.68	SA	2.80	0.76	SA
7.	Lacra	3.80	1.00	SA	2.65	0.63	SA
8.	Suede	3.64	0.84	SA	2.65	0.80	SA
9.	Chiffon	3.72	0.80	SA	3.51	0.79	SA
10.	Net	2.54	0.76	SA	1.09	0.82	SA
11.	Organza	2.50	0.87	SA	2.00	0.79	SA
	Weight of fabric						
12.	Heavy weight	2.90	0.80	SA	1.99	0.89	SA
13.	Light weight	2.58	0.78	SA	2.56	0.87	SA
14.	Medium weight	3.53	0.86	SA	3.23	0.76	SA
	Color of fabric						
15.	White	2.84	0.84	SA	1.54	0.70	SA
16.	Blue	2.53	1.20	SA	2.52	0.84	SA
17.	Black	2.80	0.78	SA	3.41	0.91	SA
18.	Yellow	2.50	0.87	SA	2.12	1.02	SD
19.	Pink	2.60	0.86	SA	2.50	0.68	SA
20.	Green	2.52	0.90	SA	2.53	0.85	SA
21.	Red	2.61	0.64	SA	2.58	0.60	SA
22.	Cream	2.52	0.69	SA	2.53	0.93	SA
23.	Gray	3.01	0.76	SA	3.00	0.84	SA
24.	Brown	2.82	0.74	SA	2.84	0.74	SA
	Texture of fabric						
25.	Cool	3.01	0.82	SA	3.24	0.86	SA
26.	Soft	3.00	0.76	SA	3.10	0.88	SA
27.	Coarse	2..80	0.68	SA	1.91	0.80	SD
	Surface of fabric						
28.	Rough surface	2.52	0.84	SA	1.00	0.68	SD
29.	Smooth surface	3.10	1.00	SA	3.20	0.82	SA
30.	Raised surface	2.51	0.62	SA	2.00	0.68	SD
31.	Embossed surface	2.54	0.78	SA	2.10	0.82	SD
32.	Embroidered	2.58	0.84	SA	2.00	0.78	SD
33.	Knitted	2.51	0.68	SA	1.02	0.80	SD
	Surface design of fabric						
34.	Plain	3.91	0.89	SA	4.00	0.87	SA
35.	Plaid	2.84	0.78	SA	3.90	0.76	SA
36.	Flowered	3.93	0.87	SA	3.68	0.64	SA
37.	Toweling	2.50	0.76	SA	1.08	0.84	SD
38.	Flannel	2.50	0.76	SA	1.68	0.80	SD
39.	Stripped	3.73	0.86	SA	3.78	0.68	SA
40.	Appliqué	2.58	0.84	SA	2.26	0.76	SD

Key: SA= Strongly agreed, SD= Strongly disagreed, Rem= Remark

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Table 2: Mean rating and standard deviation of responses on design style preferences suitable females' business clothing for workplace.

S/n	Design preferences	Mean	SD	Remark
	Silhouette of clothing			
1.	Straight gown	3.81	0.70	HP
2.	Skirt and blouse	2.62	0.82	HP
3.	Gown with flared at waist	3.80	0.80	HP
4.	Gown with pleats at waist	3.00	0.64	HP
5.	Gown with pleats at hip	2.50	0.78	HP
6.	Gown with gathers at waist	2.73	0.68	HP
7.	Skirt suit/jacket	3.10	0.80	HP
	Sleeve shape			
8.	Straight sleeve	3.90	0.74	HP
9.	Tight fitting sleeve	3.63	0.88	HP
10.	Kimono sleeve	3.68	0.87	HP
11.	Raglan sleeve	2.00	0.69	HP
	Sleeve type			
12.	Shirt sleeve	3.67	0.76	HP
13.	Puff sleeve	3.00	0.87	HP
14.	Kimono sleeve	2.86	0.81	HP
15.	Bishop	2.30	0.61	HP
16.	Leg 'O mutton sleeve	2.00	0.68	NP
17.	Bell sleeve	2.40	0.79	NP
18.	Cap sleeve	3.20	0.80	HP
19.	Sleeveless	2.00	0.64	NP
	Sleeve length			
20.	Above elbow length	3.42	0.70	HP
21.	Elbow length	3.67	0.68	HP
22.	Three quarter length	3.80	0.71	HP
23.	Long sleeve	2.60	0.72	HP
	Collar			
24.	Garment with collar	3.61	0.82	HP
25.	Garment without collar	3.81	0.74	HP
	Collar type			
26.	Shirt collar	3.75	0.68	HP
27.	Peter pan collar	3.00	0.78	HP
28.	Polo collar	1.40	0.80	NP
29.	Stand collar	1.32	0.79	NP
30.	Convertible collar	3.32	0.80	HP
31.	Shawl collar	1.80	0.64	NP
	Length of garment			
32.	Above knee length	1.60	0.86	NP
33.	Knee length	2.76	0.80	HP
34.	Below knee length	3.79	0.74	HP
35.	Ankle length	1.00	0.72	NP

Key: SD= Standard deviation, HP= Highly preferred, NP= Not preferred

Result in table 2 showed the mean and standard deviation of responses on design and style preferences suitable for females' business clothing. The silhouette was highly preferred in all items with mean range from 2.50-3.81 meaning that straight gown, skirt and blouse, gowns with pleats, flare and gathers at the waist among others were highly preferred suitable styles. Sleeve shape had mean in 4 items range from 2.68-3.90 as highly preferred and 2.00 in 1 item. This showed that straight, tight fitting, and kimono sleeves were highly preferred while raglan sleeve was not preferred. Sleeve type mean in 4 items mean range from 2.86-3.69 as highly preferred while other 4 items 2.00-2.30 not preferred. Indication is that shirt, puff kimono, and cap sleeve types were highly preferred while bishop, leg O'mutton, bell , and sleeveless were not preferred. Sleeve length all items mean range from 2.60-3.67 were highly preferred, which implies that elbow, three quarter ,and long sleeve length were preferred. Collar had mean of 3.61-3.81 showing high preference for garments with collar and without collar. Collar type in 3 items mean range from 3.00-3.75 were highly preferred while 3 items with mean range from 1.32-2.00 were not preferred, showing preference for shirt, peter-pan, and convertible collars and not polo, stand and shawl collars. Preferred garment length mean were 2.76 and 3.79 for knee and below knee length. Therefore, it shows that straight gown, gowns with pleats, flare and gathers at the waist, skirt suit and jacket, straight, tight fitting, shirt and puff sleeves; three quarter and long sleeve length; garments with collar and without collar; knee and below knee length garments, were preferred females' business clothing for workplace.

Hypothesis 1: There is no significant difference in the mean rating of fabric characteristics needed in females' business clothing for workplace job performance senior and junior staff.

Result in table 3 show there is no significant difference in the mean responses of seniors and junior staff in 4 items. The probability value ranged from 0.200-0.882 greater than 0.05 level of significance (P>0.05). As a result, the null hypothesis of no significant difference was upheld. Indication is that the senior and junior staff did not differ significantly in their responses on fabric characteristics needed in business clothing for workplace job performance.

Hypothesis 2: There is no significant difference in the mean rating of design style preferences in business clothing suitable for workplace job performance between single and married females.

Result in table 4 show there is no significant difference in the mean responses of single and married workers

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Table 3: t-test analysis of responses of senior and junior staff on fabric characteristics in business clothing

Design style	Senior x1	n=135 SD	Junior x2	n=125 SD	t-value	Sig	Dec
1. Types of fabrics	3.86	0.92	3.54	0.82	-0.284	0.840	NS
2. Weight of fabrics	3.64	0.70	3.40	0.80	0.154	0.882	NS
3. Color of fabrics	3.59	0.86	3.67	0.74	-1.010	0.311	NS
4. Texture of fabrics	3.68	0.94	3.72	0.66	0.689	0.490	NS
5. Surface of fabrics	3.54	0.76	3.69	0.74	1.026	0.200	NS
6. Surface design of fabrics	3.78	0.70	3.60	0.81	0.680	0.392	NS

Key: X1=mean for senior staff, x2=mean for junior staff, df=degree of freedom (258), t-value=calculated value of t-test using SPSS, SD=standard deviation, n1= number of single female workers, n2= number of married female workers, Sig=level of significance 0.05, NS=not significant.

Table 4: t-test analysis of responses of single and married females on design style preferences in business clothing

Design style	Single x1	n=150 SD	Married x2	n=110 SD	t-value	Sig	Dec
Silhouette of clothing	3.76	0.72	3.72	0.74	1.036	0.301	NS
Sleeve shape	3.82	0.84	3.76	0.86	-0.284	0.777	NS
Sleeve type	3.72	0.74	3.71	0.81	0.689	0.492	NS
Sleeve length	3.67	0.97	3.69	0.80	-1.011	0.313	NS
Collar	3.57	0.90	3.63	0.82	0.154	0.880	NS
Collar type	3.62	0.86	3.64	0.86	-1.110	0.812	NS
Length of garment	3.48	0.76	3.46	0.72	0.140	0.426	NS

Key: X1=mean for single females, x2=mean for married females, df=degree of freedom (258), t-value=calculated value of t-test using SPSS, SD=standard deviation, n1= number of single female workers, n2= number of married female workers, Sig=level of significance 0.05, NS=not significant.

in 5 items. Probability value ranged from 0.301- 0.880 greater than 0.05 level of significance (P>0.05), the null hypothesis of no significance was not rejected. Indication is that the single and married females did not significantly differ in their responses on design/style preferences suitable for workplace clothing.

4. Discussion of Findings

Finding showed that the fabric characteristics of business used in workplace include; cotton, linen, polyester, nylon, and lacra fabric types among others light and medium fabric weight, blue, black, gray, brown colors, cool and soft texture, rough, raised, smooth surface as well as plain, plaid, stripe and flowered design among others. This is in consonance with Sonye and Nzurumike (2022)[22] who found that cotton, linen, bright colors, plain, flowered, soft, smooth, light and medium weight fabric types were preference in garment making. It is of note that properties of cotton and linen fabrics include moisture absorbency, cool to the body in wear, and allow the heat of the body to escape. This, therefore, enhances comfort at workplace, promote efficiency and job productivity. Natural fibers and fabrics absorb perspiration and are cooler than synthetic fibres/fabrics to the body in wear (Tania, 2017).[25] Color, attractiveness and texture are crucial elements to women clothing selection, choices and wear. Color, weight and texture of fabrics used for clothes are not surprising as women are known to always want to look good, beautiful and aesthetically pleasing not only at occasions but also at workplaces.

Finding further showed female workers' preferences and needs for most fabrics characteristics as garments in workplace such as cotton, linen, nylon, lacra, polyester, light and medium weight, blue, gray, black, brown colors , cool, smooth, plain, plaid, flowered surface fabrics among others. While net, organza, coarse and heavy weight, white, yellow, toweling, knitted fabrics among others were not in preference. Nylon, polyester, and lacra fabrics are currently trendy fashion and often most workers do not want to compromise fashion to work job performance. In agreement with this finding, Surbhi (2018)[24] stressed the need for aesthetic and expressive attributes in clothing for good appearance and acceptance. These project image, authority and professionalism as well as

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efficiency for job productivity at workplace. Some of the fabric characteristics not preferred were net, heavy weight, and coarse fabrics that do not absorb moisture and do not allow heat from the body to escape, hence, not comfortable to the wearer and which may impede efficient work performance and job output. Heavy weight and thick fabrics used for wears discomfort the wearer due to poor removal and dissipation of heat (Nwaba et al, 2022).[19] Office wears require cool warm colors and not too sharp colors. Though red color clothes are considered being more confident, because of color preference such garment might depicts different interpretation or meaning for the user (Elliot & Mairer, 2014;[8] Kim et al, 2022).[14] Office clothing with innovative fashion details often times convey weaker professional image than classic fashion details. The responses of senior and junior staff did not differ significantly on fabric characteristics needed in business clothing. It is important to note that properties of fabrics to large extent determine its performance in use. Fabrics that provide balance in heat and moisture between the wearer and environment for comfort relates to the wearers' psychological, physical, and social comfort needs and values (Kaunde, 2014).[13] As workers comfort, values, clothing functionality and environment are important to organizational success than rank or position; therefore, work wears should meet protection/safety, expressive and aesthetic needs of the wearers in use for job efficiency at the workplace.

Finding shows that straight gown, waist flared, pleated, and gathered gowns, skirt. Blouse and suit/jacket, straight tight fitting, shirt, puff, cap, long sleeves, garment with or without collar, below knee length, peter-pad, and convertible collars among others were highly preferred design style of female business clothes for workplace. Suitable work clothing modifies female workers' appearance, express their individual values and worth. A classic styled skirt or pants suit or tailored outfit with jacket free of images and graphics were forms of career clothing for females that show workers professional image (Braganca, 2016).[6] Professional women prefer well-tailored fitted office clothing that are trendy in fashion; add aesthetic value to the general outlook of the garment, make the worker presentable, improve confidence and productivity (Indeed, 2023b).[10] The single and married workers did not significantly differ in their in their design styles preferred for business clothing in workplace. It would have been expected that the single female workers may differently style design from the married women. This lay credence to the fact that the practicality of the garment is foremost though aesthetic not compromised as admiration, impression, wearers' taste as well as social status of identification and expression are greatest needs in most clothing choice and use (Jill, 2016;[12] Wang et al 2021;[27] Williams, 2022).[28] These preferred design styles allow for appropriate movement, postures of sitting, standing, twisting and bending to carryout work place activities, boost job performance and outcomes. Furthermore, create psychologically safe workforce with deep sense of belonging to work for effective and smooth governance at any level.

5. Conclusion

It is the duty of employees to decide and choose what to wear daily except the ones on uniform, to ensure confidence, self-worth and professional image. Business clothing to a great extent has implication for safety, comfort, productive job performance and behavior in the work environment. Consequent upon this, finding showed female workers need appropriate work clothing with suitable fabric such as cotton, linen, light weight, smooth, cool, warm colors among others. There had preferences for straight, flared and pleated gowns, skirt and suit/jacket, blouse, skirt shirt, puff, three quarter sleeves, garment with or without collar among others design styles. The senior did not differ significantly from the junior staff on fabric characteristics needed and the single did not differ from the married females in their preferences clothing design styles suitable in business clothing for workplace.

Recommendations

These recommendations were made based on the findings of the study.

1. Female employees should not compromise job productivity to satisfy aesthetics and fashion in work clothes, this has far reaching implication for organizational performance, comfort and safety.

2. Employers should provide workplace clothing guide for employees to enhance decency, modesty, and job efficiency.

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ARTICLE

The Effect of Inquiry-Based Learning Strategy on EFL Tenth-Grade Students' Reading Comprehension

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ABSTRACT

This study examined the potential effect of Inquiry-Based Learning Strategy (IBL) on the tenth-grade students' reading comprehension. Two groups and a quasi-experimental design were used. Two complete sections of grade 10 students from a public Secondary School for Girls in Irbid was randomly assigned by the researcher. The experimental group of 30 students was chosen first, and then the control group of 30 students. A pre-post reading comprehension test was designed before and after the study in order to fulfill its goals. Additionally, the experimental group was taught using the IBL strategy, whereas the control group was taught using the traditional teaching methods recommended in the tenth-grade Teacher's Book. According to the findings, there were significant statistical differences favoring the experimental group over the control group. In light of the findings, the researcher recommended employing the IBL strategy to students with various levels and EFL skills.

1.Introduction

The world has seen significant improvements in foreign language learning and teaching strategies, which have impacted reading comprehension skills. To keep up with these developments, it's critical to align teaching practices to meet the needs and interests of students and provide an engaging, and interactive learning environment.

Reading is a crucial skill when learning a foreign or second language (Bernhardt, 1983). [18] Reading entails interaction between the text's substance and the reader's prior knowledge (Anderson, 1999). [16] Reading is one of the four language skills that enhances students' capacity for simple interpersonal contact and communication (Cziko, Greenleaf, Hurwitz, & Schoenbach, 2000). [20] According to Harmer (2007) [29] and Rubin (1975), [44] reading is the process of understanding texts. It aids in students' academic and language development, expands their knowledge base, improving their vocabulary and spelling, imparting knowledge of fundamental concepts and facts, and enjoying the texts (Hamdan, 1991). [26]

According to Goodman (1970, p. 5), [24] reading is "a complex process by which a reader reconstructs, to some extent, a message encoded by a writer in graphic language." To extract the information needed and gain knowledge, students must comprehend the text's meaning (Grellet, 1981). [25] According to Anderson (1999), [16] reading is a process that incorporates the reader's interaction with the written text in order to understand the author's message.

Reading comprehension is the process of constructing

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and understanding the meaning that is either explicitly or implicitly conveyed in written texts (Hodges, 1995). [31] Students can use prior information when reading a text by using reading comprehension. Additionally, it aids in their understanding of the words, idioms, and symbols used in specific sentences or lengthy paragraphs (Oakhill, Cain, & Elbro, 2014). [39] In order to grasp various sorts of texts in the future, it also helps students understand the definitions, substance, primary concepts, linguistic qualities, and generic structures of the text (Wahyono, 2019). [47]

The three levels of reading comprehension are literal comprehension, inferential comprehension, and critical comprehension depending on the activation of the students' prior knowledge. Finding information in a text and comparing it to the overall meaning is known as literal comprehension. Students don't have to rely on prior knowledge as much as words in the text. On the other hand, inferential understanding necessitates students to draw on their existing knowledge to ascertain the information implied in a text. Students are at the critical comprehension level when they analyze the written content of the text, contrast the material in a reading text to what they already know, and assess the writer's point of view and objectives (Burns, Roe, Ross, & Elinor, 1999). [19]

Reading comprehension skills enable students to easily and successfully understand the reading text (Mikulecky & Jeffries, 1996). [37] A number of reading comprehension skills are skimming, scanning, reading critically, reading quickly, identifying topics, guessing the meaning of unknown words, spotting relationships, summarizing, drawing conclusions, and monitoring comprehension. These comprehension skills are crucial when instructing reading comprehension classes (Afflerbach, Pearson, & Paris, 2008).[2]

Inquiry-based learning, also known as IBL, is a method of learning languages that places a strong emphasis on participation and conversation. It is becoming common to introduce language through inquiry, which makes it easier for students to learn a new language (Alameddine & Ahwal, 2016). [3] It is preferable to use more engaging teaching strategies while teaching reading than traditional ones and the IBL strategy is said to be one of these innovative strategies (Harmer, 2001). [28]

Both discovery-based learning and problem-solving are included in the IBL strategy. The following steps are part of the IBL teaching and learning strategy: By observing, making inferences, developing hypotheses, and exchanging ideas, students learn how to participate in processes of discovery and inquiry. In addition to textbooks, there are other sources of information of teacher strategies that research and inquiry based (Richards, Platt, & Platt, 1992). [43] IBL is frequently advantageous for students who have reading difficulties. Based on the experiences, interests, and needs of the students, the teacher and the students jointly identify problems and questions. A teacher actively engages in the teaching-learning process so that he/she is not just a source of information or knowledge (Raja'a, 2018). [41]

The inquiry-based learning strategy consists of several key components. The components are as follows: Students participate in discussions about the material to be taught; problem-solving is crucial; learning is dynamic; and outcomes show how learning is applied. Continuous evaluation is linked with real learning. Active learners retain information more quickly than passive ones who merely listen to lectures. Instead of reading or hearing about something, students claim they remember it better when they are actively participating in it. It is the responsibility of the English language teacher to assist students in making connections between their prior knowledge and new material as well as between curriculum and investigation (Harada & Yoshina, 2004; [27] Warner & Myers, 2009). [48]

The General Guidelines and General and Specific Outcomes for the English Language place a strong emphasis on students' reading. It has been stated that using reading strategies is necessary for understanding literary and general knowledge texts. Along with literary works (such as magazine and newspaper articles, brochures, and poems); students must also explain a variety of basic, real-world facts. From the elementary to the secondary stages, the IBL strategy can be employed as a primary resource. English classes are obligatory for all Jordanian students. Regardless of whether they are in elementary or secondary school, students typically spend four to five hours each week studying English (Ministry of Education, 2006). [38]

Reading is difficult for many EFL students in Jordan. It is a challenge for students (Amoush, 2012).[15] In some classrooms, reading comprehension skills are taught in the same way that some teachers instruct silent reading without encouraging their students to come up with original ideas (Kailani, 1998;[34] Al-Odwan, 2012).[11] Numerous studies have shown that many Jordanian EFL students struggle with reading (Al-Makhzoumi, 1986;[10] Al-Ansi, 1992;[4] Al-Saraireh & Abu-Haija, 2007;[13] Al-Jamal, Al-Hawamleh & Al-Jamal, 2013;[7] Al-Janaydeh, 2022).[8] Their conclusions showed that insufficient reading comprehension learning had a detrimental effect on student's reading skills.

2.Statement of the Problem

According to the researcher's teaching experience,

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EFL students in Jordanian schools occasionally struggle to comprehend reading texts and consequently struggle to respond to reading comprehension questions. Reading comprehension among students is still low and falls short of expectations despite the significance of reading comprehension (Amoush, 2012). [15] The student's reading comprehension is also insufficient, according to numerous Jordanian researchers (e.g., Fraihat, 2018; [23] Huwari, 2019; [32] Migdadi & Baniabdelrahman, 2016; [36] Radaideh, Al-Jamal, & Sa'di, 2020).[40]

Many Jordanian students have trouble comprehending English-language materials (Alkhawaldeh, 2011;[9] Frahihat, 2003;[22] Jarrah, 2008).[33] Unfortunately, they are unable to extract the text's primary and supplementary ideas (Hassan, 2019).[30] Additionally, they are unable to broaden their knowledge or comprehend language (Al-Rimawi & Al Masri, 2022).[12] Furthermore, according to Al-Awamleh, Bajes, Majali, and Inshasi (2021),[5] teachers are reluctant to use innovative strategies or procedures that are unrelated to their traditional strategies. As a result, the present study may benefit the development of Jordanian EFL teachers and aid in the reading comprehension growth of EFL students in the tenth grade.

Purpose of the Study

This study aims to investigate the effect of the inquiry-based learning strategy (IBL) on the reading comprehension of EFL female 10th -grade students in Jordan.

Question of the Study

This study seeks to answer the following research question:

Is there a statistically significant difference at (α = 0.05) on the reading comprehension post-test scores of Jordanian EFL tenth-grade students that may be attributed to IBL instructional strategy (IBL strategy vs. traditional instruction)?

Significance of the Study

This study is significant for teachers because it may aid them in developing their reading comprehension lessons, becoming more adept at deriving meaning from texts, and discovering ways of aiding students to understand what they read. The IBL strategy can be applied to a variety of texts, including academic articles, news items, short stories, and even novels. The results of this study could assist foreign language teachers in implementing an innovative strategy for teaching reading comprehension. The study is crucial because it can help with the planning and production of necessary assignments and activities that enhance students' reading comprehension, which can help with the development and teaching of the reading curriculum. This study will be helpful to EFL researchers because they can use it as a base-line reference for their research. The results of this study can also aid in the development of more efficient instructional strategies that can be used in a variety of educational contexts. It may also open the door to more investigation into the effects of various strategies for reading comprehension on students' academic achievement and overall learning outcomes.

Operational Definitions of Terms

In the current study, the following terms are defined as follows:

The Inquiry-Based Learning (IBL) Strategy combines students' inherent curiosity with an effective strategy to help them become more proficient readers of English. In this study, the researcher redesigned the reading texts' content to conform to the IBL strategy and created a related instructional program. The texts were taken from the Action Pack 10 textbook.

Reading Comprehension is the process of understanding meaning by coordinating a number of intricate processes, including interaction between the reader and the reading text, a link to prior knowledge, a thorough comprehension of the text, word and world knowledge, and fluency (Hodges, 1995). [30]

The ability of female students in the tenth grade to understand what is textually explicit (literal comprehension), what is textually implicit (inferential comprehension), and to evaluate the writer's ideas (critical comprehension) is what meant by reading comprehension in the current study. A reading comprehension test that covers these levels of comprehension was used to measure to measure reading comprehension.

Literal Comprehension is an awareness of the reading text's immediate meaning, including relevant dates, facts, and locations (Burns, Roe, Ross, & Elinor, 1999). [19] The ability of students in the tenth grade to skim the text for the main idea, scan the text for the specific information, and summarize the text was examined in the current study.

Inferential Comprehension is the process of interpreting an author's implicit meaning, anticipating their intended message, and making inferences (Burns et al., 1999). [19] In the present study, students in the tenth grade were tested on their capacity to identify predicted results and conclusions, analyze critical information, and extrapolate suggested meaning from context.

Critical Comprehension is the act of making judgements of a text's elements and the skill, objective, and writing

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style of the author (Burns et al., 1999). [19] The current study looked at students' judgmental skills, their capacity to compare their predictions to textual material and have discussions using terms for agreement and disagreement.

Limitations of the Study

The results of the current investigation are constrained by the following limitations:

1. During the second semester of the academic year 2022–2023, the study focused on 60 female students in the tenth grade at one public school, from Irbid Directorates of Education. If additional schools and grades had been the focus, the findings might have been more broadly applicable.

2. The treatment lasted just for eight weeks. A longer period might have produced different results.

3. Since Action Pack 10 (specifically modules 4, 5, and 6) is the textbook utilized in Jordanian public schools for this study, various textbooks with different material may produce different findings.

Review of the Related Literature

The researcher gathered the following studies after evaluating educational research that were pertinent and useful to the investigation of the IBL strategy.

Abu-El-Samen (2008) [1] examined the effect of inquiry and conventional learning styles on reading comprehension. The participants were 90 students from King Abdulaziz University in Jeddah, Saudi Arabia. The sample was divided into three groups. Data were gathered using 100 reading comprehension tests that included multiple-choice and essay questions. The results demonstrated that students who were taught cooperative and inquiry-based reading comprehension approaches outperformed those who were taught conventionally.

Trimastuti (2012) [46] looked into how well 72 Turkish students in the tenth grade were taught to read using the IBL strategy (specifically, the 5Es Model). A pre-posttest, as well as a questionnaire, were employed by the researcher to gather data. The results demonstrated that the 5E model was superior to the traditional approach in terms of teaching reading.

Sari (2017) [45] hypothesized that inquiry-based learning may enhance the reading abilities of 231 EFL students. Both the experimental and control groups were tested using to a t-test. The findings demonstrated that students' reading abilities had improved, with a clear separation between those who had received IBL training and those who had not.

Ermawati (2018) [21] looked on how IBL instruction helped EFL students improve their reading comprehension. A mixed methods strategy that includes both quantitative and qualitative techniques was used to collect the study's data through questionnaires and interviews. It was offered to third-semester students at STKIP Muhammadiyah Sidrap. The results showed that the important findings were the result of the IBL strategy.

Raja'a (2018) [41] looked into the effects of the IBL strategy on the reading comprehension and self-control growth of 86 female students in Gaza. A self-regulation scale, a pre-post reading skills test, and a list of reading comprehension skills were used as data gathering instruments. The IBL strategy had a considerable impact on the students' reading comprehension and self-control, according to the findings.

Ramasari (2020) [42] investigated the effectiveness of teaching tenth grade students reading comprehension using the IBL strategy. 20 students participated in the study. To collect data, a pre-posttest was used. The study's conclusions showed how crucial it is to teach tenth grade students reading utilizing an IBL strategy.

Ali and Ulker (2020) [6] investigated the impact of an IBL strategy on the growth of reading and writing skills in university-bound EFL students. 52 students from educational faculties took part in the study. To gather data, a pre-posttest was used. The findings demonstrated a considerable improvement in both readers' and writers' skills due to the IBL strategy.

Aslan (2021) [17] looked at the IBL activities for increasing student learning outcomes in fundamental reading skills exercises in Madrasah Ibtidayah and primary schools in Indonesia. Data was gathered by the researcher from a number of educational situations that successfully linked their IBL. The researcher employed a descriptive-qualitative design to assess a set of data. IBL is highly significant and ought to be used in the learning environment, according to the findings.

Alshammari (2022) [14] looked into how the IBL strategy affected the metacognitive reading comprehension abilities of Saudi students. 106 males and females from Shaqra University in Saudi Arabia participated in the study. With one group, the researcher used a quasi-experimental design. Data were gathered using a reading comprehension test as a pre-test and post-test. The results demonstrated that using an IBL strategy helped students develop their meta-cognitive reading comprehension abilities.

Concluding Remarks

Many studies (e.g., Abu-El-Samen (2008), [1] Trimastuti (2012), [46] Sari (2017), [45] Ermawati (2018), [21] Raja'a

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(2018), [41] Ramasari (2020), [42] Ali & Ulker (2020),[6] Aslan (2021),[17] Alshammari (2022))[14] demonstrated the benefits and effectiveness of an IBL strategy. It was also disclosed that just a few research studies had been carried out to examine the impact of an IBL strategy on college and high school students' reading comprehension. Prior studies, however, showed that an IBL strategy significantly improved the reading comprehension of EFL students as a whole. Numerous research was undertaken to determine how an IBL strategy affected EFL learners. There hasn't been much research on Arab English learners, though. Studies on the impact of an IBL strategy on Jordanian students' reading comprehension have not been conducted locally.

3. Method and Procedures

Design and Variables of the Study

The quasi-experimental design was used in the current study. The IBL strategy served as treatment on the independent variable of reading comprehension scores. The results of the students' post-test scores on reading comprehension served as the dependent variable.

Participants of the Study

Two EFL tenth-grade sections with 60 female students each made up the participants of the current study. These sections were purposefully chosen because the researcher has a close relationship with the English teacher there. They attended the public Soum Secondary School for Girls. The school year 2022–2023's second semester was used to conduct the current study.

The experimental group consisted of 30 students, while the control group also included 30 students. A pre-test was given to the students in the two groups to assure equality. The Action Pack 10 textbook's reading activities were taught to the experimental group utilizing the IBL strategy. The lesson plan for the control group was taken from the Teacher's Book of Action Pack 10, although the IBL strategy was not mentioned in it.

Research Instrument

The reading comprehension pre-posttest was designed to fulfill the study's objectives. The instrument is described as follows:

The Pre-Post Test for Reading Comprehension

The researcher designed a pre-post test for reading comprehension based on an analysis of related prior literature. The pre-posttest concentrated on the three basic reading comprehension levels (literal, inferential, and critical). Each of these levels was evaluated using a distinct set of questions that the researcher designed in accordance with the reading material and the tenth-grade modules used in Jordanian public schools. The learning and teaching resources available in the teacher's book were used to design the reading comprehension test. Before and after using the IBL strategy in the experimental and control groups, the test was designed to determine how well each student understood what they had read, both individually and collectively, in order to demonstrate the effectiveness of this instructional strategy.

For the reading comprehension pre-posttest, the researcher designed multiple-choice questions to measure the students' reading comprehension at three levels (literal, inferential, and critical). Twelve questions were asked in all. Each of these questions was assigned to one of three levels. Six questions made up the first level, which evaluated literal level, and they made up 30% of all questions. The second level, which made up a total of four questions and comprised 40% of the total, examined the inferential level. Two questions made up the third level, which evaluated the critical level, and they together constituted 30% of the total questions.

Test Validity and Reliability

The test was piloted with a sample of 20 students in order to assess the test's construct validity and internal consistency. Then, the corrected item total correlation between the skill score and the total score of its level as well as the Pearson Correlation Coefficient between the skill score and the total score of the test were retrieved. According to the findings, the ranges of the Pearson Correlation Coefficients for literal, inferential, and critical data are (0.761-0.881), (.676-.785), and (.567-.654), respectively. Pearson Correlation Between.543 and.678 is the correlation coefficient between the skill score and the test's overall score. Additionally, the corrected item total correlation for literal, inferential, and critical items varied from (0.555–0.623), (.534–.564), and (.412-.567), respectively. The test is valid since the internal consistency coefficients are higher than the threshold value (0.40) (Leach, Barrett, & Morgan, 2011). [35]

Additionally, the test's Cronbach's alpha and test-retest coefficients were extracted. The results showed that the test's Cronbach's alpha coefficients are .78, .86, .79, and .85 for literal, inferential, critical, and the entire test, respectively, while the test-retest coefficients are .79, .82, .72, and .80 for literal, inferential, critical, and the entire test. The test is reliable since the reliability coefficients are higher than the threshold value (0.70).

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IBL Strategy-Based Instructional Program

In order to achieve the goals of the study, the researcher designed an IBL strategy-based instructional program to help participants improve their reading comprehension. The researcher additionally redesigned the reading comprehension exercises in modules 4, 5, and 6 so that participants in the experimental group used IBL strategy during their reading comprehension sessions.

The Instructional Material

The instructional materials used in this study were based on Modules 4, 5, and 6 of Action Pack 10's Student's Book and Activity Book. The researcher redesigned these exercises for the participants in the experimental group based on the IBL strategy that was used to instruct reading comprehension skills.

Duration and Content of the Instructional Program

The duration of this program was eight weeks. The modules (4, 5 and 6) in Action Pack 10's reading comprehension exercises have been redesigned in light of the IBL strategy. Each unit's reading comprehension exercises were divided into two sessions of 45 minutes each, held twice a week for eight weeks.

Procedures for Designing and Implementing the Instructional Program

To implement the program, the following procedures were taken:

1. Locating reading tasks in Action Pack 10's targeted modules.
2. Determining the tasks that the IBL strategy had incorporated.
3 Putting the IBL strategy into practice for these tasks.
4. Providing the steps that were taken throughout the lesson.
5. Appropriate time allocation was made for each task.
6. The targeted IBL strategy was implemented following the administration of the reading pre-test to the control and experimental groups.
7. Giving examples of the targeted IBL strategy while introducing it to the experimental group.
8. Making use of the intended IBL strategy as a model for students to follow.
9. Reviewing the IBL strategy before each reading activity.
10. The student's comprehension skills in reading were assessed after the curriculum was implemented to determine their reading comprehension improvement.

Validity of the Instructional Program

The researcher presented the instructional program to a jury of English curriculum and instruction experts to guarantee its validity. The jury was requested to assess the program and provide the researcher with any feedback or comments regarding the program that was distributed. One of these comments was to present a hands-on lesson on the IBL strategy for teaching reading comprehension skills. The researcher made the changes as suggested by the experts.

4. Results

To answer the research question, the researcher followed the following procedures: The means and standard deviations of pre- and post-test scores in overall reading comprehension test for the two groups were calculated, as shown in Table 1.

Table 1: Pre-performance and Post-performance of the Two Groups in Overall Reading Comprehension

Reading Comprehension Level	Group	Pre-test		Post-test	
		Mean	S.D	Mean	S.D
Overall	Experimental	10.43	1.43	16.00	1.72
	Control	8.43	1.63	11.43	2.19
	Total	9.43	1.83	13.72	3.02

Table 1 shows that there is observed differences between post-performance of the two groups in overall reading comprehension. The mean scores of the experimental group (Mean=16) is higher than the mean scores of the control group (Mean=11.433) in the overall reading comprehension as measured by reading comprehension test.

To investigate the statistically significant effect of the instructional strategy (i.e., Inquiry-Based Learning Strategy vs. Traditional) on the overall reading comprehension after controlling the effect of overall reading comprehension pre-performance, a one-way Analysis of Covariance (ANCOVA) was used, as shown in Table 2.

Table 2 shows statistically significant differences in the students' overall reading comprehension between the experimental and control groups in favor of the experimental group. The partial eta squared value of 0.510 indicates that the instructional strategy explained 51.0% of the variance in overall reading comprehension.

Furthermore, adjusted and unadjusted means of the overall reading comprehension of the two groups were extracted. Table 3 illustrates the means, standards errors, and standard deviations of the two groups (post-performance) in the overall reading comprehension before and after controlling the overall reading comprehension pre-test scores (pre-performance).

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Table 2: The Effect of Instructional Strategy on the Overall Reading Comprehension after Controlling the Effect-performance Scores

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	.990	1	.990	.251	.618	.004
Group	233.918	1	233.918	59.424	.000	.510
Error	224.377	57	3.936			
Corrected Total	538.183	59				

Table 3: Adjusted and Unadjusted Means of the Overall Reading Comprehension

	Unadjusted Mean		Adjusted Mean	
Group	**Mean**	**S.D.**	**Mean**	**Std. Error**
Control	16.00	1.72	16.09	.400
Experimental	11.43	2.19	11.35	.400

As shown in Table 3, there are observed difference between the two groups in the overall reading comprehension post-performance after the differences in the overall reading comprehension pre-test scores were controlled. As such, IBL strategy enhanced post-performance in the overall reading comprehension.

Also, pre-performance and post-performance of the two reading comprehension levels (literal, inferential, and critical) were calculated, as shown in Table 4.

Table 4: Pre-performance and Post-performance of the Two Reading Comprehension Levels (Literal, Inferential, and Critical)

Reading Comprehension Level	Group	Pre-test		Post-test	
		Mean	**S.D**	**Mean**	**S.D**
literal	Experimental	3.70	.84	4.90	.71
	Control	2.77	.77	3.97	.85
	Total	3.23	.93	4.43	.91
Inferential	Experimental	3.30	.53	5.87	1.04
	Control	2.90	.76	3.90	.84
	Total	3.10	.68	4.88	1.37
Critical	Experimental	3.43	.57	5.23	.82
	Control	2.77	.77	3.57	.90
	Total	3.10	.75	4.40	1.2

Table 4 shows that there are observed differences between the post-performance scores of the two groups' post-test performance in the three levels of reading comprehension. The post-performance scores of the experimental group are higher than the mean scores of the control group in the reading comprehension levels as measured by the reading comprehension test.

To evaluate the effect of the instructional strategy (i.e., IBL strategy and conventional method) on the linear combination of the reading comprehension levels after controlling the effects of pre-test scores, a one-way Multivariate Analysis of Covariance (One-way MANCOVA) using multivariate test (Hoteling's' Trace) was conducted. Table 5 illustrates the results.

Table 5: The Effect of Instructional Strategy on the Reading Comprehension Levels

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Teaching Strategy	1.052	18.581	3.000	53.000	.000	.513

Table 5 shows that the main effect of the instructional strategy was significant. This indicates that the linear composite of the reading comprehension differs across the two groups. The partial eta square value of .513 indicates that 51.3% of the variance in the composite of the reading comprehension levels could be attributed to the instructional strategy. Since the effect of the instructional strategy on the combination of the reading comprehension levels is significant, follow-up univariate analysis (Tests of between-subject effects) was performed, as shown in Table 6.

Table 6 shows that there were statistically significant differences between the two groups in the three levels of reading comprehension in favor of experimental group. The partial eta squared values of inferential, literal, and critical were .264, .419, and .415, respectively. This means that the instructional strategy explained 26.4%, 41.9%, and 41.5 % of the variance in (inferential, literal, and critical) levels, respectively.

Additionally, adjusted and unadjusted means of the three levels of reading comprehension for the experimental and control groups were extracted. Table 7 illustrates the means, standards errors, and standard deviations of the two groups in the three levels of reading comprehension before and after controlling the pre-test scores of reading comprehension levels.

Table 7 shows that there are differences between the two groups on the three levels (i.e., inferential, literal, and critical) remaining after the differences in the pre-test scores are controlled. As such, IBL strategy improved students' performance on inferential, literal, and critical. Based on this, the highest effect size of IBL strategy was on critical, followed by inferential, and literal.

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Table 6: The Effect of the Instructional Strategy on the Reading Comprehension Levels after Controlling the Effect of Pre-Test Scores

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-Literal	Literal	.164	1	.164	.261	.612	.005
	Inferential	1.005	1	1.005	1.084	.302	.019
	Critical	.623	1	.623	.816	.370	.015
Pre-Inferential	Literal	.334	1	.334	.532	.469	.010
	Inferential	.045	1	.045	.049	.826	.001
	Critical	.007	1	.007	.010	.922	.000
Pre- Critical	Literal	.160	1	.160	.255	.616	.005
	Inferential	.318	1	.318	.342	.561	.006
	Critical	.289	1	.289	.379	.541	.007
Teaching Strategy	Literal	12.384	1	12.384	19.725	.000	.264
	Inferential	36.850	1	36.850	39.735	.000	.419
	Critical	29.732	1	29.732	38.962	.000	.415
Error	Literal	34.531	55	.628			
	Inferential	51.006	55	.927			
	Critical	41.971	55	.763			
Corrected Total	Literal	48.733	59				
	Inferential	110.183	59				
	Critical	84.400	59				

Table7: Adjusted and Unadjusted Means of the Reading Comprehension Levels

Dependent Variable	Group	Unadjusted mean		Adjusted mean	
		Mean	S.D	Mean	S.E
literal	Experimental	4.90	.71	4.99	.161
	Control	3.97	.85	3.88	.161
Inferential	Experimental	5.87	1.04	5.84	.196
	Control	3.90	.84	3.93	.196
Critical	Experimental	5.23	.82	5.26	.177
	Control	3.57	.90	3.55	.177

5. Discussion

The research question aimed to determine whether there were any statistically significant differences between the IBL strategy and traditional strategy in the tenth-grade Jordanian EFL students' overall and (literal, inferential, and critical) reading comprehension levels from the post-test scores that could be attributed to the instructional strategy. The study's findings indicate that using the IBL strategy did significantly affects reading comprehension scores at all three levels (literal, inferential, and critical). As a result, on the reading comprehension post-test, the experimental group's students significantly outperformed the control group's students in terms of both overall performance and performance on the literal, inferential, and critical comprehension levels. The results also show that the students' level of reading comprehension increased as a result of using the IBL strategy.

For a number of potential reasons, the IBL strategy improved the experimental group of students' post-test reading comprehension. One of the potential deciding elements is how an educational program is designed since IBL needs the teacher to carefully plan and approve an order to achieve learning objectives. Topics were chosen from the students' curriculum, the reading assignments were carefully crafted by the researchers, brief and well-structured to produce better conversation topics, and the

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time allotted was appropriate.

The cooperative setting is another factor that might have improved the students' reading comprehension. IBL strategy increased students' collaboration to complete tasks by concentrating on individual characteristics. This led to the program's creation of exercises appropriate for both individual and group work, which were intended to encourage students to engage more deeply with the texts they read. The interactive nature of the IBL strategy encouraged student participation in the learning process rather of relying solely on teacher instruction.

Through this strategy, the teacher was able to provide each student specific feedback that helped them improve their comprehension of the subject matter and their reading skills. Students also felt more motivated and involved. A major factor in the high interest level of this English language study strategy among students is the teacher's role as a mentor, educator, and encourager, especially in the context of reading comprehension sessions.

The IBL strategy-based instructional program increased the students' reading comprehension abilities in two different ways. It first enhanced students reading abilities by incorporating specific reading comprehension techniques within different IBL phases. After that, it gave them the ability to engage with increasingly complex texts and locate textual support for their theories. It was expected of the students to explain what they had been given, especially at the processing stage. As a result, when students tried to reply to the questions, they supported their answers with passages from the text.

6. Conclusion

The study's goal was to determine how the IBL strategy affected the reading comprehension of female EFL students in Jordan's tenth grade. Throughout the academic year 2022–2023, an instructional program was designed and put into place with the goal of achieving this. The results of the research led to the following conclusions:

- The teaching strategy improved reading comprehension while simultaneously enhancing student participation and classroom activities.
- Students were able to comprehend what they were reading more clearly at the literal, inferential, and critical levels thanks to the IBL strategy-based instructional program.
- Following the implementation of the IBL strategy-based instructional program, students' engagement increased. Sharing of thoughts and solutions by the students was encouraged. They discussed the text using the IBL strategy.
- After the implementation of the IBL strategy-based instructional program, students were more attentive in class. IBL was used throughout both pair and group works. This strategy allowed the students to interact with one another.

Pedagogical Implications

Based on the findings, the following pedagogical implications are presented:

- The IBL strategy, which enables students to draw on their existing knowledge and experiences to connect with the text, should be emphasized for EFL students. In order to develop a strong understanding of the entire text, it also helps them skim for key ideas, scan the text for specific information, summarize the material, and draw inferences.
- Reading comprehension can be performed on three different levels: literal, inferential, and critical. EFL teachers should emphasize the value of reading comprehension. The first level's (inferential) objective is to prepare students to comprehend and identify the key details of the material provided in the text as well as to determine the author's main ideas. Second-level (literal) students can comprehend what the text is saying. At the third level (critical), students are able to confirm, discuss, and assess.
- EFL teachers should think about teaching reading comprehension levels to simplify the teaching and learning process. The study's ending pedagogical implication calls for the inclusion of explicit IBL strategy in EFL school textbooks as well as the inclusion of reading activities like filling in blanks, summarizing texts, determining the author's intended audience, drawing conclusions, and answering multiple-choice and true-false questions.

Recommendations

The following recommendations are provided for EFL teachers, EFL supervisors, EFL textbook designers, Ministry of Education, and researchers based on the findings of the current study.

Recommendations for EFL Teachers

It is recommended that EFL teachers should: Utilize the IBL strategy, which is one of the best strategies for helping students understand the reading material and participate in the teaching-learning process.

Recommendations for EFL Supervisors

It is recommended that EFL supervisors should: Increase their understanding of the value of adopting the

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IBL strategy into reading activities and its potential in the classroom. The use of such a strategy may enhance the students' participation, understanding of the subject matter, and engagement.

Recommendations for the EFL Textbook Designers

It is recommended that EFL textbook designers should:

- IBL strategy should be given more consideration, and a range of teaching and learning activities should be presented.
- IBL strategy should be clearly incorporated into the student's textbooks and the teacher's book by way of the presentation of a variety of teaching and learning activities with a reading comprehension focus.

Recommendations for the Ministry of Education

It is recommended that the Ministry of Education should:

- Consider the advantages of employing the IBL strategy to teach reading comprehension, and train EFL teachers on how to utilize it in their instruction so that they can put it into practice and break the mold of traditional methods of teaching.
- Provide training programs to equip EFL teachers with reading comprehension instruction strategies that get around textbook limitations and consider the requirements and interests of their students.

Recommendations for Future Research

It is recommended that researchers should: Conduct numerous research to ascertain how the IBL strategy impacts different language skills and how students perceive it, conduct a variety of studies on Jordan's schools and language levels, and benefit from and replicate the study's findings.

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