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EXPLORING GENDER AND PREFFERED LEARNING STYLES INFLUENCES ON TEST-TAKING SKILLS OF UNDERGRADUATES IN RIVERS STATE

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Abstract: **The study investigated the influences of learning styles and gender on test-taking skills of undergraduates in Rivers State. Two research questions and two null hypotheses guided the study. An ex-post facto research design was adopted for the study. A sample of 474 third-year undergraduates from the three universities in Rivers State (University of Port Harcourt, Rivers State University, and Ignatius Ajuru University of Education (IAUE) were used for the study. The sample was obtained using a two-stage method where non-proportionate stratified random sampling was used for the first stage, while purposive and accidental techniques were used for the second stage. To collect data, two adopted instruments tagged "Undergraduates Test-Taking Skills" (UTSS) and "Undergraduates Learning Styles Questionnaire" (ULSQ) were used. These instruments were adapted from Dodeen (2008) and Honey and Munford (1986) respectively. The reliability of the overall UTSS obtained by Cronbach Alpha Method yields a coefficient of 0.85. For the ULSQ, Split-Half method was used with 0.68, 0.72, 0.75, 0.70 and 0.79 obtained for theorist, reflector, activists, pragmatist and the overall ULSQ respectively. Data collected were analysed using mean, standard deviation, two-way analysis of variance and Scheffe's Test appropriately. Results obtained indicated that learning styles have a significant influence on TSS. On the other hand, gender was not an influential factor in TSS. Based on the result, recommendations were made.**

Keywords: **test-taking skills, learning styles, Undergraduates Test-Taking Skills" (UTSS).**

1. INTRODUCTION

Tests are usually given to students to determine their knowledge level in a given content or unit of a lesson. Through this, scores are obtained following measurement as indices or measures of their knowledge or ability levels. Based on the scores obtained, decisions are made concerning a particular student, group of students or the programme. For accurate and authentic decision to be made or taken, the indices or measures of students' knowledge or ability should be valid and reliable. A valid and reliable score is one that is not affected by unrelated factors such as improper preparation and test anxiety. Kurtus (2012) stated that factors such as test anxiety and slow writing are some of the factors that reduce students' performance. Dodeen (2015) stated that when unrelated factors affect students' performance, the obtained scores are no longer valid indicators of their knowledge or ability levels. Experience had revealed that most times some students develop anxiety and fear on hearing that there will be a test. Mcmillian (1997) attributed these to lack of test-taking skills and not just inadequate knowledge of the subject matter. It is obvious that writing any test with a high level of test anxiety

reduces students' test scores, which in turn reduce the validity of the test results. In essence, students with adequate test-taking skills may not develop anxiety to the level that will adversely affect their performance. Hence, their scores in a test will be a true representative of their ability levels. On this basis, it could be deduced that the acquisition of test-taking skills will help to ascertain the validity of their test scores.

Sweetnam (2002) is of the view that students who are familiar with the subjects without the acquisition of test-taking skills may likely perform poorly. This implies that the ability of students is not the only factor that affects test performance but other factors such as achievement motivation, anxiety, attitude towards the subject, attitude toward the test, knowledge of the subject matter and test-taking skills or strategies (Hambleton, Swaminathan and Rogers in Dodeen 2015).

Valid test scores can be obtained when teachers ensure that students' scores are not low due to any other factor except that they do not know the right information guiding the response to the questions asked. This is because test-taking skills may introduce differentials in the level of test wiseness among students' which may, in turn, invalidate their test scores (Miller, Fugua and Fagley in Hayati and Ghojogh 2008). Influence of other factors on students' test scores can reduce or increase test scores which may adversely affect the validity of test results.

Again the entrance of other factors on the test scores can introduce error in the measurement which may lead to an increase or reduction of students' scores. On this basis, the true pictures of the students may be hidden. Ebel in Dodeen (2015) asserted that one of the factors that may introduce error in measurement is the lack of or inadequate test-taking skills.

Exposure to a series of testing does not imply the acquisition of adequate test-taking skills but the approach the student used to take a test. Test-taking skills involve the establishment of good attitudes when taking a test, expression of proper and adequate knowledge on how to respond to item format, application of good grading procedures and following direction or instruction guiding test administration. Dodeen (2009) viewed test-taking skills as cognitive skills that empower students to appropriately approach any test and to determine the right thing to do before, during and after the test irrespective of the testing situation. That is, test-taking skills are the abilities to understand and approach test-taking situations in a suitable manner in such a way that one applies the appropriate strategies before, during and after testing. Furthermore, test-taking skills are not related to the knowledge of the subject matter but are to one's attitude and approach used in taking a test situation.

Concept of Test Taking Skills

Test-taking skills involve the acquisition of positive attitude towards test-taking, knowledge of how to respond to the different test items and their grading pattern, adhering to instruction guiding the test, responding to the item without wasting much time and making good attempts to respond to difficult questions. Therefore, when an individual can effectively manage their time, map out strategies to respond to test items based on their formats and their difficulties, survey all the test items before responding to them and reviewing the responses made before submitting the scripts, he or she posses good skills of taking a test.

Test-taking skills play some significant roles in both students' performance and teachers' career. For instance, test-taking skills promote high motivation among students even in stressful situations. They promote a favourable attitude towards test-taking and a sense of self-efficacy to face pressure in testing situationS (Dodeen & Abdelmabood, 2005). Acquisition of test-taking skills helps to reduce test anxiety levels of students. Chittooran and Miles (2001) reported that inadequate preparation for the test, and lack of test-taking strategies triggers high anxiety levels among students. Supporting this, Dodeen (2015) opined that the acquisition of test-taking skills help students to cope with test anxiety.

Again, test-taking skills promote a high level of self-confidence and locus of control. Hong, Sas and Sas (2006) reported that training on test-taking strategies helps increase students' locus of control which in turn help to improve their performance in a test. Test-taking skills can also promote retention level. This is because the acquisition of these skills empower students to translate the knowledge they acquired in the classroom to an appropriate way of responding to question during testing (Mclellan & Craig in Dodeen 2015).

Furthermore, test-taking skills are transferable skills which help students to apply learning in practical life situations. Test-taking skills help students to achieve high in both academic and workforce circles. They are transferable skills which when acquired enable students to excel across many life activities in both school and non-school settings. These skills empower the individual to work very accurately and fast under any given pressure (Sefcik, Bice & Prerost, 2013). Also, test-taking skills promote high performance among students. In line with this, Sampson (1985) reported that students who received training on test-taking skills had higher academic success than those who did not. Emphasizing on this, Knapen (2011) stated that two students with equal abilities in a given subject may differ in their level of achievement or performance in a test due to the differential abilities in time management, freaking out or mentally lapsing during tests, over compulsive answering and detailing in responding to tests questions. These factors, therefore, highlights the influence of test-taking skills on students' academic performance.

Considering all these, it is obvious that to score high in any given test does not solely depend on the knowledge of the subject matter but it also links to one's test-taking skills. In all, test-taking skills can, directly and indirectly, have a positive impact on students' performance. Directly, the skills help to promote students' achievement through the effective use of time effort and test conditions. On the other hand, the skills indirectly promote students' achievement by reducing their test anxiety, promoting the right attitude towards tests and test wiseness.

So many benefits are derived from the acquisition of test-taking skills. In recognition of the importance of the skills, Sarnacki in Linn and Gronlund (2000) recommended training of all students in test-taking skills. In other words, it is proper for all students to possess adequate test-taking skills.

However, experience had shown that male and female students write their test using different levels of test-taking skills. This is evident in their different levels of performance in the school-based assessment as well as external examinations. So studies related to students' test-taking skills should be a welcome venture and not to be neglected. Test-taking skills can be developed and achieved by teaching students in a systematic manner similar to that applied in the acquisition of other skills (Dodeen, Abdelfattah & Alshumrani, 2014). On this note, it is possible that the acquisition of test-taking skills may depend on many factors which gender and preferred learning styles may be included.

Studies related to test-taking skills

Nevertheless, studies had revealed that test-taking skills partially relate to academic performance but racial differences were recorded (Edwards, 2003). Ellis and Ryan (2003) reported racial difference in the use of test-taking strategies. Specifically, they reported that African-Americans were found to use ineffective test-taking strategies more than their white American counterparts.

Mohamed, Gregory and Austin (2006) compared the test-taking skills of Canadian senior-level pharmacy students and those of international pharmacy graduates. A 20-item test wiseness questionnaire was administered to 102 of the participants. After data analysis, it was found that the senior level pharmacy students had a better testing-skills than their international pharmacy graduates. This implied that the ability influence test-taking skills.

In 2008, Hayati and Ghojogh determined how higher education students use test-wiseness strategies based on their proficiency and gender. A 50-item instrument was administered to 80 undergraduates from Shahid Chamran university who were classified based on their proficiency levels and gender. Results from data analysed using one-way analysis of variance indicated that gender and proficiency levels are not significant influential factors on test-taking skills.

From another perspective, Baldiga (2014) investigated the gender differences in skipping items in place of guessing. It was found that females are more involved in skipping items more than males when there is a correction for guessing formula as a penalty for any wrong answer. DeMars, Beshkow and Socha (2013) reported gender differences in their perceived test motivation with the female reporting higher levels of test motivation on low stakes tests. Furthermore, Stenlund Eklof and Lyren (2017) investigated on how achievement level and gender influence students' test-taking behaviour in Swedish Scholastic Aptitude Test (SWESAT). The study made use of 1129 registrees of SWESAT in autumn of 2012, who were purposively selected because they completed the SWESAT for the first time. Results from data analysis indicated that high and low achievers, as well as male and females, differ significantly in their use of test-taking strategies. Specifically, females were more involved in the use of random guessing than their males. Igwe and Orluwene (2019) conducted a study on predicting Mathematics achievement of students on test-taking strategies. It was reported that

test-taking strategies jointly predicted Mathematics achievement significantly. Again, it was shown that item analysis strategy had the highest predictive power on mathematics positively, followed by cognitive strategy, which had a negative prediction. Thereafter, time management strategy, meta-cognitive distracter selection and then social test-taking strategy. However, among all, the social and distracter selection and then social and distracter selection did not make significant prediction on mathematics achievement of students.

Concept of Learning Styles

Another variable under the present study is learning styles. Learning styles are the different ways individuals process, internalized and retains facts and difficult data. (Abidin, Razee, Abdullah, & Singh, 2011). To Kolb and Kolb (2005), learning styles describes individual differences in learning based on the learners' preference for employing different phases of the learning cycle. An individual's learning style is the preferential way such individual can absorb, process, understands and retain information. It stands to interpret that individuals are varied in the manner they choose to approach learning situations. So to this end learning styles may be regarded as the individual's chosen and accepted ways of receiving, processing, comprehending and retaining information.

Capretz (2000) asserted that the strength and weakness of each learning style is very specific, hence no individual sticks to a particular one but he/she uses different learning style based on different situation. This implies that no individual may learn using a particular style always but may use different learning styles in different situations. However, Moradkhen and Mitaheri (2011) stated that individuals often have a preferred learning style across various situations which can be used to identify them.

There are different models of learning styles which include but not limited to Fleming's VARK, Kolb Learning Style Inventory, Honey-Mumford model, Felder-Silverman Model, 4MAT Model, Gregorc Model, Hermann Brain Dominant Instrument (HBDI) and Howard Gardners theory of multiple intelligences. However, of all the models mentioned, only Honey-Mumford model was considered in this study. Reason being that it seeks to explore the ways adults prefer to learn, a developmental stage in which most undergraduates belong to. Honey-Mumford model of learning styles is a model that have four distinct learning styles namely theorist, reflector, activist and the pragmatist (TRAP) following the work of Kolb.

Theorists are learners who consider problems in vertical and step-by-step manners. They like to organize different ideas into an easy clear and understandable way. Hence, they prefer to analyse and synthesis facts and ideas. On this basis, theorists often ask questions like "does it make sense? "How does this fit with what is on the ground? "What are the basic assumptions"? They are very keen on maximizing rational objectivity but do not accept anything subjective or ambiguous. Theorists tend to be perfectionists who do not want to rest or relax until something is done the right way. They learn more through learning activities that involve models, statistics, stories, quotes, and applying theories.

Reflectors are learners who are good in observing and pondering over information gathered in different perspectives to draw authentic decision/conclusion. They are not quick to taking action because they like to stand back to thoroughly collect and analyse data about different ideas and events. So their approach is to be very careful. They take their decision after observing and drawing conclusions from information gathered from other people's point of view. They learn more in paired discussion, self-analysis questionnaire, observing activities, coaching, interviews and feedback from others.

Activists are learners who learn mostly by doing. They are open-minded hence they are very eager and enthusiastic about new experiences. Their lives are full of activity and they dislike being idle. This makes them look for new activities that will engage them mostly after one. They learn more through learning activities which involve brainstorming, problem-solving, group discussion, puzzles, competitions and role-play. Nevertheless, activists are sociable who like to work with other people, but in doing so, they like to be the leader thus they centre all the activities on themselves.

Pragmatists are learners who are very interested in trying the workability of new ideas, theories and techniques in a real-life situation. That is they like experimenting with new ideas with confidence. They learn easily well by careful pondering over the best method of applying new ideas in real life and the best method of solving problems hence their philosophy is "there is always a better way". They learn better through activities that involve discussion, case study, problem-solving and experimenting.

These learning styles (theorists, reflector, activist and pragmatist) were developed on the basis that optimal learning depends on the knowledge of one's learning style and application of the identified learning styles during learning. Again, Grebner (2016) stated that the identification of one's learning style helps one to be smarter at achieving the learning objectives at ease. Understanding ones learning style helps one to achieve more hits and fewer misses hence it helps to solve the problem of learning on a hit-and-miss (trial and error). In other words, identification of one's learning style makes learning easier, more effective and more interesting.

Learning styles identification can expand the bandwidth' of experiences from which one can benefit from. That is to say that when one identifies his/her learning style or preference, it opens the door to the acquisition of wide varieties of different experiences, hence making the individual an all-round learner.

Identification of one's learning style helps to improve individual learning skills and processes. That is one will be very open to self-scrutiny and improvement leading to "learning to learn mindset" which is the gateway to the development of whatever one wants to develop. It was also asserted that the ability of an individual to learn using the combination of identified learning styles with other methods/styles makes such individual an effective learner.

It is very important to determine an individual preferred way of learning because it will guide teachers to teach in line with the students learning styles instead of the teachers' learning styles thereby making learning easier. Learning is very complex and then teaching is done based on the teachers' style, students may find it difficult to understand.

Moreso, identification of the students' learning styles help to enhance self-confidence, self-regulated and well-managed learning. Knowledge of students' learning styles influence teachers' teaching method and strategies and at the same time give the opportunity to strengthen those with weaker learning styles that are not productive.

Additionally, it is good for students to identify their learning styles and also apply them during learning. This is because Grebner (2015) opined that the identification of ones learning style help students to become better in decision-making during learning opportunities. It increases the range and diversifies experiences which help to improve learning skills and awareness among students.

Cassidy (2004) asserted that learning style is one of the concepts that contribute greatly to the acquisition of cognitive and non-cognitive skills. That is learning style impact so much on the individual's performance or achievement in any learning activities which acquisition of test-taking skills may not be excluded.

Obviously, in a study by Rassool and Rawaf (2008), learning styles preferences of undergraduate nursing students were investigated alongside the influence on their academic achievement. It was found that reflector learning styles was the dominant learning styles among most of the undergraduate nursing students. Again that only dual learning styles preference significantly influence learning outcomes. Nevertheless, the results were obtained from the analysis of data collected from nursing students' responses on the Honey and Mumford's learning styles inventory.

Using, another learning style Razaeinejad, Azizifar and Gowhary (2015) found that visual-verbal learning positively relate significantly with students educational achievement among students in Mathematics field. On the other hand, for humanistic field, sequential-global, visual-verbal and sensing-intuitive learning styles significantly relate positively with their educational achievement. In all the studies reviewed, none considered the influence of learning styles in test-taking skills, hence the present study on how preferred learning style influence students test-taking skills

In sum, the reviewed studies indicated that male and female undergraduates of Rivers State may differ in their preferred learning styles and also in the extent to which they acquire the test-taking skills. This is reflected in the differential levels of their achievements in examinations.

On this note, the researchers of this study are of the view that students preferred learning styles may be a determinant of their acquisition of test-taking skills. The role of learning styles to achievement had attracted many researchers and practitioner-based studies in the area. Cassidy (2004) stated that for educators to understand the role of learning styles on students' performance, there should be empirically based studies. Again, it is good to carry out studies that link learning styles to factors that affect test scores like test-taking skills. These concerns paved the way for the current empirical-based study on the exploration of learning styles and gender influences on test-taking skills of undergraduates of universities in Rivers State, Nigeria.

Significance of the Study

The present study may impact positively in the field of education. This is because it is expected that through the findings from the study the risk of teaching students that may be educationally ineffective may be reduced. This is because the identification of students' learning styles can persuade their teachers to use a variety of activities that match their learning styles in teaching. This will help students to demonstrate their intellectual ability in a manner that improved success can be achieved.

It is also hoped that through the findings from the study, better teaching strategies or techniques that teachers, test developers, educators will use to effectively impact test-taking skills in the students may be mapped out. Again, finding from this study may also help to promote other life activities. This is because tests are indispensable tools in both school and non-school settings. For instance, many critical and crucial decisions about many life activities depend on the outcome of test e.g. employment of staff, election activities, admitting students into a programme, as well as promotion and demotion of staff.

Aim and Objectives of the Study

This study aims to explore into how gender and preferred learning styles influence test-taking skills of undergraduates in universities in Rivers State. Specifically, the following objectives were stated to achieve the aim of this study.

1) To find out how learning styles influence the test-taking skills of undergraduates in universities in Rivers State.

2) To determine how gender influence test-taking skills of the undergraduates in universities Rivers State.

Research Questions

The following research questions were formulated to guide the study:

1. To what extent does undergraduate preferred learning styles influence their test-taking skills?

2. How do the test-taking skills of the undergraduates differ based on their gender?

Hypotheses

To further guide the study, the following null hypotheses were tested at 0.05 level of significance:

1. Preferred learning styles of the undergraduates do not significantly influence their test-taking skills.

2. Gender does not significantly influence the test-taking skills of the undergraduates in Rivers State.

2. METHODS

The ex-post-facto research design was adopted for this study, which was conducted using a sample of 480 third-year undergraduates of universities in Rivers State, Nigeria. The sample was constituted using a two-stage sampling, method. At the first stage, three universities in Rivers State were chosen using purposive sampling technique. Thereafter, non-proportionate stratified random sampling was used to select 160 third-year undergraduates from the three universities; University of Port Harcourt (UNIPORT), Rivers State University (RSU) and Ignatius Ajuru University of Education (IAUE). To obtain the 160 undergraduates from each university, the three universities represented three strata and then by purposive and accidental sampling technique, 160 undergraduates were chosen from each university irrespective of their population size. This gave rise to a total of 480 third-year undergraduates. However, during the collection of the instruments 6 copies (1.25%) of the instruments were invalidated while the remaining 474 (98.75%) were used for data analysis. The invalidated copies are four copies from UNIPORT and two copies from RUS.

For data collection, two instruments were used. The first one was the Undergraduates Test-taking Skills Scale (UTSS) adopted from Test-Taking Skills Scale (TSS) developed by Dodeen (2008). It has four subscales namely before-test, time management, during-test and after-test skills. There are eight items in the before-test skills, seven items in the time management skills, eleven items in the during-test skills and five items in the after-test skills resulting in a total of 31 items. The items were responded using a 5-point Likert scale of never, seldom, sometimes, often and always. Their points range from 1 for never to 5 for always respectively, This, therefore, implies that a minimum of 31 points and a maximum of 155 points were obtainable for the test.

The second instrument is tagged Undergraduates Learning Styles Questionnaire (ULSQ) adapted from Honey and Mumford (1986). It is made up of four subscales namely theorists, reflectors, activists and pragmatists. Each of the scales has 20 items that were dichotomously scored as Agree or Disagree for 1 and 0 points respectively. So each subscale has a minimum and maximum point/score of 0 and 20 respectively. However, in this instrument, a section that assesses the undergraduates' gender was added. To ascertain the suitability of the test to the level 300 undergraduates in Rivers State, copies of the two different instruments were subjected to the scrutiny of three experts in test and measurement, whose suggestion supported the adoption of both instruments. Furthermore, in assessing the reliabilities of the first instrument UTSS, Cronbach alpha method was used. This was executed by subjecting the UTSS scores of 30 third-year undergraduates chosen outside the main sample of the study from the three universities and tested on both instruments. The result of the Cronbach Alpha method yielded alpha coefficients 0.66, 0.72, 0.64, 0.81 and 0.85 respectively for the before the test, time management, during the test, after the test and the overall UTSS. The coefficients obtained indicated that both the subscales and overall scale are adequate for the study.

The reliability of the second instrument ULSQ was estimated using the split-half method. The pilot tested scores of the students. On subjecting their scores on each subscale and that of the overall scale coefficients value such as 0.68, 0.72, 0.75, 0.70 and 0.79 were obtained respectively for activists, reflectors, theorists, pragmatists and the overall ULSQ scales. The values obtained revealed that ULSQ possesses high internal consistency (reliability) level adequate for use for study.

After the validation of the instruments, copies of the two instruments were administered on the 480 undergraduates using direct delivery approach. After their response, the copies of the instruments were retrieved, scored and collated for data analysis.

Data collected were analysed using mean, standard deviation and two-way analysis of variance where the tenability of the result was at 0.05 level of significance.

3. RESULTS

After data analysis, the results of research questions 1 and 2 were displayed in Table 1, while those of hypotheses 1 and 2 were displayed in Table 2. The results of the posthoc multiple comparisons by Scheffe's test are displayed in Table 3.

Table 1: Mean and standard deviation on the test-taking skills of undergraduates in Rivers State by gender.

Learning styles	Gender	N	Mean	Std deviation
Theorist	Male	52	63.96	22.72
	Female	74	60.12	18.96
	Total	126	61.71	20.60
Reflectors	Male	77	60.17	17.33
	Female	62	60.23	19.17
	Total	139	60.19	18.11
Activists	Male	48	80.02	24.32
	Female	49	73.27	18.23
	Total	97	76.61	21.62
Pragmatists	Male	56	67.13	19.96
	Female	56	71.05	22.62
	Total	112	69.07	21.32
Total	Male	233	66.78	21.88
	Female	241	65.36	20.55
	Total	474	66.06	21.20

In Table 1, it is shown that the undergraduates who adopt theorists learning styles are 126 in number, 52 males and 74 females. The males had a mean score of 63.96 (SD = 22.72) while the females had a mean score of 60.12 (SD = 18.96). So among the theorists, males possessed higher level test-taking skills than the females by a difference of 3.84. The mean

scores obtained by the male and female undergraduates that are reflector in their learning style are 60.17 (SD = 17.33) and 60.23 (SD = 19.17) respectively. Their mean scores indicated that the females acquired higher test-taking skills a little than the males by a difference of 0.06. However, irrespectively of their gender the undergraduates with reflector learning styles had a mean score of 60.19 (SD = 18.11) in their test-taking skills.

Considering the activists learning style, male and female undergraduates in this style had mean scores of 80.02 (SD = 24.32) and 73.27 (SD = 18.23) respectively. This indicated that the male activist acquired more test-taking skills than their female counterpart by a mean difference of 6.75. Then, the mean score of the activists (N = 097) when gender is disregarded is 76.61 (SD = 21.62).

Furthermore, male and female undergraduates under the pragmatist learning style had the mean scores of 67.13 (SD = 19.96) and 71.05 (SD = 22.62) respectively. This means that females had higher test-taking skills than their male counterpart by a difference mean value of 3.92. However, when gender was disregarded, undergraduates with pragmatist learning style (N = 112) had a mean score of 69.07.

More so a careful observation on Table 1 revealed that considering the learning styles of undergraduates irrespective of their gender, it is clear that the activists had the highest score in test-taking skills. This is followed by the pragmatists, theorists and then the reflectors. On the other hand when gender is considered irrespective of their learning styles the male undergraduates generally acquired higher test-taking skills than their female counterparts since their mean scores are 66.78 (SD = 21.20) out of a total score of 155 points in the test-taking skills.

For further investigation, the observed mean differences among the undergraduates based on their learning styles and gender were tested for significance using two-way analysis of variance (2-way ANOVA). The results obtained are presented in Table 2.

Table 2: Summary of 2-way ANOVA on the influence of learning styles on test-taking skills based on the undergraduates' gender.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	20980.495[a]	7	2997.214	7.289	.000	.099
Intercept	2069171.740	1	2069171.740	5032.354	.000	.915
LearningStyles	18574.987	3	6191.662	15.059	.000	.088
gender	314.738	1	314.738	.765	.382	.002
LearningStyles * gender	1744.971	3	581.657	1.415	.238	.009
Error	191606.967	466	411.174			
Total	2280897.000	474				
Corrected Total	212587.462	473				

Results in Table 2 revealed that the f-ratio for learning styles is 15.06 at 3 and 466 degrees of freedom at 0.0005 level of significance ($p<0.05$). So since the p-value is less than 0.05, the chosen level of significance, it is deduced that the undergraduates learning styles significantly influence their level of test-taking skills. Again in the same Table 2, it is also shown that the f-ratio for gender, 0.765 was obtained at degrees of 1 and 466 at a p-value of 0.765, ($P>0.05$) which is greater than 0.05, the chosen level of probability. Thus gender of the undergraduates does not significantly influence their level in test-taking skills.

A further observation on the same Table 2 shows that the f-ratio for an interaction effect between learning styles and gender, with 1.415 obtained at degrees of freedom of 3 and 466 with a p-value of 0.238 ($p>0.05$). So the interaction effects between learning styles and gender insignificantly influence the test-taking skills of the undergraduates in the three universities in Rivers State.

Nevertheless, since the four different learning styles significantly influence test-taking skills of the undergraduates, it is necessary to determine the direction to which the significance influence emanated from. This led to the employment of posthoc multiple comparisons using Scheffe's test. The results obtained are presented in Table 3.

Table 3: Direction of significant influence of four different learning styles on test-taking skills of undergraduates

Compared groups	Absolute mean difference	p-value
Theorists and reflectors	1.51	0.947
Theorists and activists	14.90	0.0005
Theorists and pragmatists	7.38	0.050
Reflectors and activists	15.41	0.0005
Reflectors and pragmatists	8.90	0.008
Activists and pragmatists	7.52	0.069

Table 3 shows that when the mean scores of the undergraduates who adopted the four different learning styles were compared pair-wisely that a significant mean difference was obtained when the following groups' mean scores were compared: theorists and activists, theorists and pragmatists and reflectors and activists groups. This is because their mean differences were obtained at p-values lower than 0.05 ($p<0.05$). Thus, the direction of the significant difference emanated from their comparisons.

On the other hand, no significant mean difference was obtained when the group means of the theorists and reflectors, theorists and pragmatists, and activists and pragmatists were compared. This is because their p-values were either greater or equal to 0.05, the chosen level of probability. Thus their comparison did not contribute to the significant influence of learning styles on undergraduates test levels on test-taking skills.

4. DISCUSSION OF RESULTS

One of the results obtained from this study is that learning styles of the undergraduates in Rivers State significantly influence their test-taking skills. Specifically, it was found that the activists significantly acquire more test-taking skills than the others such as reflectors, and theorists while their mean difference with the pragmatist was not a significant one. This indicated that the activists learning activities that involve brainstorming, problem-solving and group discussion helped to expose them to more different ways of tackling problems as well as answering questions right. This is because if one is involved in problem-solving, diversities of techniques leading to better ways of achieving one's goal will be acquired, therefore improving one's test-taking skills. This is also the same as the pragmatists who also learn through problem-solving and discussion. However, the activists acquired more test-taking skill than the pragmatists because they enjoy working with other people and are always ready to be exposed to new experiences that will keep them busy and active in exploring the consequences. Again through brainstorming undergraduates can improve their abilities to think outside the box through exposure to a different perspective. It is obvious that one who thinks outside the box will have better test-taking skills.

Again in comparing the test-taking skills of the activists with the theorists and reflectors, it could be that the learning activities they enjoy do not promote the better acquisition of test-taking skills. However, this finding did not support the previous finding by Hayati and Glojogh (2008) who found that proficiency level is not a factor of test-taking skills. Furthermore, it was found from the study that the gender of undergraduates did not significantly influence their test-taking skills. This implies that both males and females adopt approximately the same level of test-taking skills. This could be traceable to the fact that society has embraced gender equality in almost all the activities of life. This finding supports that of Hayati and Glojogh (2008) that gender is not an influential factor on test-taking skills of students. On the other hand, the finding is at variance with that of Baldiga (2014) who found that females skip items more than the male when correction for guessing formula is used during assessments.

Finally, from the study, it was found that the mean score of the undergraduates irrespective of their learning styles and gender (66.06) is below 50% of the total point 155 which was 77.5 (approximately 78). This indicated that generally, the test-taking skills of the undergraduates in Rivers State is low. This may be one of the reasons why performance and advancement in schools recently are dwindling.

5. RECOMMENDATION

Considering the findings from this study the following recommendations were made.

1) Undergraduate students should be encouraged to adopt better learning styles such as the activist which can promote better test-taking skills.

2) Lecturers should endeavour to give undergraduates activities that will involve brainstorming and group discussion.

3) Students should be given feedback on the effectiveness of what they have learnt. This will inform them of the adequacy of their learning styles to make plans to retain or modify them.

6. CONCLUSION

The finding of the study indicates that undergraduate differs in their preferred learning styles which in turn influence their level of test-taking skills. Their mean score in test-taking skills indicates that they possess a moderate level of test-taking skills. So much effort is needed by both the undergraduates and their lecturers

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