Effect of Portfolio Assessment Technique on Transfer of Learning in Agriculture among Economics Students in Secondary Schools in Nsukka Local Government Area

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Abstract

The study investigated effect of Portfolio Assessment Technique (PAT) on transfer of learning in Agriculture among Economics Students in Nsukka Local Government Area, (LGA) Enugu State, Nigeria. Specifically, it determined mean transfer of learning scores among Economics students taught with PAT and those taught with conventional assessment; mean transfer of learning scores among rural and urban economics students; and interaction effect of assessment technique and location on transfer of learning among Economics students. The study had three research questions and three hypotheses. Quasi-experimental design was used. Population of 2,565 SS2 students in 30 government secondary schools in Nsukka Local Government Area, had a sample of 169 Senior Secondary two Economics students. Instrument for data collection was Economics Transferability Test (ETT). The ETT instrument had both face and content validation. ETT had a reliability coefficient of 0.74. Mean scores were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. The findings revealed that PAT was more effective on students transfer of learning than Conventional Assessment Technique (CAT) in Economics. There was no significant influence of location on students' transfer of learning in Economics among others. It was recommended among other things that teachers should be properly guided on the use and benefits of Portfolio Assessment Technique in the classroom to expand students' ability for learning transfer and self-evaluation.

Keywords: Portfolio, Assessment, Economics, Conventional, Transfer, Learning, Location.

Introduction

Transfer of learning is the application of previous knowledge to learning something new when applied to both similar and new situations (Haskel, 2004). Mohalla (2021) further explained transfer of learning as that process of extending knowledge, skills, habits and attitude from one training situation to another training situation. In other words knowledge acquired in one subject is expected to help in the understanding of

a relative new subject. Some studies have proven that knowledge/learning can be transferred from one subject to another. For instance, Obiagu, Mezieobi, Aroh and Akubue (2019) using cooperative concept mapping, found out that students had transfer of learning from conflict concept to peace concept in Social Studies than the use of lecture method. Dixon (2019) identified that students with higher scorers were able to transfer mathematics, science and design concepts making more connections to concepts learned from Project Lead the Way curriculum. Beklenky and Nokes (2009) found that intensive knowledge enhanced better understanding of related concepts in English in Pittsburgh. Knowledge and skills acquired in school subjects help in solving problems, critical thinking, communication and creativity in diverse subjects and areas of life (National Academic of Science, Engineering and Medicine, 2012). It is then relevant that Economics promotes insights to solving problems of present times and also a determinant of success in related subjects. Economics is related with other social sciences and subjects such as Philosophy, Psychology, and Sociology (Pettinger, 2020), as well as Agricultural Science which is an aspect of Economics that deals with business and management specifically on production (Mitchell, 2022).

This study was concerned with students' ability to transfer knowledge in Economics to Agricultural science. It is believed that the knowledge of Economics could boost the understanding of Agricultural Science. This is because some of the contents of Economics curriculum are found in Agricultural science. Both Economics and Agricultural science are to a very large extent practical subjects that tend to solve one of the biggest societal problems which is unemployment, hence the reason for the choice of Agricultural Science in this study. Agricultural practices are largely carried out in rural settings. Nsukka Local Government Area (LGA) has public schools located in rural and urban settings. The geographical land scope determines urban areas which are characterized by physical development in cities and sub-urban cities (McCracken, 2014). On the other hand, rural areas are characterized by underdevelopment, poor access to technology and low means of livelihood and presence of agricultural practices (Morgan, 2022; Ford & Chaprasov, 2022). Differences in school location could be seen in methods of teaching and learning (Adu, Ojelabi & Adeyanju, 2009 and Kola, Olanipekan & Ogundele, 2013). For instance, Olatunde (2010) observed that urban students performed better than rural students in the overall general performance of academic achievements which has influence on creativity for future determination. On the contrary Okorie and Eze (2016) reported that students from rural schools did better in Chemistry Bonding Achievement Test than their urban counterparts. This study therefore, sought to determine if students of rural setting who were assumed to be more knowledgeable in farming (agriculture) can easily transfer learning from Economics to Agricultural science more than urban students who were assumed to not have such farming exposure in Nsukka LGA.

This study is necessitated due to students' poor performance in Economics and Agricultural Science in Nsukka LGA, studies such as Nji (2014) reported students' dwindling academic

achievement in Economics and Otekunrin and Ona (2017) reported a retarded students' zeal in Agricultural Science due to students' nonchalant attitude towards the subject both carried out in Nsukka education zone. Furthermore, the statistical reports by the West African Senior Secondary Certificate Examination (WASSCE) chief examiners report on Agriculture Science (2018-2019) stressed on students weakness in the subject, of which Nwakili, Nwankwo, Ekenta, Ameh and Nwokolo (2022) showed students' poor performance in Agricultural Science in five randomly selected schools in Nsukka education. Students' poor performance has mostly been attributed to teachers' approach to teaching and assessment techniques, among others (Karade & Kulkarn, 2005; Al-Zoubi & Younics, 2015; Olajire, 2020).

The teaching of students in Economics requires in-depth knowledge and comprehension which could be assessed and evaluated to reflex transfer of learning to related subjects such as Agriculture. Assessment is the procedure used to know the extent to which teaching and learning have been achieved. Huba and Freed (2000) pined that assessment is the process of gathering information from multiple and diverse sources in order to develop a deep understanding of what students know. Assessment can take the forms of traditional/conventional and authentic assessment (Huba and Freed). Though, assessment of students using traditional or conventional pen and paper assessment using oral questions in classes and written tests are shortfalls of poor performance in public schools in Nsukka LGA. Conventional assessment (CA) is most of the times administered only once or twice during a term. It seems not to showcase the gradual progress of students. It is mainly used for promotion since it is product oriented. The strengths and weaknesses of students are largely not taken up for consolidation and improvements, thereby, ignoring students' capabilities and interests, knowledge and skills. Learners have their own interests, needs, abilities, strengths, and weaknesses and thus, one single method of assessment does not suffice to get a comprehensive picture of students' progress (Shirvan & Golparvar, 2016). Hence the need for this study to try out Portfolio Assessment Technique that is process oriented to determining students' ability to produce and apply knowledge and concepts to real-life situations which is transfer of learning.

Portfolio involves method of documenting students overall learning process that shows how students integrate specific learning or skills to aid progress towards both basic and advanced mastery of students reflection. Portfolios may be in form of files of works, assignment, drawing, teacher's note of lesson, diary, lesson plans in a collection. Sharp (2012) identified that portfolio comprises of weekly journal entries, solution to student-selected homework problems explained in writing, and a synthesis entry relating to previous topics and or to other principles previously studied.

Portfolio Assessment Technique (PAT) is a form of authentic assessment. In, PAT students are assessed based on teaching and self learning by documenting works over time for reflective learning. Alimemaji and Ahmatag (2010) explained that Portfolio Assessment Technique is an orderly way of collecting students' works in a given instruction towards self evaluation over a period of time.

Portfolio Assessment Technique shows students the progress of their works, achievement and self reflection over a period of time (Tabatabaei & Assefi, 2012). In this study, Portfolio Assessment Technique is the systematic collection of periodic activities (instruction) in Economics by the learner over a period of time for the purpose of expanding students' understanding and learning for assessment purpose on Agricultural science. Therefore, PAT is to encourage learners to become autonomous, take control of their learning, make decisions, participate in evaluation process and solve problems identified individually (Tabatabei & Assefi, 2012). The efficacy of PAT has somehow been proven. For instance, Adeyemi (2015) and Biaike, Schanau and Steers (2009) observed that PAT has a positive benefit on students' learning outcomes. Portfolio assessments were determined to have positive effects on attendants' meta-cognitive skills (Evin-Gencel, 2017). In a study by Powell (2013), it was proven that portfolios utilized concept analysis, helped in developing and also improving self-efficiency and comprehension and thus increasing the level of self efficiency. With PAT, the learner has opportunity to explore the environment, learn new concepts and translate it to similar situations or concepts which will aid transfer of learning.

Objectives of the Study

The general objective of the study was to examine effect of portfolio assessment technique on students' transfer of learning in Agriculture among Economics students in Secondary schools in Nsukka Education Zone. Specifically, the study determined:

1. mean transfer of learning scores among Economics students assessed with PAT and those taught with conventional assessment (CA).
2. mean transfer of learning scores among rural and urban Economics students.
3. interaction effect of assessment technique and location on Economics students' mean transfer of learning scores.

Research Questions

1. What is the mean transfer of learning scores among Economics students assessed with PAT and those taught with CA?
2. What is the mean transfer of learning scores of urban and rural Economics students?
3. What is the interaction effect of technique and location on Economics students' mean transfer of learning scores?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

Ho_1: There is no significant difference in the mean transfer of learning scores among Economics students assessed with portfolio assessment technique and those taught with conventional assessment.

H_{O2}: There is no significant difference in the mean transfer of learning scores of urban and rural Economics students.

Ho_3: There is no significant interaction effect of technique and location on Economics students' mean transfer of learning scores.

Methodology

Design of the study: The design used for this study was quasi-experimental pre-test post test non-equivalent control group design. In this study the researchers have the experimental and control groups selected in their intact nature, both groups are given test before and after the experiment.

Area of the study: The study was carried out in Nsukka Local Government Area of Enugu State, Nigeria. The area comprises urban and rural locations. The rural area is characterized by homogeneity population, poor network visibility and has main occupation of agriculture while urban area is characterized by good network visibility, nonagricultural jobs and heterogeneity population. There exist public secondary schools located in both rural areas and urban areas of Nsukka Local Government Area.

Population of the study: The rural area comprises twenty-one government secondary schools while the urban area comprises nine secondary schools from the thirty 30 public secondary schools in Nsukka Local Government Area in the 2016/2017 academic session (Post primary Board, Nsukka). The population was made up of 2,565 senior secondary two students (SS II), of which 1,095 were in the rural and 1,470 were in the area. The choice of SS II students was informed by the fact that the students were expected to have been exposed to a reasonable level of knowledge in Economics but not in Agriculture. The reason is because the study intends to identify the extent students of Economics can transfer learning to Agricultural science that was never taught as a subject in the class.

Sample for the study: A random sample of 169 students was chosen using two stages of sampling procedure. Firstly, a random sample for the selection of four schools (2 urban and 2 rural), secondly, purposive sample was used in selection of intact classes (4) that had no Agriculture science students. The reason for selecting of students is because non-agricultural science students were needed for this study.

Instrument for Data collection: The Economics Transferability Test (ETT) was generated by the researchers from past West African Senior Secondary Certificate (WASSCE) papers in Agricultural science related to the content taught in Economics. (This is done to determine whether students would be able to transfer learning of Economics that has Agricultural contents to understanding and answering Agricultural Science questions). The ETT is a 20 multiple choice achievement test with options A-D and each of the items has five marks each. The contents covered cost concept, theory of consumer demand and agriculture in Economics SSII scheme of work. These topics were chosen to test transferability and integrated nature of some Economics concepts to Agricultural science. Economics Transferability Test (ETT) was face validity by three experts (two Economics and one Agricultural Science teachers) from a college and the corrections were reflected in the final instrument for the study. Content validation of the instrument was determined by the use of table of specification.

The internal consistency of the instrument was determined using Kuder Richardson 20 (KR20). The test was administered to 30 respondents from two schools not represented in the sample of the study. The reliability index was 0.74. The temporal stability of the instrument

was done; test-retest method was used at an interval of two weeks. The scores obtained yielded a correlation coefficient of 0.78 which indicates a high correlation of two scores.

Method of Data collection: A two-day orientation and training was organized for regular Economics teachers on the use of PAT. The students were taught for six weeks. Thereafter, teachers in the experimental group (PAT) gave take-home assignments and quiz to the students. They were asked to prepare their portfolios for self assessment overtime. Teachers and students were allowed to self-evaluate themselves through self-marking of assignments and scripts.

The conventional assessment (CA) technique as used in this study consisted of the normal oral questions asked by the teacher during lesson periods and written tests by students. The teachings lasted for six weeks. The ETT was administered to both the experimental and control groups before (pretest) and after (posttest) treatment. ETT was reshuffled then re – administered for the posttest.

Technique for Data analysis: Mean scores and standard deviations were used to answer the research questions while hypotheses were tested at $p > 0.05$ level of significance using Analysis of Covariance (ANCOVA). ANCOVA was used to test non-equivalent nature of the intact classes in the study.

Results

Table 1: Mean Transfer of Learning Scores of Students Assessed with Portfolio Assessment Technique (PAT) and Those Assesses with Conventional Assessment (CA)

20 Multiple Choice ETT (Questions)	Pretest(x)		Posttest(x)	
	PAT	**CA**	PAT	CA
Item 1	64.02	30.60	78.60	44.08
Item 2	62.01	46.80	65.60	55.02
Item 3	68.03	38.20	67.36	45.01
Item 4	5.08	38.90	59.60	53.06
Item 5	6.13	35.12	58.24	50.08
Item 6	58.20	42.28	69.51	47.08
Item 7	57.87	96.70	88.17	32.18
Item 8	60.00	27.07	56.57	52.10
Item 9	4.18	52.28	66.03	45.09
Item 10	62.68	33.58	54.24	43.25
Item 11	52.02	38.68	68.32	55.10
Item 12	67.02	32.72	66.64	45.18
Item 13	61.00	44.66	58.24	44.08
Item 14	4.49	35.70	74.96	38.51
Item 15	7.25	41.68	66.60	46.10
Item 16	69.02	31.70	79.03	51.65
Item 17	7.21	45.70	53.28	23.01
Item 18	53.02	39.40	67.72	45.08
Item 19	52.00	49.90	60.04	39.06

Item 20	9.21	38.70	73.24	46.88
Grand Mean	41.79(SD 11.02)	38.70(SD 12.99)	66.60(SD 10.61)	45.08(SD 10.24)
Mean Gain			24.81	6.38

PAT-Portfolio Assessment Technique, CA-conventional Assessment *The 20 items are in Appendix I, page 17. ETT = Economics Transferability Test.

Table 1 shows transfer of learning mean scores of PAT and CA students item by item. It shows that CA students however, had higher learning transfer mean scores than PAT students on some of the items (4, 5, 9, 14, 15, 17 and 20) in pretest. In posttest, PAT students had higher learning transfer mean scores than CA students on all the 20 items. Furthermore, under the grand mean, the table shows that students taught with PAT had pre- test mean transfer of learning score of 41.79 and post-test mean transfer of learning score 66.60. Those that were taught with CA had pre-test mean score of 38.70 and post test mean score of 45.08. The mean gain scores of 24.81 and 6.38 were recorded for the two groups respectively. This shows that students that used PAT achieved higher than their counterparts who used CA.

Table 2: ANCOVA on Economics Students' Mean Transfer of Learning Scores

Sources of Variation	Sum of Squares	Df	Mean Square	F	Sig
Corrected Model	19615.536[a]	2	9807.768	89.909	.000
Intercept	398779.342	1	39879.342	365.578	.000
Pre-transfer	54.717	1	54.717	.502	.480
Technique	**18977.266**	**1**	**18977.266**	**173.966**	**.000**
Error	18108.251	166	109.086		
Total	568380.000	169			
Corrected Total	37723.787	168			

Significant at Alpha Level of $\leq$ .05 [b] computed using alpha = .05

Table 2 shows the main effect of transfer of learning scores in Economics as $F(173.966)$ with probability value of 0.00. Since the probability value is less than 0.05 level of significance at which the hypothesis was tested, the null hypothesis therefore, is rejected. Hence, there is a significant difference in the mean transfer of learning scores among Economics students taught with portfolio assessment technique and those taught with conventional assessment.

Table 3: Mean Transfer of learning scores of Urban and Rural Economics Students

20 Multiple Choice ETT (Questions)	Pretest		Posttest	
	Urban	Rural	Urban	Rural
Item 1	38.04	30.05	50.21	51.31
Item 2	41.50	40.20	59.00	53.82
Item 3	30.04	30.85	60.01	57.01
Item 4	39.24	35.05	55.41	55.01
Item 5	49.02	57.98	58.22	58.70

Item 6	48.61	43.05	56.22	53.01
Item 7	26.52	42.90	55.91	50.03
Item 8	30.24	39.02	60.41	53.00
Item 9	40.26	32.82	41.21	58.80
Item 10	40.22	31.22	53.21	58.71
Item 11	39.12	33.60	55.31	58.11
Item 12	39.60	52.00	59.01	53.22
Item 13	40.12	50.41	52.22	52.00
Item 14	39.04	33.22	74.58	53.01
Item 15	36.58	49.06	51.00	61.00
Item 16	43.01	41.22	62.11	54.01
Item 17	69.02	51.00	54.31	53.31
Item 18	37.27	40.02	55.62	58.61
Item 19	72.13	45.22	51.22	57.53
Item 20	41.21	39.05	53.01	61.00
Grand Mean	39.54(SD 10.49)	40.90(SD 13.35)	56.41(SD 16.92)	55.71(SD 13.19)
Mean Gain			16.67	14.81

PAT-Portfolio Assessment Technique, CA-conventional Assessment *The 20 items are in Appendix I, page 17. ETT = Economics Transferability Test.

Table 3 shows the transfer of learning mean scores of urban and rural students item by item. The data show that rural students had higher learning transfer mean scores than urban students on nine of the items (3, 5, 7, 8, 12, 13, 15, 17 and 20) in pretest. In posttest, rural students also had higher learning transfer mean scores than urban students on nine of the items (1, 5, 9, 10, 11, 15, 18, 19 and 20).

The table also shows that students in urban school had mean transfer of learning scores of 39.54 in pretest and 56.41 in post test. Those in rural school had mean transfer of learning score of 40.90 and 55.71 in pre test and post test respectively. This showed that students in urban school had high transfer of learning than their counterparts in rural school location. Also, the table showed that urban school students had a standard deviation score of 10.49 and 16.92 for pretest and post test respectively.

Table 4: ANCOVA for Urban and Rural Economics Students' Mean Transfer of Learning Scores

Sources of Variation	Sum of Squares	Df	Mean Square	F	Sig
Corrected Model	673.590[a]	2	336.795	1.509	.224
Intercept	34027.935	1	34027.935	152.459	.000
Pre Transfer	653.246	1	653.246	2.927	.089
Location	**35.320**	**1**	**35.320**	**.158**	**.691**
Error	37050.197	166	223.194		
Total	568380.000	169			
Corrected Total	37723.787	168			

Table 4 shows that the calculated value of **F(0.158)** for the influence of school location on students' transfer of learning in Economics is significant at 0.691. Since, the probability value of 0.691 is greater than the 0.05 level of significance (p>0.05) at which the null hypothesis was tested, the null hypothesis is accepted. Therefore, there is no significant difference in mean transfer of learning scores of urban and rural Economics students.

Table 5: Mean and standard deviation on interaction effect of technique and location on Economics students' mean transfer of learning scores

Group/location	N	Mean	Standard deviation	Mean gain
PAT Urban	40	69.13	10.47	26.985
Rural	46	63.84	8.90	
CAT Urban	38	42.15	10.25	16.495
Rural	45	47.35	10.53	

Table 5 shows urban school students when exposed to PAT had a mean transfer of learning score of 69.13 while rural school students had a mean score of 63.84. Similarly urban school students who were exposed to conventional assessment had a mean of 42.15 and rural school students had a score of 47.35. This implies that both urban and rural school students transfer of learning scores were high when exposed to PAT, than those who were exposed CA. It is also shown in the table that there is a high standard deviation for PAT group at 10.47 and 8.91 for urban and rural school locations respectively while CA had standard deviations of 10.25 and 10.53 for urban and rural school location respectively.

Table 6: ANCOVA of Interaction Effect of Technique and Location on Economics Students' Mean Transfer of Learning Scores

Sources of Variation	Sum of Squares	Df	Mean Square	F	Sig
Corrected Model	21017.49[a]	8	2627.187	25.161	.000
Intercept	37002.897	1	37002.897	354.385	.000
Pre transfer	64.377	1	64.377	.617	.433
Technique	17103.291	1	17103.291	163.802	.000
Location	1.034	1	1.034	.010	.921
Technique *Location	**1051.951**	**1**	**1051.951**	**10.075**	**.002**
Error	16706.294	160	104.414		
Total	56838.00	169			
Corrected Total	37723.787	168			

Table 6 shows the main interaction effect of technique and location on students transfer of learning scores in Economics as F(10.075) with probability level of 0.002. Since the Probability value (0.002) is less than 0.05 level of significance at which the hypothesis was tested, the null hypothesis is rejected. Therefore, there is a significant interaction effect of technique and location on Economics students' mean transfer of learning scores.

Discussion

The result of this study revealed that students were able to transfer learning using Portfolio assessment technique (PAT) with grand mean score 66.60 while students that used Continuous Assessment technique (CAT) had grand mean of 45.08. Based on the finding PAT was more effective on students' learning transfer than the conventional assessment technique. This suggests that the introduction of PAT for assessing students would improve students' general knowledge. The findings concur with Tabatabaei and Assefi (2012) who reported that the use of Portfolio Assessment Techniques on writing was more efficacious than traditional approach to writing. The findings further uphold Adeyemi (2015) report that PAT has a positive benefit on students' learning outcomes. Thus, in order for students to perform exceptionally different there is need for self evaluation and monitoring of assessments overtime to identify strengths and weakness which could be of benefit to the use of PAT. According to Obiagu (2015), students were able to transfer learning from Social Studies to English such that intensive knowledge enhanced better understanding of related concepts. This finding affirmed the study of Shirvan and Golparvar (2016) that portfolio assessment significantly improved General English students' Locus of Control and affected their achievement in Iran. Furthermore, Javanmard and Farahani (2012) found out that the use of the portfolio had significant positive influence on students' language. Therefore, the product-oriented traditional assessments had limited possibility to influence teaching and

learning positively and are no longer fit with current classroom practices (Javanmard & Farahani ,2012).

The observation made in this study is expected as PAT aids the acquisition of intensive and authentic knowledge and students' involvement in their own study and evaluation process. Under PAT, students master content through deep learning and become responsible for their learning through self reflection (Tiwari, 2009). In PAT, students actively participate in their learning through engagement, interactive process and feedback. The benefit of portfolio assessment technique is feedback which has given students opportunity to understand the subject clearly. This is partly due to the fact that PAT taps into the process of learning as well as its product and integrate teaching and testing activities (Yurdabakan and Erdughan, 2009). Also, teachers, students and administrators have opportunities to view students learning progress (Heidi, Kasten & Georgia, 2012). Accordingly, Powell (2013) observed that a portfolio assessment enabled participants to develop a progressive attitude towards self-enhancement because the experiments associated portfolios with the creation of mental images among its users. These images are practical in fostering cognitive skills in the users because they create a lasting impression on the brains of the students thus facilitating communication as well as understanding.

The findings of the study revealed that rural students had higher learning transfer mean scores for nine items in both pretest and posttest than their urban counterparts. Yohanna and Muhammad (2022) observed that students from rural secondary schools performing better is

probably due to experience gathered from farming activities they are fully involved with from childhood, as farming is the major occupation of the rural populace and also the availability of vast farm plots for practical agricultural science, which are limited in most urban schools. On grand mean however, the findings revealed that students taught in urban location had a very slight higher grand mean than their counterparts in rural area; however, the difference was not statistically significant. This observation is unexpected as the researchers suspected that since students in the urban school are already exposed they would outperform their rural counterparts out rightly.

However, the low and insignificant difference in urban and rural students' mean scores could be attributed to the fact that rural students are already familiar with agricultural terms since it is assumed that they do actual farming in their rural settlements. Onwunali, Muhammad and Balogun (2022) found out that location had a strong influence on the performance of agricultural science. Yohanna and Muhammad (2022) found out that the mean scores of rural students (43.69) were relatively higher than urban students (39.19) Agricultural Science. Okorie and Eze (2016) found out that students from rural schools did better than their urban counterparts in Chemistry. Furthermore, Owoeye and Yara (2011) found out that students in urban areas had better learning outcome than their rural counterparts. This could be as a result of exposure of students in urban schools to good network facilities and Information Communication Technology available. This finding affirmed the study of Abamba (2021) that there is no significant difference between rural and urban students' achievement in Physics using 5E learning circle.

Furthermore, the findings revealed a significant interaction effect of assessment technique and location on students' learning transfer. This shows that assessment technique and school location combined to effect students' transfer of learning scores in Economics. On the contrary, Nji (2014) and Ezeudu, Olawei and Umeifekwem (2014) reported a no significant interaction effect of method and location on students' achievement. The finding of this study shows that with the right assessment techniques, both rural and urban students can do well in transferring learning from Economics to other subjects and areas.

Conclusion

The most important aspect of learning is the ability to transfer what has been learnt to real life experiences and lifelong learning, thus Portfolio Assessment Technique is an alternative assessment that has been found out to help students have in-depth knowledge and ability to transfer learning from one subject area to other. This would automatically boost their creativity. PAT gives students the avenue to assess themselves (self-evaluation) on a regular basis and constantly providing opportunity to their teachers to monitor their growth and provide feedback unlike the conventional or traditional assessment (CA) which is one shot test with no adequate follow-up or feedback. The researchers observed that there was slight difference between urban and rural students assessment using PAT which was not significant. Therefore, indication shows that no matter the area of school location PAT is of great importance on students'

assessment. The researchers therefore, conclude that PAT aids transfer of learning in Economics to agriculture more than conventional Assessment.

Recommendations

The following recommendations were made based on the findings of the study:

1. Curriculum planners should incorporate PAT as an assessment into Economics curriculum.
2. Teachers should be motivated to adopt PAT in their teaching rather than adopting only conventional assessment technique in the classroom.
3. Students in the rural should be given extra attention, basic facilities that can enhance learning and care to meet up with their urban counterparts with the right assessment techniques such as PAT.

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Appendix 1: Multiple Choice Questions: ETT

1. A piece of land is said to be on lease to a farmer when it is (a) Given as compensation (b) purchased on credit (c) rented for a period (d) Given as a gift. (Ans = c)

2. Farm mechanization does not (a) involves the use of motorized equipment (b) require much capital (c) promote employment (d) involve the use of heavy machinery (Ans = c)

3. Land is said to be fixed asset. This means that a) its features and topography are fixed (b) soil nutrients and its Vegetative cover can be replaced (c) its size remains fixed over time (d) its micro organic composition is constant over time. (Ans = a)

4. Determine the price elasticity of demand if the price of yam tuber rises by 10% (0.1) and the quantity demanded falls by 5% (0.05). (a) 0.5 (b) 0.4 (c) 0.3 (d) 0.1 (Ans = a)

5. An agricultural extension officer should be able to a) create new jobs for farmers (b) raise funds for farmers (c) cultivate a large farm (d) guide and educate farmers (Ans = d)

6. Which of the following benefits of agriculture is of least importance to the peasant farmer (a) materials for shelter (b) employment (c) foreign exchange (d) income (Ans = c)

7. Which of the following is not a government programme? (a) operation feed the nation (b) Agricultural development projects (c) farm settlement schemes (d) West Africa Rice Development Agency (Ans = d)

8. Agricultural business is difficult to insure in West Africa mainly because (a) agricultural production is not very profitable (b) agricultural production is highly risky (c) many farmers are very poor (d) the premium is high (Ans = b)

9. A farm business makes profit when (a) total revenue equals total cost (b) total cost exceed total revenue (c) total revenue exceeds total cost (d) average cost equals total revenue. (Ans = c)

10. Which of the following factors of production has profit as its reward? (a) land (b) labour (c) capital (d) management. (Ans = c)

Use of following information to answer questions 11 and 12. A farmer sold all his harvested maize totaling 360kg at N5.50/kg thereby making profit at N430.00.

11. Calculate the production cost of maize per kg (a) N4.05 (b) N3.85 (c) N3.75 (d) N3.65 (Ans = b)

12. Determine the percentage profit per kg of maize sold (a) 35% (b) 40% (c) 43% (d) 52% (Ans = c)

13. The demand for agricultural produce is generally (a) Elastic (b) inelastic (c) unitary (d) static (Ans = a)

14. Agricultural credits should be put to the following uses except (a) purchase of inputs (b) meeting family needs (c) improvement of structures (d) adoption of innovations. (Ans = b)

15. Agricultural education programmes for rural youth will reduce the (a) rate of adoption of innovations (b) population of youth in rural areas (c) age at which youth will venture into family life (d) Dependency of youth on parents. (Ans = d)

16. Which of the following types of labour is commonly used in peasant agriculture? (a) co-operation (b) casual (c) migratory (d) family (Ans = d)

17. The quantity of food crop available for sale at the current market price over a period of time is known as (a) demand (b) joint supply (c) supply (d) competitive demand (Ans = c)

18. Agriculture contributes to the economy of West African countries through the following means except a) reduction of poverty through job creation (b) supply of armament for territorial defense (c) provision of foreign exchange (d) supply of raw materials to industries. (Ans = b)

19. The most important factor which determines the demand for cowpea by consumers is the (a) income of consumers (b) price of cowpea (c) supply of cowpea (d) taste of consumer. (Ans = b)

20. Government finances agriculture through the following means except (a) reduction of tariffs on agricultural inputs (b) granting of subsidies to farmers (c) establishment of agricultural colleges (d) establishment of credit sources. (Ans = c)