

Interest and learning approaches as discriminating factors in the performance of senior secondary school students in Economics

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Suggested Citation:

Stephen, O. O., Grace, O. T. & Abimbola, A. B. (2019). Interest and learning approaches as discriminating factors in the performance of senior secondary school students in Economics. *Contemporary Educational Researches Journal*. 9(1), 001-013.

Received from September 05, 2018; revised from November 21, 2018; accepted from January 1, 2019.

Selection and peer review under responsibility of Assoc.Prof.Dr. Deniz Ozcan, Ondokuz Mayıs University, Turkey.

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Abstract

The study utilised the *ex-post facto* research design to investigate how interest and learning approaches utilised in Economics discriminates the academic performance of students in the subject area. The population comprised senior secondary school two students in Ife Central Local Government of Osun State, while the sample comprised 94 students in five secondary schools in the area. Three research instruments *viz*: Individual Interest Questionnaire, Revised Two Factor Study Process Questionnaire and Economics Achievement Test were used to collect appropriate data. The Discriminant Function Analysis was utilised to analyse the data collected. Findings revealed a function with coefficients in order of magnitude as revealed by structure matrix as follows: Interest in Economics (1.06), Surface Approach (0.41) and Deep Approach (-1.14). None of the coefficients was significant at 0.05 significance level. The function was maximised for: 47.1% of students who scored above 50% and 57.1% of those who scored below 50%.

Keywords: Discriminant function analysis, interest, learning approaches, performance, senior secondary school.

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1. Introduction

Economics as a secondary school subject has enjoyed high number of entries *vis-a-vis* other subjects asides Mathematics and English language at senior secondary school certificate examinations. In the words of Yusuf (n.d.), Economics is probably the most important subject in the secondary school curriculum if the popularity of a secondary may be determined by the number of schools that teach it and the number of candidates that offer it in school learning (sic) certificate examination (p1). The reasons for this popularity and thence high acceptability of the subject may not be far-fetched from people’s perception of the pragmatality of the subject matter. The syllabus in the subject was according to West Africa Examinations Council (WAEC, 2004) designed to expose students to the basic economic principles as useful guide to rational decision-making relating to individuals, business, government and society in general; and to enhance their understanding and appreciation of Economics not only as an academic field of the study but also as a practical subject. More specifically, the objectives of teaching the subject are to enable students to: be acquainted with basic economic principles, concepts and the tools for economic analysis; be familiar with the structure and functioning of the economic institutions—commercial, industrial and financial; understand the basis for rational economic decisions; understand and be able to explain the basis and structure of the West African economy, including the roles of agriculture, industry and mining and the contributions to the national income; be able to follow the role and status of the West African countries in international economic relationships and; appreciate the problems West African countries encounter in their economic development.

Similarly, albeit there appears to be distinction in scope, the subject’s objectives according to the Joint Admissions and Matriculations Board (JAMB, 2010) are to: demonstrate sufficient knowledge and understanding of the basic concepts, tools and their general applications to economic analysis; identify and explain the basic structures, operations and roles of the various economic units and institutions (national and international); describe major economic activities-production, distribution and consumption; identify and appraise the basic and current problems of society and; develop the competence to proffer solutions to economic problems identified.

Suffice it to state that the subject was categorised as a broad based non-vocational elective in the fourth edition of the nation’s National Policy on Education (NPE) (Federal Republic of Nigeria, 2004). It was however recognised as a humanities-field elective in the new NPE (6th edition) (Nigeria Educational and Research Development Council, 2013). Being a pragmatic subject coupled with the centrality of the subject as a major requirement for admission into major social sciences and humanities disciplines at the tertiary education level, it may not be considered outrageous for stakeholders to expect a reasonable level of performance from candidates who sit for examinations in the subject. This is, however, not the case as the analysis of trends in performance reveal inconsistencies in the percentage of students with passes at credit level during the pre-2013 period. An all-time high percentage of 67.11% credit level passes was recorded in 2013 during an 11-year period that spanned 2003–2013. The observations reveal that post-2013 period has witnessed persistent decline in the performance of students in the subject with a 22.46% decrease in performance in 2014 and a 35.23% decrease in 2015 (using 2013 as base year performance).

Table 1. Students’ academic performance in economics in the May/June WASSCE 2003–2015

Year	Entry figure	% & figure of candidate that sat	Passes at credit level and % (Grades 1–6)	Non-credit passes and % (Grades 7–8)	% of failure (Grade 9)	Number of absentees & as % of total entry
2003	1,121,302	1,100,878 (98.17)	469,373 (42.63)	306,358 (27.82)	185,258 (16.82)	20,424 (1.82)
2004	1,004,535	985,695 (98.12)	367,376 (37.27)	364,828 (37.01)	221,028 (22.42)	18,840 (1.87)

2005	1,040,297	1,019,456 (97.99)	357,999 (35.00)	418,258 (41.03)	209,484 (20.55)	20,841 (2.00)
2006	1,124,832	1,099,837 (97.77)	547,302 (49.76)	363,643 (33.06)	174,924 (15.90)	24,995 (2.22)
2007	1,213,092	1,188,228 (97.95)	466,949 (39.29)	425,655 (35.82)	274,358 (23.08)	24,864 (2.04)
2008	1,230,131	1,204,515 (97.92)	592,939 (49.23)	392,579 (32.59)	201,588 (16.74)	25,616 (2.13)
2009	1,298,733	1,270,557 (97.83)	577,345 (45.44)	383,875 (30.21)	157,925 (12.43)	28,176 (2.22)
2010	1,256,886	1,228,401 (97.73)	690,949 (56.25)	342,949 (27.92)	164,377 (13.38)	28,485 (2.27)
2011	1,446,686	1,413,886 (97.73)	841,258 (59.50)	399,311 (28.24)	169,864 (12.01)	32,800 (2.27)
2012	1,583,775	1,540,902 (97.29)	864,273 (56.09)	444,308 (28.83)	232,321 (15.08)	42,873 (2.71)
2013	1,569,641	1,532,434 (97.63)	1,028,343 (67.11)	312,035 (20.36)	160,294 (10.46)	37,207 (2.37)
2014	1,370,227	1,343,582 (98.06)	699,253 (52.04)	332,962 (24.78)	286,249 (21.31)	26,645 (1.95)
2015	1,199,182	1,175,348 (98.01)	511,007 (43.47)	329,396 (28.02)	309,757 (26.35)	23,834 (1.98)

Source: WAEC Statistic Division, Yaba, Lagos (2003–2015).

Recent chief examiners' reports stated that the weaknesses of candidates in the subject are poor graphical analysis, the use of wrong terminologies, and failure to expatiate points, lack of adequate preparation for the examination, deviations in answering questions and raising of points in essays without explanations and lack of knowledge of the subject matter (WAEC, 2016; 2017). Besides Chief Examiners' reports as indicators of areas for improvement in the subject, several studies have been carried out in order to explain and possibly proffer solutions to the downward trend in the performance of students in Economics. Ganyaupfu (2013) investigated the differential effectiveness of three teaching methods of teacher-centred, teacher–student interactive and student-centred methods on the performance of students. Results demonstrated that teacher–student interactive was the most effective, followed by student-centred method, while the least effective was the teacher-centred method. Ekweoba (2014) reported that computer concept maps enhanced slightly secondary school students' achievement in labour market unit of Economics more than the manual concept maps. Other recent studies that have exhorted student-centred methods above teacher exposition method include: AbdulRaheem, Yusuf and Odutayo (2017) on peer learning, Zain, Subramaniam, Abd Rashid and Ghani (2009) and Adu and Galloway (2017) on cooperative leaning.

Observably too, majority of these studies have focused mainly on process variables, while those that focused on presage variables have been concerned with primary presage variables of socio-economic status, motivation, class-size, teacher-related variables, school location etc. For instance, Durowoju and Onuka (2015), in their study on teacher self-efficacy enhancement and school location effect on students achievement in Economics in senior secondary schools in Ibadan, Oyo State, Nigeria, found that teacher self-efficacy enhancement had significant main effect on students' achievement in the subject; school location also had significant main effect on students' achievement, while both variables—teacher self-efficacy enhancement and school location—had no significant interaction effects on students' achievement in Economics. Presage variables such as interest in Economics and learning approach used in studying Economics that are subject-specific are not extensively reported.

On another plane, decline in performance could be as a result of change in the NPE which now recognises Economics as a field-dependent elective rather than a broad-field elective and the availability of a wide range of subjects for admission requirement purposes as a result of the inclusion of more subjects including trade/entrepreneurship subjects. This scenario could lead to an unfavourable change in schools' policy and teachers' and students' personal idiosyncrasies such as interest and learning approaches which are related to the teaching and learning of the subject; the duo of change in school policy and personal idiosyncrasies interacting to influence students' learning outcomes in the subject. An unfavourable change in school policy on the subject could for instance cause an inward shift (decrease) in the interest of the students towards the subject and thence a shift in the approach adopted in studying the subject from a deep approach to a surface approach.

Interest drives learning (Rotgans, 2015). Interest for the sake of this study refers to individual interest as distinct from situational interest. Individual interest refers to a more or less stable type of interest, such as deep-seated interest in physiology, in science, in music, sports or travel (Schiefele, 1991). It is characterised by development over time and is usually considered a predisposition to engage and re-engage with particular content over time (Hidi & Renninger, 2006). Situational interest, however, refers to a transitory, changing type of interest which is usually aroused by environmental conditions and stimuli, such as puzzles, authentic problems, surprising or unexpected phenomenon, and is therefore more easily manipulated under the control of more significant others such as teachers (Rotgans & Schmidt, 2004 in Rotgans, 2015). Previous research has shown that interest could be a powerful predictor of study success and study choices (Harackiewicz, Barron, Tauer & Elliot, 2002; Hauer et al., 2008; Hauer, Fagan, Kernan, Mintz & Durning, 2008).

Learning approaches refer to the repertoire of strategies used by teachers or students in the accomplishment of prior stated learning and teaching goals. Biggs, Kember and Leung (2001) refer to learning approaches as a part of presage factors in the Presage-Process-Product (3P) model and it describes the nature of the relationship between student, context and task. Three types of learning approaches have been identified in the literature *viz*: deep approach, surface approach and achieving approach. The first two were identified by Marton and Saljo (1976), while Biggs (1987) was credited with the identification of the third, respectively. Students who adopt a surface approach only aim to achieve the minimum requirements, whereas deep learners will study detailed content precisely, aiming for complete comprehension of the meaning (Teoh, Abdullah, Roslan & Daud, 2014). According to Biggs (1987), learners who use the achieving approach focus on obtaining high grades in their study. Research reports suggest that students use a variety of learning approach depending on context and a variety of factors such as teaching and learning process, the assessment mode and the learning environment (Poh, 1999). This makes studies evolving and dynamic. Poh, Mau, Quek and Cheng (1997) and Poh, Ng and Yan (1997), both cited in Poh (1999), also reported in their studies that generally students in Singapore adopted the deep approach more than the surface and achieving approaches. Emilia, Bloomfield and Rotem (2012) reported that the Indonesian clinical students in their study had higher scores for deep learning. Tasdemir, Caliskan and Kula (2014) found that prospective teachers in a university in Turkey prefer surface approach to a deep one. From the studies highlighted above, it appears there are limited studies on learning approaches adopted by secondary school students *vis-a-vis* specific subjects where dwindling performance has been recognised. Hence, the need for this study.

Trend in research reports is that the surface approach is related to poor quality processes and outcomes, whereas a deep approach is connected to high quality processes. In other words, positive relationship exists between deep approach and academic performance and a negative relationship between surface approach and academic performance (Cetin, 2016; Herrmann, McCune & Bager-Elsborg, 2017; Prosser & Trigwell, 1991; Teoh et al., 2014). The achieving approach is noted to also tend towards doing well in exams though more externally driven to gain higher grades (Biggs & Moore, 1993 in Teoh et al., 2014). Notwithstanding the instructive nature of the general thesis on the relationship among the approaches and academic performance, research frontiers have been extended that present the need for caution in the generalisation of findings. For instance, the study by

Prosser and Trigwell (1991) which studied the relationship between the observed approaches to learning and the academic achievement of 122 first-year students in a nursing course found a positive correlation between a deep approach to learning and high *qualitative levels* in the academic achievement. However, they found no such correlation to *quantitative* differences in outcome. It also appears that learning approaches do not best discriminate academic performance as could be observed in the findings of Richardson, Abraham and Bond (2012). This latter study reported a negative but weak relation between a surface approach to learning and grade-point average (GPA) ($r = -0.18$) and a positive and weak relation between GPA and deep ($r = 0.14$) and strategic approaches ($r = 0.23$) to learning, respectively. Richardson et al.'s findings, thus, corroborate the assertion made by Entwistle, Hanley and Hounsell (1979) that deep and surface approaches had developed into fairly regular fused learning behaviours that were apparent simultaneously across different learning tasks.

Suffice it to mention that the duo of deep and surface approaches have been validated across different cultural contexts, disciplines and milieu (Fox, McManus & Winder, 2001; Martinelli & Raykov, 2017; Mogre & Amalba, 2014; Phan & Deo, 2007; Poh, 1999; Smith, 2005) and have been adopted for this study. On the account of changing context in which the subject is offered as highlighted above, it becomes imperative to study the interest of students towards Economics; the learning approach adopted by students and how these two variables discriminate the performance of the students in the subject. Findings from the study are expected to trigger, within the ambits allowed by generalisation of same considering the sample size and scope, chains of interventions targeted at maximising learning outcomes for students in the subject area by stakeholders.

2. Objectives of the study

The specific objectives of the study are to:

- i determine the levels of students' interest in Economics in the study area?
- ii assess students' reported studying approaches in Economics?
- iii assess how interest in Economics and learning approaches discriminates the academic performance of students in the subject in the study area.

3. Research questions

The research questions raised and answered in this study are:

- i. what are the levels of students' interest in Economics in the study area?
- ii. what are students' reported learning approaches in Economics?
- iii. how does interest in Economics and learning approaches discriminate the academic performance of students in Economics?

4. Methods

The study utilised the *ex-post facto* research design.

4.1. Population, sample and sampling technique

The population comprises all secondary school two students offering Economics in Ife Central Local Government Area of Osun State. The sample for the study consists of 94 students in five senior secondary schools in the study area. One intact class of students who offer the subject was randomly selected from each of the five schools.

4.2. Instrumentation

Three instruments were used for the collection of data used for the study. These instruments are: Individual Interest Questionnaire (IIQ), the Revised Study Process Questionnaire (R-SPQ-2F) and Economics Achievement Test.

4.3. The individual interest questionnaire

The IIQ was adopted from Rotgans (2015). The seven-item questionnaire assesses the importance students' place on studying a particular subject on a five-point Likert scale of 'Not true at all' (1), 'Not true for me' (2), 'Neutral' (3), 'True for me' (4) and 'Very true for me' (5). Besides changing the subject matter in the original questionnaire to Economics as called for by Rotgans, the scores assigned to the Likert scale were rearranged as follows: 'Not true at all' (1), 'Not true for me' (2), 'Neutral' (0), 'True for me' (3) and 'Very true for me' (4). The questionnaire has good reliability and validity indices across different disciplines with Confirmatory Factor Index of 0.96 for History, 0.98 for Chemistry and 0.94 for Geography. Reliability analysis using Hancock's coefficient H revealed 0.81 for History, 0.85 for Chemistry and 0.85 for Geography. The items of the questionnaire were considered appropriate for the present study having established a Cronbach alpha value of 0.77. Sample items from the questionnaire include: 'I am very interested in Economics', 'I always look forward to my Economics lessons, because I enjoy them a lot' and 'when I am reading or watching something about Economics, I am fully focused and forget everything around me'.

4.4. The revised two factor study process questionnaire (R-SPQ-2F)

The R-SPQ-2F was developed to enable teachers evaluate their own teaching and the learning approaches of their students on a five-point Likert scale of 'Never or only rarely', 'Sometimes', 'Half the time', 'Frequently' and 'Almost or almost always'. The instrument assesses deep and surface approaches only. It included the deep and surface motive and strategy scales each with five items, 10 items per approach score. The unidimensionality of the items for each of the four subscales have been established through Confirmatory Fit Index and Standardised Root Mean Squared Residual. Cronbach Alpha values of 0.73 and 0.64 were obtained for the deep approach and surface approach, respectively, in a sample of 495 undergraduate students from a variety of departments in a university in Hong Kong. Shah et al. (2006) established internal consistency co-efficients ranging from 0.71 to 0.72 from a sample of medical students in Nepal. Martinelli and Raykov (2017) indicated acceptable internal consistency coefficients of 0.73 and 0.75 for deep and surface approaches, respectively, using Cronbach's Alpha in a sample of prospective teachers, while Tasdemir et al. (2014) established Cronbach alpha values of 0.79 for the deep approach and 0.74 for the surface approach from a sample of prospective teachers in Turkey. For the present study, Cronbach Alpha values of 0.86 and 0.75 for deep and surface approaches, respectively, were established. Sample items from the deep approach subscale include: 'I find that at times studying gives me a feeling of deep personal satisfaction' and 'I feel that virtually any topic can be highly interesting once I get into it', while sample items from the surface approach subscale include: 'my aim is to pass the course while doing as little work as possible' and 'I learn some things by rote, going over and over them until I know them by heart even if I do not understand them'.

4.5. Economics achievement test

The Economics Achievement Test comprises of 50 multiple choice question items that were adopted from previous questions set by the WAEC in the subject. All things remaining same, WAEC set questions for Senior Secondary Certificate Examinations (SSCE) are deemed to possess desirable test properties of discrimination and difficulty power. The items were selected from a pool of past questions from 1998 to 2018 with the aid of the scheme of work and a test blueprint in order to

ensure spread in the items and in the cognitive level assessed. The selected questions cover the following themes: Principles of Economics (11 items); Economic Systems (six items); Consumer Behaviour, Price Determination and Market Structure (11 items); National Income and Public Finance (six items); Money and Inflation/Deflation (11 items) and Distributive Trade (five items). Each correctly answered item was awarded two marks.

5. Results

Research question 1: What are the levels of students’ interest in Economics in the study area?

In order to answer this question, descriptive data were obtained for the interest in Economics variable. The results obtained are as presented in Table 2.

Table 2. Descriptive statistics of interest in Economics, learning approaches and performance of students in Economics

Variables	Sub-scales	N	Mean	SD	Skewness	Minimum score obtained	Maximum score obtained	Maximum score obtainable
Interest in Economics	High interest (23 and above)	22	24.82	1.5	0.81	23	28	28
	Moderate interest (13–22)	52	17.62	2.95	0.17	13	22	28
	Low interest (12 and below)	20	9.35	2.06	-0.32	6	12	28
	Total	94	17.54	5.75	-0.18	6	28	35
Learning Approaches	Deep approach	94	32.84	9.34	0.087	16	50	50
	Surface approach	94	31.73	8.62	0.03	14	49	50
Performance in Economics	Above 50%	17	58.47	6.54	0.55	50	70	100
	50% and below	77	31.64	8.17	0.27	10	48	100
	Total	94	36.48	13.00	0.69	10	70	100

Table 2 shows that students’ interest in Economics is relatively high with 17.54 as the overall mean value (out of a maximum score obtainable of 28). Students’ interest in the subject was further categorised into high, moderate and low interest levels using the mean ± 1 standard deviation rule. Consequently, 22 students representing 23.40% of the respondents were high interest students; 52 students representing 55.32% were moderate interest level students, while 20 students representing 21.28% were low-interest students. From this classification, it could be observed that majority (74 representing 79% of the respondents) of the students have moderate interest in Economics.

Research Question 2: What are students’ reported learning approaches in Economics?

In order to answer this question, the descriptive statistics values for learning approaches in Table 2 were utilised. Table 2 depicts that the mean value for the deep approach is 32.84 with a standard deviation value and skewness index of 9.34 and 0.084, while the standard deviation for the surface approach is 31.73 with a standard deviation value and skewness index of 8.62 and 0.03, respectively. These suggest that students use the deep approach than surface approach. The scores as could be observed, however, show that there is a negligible difference between the use of the deep and surface approaches with the implication that the students employ both deep and surface approaches in the

study of Economics. This is established using the paired samples *t*-test with mean difference = 1.11, *t* = 1.87 and *p*-value of 0.064.

The learning approaches were further classified based on their dominance. The results obtained are shown in Table 3.

Table 3. Classification based on dominance of study approach

	Frequency	Cumulative frequency	Percentage
Deep approach	56	56	59.57
Surface approach	34	90	36.17
Surface-Deep approach	4	94	4.26

Table 3 reveals that about 60% of students utilise the deep approach as their dominant study approach for Economics, while about 36% of students have the surface approach as their dominant study approach for the subject. About 4% of students show equal level of use for both approaches in the subject.

Research Question 3: How does interest in Economics and learning approaches discriminate the academic performance of students in Economics?

In order to answer this question, discriminant function analysis was used in analysing the data gathered on each of the variables (dependent = learning approaches and interest in Economics; independent = academic performance in Economics). The results obtained are as presented in Tables 4–8.

Table 4. Eigen value of discriminant function

Eigen values				
	Eigen value	% of variance	Cumulative %	Canonical correlation
1	Function	100.0	100.0	0.239

^aFirst 1 canonical discriminant functions were used in the analysis.

Table 4 depicts the Eigen value of 0.061. This indicates that the proportion of variance explained by the discriminant function analysis is small. The implication of this is that the function presented by the analysis is a weak one. This is also corroborated by the canonical correlation coefficient of 0.239, which though positive is weak. The combination of the factors (interest in Economics and learning approaches) presented by the discriminant function equation is 0.0579 (about 6%) (obtained by calculating the square of 0.239).

Table 5. Wilks' Lambda coefficient of the discriminant function

Wilks' Lambda				
Test of function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	0.943	5.345	3	0.148

Wilks' Lambda value as revealed by Table 5 is 0.943. This is the proportion of the total variance in the discriminant scores not explained by the differences among groups. This value is not significant at 0.05 level of significance (*p* = 0.148). In spite of this non-significant status, the function presented maximises the predictor variables of interest in Economics and learning approaches in the prediction of academic performance in Economics. The standardised canonical discriminant function coefficients and structure matrix are presented in Tables 6 and 7.

Table 6. Standardised discriminant function coefficients and structure coefficients

Standardised Canonical Discriminant Function Coefficients	
	Function 1
Deep approach	-1.144
Surface approach	.410
Interest	1.061
Structure Matrix	
	Function 1
Interest	0.659
Deep approach	-0.275
Surface approach	-0.003

From Table 6, the standardised discriminant coefficient revealed the values of -1.14, 0.41 and 1.06 for deep approach, surface approach and interest in Economics, respectively. The function that can be derived from the Table 6 and which can be used to calculate a score for each subject for the discriminant function is:

$$DDA + \text{Score} = 1.06 \text{ Interest in Economics} + 0.410 \text{ Surface approach} - 1.14 \text{ Deep approach} \quad (1)$$

+ Descriptive Discriminant Score

The function could be interpreted that for every 1 standard deviation increase in deep approach scores their DDA score is predicted to decrease by 1.14 if all other variables are held constant. The function reveals that for every 1 standard deviation increase in surface approach scores students' DDA score is predicted to increase by 0.41 if all other variables are held constant. Last, for every 1 standard deviation increase in interest in Economics scores DDA scores is predicted to increase by 1.06 assuming also that all other variables are held constant. More substantively, because the discriminant function maximises the differences between the academic performance of the students, it can be seen that interest in the subject contribute positively to group differences and also show more between-group variation. This is supported by the discriminant structure coefficients. The discriminant structure coefficients show an indeterminate structure coefficient for deep and surface approaches. The structure coefficient also suggested that the use of deep approach is inimical to students' performance in the subject as it takes away from the discriminant function rather than add to it.

Table 7. Functions at group centroids

Functions at group centroids	
Classification of performance	Function 1
Scored 50 and above	-0.519
Scored below 50	0.115

Unstandardised canonical discriminant functions evaluated at group means.

The average discriminant score for subjects in the two groups are as presented in Table 7. It shows that when the variable means are entered into the discriminant function, the discriminant score will be -0.519 for those who scored 50 and above and 0.115 for those who scored below 50. The reason for the negative integer obtained for those who scored above 50 might be due to their use of deep approach which decreases the DDA score as presented in Eq (1).

Table 8. Prediction of group membership

		Classification results ^a		
Classification of performance		Predicted group membership		Total
		Scored 50 and above	Scored below 50	
Original Count %	Scored 50 and above	8	9	17
	Scored below 50	33	44	77
		47.1	52.9	100.0
		42.9	57.1	100.0

^a55.3% of original grouped cases correctly classified.

Table 8 shows that 47.1% of the students who scored above 50 are correctly classified, while 57.1% of those who scored below 50 are correctly classified.

6. Discussion of findings

The study examined how students’ perceived interest in the subject-matter of Economics and learning approach adopted in the study of the subject predict academic performance in the subject among senior secondary school students. The first objective determined the levels of students’ interest in Economics in the study area. Findings revealed that that the students have a relatively high interest in Economics as the mean of students’ perception is 17.54 out of a maximum obtainable score of 28 with a standard deviation of 5.75 and a skewness index of -0.182. The mean score was observed to be above average of the total obtainable score of 28. As a science albeit, a social science with its own distinct tools of analysis and decision making, the present result is contrary to the widely accepted idea that interest in science and technology is rapidly declining. This is corroborated by Christidou (2011) who is in a review of more than 100 references, argued that ‘as they advance from primary to secondary education, students rapidly lose their interest in science and cease seeing it as a viable option for their future, or associating it with their success aspirations’.

The second objective assessed the learning approaches employed by the students. Findings show that students use the deep approach than the surface approach although additional statistics suggests that the students might have employed both approaches in the study of Economics. This finding is consistent with that of Martinelli and Raykov (2017) which reported that overall students’ scores for the deep and surface approaches are invariant in regard to gender and the year of study with high scores consistently reported for the deep approach compared with the surface approach. The present findings corroborates the assertion made by Entwistle et al. (1979) that deep and surface approaches had developed into fairly regular interconnected learning behaviours as these approaches were apparent simultaneously across different learning tasks.

The third objective examines how the variables of interest in Economics and learning approach Economics discriminate students’ performance in the subject. Using the discriminant function analysis, results show that of the dual variables, interest in the subject matter of Economics best discriminates students’ performance. The findings of this study, however, contradict that of Cetin (2016) and Prosser and Trigwell (1991) which reported a high positive correlation between deep approach and high levels of academic performance. It also contradicts that of Herrmann et al. (2017) which found a negative relationship between a surface approach and academic achievement though reporting that the negative effect of a surface approach was stronger in some programmes than in others. The present findings could, however, be highlighted to be consistent with the other findings by Hermann et al. (2017) where no statistically correlation was found between academic achievement and deep approach. The present findings may not also be surprising going by the near similitude in the pattern of correlations between each of the approach and academic performance presented in the study by Richardson et al. (2012); and the interrelationship between the approaches as explained by Entwistle et al. (1979). Another possible explanation for the rather modest strengths of association between approaches to learning and examination grades has been that assessment systems in secondary

education might not always reward high quality learning outcomes, especially when assessment relies on examination by means of multiple-choice test (Biggs, 1987). This explanation becomes tenable as the study utilised the multiple-choice test which rarely reflects wholly intelligence but may include biases of test interest, guessing, test-wiseness etc. Also, Vermunt (2005) concluded that aspects of students' learning strategies such as critical, analytical and concrete thinking seemed to only be rewarded to a lesser extent in examination results. In this respect, Gijbels, van de Watering, Dochy and van den Bossche (2005) pointed out the fact that a deep approach to learning was rarely rewarded by the evaluation system used in schools. The reason, therefore, may be that the evaluation mainly assesses knowledge for which the use of both the deep and surface approach suffices to be successful (Scouller, 1998).

7. Conclusion

From the findings of the study, it could be concluded that interest of the students in the subject matter of Economics is an important determinant of performance in the subject, while students' use of surface and not deep approach to studying the subject predicts performance in the subject. The implications of these for the teaching and learning of the subject is that teachers of the subject should employ a range of techniques to positively drive the interest of the students in the subject. This should include drawing out the utilitarian value of the topics when taught. Also, teachers should encourage the students to adopt and maintain a relative balance in the use of both the deep and surface approaches to study the subject. This would allow the students to cover a larger percentage of the contents needed for success at senior school certificate examinations and yet retain concepts for a relatively long period of time for transfer to novel economic decision making processes. Last, there is a need for the use of assessment formats that are true to the attainment of high-level domain-specific learning. Such assessment may encourage students to utilise deep approach as well as the surface approach. The present findings are, however, limited on the account of the small sample used. Further studies should take cognizance of this and use a larger sample.

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