

An analysis of some factors affecting student academic performance in an introductory biochemistry course at the University of the West Indies

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High failure rates at tertiary institutions result in unacceptable levels of attrition, reduced graduate throughput and increased cost of training a nation's labour force. It is imperative that diagnostic studies are carried out to identify the major factors that are associated with suboptimal academic performance with a view of instituting corrective measures. This study was, therefore, designed to identify and analyse some determinants of academic performance (as measured by coursework exam grades) in an introductory biochemistry (AGRI 1013) course plagued by chronic high failure rates. The course is offered to first year undergraduate students in the Faculty of Science and Agriculture at the University of the West Indies, St. Augustine campus. A survey instrument was administered to a random sample of 66 registered students of AGRI 1013 (representing a 40% sampling fraction) to generate data on demographics (gender and age), learning preference, and entry qualifications. The effect of learning preference, age, gender, and entry qualifications on academic performance (measured as the final coursework mark obtained) was determined. Relationships/associations between gender and learning styles, gender and entry qualifications, age and learning preferences, and age and entry qualifications were analyzed using Pearson's chi-square test. There were significant ($P < 0.05$) associations between entry qualifications and both gender and age. However, since entry qualifications did not significantly ($P > 0.05$) affect academic performance, this association should be of limited concern. None of the investigated factors significantly affected academic performance. This observation could be a consequence of an impressive performance in the coursework exams by a large proportion of students resulting in less variation in the recorded grades. Learning preferences were found to be independent of both the age and gender of students. It was concluded that more determinants of academic performance need to be investigated and that students who are admitted based on a diploma in agriculture may need a remedial course given that their coursework grades, though statistically insignificant were consistently lower than that of the other students.

Keywords: high failure rates, introductory biochemistry, learning preferences, mature students, gender, entry qualifications.

Introduction

The academic performance of students at the University of the West Indies (UWI) has recently come under the spotlight for a number of reasons. According to a report from UWI's Office of Planning and Development (2011), 10% of all undergraduate courses offered at UWI, St. Augustine have high failure rates. The

purpose of this report was to initiate a discussion on the possible causal factors and ways of addressing them so that academic performance can be improved. High failure rates are costly to all stakeholders since the throughput of the University is reduced. This increases the cost of training graduates as well as reducing admission opportunities for high school students seeking a University education. Low pass rates impose a huge cost to the Caribbean community in terms of the low number of students graduating and the reduced intake of potential students due to shortage of spaces caused by low throughput. In order to ensure that a larger proportion of the Caribbean's labour force is highly trained, UWI must put in place measures that ensure high completion rates. Much of the attrition that reduces completion rates can be attributed to low academic performance in early pre-requisite undergraduate courses (Scott & Graal, 2007) such as Introduction to Biochemistry (AGRI 1013), the subject of this investigation. Over a period of 3 years (2006 – 2008), the failure rate of this course has averaged 40% which is considered to be very high. As a result of this high failure rate, the 2010/2011 academic year class size is now approaching 200 due to failing students retaking the course. Class size is one of the factors that impact upon academic performance and the general relationship is a negative one (Heinesen, 2010), as such a vicious cycle seems to have been created. It is important, therefore, that an investigation be carried out to identify some of the factors that are closely associated with poor academic performance in this course so that corrective measures, where possible, can be taken. A number of studies have been carried out to identify causal factors of poor academic performance in a number of institutions worldwide. Most of these studies focus on the three elements that intervene, that is, parents (family causal factors), teachers (academic causal factors), and students (personal causal factors) (Diaz, 2003). The combination of factors influencing academic performance, however, varies from one academic environment to another, from one set of students to the next, and indeed from one cultural setting to another.

The purpose of this exploratory study was, therefore, to identify and analyse the factors that influence academic performance in AGRI 1013. The study sought to define relationships between selected student factors (demographic information, learning style, admission criteria, and high school achievements) and academic performance (measured in terms of the total of two coursework grades) in the AGRI 1013 course in the 2010/2011 academic year. A formal study of this nature contributes towards unravelling those significant determinants of students' performance that need to be addressed. The findings of this study may also be applicable to related courses (those that require the application of Chemistry and Biology knowledge) with high failure rates.

Literature review

A number of studies have been carried out to identify and analyse the numerous factors that affect academic performance in various centres of learning. Their findings identify students' effort, previous schooling (Siegfried & Fels, 1979; Anderson &

Benjamin, 1994), parents' education, family income (Devadoss & Foltz, 1996), self motivation, age of student, learning preferences (Aripin, Mahmood, Rohaizad, Yeop, & Anuar, 2008), class attendance (Romer, 1993), and entry qualifications as factors that have a significant effect on the students' academic performance in various settings. The utility of these studies lies in the need to undertake corrective measures that improve the academic performance of students, especially in public-funded institutions. The throughput of public-funded institutions is under scrutiny especially because of the current global economic downturn which demands that governments improve efficiency in financial resource allocation and utilization. Although there has been considerable debate about the determinants of academic performance among educators, policymakers, academics, and other stakeholders, it is generally agreed that the impact of these determinants vary (in terms of extent and direction) with context, for example, culture, institution, course of study etc. Since not all factors are relevant for a particular context, it is imperative that formal studies be carried out to identify the context-specific determinants for sound decision making. This literature review provides a brief examination of some of the factors that influence academic performance. The choice of factors reviewed here was based on their importance to the current study.

Students' learning preferences

A good match between students' learning preferences and instructor's teaching style has been demonstrated to have positive effect on student's performance (Harb & El-Shaarawi, 2006). According to Reid (1995), learning preference refers to a person's "natural, habitual and preferred way" of assimilating new information. This implies that individuals differ in regard to what mode of instruction or study is most effective for them. Scholars, who promote the learning preferences approach to learning, agree that effective instruction can only be undertaken if the learner's learning preferences are diagnosed and the instruction is tailored accordingly (Pashler, McDaniel, Rohrer, & Bjork, 2008). "I hear and I forget. I see and I remember. I do and I understand." (Confucius 551-479 BC) – a quote that provides evidence that, even in early times, there was a recognition of the existence of different learning preferences among people. Indeed, Omrod (2008) reports that some students seem to learn better when information is presented through words (verbal learners), whereas others seem to learn better when it is presented in the form of pictures (visual learners). Clearly in a class where only one instructional method is employed, there is a strong possibility that a number of students will find the learning environment less optimal and this could affect their academic performance. Felder (1993) established that alignment between students' learning preferences and an instructor's teaching style leads to better recall and understanding. The learning preferences approach has gained significant mileage despite the lack of experimental evidence to support the utility of this approach. There are a number of methods used to assess the learning preferences/styles of students but they all typically ask students to evaluate the kind of information

presentation they are most at ease with. One of these approaches being used widely is the Visual/Aural/Read and Write/Kinaesthetic (VARK®) questionnaire, pioneered by Neil Fleming in 1987, which categorizes learners into at least four major learning preferences classes. Neil Flemming (2001-2011) described these four major learning preferences as follows:

- *Visual learners*: students who prefer information to be presented on the whiteboard, flip charts, walls, graphics, pictures, colour. Probably creative and may use different colours and diagrams in their notebooks.
- *Aural (or oral)/auditory learners*: prefer to sit back and listen. Do not make a lot of notes. May find it useful to record lectures for later playbacks and reference.
- *Read/write learners*: prefer to read the information for themselves and take a lot of notes. These learners benefit from given access to additional relevant information through handouts and guided readings.
- *Kinesthetic (or tactile) learners*: these learners cannot sit still for long and like to fiddle with things. Prefer to be actively involved in their learning and thus would benefit from active learning strategies in class.

A number of learners are indeed, multimodal, with more than one preferred style of learning in addition to using different learning styles for different components of the same subject. There is a strong possibility that learning preferences would depend on the subject matter being taught. The question that arises is whether a particular learning preference is favoured in certain subjects/courses. This study will attempt to answer this question with regard to an introductory biochemistry course taught in the Faculty of Science and Agriculture at the University of the West Indies, St. Augustine. Learning style in this study was measured by administering to students, the VARK® questionnaire that provides users with a profile of their learning preferences. The category with the highest score was taken as the student's learning preference. Where categories had equal scores, all the categories were taken as the student's learning preferences (multimodal).

Class attendance and academic performance

In his widely cited paper, Romer (1993) is one of the first few authors to explore the relationship between student attendance and exam performance. A number of factors have contributed to declining class attendances around the world in the last 15 years. The major reasons given by students for non-attendance include assessment pressures, poor delivery of lectures, timing of lectures, and work commitments (Newman-Ford, Lloyd & Thomas, 2009). In recent times, students have found a need to seek employment while studying on a part-time basis due to

financial constraints. The numbers of part-time and mature students has also risen sharply. The use of information technology also means that information that used to be obtained from sitting through lectures can be obtained at the click of a mouse. Indeed, web-based learning approaches have become the order of the day. Given all these developments that either make it impossible or unnecessary for students to attend classes, the question that needs to be asked is whether absenteeism affects students' academic performance. Research on this subject seems to provide a consensus that students who miss classes perform poorly compared to those who attend classes (Devadoss & Foltz, 1996; Durden & Ellis, 1995; Romer, 1993; Park & Kerr, 1990; Schmidt, 1983). Based on these findings a number of stakeholders have called for mandatory class attendance. Although the existing evidence points to a strong correlation between attendance and academic performance, none of the studies cited above demonstrate a causal effect. The inability of these cross-sectional studies to isolate attendance from a myriad of confounding student characteristics (e.g. levels of motivation, intelligence, prior learning, and time-management skills) is a major limiting factor to the utility of these findings (Rodgers & Rodgers, 2003). Durden and Ellis, (1995) controlled for student differences in background, ability and motivation, and reported a nonlinear effect of attendance on learning, that is, a few absences do not lead to poor grades but excessive absenteeism does.

Entry qualifications and prerequisites

For a number of institutions, student admission is based on a number of different qualifications to the extent that students receiving instruction in the same course differ widely in terms of their prior knowledge. Learning is a cumulative process, thus a student recruited with higher entry requirements will be well prepared for the course material compared to a student admitted based on the bare minimum qualifications. It is important for educators to have an idea of how well- or ill-prepared admitted students are based on their qualifications. This study seeks to explore the possible effects of entry qualifications on student performance. Such an analysis would allow admission decisions to be based on projections of academic performance. At least four criteria (CAPE passes, Associate degrees, Diplomas, Work experience and CXC passes only) are used to admit students into degree programmes in the Faculty of Science and Agriculture. It is important to identify students who might need extra attention based on level of prior competencies upon admission.

Other determinants of academic performance

The influence of age and gender on academic performance has been investigated in a number of studies with widely differing conclusions. Most of the differences in reported findings are due to varying contexts such as subject of study, age and gender interactions. Research has shown that men perform better than women in certain settings while women outperform men in other settings (Haist, Wilson, Elam, Blue, & Fosson, 2000). Borde (1998), on the other hand, found no evidence

of academic performance being influenced by gender. Based on an analysis of close to two million graduating students, Woodfield and Earl-Novell (2006) found that female students outperformed male students and attributed this partly to female students being more conscientious and thus less likely to miss lectures. With regard to the issue of student age, recent changes in educational policies around the world have led to an increase in the number of mature-age admissions in educational institutions. While a large proportion of undergraduate students are still 19-year olds, the ages of students in classes are now more variable than 10 to 15 years ago. The definition of a mature student varies by country with 21, 22 and 25-year old students being classified as mature students in the United Kingdom, United States of America and Australia, respectively (Trueman & Hartley, 1996). In this study, mature students are defined as those students whose age was greater than 21 years on their first day at the university. Students who were 21 years of age and younger were classified as 'young' students. Mature students are thought to lack basic skills required for effective study or to be impaired by age-related intellectual deficits. Mature students tend to be admitted into their programmes with distinctly lower educational attainment than the young students (Newman-Ford, Lloyd & Thomas, 2009). However, when compared to the younger students, the academic performance of mature students is as good, if not better (Richardson, 1994). It should, however be pointed out that this comparison depends on the subject matter and types of assessment used. Richardson (1994, p. 5) concludes his study by making the observation that "... mature students were rather more likely than younger students to adopt a deep approach or a meaning orientation towards their academic work, and were conversely less likely than younger students to adopt a surface approach or a reproducing orientation." Other determinants of academic performance not discussed above include self-motivation, family income, and parents' level of education. While a positive relationship between self-motivation and academic performance has been established (Zimmerman, Bandura, & Martinez-Pons, 1992), the effect of family income and parents' level of education on academic performance is far from being unravelled without equivocation. Socioeconomic status of students and their families show moderate to strong relationship with academic performance (Sirin, 2005) but these relationships are contingent upon a number of factors such that it is nearly impossible to predict academic performance using socioeconomic status.

Methodology and methods

Context of the study

The University of the West Indies is an autonomous regional university serving 17 English-speaking Caribbean countries and territories. The university has three physical campuses located in Jamaica (Mona campus), Barbados (Cave Hill campus) and Trinidad and Tobago, (St. Augustine campus) and one virtual campus, the Open Campus. This study was carried out in the Faculty of Science and Agriculture at the St. Augustine campus. The faculty has several departments, including the

Department of Food Production which offers AGRI 1013 to first year students majoring in general agriculture, environmental science, geography, chemistry and human nutrition. Admission criteria into these majors varies widely, ranging from diplomas in relevant disciplines, Caribbean Advanced Proficiency Examination (CAPE), General Certificate in Education (GCE) Advanced level, Caribbean Examinations Council (CXC), and associate degrees in relevant disciplines. The AGRI 1013 course is a prerequisite to a number of second and third year courses, meaning that a student who fails AGRI 1013 will find their choice of courses limited in subsequent years and may be unable to graduate on time.

Population and sample

The target population for this study was all students taking the introductory biochemistry (AGRI 1013) course in the Faculty of Science and Agriculture, at the University of the West Indies, St. Augustine. According to the University's records of registered students, there were 165 registered students for the 2010/2011 academic year. The list of these students was downloaded from Banner® (a student administration software) into an Excel file and used as a sampling frame from which a random sample was drawn with a sampling fraction of 40%. Random numbers between 0 and 1 were generated in the Excel file against the list of students using the = RAND () function in Microsoft Excel 2010.

Data collection and analysis

The survey instrument was in two parts. The first part consisted of 18 questions based on factors that influence academic performance. These factors included students' demographics, effort and attendance, entry qualifications, and high school achievements. The second part of the instrument was the VARK® questionnaire used to measure students' learning preferences. A detailed description of the VARK® approach to establishing learning preferences was given in the literature review. Students' learning preferences were initially classified into four groups: visual, aural, read/write, and kinaesthetic. Upon completion of the VARK® the group with the highest score was designated as the preferred learning style for each respondent. Where two or more groups had equal scores, the learning preference was classified as multimodal, which became the fifth group. The survey instrument was pre-tested on a group of veterinary students that were not part of the study for readability and clarity. Upon completion of the pre-test, a few statements were reworded for clarity and readability. The survey instrument was handed out to the 66 randomly selected students during lecture and tutorial sessions during the last two weeks of the semester. Students were informed in a cover letter accompanying the survey instrument and also verbally, during class, that participation in the survey was voluntary and that their anonymity was guaranteed. Students were not required to supply identifying information on the survey instrument thus guaranteeing anonymity. The objectives of the survey, as well as a note on how the collected data would be used were also included in the cover letter and explained

verbally. The students were allowed to carry the instrument away, complete it in their own spare time and return the completed questionnaires using an unmanned collection box. This collection procedure was designed to assure students that declining to participate in the survey (i.e. failure to return questionnaire) would not lead to victimisation by tutors and lecturers.

For the purposes of data analysis, learning styles, demographics (age and gender), and entry qualifications were designated as independent variables. The dependent variable was academic performance assessed as the grades obtained in two coursework examinations making up 40% of the final course mark. Data were analyzed using frequency tables, and descriptive statistics (frequency distribution and descriptive statistics such as percentages, means, and standard deviations) to examine the data with regards to the profile of the sample. The effect of learning styles, demographics (age and gender), and entry qualifications on academic performance was analysed using analyses of variance procedure of Statistical Package for Social Sciences (SPSS) Version 19. Nominal relationships/associations between gender and learning styles, gender and entry qualifications, age and learning styles, and age and entry qualifications were analyzed using Pearson's chi-square test. The strength of the association was interpreted using Cramer's V score.

Assumptions and constraints

The major assumptions made in this study were that students answered the survey questions truthfully and that they fully understood what the questionnaire required of them. It was also assumed that the VARK® questionnaire accurately measured students' learning preferences. Chances of recall error were high when students were asked to state their current grade point average (GPA). This study tested a representative sample of students taking AGRI 1013 in the 2010/2011 academic year thus results are not subject to generalizations beyond this group of students. Only tendencies between academic performance and demographic information, learning style, admission criteria, and high school achievements were measurable – not causality. The study was carried out before the final examinations were written thus it was not possible to include the final exam grade (this would have entailed collecting student identifying information on survey instruments and thus violating the anonymity of respondents) in the evaluation of academic performance.

Results and discussion

Sample profile

Of the 66 questionnaires distributed, 55 were completed and returned, a response rate of 83.3%. However, one of the questionnaires had too many item (partial) non-responses (most of the affected items were on the VARK® questionnaire) and it was classified as a unit (complete) non-response, thus reducing the response rate to 81.8%. The sample of 54 respondents consisted of 64.8% female and 35.2% male students. Only three students out of the 54, representing 5.6%, were part-time students while the rest were full-time students. When grouped by age (≤ 21 years old

= 'young' and > 21years old = 'mature') 68.6% of the respondents were classified as young students and 29.6% were classified as mature students while one respondent did not give his/her age. In terms of year of study, 74.1% of all respondents were in the first year, while 20.4% were in the second and 5.6% were in the third. This indicates that 26% of the respondents were re-taking AGRI 1013, either after failing it in the previous academic year or having been unable to take the course in early years due to credit overload. Table 1 shows the frequency distribution of the entry qualification categories.

Table 1. Frequency distribution of entry qualifications used for admission of students

Entry qualification	Frequency	Percent
CAPE	32	59.3
GCE advanced level	3	5.6
Associate degree	10	18.5
CXC only	1	1.9
Diploma in agriculture	6	11.1
Other	2	3.7

(N = 54, sd = 1.73)

The majority (64.9%) of respondents were admitted into their respective degree programmes based on their advanced level (CAPE and GCE) qualifications. However, 51.9% and 57.9% of respondents had no passes in advanced level biology and chemistry, respectively, while only 31.5% of respondents had a pass in advanced level mathematics. The fact that more than half of the students of biochemistry do not possess passes in advanced level biology and chemistry is a cause for concern. These two high school subjects are the bedrock upon which an understanding of biochemistry should be built. Competencies in biology and chemistry should be made prerequisites for AGRI 1013 by selecting students with the required passes and/or mounting compulsory remedial courses for affected students. In terms of the frequency distribution of learning preferences among respondents, 31.5% of respondents had a kinaesthetic learning preference (Table 2) while only 3% have a visual learning preference.

Table 2. Frequency distribution of learning preferences of AGRI 1013 students

Learning preference	Frequency	Percent
Visual	3	5.6
Aural	10	18.5
Read/Write	15	27.8
Kinesthetic	17	31.5
Multimodal	9	16.7

(N = 54, sd = 1.14)

16.7% of the students were multimodal, meaning that they employ more than one learning style. The second highest frequency was for the read/write learning preference with 27.8% of respondents, while the aural learning preference had a frequency of 18.5%. The large variation in the learning preferences of students taking the same course is a challenge for instructors. It is imperative that lecture material be presented in a variety of ways to ensure that a large proportion of students benefit.

Nominal relationships involving students' ages and gender

Table 3 presents the measures of association between age and entry qualifications, age and learning preferences, gender and entry qualifications and gender and learning preferences. The strength of association is reported using Cramer's V score. A positive and significant association was observed between entry qualifications and both the age (Cramer's V = 0.734, $P < 0.0001$) and gender (Cramer's V = 0.454, $P < 0.05$) of students of AGRI 1013. Learning preferences of students were independent of age and gender as indicated by the statistically insignificant ($P > 0.05$) Cramer's V scores (Table 3).

Table 3. Measures of association (Cramer's V score) between nominal variables involving age and gender of students of AGRI 1013

Crosstab	Cramer's V score	Significance ¹
Age x entry qualifications	0.734	***
Age x learning style	0.121	NS
Gender x entry qualifications	0.454	*
Gender x learning style	0.267	NS

¹Significance: NS = not significant ($P > 0.05$); * significant ($P < 0.05$); *** significant ($P < 0.001$)

While only 5.4% of younger students were admitted on the basis of an associate degree, 50% of mature students were admitted on this basis. However, since entry qualifications had no significant effect on academic performance, this should not be a cause for concern. Perhaps indicating that GCE advanced level examinations have long been discontinued in the formal education system in the Caribbean, none of the younger students had this qualification while 12.5% of the mature students hold GCE advanced level passes upon which their admission was based. In contrast, the majority (78.4%) of the younger students were admitted based on CAPE passes compared to only 18.8% of the mature students. With regards to the association between gender and entry qualifications, 25.7% of female students compared to only 5.3% of male students were admitted based on an associate degree. However, more male students (26.3%) compared to 2.9% of female students were admitted based on a diploma in agriculture qualification.

Effect of gender, age, learning style and entry qualifications on academic performance

Table 4 presents data on the effect of age and gender on academic performance as measured by the total coursework mark (maximum possible mark = 40%) obtained in AGRI 1013. Although male students had a percentage point higher average grade than their female counterparts, this difference was not statistically significant ($P > 0.05$). This finding is in agreement with several other studies including the seminal paper by Newman-Ford, Lloyd and Thomas (2009) who showed that gender had only minor impacts upon educational achievement. It is however, important to point out that gender differences do exist depending on subject matter (Haist et al., 2000).

Table 4. Effect of gender and age of students of AGRI 1013 on academic performance

Factor	Levels	Academic performance ¹	SE ²
Gender	Male (N = 19)	25.7	0.96
	Female (N = 35)	24.6	0.55
Age	Young (N = 37)	25.2	0.67
	Mature (N = 16)	24.6	0.67

¹Academic performance = coursework grade (out of 40), ²SE = standard error of the mean

It has been suggested that mature students may have difficulties coping with the demands of learning compared to young undergraduate students. The mature students are thought to lack basic skills required for effective study or to be impaired by age-related deficits (Newman-Ford, Lloyd & Thomas, 2009). However, the results obtained in this study show that the academic performance of mature students did not differ ($P > 0.05$) from that of younger students. This is in accordance with the findings of Richardson (1994) who reported that the academic performance of mature students is as good, if not better than younger students in most settings. As long as the mature students are admitted into study programmes for which they possess the basic competencies, then their performance will not be worse than that of their younger peers. Indeed, Richardson (1994) concludes that mature students seek a deeper meaning towards their academic work and were less likely to adopt a surface approach or reproducing orientation like the younger students. In a sense, a reproducing orientation is somewhat encouraged in AGRI 1013 due to the nature of questioning adopted in examinations. It is probably for this reason that the average performance of mature students (24.5/40) was slightly less than that of the younger students (25.2/40).

The effect of learning preferences on academic performance in AGRI 1013 is presented in Table 5. There was no significant ($P > 0.05$) difference in academic performance among the five learning preferences: visual, aural, read/write, kinesthetic and multimodal. This finding is in disagreement with Felder (1993), who is one of few researchers to report that an association exists between

a student's learning preference, teaching style and academic performance. Apart from Felder's work, there is a general lack of experimental evidence to support the effectiveness of aligning instruction methods with learning preferences. The lack of association between learning preferences and academic performance in this study could either be a result of the VARK[®] questionnaire failing to accurately assess the learning preferences (and hence failing to place students into distinct learning preference categories) of the students or a reflection of a teaching style that encompasses different delivery methods such that none of the learning preferences were disadvantaged.

Table 5. Effect of learning style on academic performance of AGRI 1013 students

Learning preference	Academic Performance ¹	SE ²
Visual	25.4	0.24
Aural	25.2	1.40
Read/write	25.8	0.87
Kinesthetic	24.1	1.08
Multimodal	25.0	0.95

¹Academic performance = coursework grade (out of 40), ²SE = standard error of the mean

The effect of entry qualifications used for admission of students of AGRI 1013 into their respective degree programmes is presented in Table 6. There was no significant ($P > 0.05$) difference in academic performance between students due to differences in their admission criteria. This could be a reflection that the admission criteria employed, though varied, are adequate assessments of the potential of students to grapple with the demands of AGRI 1013 and other courses in the Faculty of Science and Agriculture. It could therefore be argued that there is no need to revise the admission criteria of these students. However, the holders of diplomas in agriculture and 'other' qualifications appear to be at the bottom of the academic performance chart and could benefit from extra attention in terms of instructional approaches. An increase in the number of relevant foundation courses offered to these students could be helpful.

Table 6. Effect of entry qualifications used for admission on academic performance in AGRI 1013

Entry qualifications	Academic performance ¹	SE ²
CAPE	25.0	0.74
GCE Advanced Level	27.3	1.52
Associate degree	25.3	0.86
CXC only	25.3	
Other	23.9	0.15
Diploma in Agriculture	23.9	1.54

¹Academic performance = coursework grade (out of 40), ²SE = standard error of the mean

Overall, the academic performance of this group of students was very good (compared to previous years) with the lowest grade being 18/40, the maximum being 32.3/40 with an average performance of 25/40 (sd = 3.4). This suggests a concerted effort by both the lecturers and students to raise the academic performance in the course (perhaps in response to the concerns already raised within the UWI system) resulting in reduced variation (sd = 3.4) in student performance, a scenario that would have resulted in the lack of statistical significance of investigated determinants of academic performance.

Conclusions and recommendations

None of the selected factors investigated in this study had a significant effect on the academic performance of students in the introductory biochemistry course. The list of factors investigated was not exhaustive, for there are several other factors that can influence academic performance. Further analysis of these other factors that are known to influence academic performance (such as student motivation, socioeconomic status, and attendance) is required. The conclusions to be drawn from this study are that gender, age, learning preferences, and entry qualifications did not cause any significant variation in the academic performance of students. Although their academic performance was not significantly different from the rest of the students, holders of the diploma in agriculture seem to consistently lag behind the rest of the students. A closer analysis of the challenges faced by these students may be worthwhile. If required, a remedial course can be offered to these students as a corrective measure to ensure that they are equally well-equipped to handle the demands of AGRI 1013.

Acknowledgements

Thanks to the 2010/2011 Introduction to Biochemistry (AGRI 1013) students who agreed to participate in this study. Thanks are also due to Mr. Andell Edwards for assisting with the distribution and collection of the survey instrument.

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