

Student-Related Factors Influencing Academic Performance: Experience from a Nigerian Medical Institution

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Abstract

Objectives: The student and their learning environment determine the achievement of learning outcomes. Regardless of the affordances presented to a student, learning will not occur if factors exist that significantly compete with the students' ability to engage. This study was to determine student-related factors influencing academic performance

Materials and Methods: This was a cross-sectional analytic study of graduands within 0-12 months of graduation from the Medical School of Delta State University, Nigeria. Only non-consenting doctors were excluded. A questionnaire was used to obtain socio-demographic data, information about motivation to study medicine, social behaviours, study habits, dietary habits, family support, and self-perceived emotional status. Data analysis was performed using IBM SPSS Statistics for windows version 22 (IBM Corp., Armonk, NY, USA)

Results: Seventy-one newly graduated medical students were studied. The mean age was 25 ± 2.5 years, and males were in the majority (59.2%). Forty-eight out of 71 students (67.6%) reported intrinsic motivation to study medicine.

The majority (95.8%) spent >2hrs daily studying alone, while 28.1% spent >2hrs weekly in academic group discussions. Only 15.5% used online learning resources regularly, while 8.5% had never used online resources. Only 46.5% frequently studied using their curriculum as a guide, while 15.5% tended to study ahead of their lectures

More males than females had resit examinations (38.1% vs 10.3%, $P=0.013$). A higher proportion of those who had 0-1 resit engaged in over 2 hours/week of peer group academic discussions compared to those who had more resits (36.5% vs 5.2%, $P=0.015$). Daily time on social media was >2hrs in 73.7% and 71.2% of those with '>1' and '0-1' resit respectively, $P=0.834$.

A higher proportion of students who had '>1 resits' compared to those with '0-1 resit', skipped breakfast (68.4% vs 48.1%, $P=0.180$) skipped lunch (42.9% vs 26.9%, $P=0.254$), and described themselves as always angry (10.5% vs 3.8%, $P=0.279$). The availability of financial support was commoner among those with '0-1 resit' (59.6% vs 47.4%, $P=0.423$); the proportion of students who engaged in recreational activities was comparable in both groups (69.2% and 63.1%).

Conclusion: A great proportion of students did not use online learning resources, although they spent considerable hours on entertainment social networking. The students seldom used their course curriculum during students' private study. Examination resit rate was significantly commoner among males and those who had fewer hours of peer group academic discussions. Recreational activity, skipping

meals, time on social media, and financial support, did not significantly affect academic performance.

Keywords: Academic Performance; Medical Students; Influencing Factors

Introduction

The student and the learning environment are vital determinants of academic performance. Ramsden and McInnis et al. [1,2] categorised learning environment into teaching, learning resources, workload, assessment, learning community, program goals, and objectives. An ideal situation for high performance will be the presence of an effective and efficient learning environment and learner.

Researchers have previously identified several student-related factors that influence learning, such as student characteristics and lifestyle, study habits, study attitudes, motivation for study, prior academic ability, and English proficiency [3,4]. The style of learning (i.e. surface, deep, or methodical achievement motivated) may also influence academic performance [5]; students who practice deep and methodical learning tend to perform better than those who employ surface learning. However, Ferguson et al. noted that learning style could change in an individual and therefore this factor may be a moderate influencer of performance [6].

Teaching methods such as peer learning and the use of e-learning technologies have been shown to enhance deep learning [7-10]. Peer learning promotes dialogue, reflection, questioning and ability to create one's knowledge, thereby enhancing deep learning. E-learning technologies are considered very useful in modern-day education, although excessive online information can become a burden to students who are not adequately guided by their instructors. More recently, social networking based e-learning has become increasingly popularly and has been shown to enhance communication and collaboration between learners and their teachers and peers [11,12]. Furthermore, researchers have now shown that social media has a high potential for adaptive and personalised learning [13,14].

Other habits and lifestyle, such as the use of psychoactive substances, sleep pattern/hours, engagement in recreation, have also been studied [15-17]. Contrary to popular belief, engaging in recreation, is not associated with poor performance [15,16]; rather it enhances learning possibly through boosting the students' stamina and mental fitness. The ambience of one's natural environment determines intellectual productivity and innovation; lower productivity has been associated with a hot and humid environment, while mental efficiency is presumably best in a cold environment [18,19]. Researches have suggested that students in hot and humid environments such as Sub-Saharan Africa should preferably study in the cold mornings and late evenings [20].

Agreeably, consistent hard work is one key ingredient that determines academic excellence in medical education. However, many students, especially in developing countries, generally perceive medical school to be rigorous and stressful, and this leads to anxiety that often affects their academic performance. Since the achievement of learning outcomes is the primary goal of all stakeholders in medical education, learning experiences should be tailored to achieve this. However, regardless of the affordances presented to a student, learning will not occur if other factors exist that significantly compete with the student's ability to engage. This study, therefore aimed at identifying some of the student-related factors that influence academic performance in the context of a developing country, with the view of informing interventions that will foster academic excellence.

Materials and Methods

This cross-sectional study investigated medical graduands within 0-12 months of graduation from the School of Medicine, Delta State University, Abraka, Nigeria. The medical school was established in the year 2012 and has graduated 11 sets of medical students. A clinical set typically comprises of not more than 50 students who are accommodated in a hostel with shared rooms. The institution provides basic amenities such as water, power and waste disposal to a reasonable extent. Students are responsible for their feeding, provision of stationery, textbooks, and Internet connectivity.

Ethical approval was obtained from the Delta State University Teaching Hospital Health and Research Ethics Committee. Only non-consenting doctors were excluded. A confidential self-administered questionnaire was used to obtain socio-demographic data, information about motivation to study medicine, social behaviours, study habits, dietary habits, family support, and self-perceived emotional status. The outcome variable was 'academic performance', and the number of resits students undertook during their years of training was the defining factor. Academic performance was categorised as '0-1 resit' and '>1 resits'. The Chi-square test was used to determine any relationship between potential influencing factors and academic performance. Data analysis was performed using IBM SPSS Statistics for Windows version 22 (IBM Corp., Armonk, NY, USA).

Results

Seventy-one newly graduated doctors were studied. Mean age was 25.1±2.6years, while males were in the majority (59.2%). Only 2.8% of the doctors were married (Table 1). Forty-eight out of 71 the students (67.6%) reported they were intrinsically motivated, while 32.4% of students were extrinsically motivated to study medicine. Of those extrinsically motivated, 75% were influenced by their parents.

Only 46.5% of students frequently used their curriculum as a study guide, while 15.5% tended to study ahead of their lectures. Sixty-eight out of 71 doctors (95.8%) study alone for >2hrs a day. Only 28.1% spent > 2hrs per week on peer-group discussions (Table 2). Forty-five out of 71 (63.4%) preferred to read lecture notes regularly, while 47.9% preferred their texts. The majority (95.8%) of the students owned smartphones, 15.5% used online learning resources regularly, and 8.5% had never used online learning resources; 71.8% spent more than 2hrs daily on social media entertainment.

Forty-eight out of 71 students (67.6%) participated in recreational activities; 68.7% of them engaged in these activities once to twice weekly while the remainder spent more than two days weekly. The majority (62.5%) spent 1-2 hours each time they engaged.

Thirty-two students (45.7%) sat for at least one resit examination during their years of training, 26.8% sat for more than one resit

examination, while 27.5% had no resit. More males than females had resit examinations (38.1% vs 10.3%, P=0.013). A significantly higher proportion of those who had 0-1resit engaged in more hours of peer group academic discussions compared to those who had more resit examinations (36.5% vs 5.2%, P=0.015). See table 3

Daily time on social media was >2hrs 73.7% and 71.2% in those with '>1' and '0-1' resit respectively, P=0.834. The three students

Table 2: Study hours for all students.

Daily Personal Study Time	>1 Resit	0-1 Resit	Total
<2 hours	0 (0.0)	3 (5.8)	3(4.2)
2-4 hours	13 (68.4)	36 (69.2)	49(69.0)
>4 hours	6 (31.6)	13 (25.0)	19(26.8)
Total	19 (100.0)	52 (100.0)	71(100.0)
X ² = 1.323, P =0.627			
Weekly Group Study			
<2 hours/week	18 (94.7)	33 (63.5)	51(71.8)
2-4 hours/week	1 (5.3)	19 (36.5)	20(28.2)
Total	19 (100.0)	52 (100.0)	71(100.0)
X ² =6.727, P = 0.015			

Table 3: Factors and association with academic performance.

Characteristics	Alln = 71	>1 Resitn=19	0-1 Resitn=52	P value
Males	42 (59.1)	16 (84.2)	26 (50.0)	0.013*
Group discussions >2hrs/week	20 (28.1)	1 (5.2)	19 (36.5)	0.015*
Single	69 (97.2)	18 (94.7)	51 (98.1)	1.000
Birth order (first-born)	25 (35.2)	6 (31.6)	19 (36.5)	0.784
Extrinsically motivated to study medicine	23 (32.4)	6 (31.6)	17 (32.7)	1.000
Engage in Recreation	48 (67.6)	12 (63.1)	36 (69.2)	0.775
Engage in extra-curricular activities	41 (57.7)	11 (57.9)	30 (57.7)	1.000
No smart phone	3 (4.2)	0 (0.0)	3 (5.8)	0.509
< 2hrs on social media daily	20 (28.1)	5 (26.3)	15 (28.8)	0.834
Takes Breakfast daily	33 (46.5)	6 (31.6)	27 (51.9)	0.180
Takes lunch daily	49 (69.0)	11 (57.9)	38 (73.1)	0.254
Takes dinner daily	62 (87.3)	17 (89.5)	46 (88.4)	1.000
Retires before 8pm	6 (8.4)	3 (15.8)	3 (5.8)	0.196
Always Sad	10 (14.1)	3 (15.8)	7 (13.5)	0.803
Always Angry	4 (5.6)	2 (10.5)	2 (3.8)	0.279
Always Happy	25 (35.2)	7 (36.8)	18 (34.6)	0.862
Always motivated to learn	28 (39.4)	6 (31.6)	22 (42.3)	0.415
Strong circle of friends	44 (62.0)	11(57.9)	33 (63.5)	0.784
Financial support+	40 (56.3)	9 (47.4)	31 (59.6)	0.423

Table 1: Demographic characteristics of students studied (n=71).

Characteristics	n (%) or Mean ± SD
Sex	
Male	42 (59.2)
Female	29 (40.8)
Marital Status	
Single	69 (97.2)
Married	2 (2.8)
Mean Age (yr)	25.1 ± 2.6
Religion	
Christian	71 (100.0)
Birth Position	
1 st	25 (35.2)
Other	46 (64.8)

who did not own smartphones had no resit examination ($P=0.509$). A higher proportion of students who had '>1 resits' compared to those with '0-1 resit' skipped breakfast (68.4% vs. 48.1%, $P=0.180$), skipped lunch (42.9% vs. 26.9%, $P=0.254$), retired early (15.8% vs. 5.8%), and described themselves as always angry (10.5% vs. 3.8%, $P=0.279$). See Table 3. On the other hand, a higher proportion of those with '0-1 resits' had available financial support (59.6% vs 47.4%, $P=0.415$), and motivation to study (42.3% vs 31.6%, $P=0.423$) compared to those who had more resit examinations. The proportion of students who engaged in recreational activities was comparable in both groups (69.2% and 63.1% $P=0.775$)

Discussion

This cross-sectional study of Nigerian medical grandaunts reveals that academic performance was better in females, and those who engaged in long hours of peer-group discussion; other behavioural and social factors did not influence academic performance significantly. Furthermore, the students seldom use online academic resources or their course curriculum as a learning tool.

The majority of the students (67.6%) in this study reported intrinsic motivation to enrol in medical school. Clayton B. compared motivation for studying medicine between the UK and Ghanaian medical students and similarly reported that 63.5% and 75.0% were intrinsically motivated in Ghana and the UK, respectively [21]. Extrinsic factors that may influence students to study medicine include parents' influence; income of physicians, job security and lifestyle, respect accrued to a physician, amongst others [21]. Parents influenced three-quarters of the extrinsically motivated students in this study.

Although all students receive student handbooks at the beginning of medical training, more than half of the students seldom referred to it for guidance in learning. The reasons for this behavior was not explored further in this study, but some possible reasons may include teachers not sufficiently emphasizing the usefulness or a lack of interest amongst students. Students may lack interest in their institution's handbook if they find it bulky and overloaded with endless lists of lecture topics and learning outcomes that are not specific, measurable, attainable, relevant and time-based (SMART).

The majority of students studied alone for more than 2 hrs daily, while only 28.1% engaged in peer-group discussions for more than 2 hrs per week. In a study by Shawwa et al., 73.5% of students preferred to study alone, while only 7.5% preferred group study [15]. Ideally, students are expected to engage in substantial hours of study to achieve their course objectives; however, the details of the course content and the student's learning styles may significantly affect the achievement of this goal. Authors have argued that both quantity and quality of study is essential for academic success, since long hours of consuming but ineffective study is counterproductive [22,23].

The students rarely used online learning resources, with a substantial proportion of them preferring to study their lecture notes and texts. Although this study did not explore the reasons for non-use of online resources, the main reason for this may be lack of Internet access since students bear the additional costs of Internet data out-of-pocket. Other plausible reasons may be lack of interest, perceived excess workload and lack of time to consult additional resources. In one Indian study, 66.2% of medical students affirmed that their department is connected to the Internet, while 51.2% used it daily [24]. However, the main reasons for using the Internet included mails (36.6%), academic (35.2%), and fun (19.2%) [24]. The opposite obtains for students in developed countries with regards to the availability of Internet resources; the required internet facilities are provided, while the teachers focus on guiding students to handle the excess information available online. The use of e-learning technologies is not a widely practised teaching method in many undergraduate institutions in Nigeria, the reasons being the scarcity of Internet connectivity and paucity of knowledge and skills

amongst the teachers.

Factors and Association with Academic Performance

Profile of students

This study shows that males were more likely to have a resit examination compared to females. Similarly, Dakum et al. in Nigeria found that fewer males (67.9%) passed the final year examination in surgery compared to females (93.3%), and the authors suggested several reasons including, more engagement in extra-curricular activities among males and more financial and family responsibilities [25]. They further suggested that females tend to handle pressures better than males and have better communication skills, which may put them at an advantage in oral examinations and traditional clinical examinations; and may be favoured by male examiners as a result of feminine appeal. The reason for the observation in this current study was not explored, but some additional suggestions are that females tend to be more available, committed, and studious; this may be due to fewer distractions as suggested above or socio-environmental conditioning that makes them acquire domestic skills and learn to multi-task in the process. Use of psychoactive substances also tends to be commoner among males, and the chase after their female counterparts may be an additional source of distraction, although this was not assessed in the current study.

Study habits

Engagement in the peer-group discussion was associated with better academic performance, and studies reported this as early as the 90s [26,27]. Fullilove et al. reported that introducing structured peer group/teamwork resulted in an improvement of D or F grades (equivalent to a numeric value of 1 and 0 respectively) for African American mathematics students from 60% to 4%, and students from ethnic groups who had previously struggled had exam scores similar to other students [26]. Angelo and Cross similarly discussed a case of a calculus instructor who observed improved student grades and a 100% pass rate for the first time in 30 years, after mandating his students to discuss their homework problem-solving strategies with classmates [27]. Academic discussions allow students to dialogue, reflect, question and create their knowledge; this enhances memory, boosts self-esteem, and ultimately results in improved academic performance [8,9]. However, students who are introverts or weak students may find this exercise uncomfortable, and some may develop a feeling of inferiority to brighter or more eloquent colleagues; this may affect learning negatively, and such students should receive extra attention.

Lifestyle and social habits

Majority of students owned smartphones and spent more than 2hrs on social networking daily Surprisingly use of social networking or owning smartphones did not significantly determine academic performance, although the three students who did not own smartphones had no resit examination. Shawa et al. corroborated this finding in a study of third to seventh-year medical students of a medical school in Saudi Arabia. They observed that although a higher proportion of students (47.1%) with a low-grade point average (GPA) spent long hours on social media compared to those with high GPA (27.5%), it did not reach statistical significance [15].

Social networking (SN) can play a significant role in modern-day education and has been recommended by notable medical associations [28,29]; but it may be a distraction if used excessively for entertainment. Although a high proportion of students in this study engaged in social networking, it appears this was mostly for messaging and entertainment as only 15.5% used online learning resources. This may explain why the three students who had no smartphones did not resit any examination. A study of medical students in Saudi Arabia reported that the main reasons for using social networking was for entertainment in 95.8% of

the students, and for academic studies in 40% [26]. Conversely, Lahiry et al from India reported that 88.5% of students of a medical centre used social media, and 82.7% used it for academic purposes [16].

Troussas et al extensively reviewed the literature on existing SN-based learning platforms and concluded that the tutoring systems available mainly possessed social features but do not provide adaptive and personalised learning; and they lacked support for complex decision making [1,31]. These authors have recently developed intelligent, adaptive and fuzzy-based inference systems, which will potentially revolutionise the application e-learning technology [13,14]. Unfortunately, even the basic e-learning technologies are not widely available or used in Nigerian institutions. Given that internet data bundles required for social networking is cheaper and widely used by students, teachers should be encouraged to acquire the necessary knowledge and skills in SN learning as this will provide exciting and effective learning for students.

Engaging in recreational and extra-curricular activities was commoner among students with better academic performance but did not reach statistical significance, and a study conducted in Saudi Arabia reported the same [15]. Recreational and extra-curricular activities boost the general well being of the student, making them physically fit, psychological balanced and mentally alert. However, students must manage time efficiently to avoid spending excessive time on these activities. Finally, other factors such as financial support, motivation to study, adequate sleep hours, having an inner circle of friends and positive self-perceived emotional status were relatively more present amongst students with better academic performance as was expected but did not reach statistical significance.

Study Limitations

Students were not interviewed, and so certain behaviours were not explored in detail. There is a potential for recall bias such that the longer the time since graduation, the less accurate their recollection may be. There is also a potential of not wishing to be 'honest' about certain questions. Definition of academic performance (number of resits) was subjective (based on students' reports), a more objective assessment may have been the students' summative assessment scores although this was not feasible because of the need to maintain confidentiality.

Conclusion

A considerable proportion of students did not use online learning resources, although they spent considerable hours on entertainment social networking. The students seldom used their course curriculum during private study time.

Almost half of the students had at least one resit examination during their undergraduate medical training. Examination resit rate was significantly commoner among males and those who had fewer hours of peer group academic discussions. Recreational activity, skipping meals, time of retiring, time on social media, an inner circle of friends, and financial support, did not significantly affect academic performance.

Findings from this study will inform future interventions geared towards improving the academic performance of students in Nigerian medical institutions.

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