

Exploring the determinants influencing university students' high academic achievement: A High Performance Equation Model

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This exploratory study examined the determinants of university students' academic achievement through the employment of Schermerhorn's High Performance Equation Model (Schermerhorn, Jr., 1984). Cross-tabulations and Spearman's rho were used to examine the nature of the relationships between the constructs of the proposed high academic achievement framework. The study also made an interesting contribution towards investigating the determinants' landscape believed to have strongly influenced the students' high academic achievement. The findings provide both a strong foundation and methodological base for further investigations into assisting undergraduate students towards high academic achievement.

Keywords: High academic achievement, academic achievement, achievement motivation, motivation, higher learning motivations.

Introduction

Students vary in their strength of academic motivation to start and pursue Finance training (e.g., an undergraduate degree in International Finance). For this reason, we at Universiti Malaysia Sabah are interested in examining the true nature of the determinants leading to their high academic achievement (i.e., high and low achievement motivation).

As university policy makers, particularly in Malaysia are becoming more and more concerned with the relationship between entry grades and performance at university, some common questions (common) that we might initially ask are:

- Do students who score high on entry grade (i.e., right ability) perform well in university?
- Do students who score low on the entry grade (but with significant amount of effort) perform marginally in university?
- Is there any relationship between parental/tutor/university support and student's effort towards her or his studies?
- Is there any relationship between students' ability and their effort towards their studies?

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In many instances, when academic performance was generally down, it was so easy to blame the students involved for meagre ability or insufficient effort, and to underrate the influence of situational inadequacies such as limited parental, collegial, tutor and university support (Anaya & Cole, 2001; Sinclair, Dowson & Thistleton-Martin, 2006; Jones & Jones, 2015).

On the other hand, perceived strong pressure (i.e., from the parental, collegial, tutor and university) to do well in university may well “backfire” on significant number of students (Dillard and Pfau, 2002; Yang, 2004; Bishop, 2006; Savvidou, 2013) as it has caused a growing use of maladaptive learning strategies. As a result, the significance of understanding this phenomenon of high academic achievement cannot be understated. The purpose of this study is thus to explore the landscape of the determinants (i.e., ability, effort and support) believed to have strongly influenced the students’ high academic achievement through the employment of Schermerhorn’s High Performance Equation model (Schermerhorn, Jr., 1984).

This study was developed to make a significant first step towards investigating the nature of the determinants believed to have influenced the student’s academic achievement. The findings will also provide both the foundation and methodological bases for further investigations into the student’s prerequisite for high academic achievement.

Review of the literature

There is an abundant empirical literature that reveals countless behavioral correlations of high academic performance and achievement motivation (Ames, 1992; Noguera, 2003; Dekker & Hansen, 2004; Holmes, Gathercole and Dunning, 2009). Need for achievement (achievement motivation) refers to the strength of a student’s desire to excel, to succeed at problematic tasks and to do them better than others. Braten & Olaussen (2005) argued that people with achievement motivation tend to evade tasks that are extremely simple (because these offer little challenges) and that are immensely difficult (because these are likely to result in failure). They also argued that students may have faith in what they can study but see no reason for doing them, whereas others may see decent reasons for studying tasks but do not trust that the tasks can be properly done, i.e., students who believe they possess the ability to perform many different tasks are high in generalised self-efficacy, and they often achieve higher levels of performance than those of who lack such self-confidence in their abilities.

In addition, these findings were in line with Carlson’s studies (Carlson, 1997) who strongly argued that students who imposed high standards on themselves may be inspired by external reward for their academic work (e.g., grades) and concerns with their rivals. In short, the multidimensional nature of achievement motivation and its relationships to strong academic performance have generated much research for the last three decades (Boyd, Lankford, Loeb, & Wyckoff, 2005; Nichols, Glass & Berliner, 2006).

Characteristics of high achievers

Many studies in the academic motivation have confirmed the interest in the subject matter (Breen & Lindsay, 1999; Eastwood and Lipton, 2002; Nichols, Glass & Berliner, 2006). Through years of empirical research, however, McClelland (1985) and his colleagues have identified a set of three characteristics that describe high achievers.

First, high achievers (e.g., students) like situations in which they take personal accountability for finding solutions to problems. They need to play a lively role in determining the outcome rather than relying upon chance or luck. They want to make their

own opportunities. These people wanted to be successful through heavy labor (i.e., consistently chose to work the complex problem).

Second, high achievers tend to take only moderate risks rather than high or low risks. If they take a stumpy risk, there is little pleasure in the accompanying success. If they take a high risk, there is likely to be little satisfaction because the chance of success is so remote (Eccles, Vida and Barber, 2004). In addition, failure to realise may prove to be a source of frustration. The best chance for maximising a sense of achievement (i.e., a proud feeling of having done something difficult and worthwhile) and the likelihood of success occurs with moderate risks. Third, high achievers want tangible feedback (both summative and formative) on their performance. They like to distinguish how well they are doing. There is suggestion that positive and negative criticisms concerning a prior performance harvests better performance among persons high in attainment motivation.

High Performance Equation

Schermerhorn, Jr. (1984) argued that they vital effects on the level of work performance can be illustrated by:

$$\text{Performance} = \text{Ability} \times \text{Effort} \times \text{Support}$$

This equation argues that there is a strong belief that a high level academic performance results from the blend of task-related skills. If one of them are missing, high performance will be seriously negotiated. The multiplicative supposition of this equation also implies that if any one components is zero, then the overall level of work performance is none. He further claimed that,

“A hard-working individual with great support can't perform without the required abilities. A capable individual willing to work hard can't perform without good support. The competent individual who is well supported but unwilling to put forth the necessary effort won't be a high performer (Schermerhorn, Jr., (1984), p.268).

The equation further specifies that all three components must occur for high performance to fully transpire. To explore Schermerhorn's claims, the components of the model are scrutinised in details.

Performance requires ability

Ability is the power of a person to do something, while skill refers to the level of talent one has in performing a specific task. It includes both the natural aptitudes and the learned capabilities required to effectively complete a given task. Intellectual abilities are abilities needed to perform mental activities – for reasoning and problem solving. Undergraduate students, particularly in developing countries place a high value on intelligence. Although the changing nature of work proposes that logical abilities are becoming increasingly important for many study related task, and will remain, vital for a student who would like to successfully doing certain study related task.

Many people have the ability to do a job but have not acquired the skill to do it commendably. For example, one may have enough finger dexterity to be a fast typist, but she may have never learned more than to chase the peck while typing. In this instance, she has the ability, but not the skill. Skills can be learned faster if the basic abilities are present. Psychologist (McNeill and Wang, 2005) has argued that there are four types of abilities people may have:

- Creative ability: manipulating, arranging, and grouping symbols in ways that are fresh and useful.
- Mechanical ability: seeing and manipulating spatial relationships, understanding how pieces fit together as a whole.
- Mental ability: intelligence and knowledge; verbal and numerical ability.
- Motor ability: physical manipulation of objects.

In short, undergraduate students vary so widely on each of these ability dimensions (Vance & Schlechty, 1982; Gerdes & Mallinckrodt, 1994; Covington & Teel, 1996; Newmann, 1996; Gitomer & Latham, 1999; Eastwood & Lipton, 2002). These differences are caused by both genetic and environmental determinants. Ability, for instance, is nonetheless the basis of aptitudes from which performance potential can be really optimised. It establishes a student's capacity to properly perform at a high level of achievement.

Performance requires effort and support

Schermerhorn, Jr. (1984) further argued that the most lasting motivation is driven within the student herself as offers of monetary rewards. Effort can be defined as a conscious force of physical or mental power to seriously achieve a particular purpose or result while Schermerhorn, Jr. (1984) further argued that effort as an irreplaceable foundation of high achievers' environment. This effort may be generated by a need for esteem, for self-actualisation or for knowledge and understanding. Even the most talented students won't attain consistent high performance unless they are willing to work hard enough (Henningsen, & Stein, 1997; Sinclair, Dowson, Thistleton-Martin, 2006).

In the case of support, without it, even the most accomplished and hard-working students will still be a marginal performer. It creates a work environment rich in chance to apply one's talents to full advantage. The High Performance Equation has been employed in many organisational behavior studies. It has been used in understanding the nature of high achievers at workplace.

Research methodology

The chosen research design model was led by ongoing outcomes throughout this research. Firstly, it was due to the exploratory nature of this study. In addition, the literature examining the employment of the equation showed little effort has been done in the higher education domain.

A request was made to the faculty for relevant students to be interviewed (i.e., who have scored all As when they were in the first year of their studies). To the investigator's surprise, only 5 students were identified as being qualified as potential informants for this study. These students were then approached for full-scale in-depth face-to-face interviews. Three students rejected the request due to the forthcoming end of term examinations, leaving only two possible informants. These two students were interviewed and their insights were employed to guide the development of the questionnaire. The interviews have assisted the research process in several ways:

- First, it helped to refine the nature of the questions as well as the overall research design that can be followed.
- Second, it helped to clarify the proposed theoretical framework of the study by allowing a focus on several main issues that may have been unclear previously.

By viewing the pilot process as being exploratory, these pilot cases offered valuable insights into the central issues being studied as the data was used in parallel with the ongoing

review of the literature. These interviews were also used to further understand the meaning of three main determinants outlined by Schermerhorn's (1984) High Performance Equation.

This understanding played a crucial role in the subsequent survey research questionnaire processes (e.g., in developing the correct attitude measurement of the items). The findings from the pilot interviews were used in developing the questionnaire, resulting in a more credible set of questions. This increased the confidence that no particular determinants should be given more attention than another. From the pilot processes, a better understanding of the determinants discussed in the literature emerged.

The examples provided by both students clarified many of the arguments presented by the literature, for example, in the second interview the actual meaning of 'support' became far more apparent through the descriptions given. This process mirrors a phenomenological interpretation of the world. The key feature of this sampling approach is that population elements were purposively selected while the questionnaires were pre-tested shortly after the questionnaire was developed. In an iterative mode, a large number of items were generated, discussed, rephrased, and reduced.

The respondents were asked how they thought or reasoned when they had responded to the items developed. Refinement was done and the questionnaire was distributed via email. The respondents were purposively selected from the second and third year students. The questionnaire was sent to them through e-Mail. A total of 45 responses were received and 5 responses were removed due to perceived frivolity. The questionnaire comprised of 5 main sections. Section 1 introduces the objective of the survey. With a 5-point Likert-Scale, sections 2-4 measure the ability, effort and support characteristics of the respondents.

Analysis of data

Two stages of data analysis were conducted to appreciate the nature of the variables influencing student's high academic achievement:

- First, descriptive statistical-based tests (mainly cross tabulations) was run to determine the nature of the data that have been gathered¹, and
- Second, Spearman's rho was used to measure the degree of association between these determinants.

The analysis started by exploring the profile of the respondents (Table 1). Only 8.5% of the respondents have scored all As in their first year examination while 25.5% of them did not have any As at all. Table 2 further explores the relationship between the respondents' grades and the nature of their living (accommodation). 91.5% of them were staying off-campus when the interviews were conducted.

Table 1. Number of as in first year examination against their gender.

	Male	Female	Percent
1 A	5	5	21.3
2 As	2	8	21.3
3 As	3	5	17.0
4 As	2	1	6.4
All of them (5 As)	2	2	8.5
None	6	6	25.5

¹Cross-tabulation is one important approach to bivariate analysis aimed at explaining the relationships between variables and uncovering the regular patterns among events and variables.

Table 2. Living on campus

	Yes	No
1 A	1	9
2 As	1	9
3 As	2	6
4 As	0	3
All of them (5 As)	0	4
None	0	12

Table 3 shows how many of these respondents were working while studying for their degrees. In total, 68.8% of them were working. Out of this amount, 6% of them were working more than 10 hours a week. The table does also indicate that 26.7% of those who were not working did not do well in their first-year examination (i.e., have no As at all) while those who have at least one A (17%) were working on a part-time basis. In this case, one might suggest that working part-time should not impair the student's overall academic achievement.

Table 3. Working status (respondents)

	Working hour per week		
	Less than 10 hours	Between 10 – 20 hours a week	Not applicable
1 A	8	0	2
2 As	5	1	4
3 As	5	0	3
4 As	2	0	1
All of them (5 As)	3	0	1
None	7	1	4

Table 4 indicates the family income cross tabulation of the sample. Family income is one of the strongest socio-economic status indicators of any given populations. It does symbolise one's family ability to bear the student's educational costs (i.e., financial support). To understand that nature of these respondents' further, the study also explored the parents' working status. Table 5 and Table 6 indicate the parents' working status, showing 89.4% of the respondents' father was in full-time employment.

Table 4. Respondent's family income

	Less than 25K	Between 25K – 50K	More than 50K
1 A	5	5	0
2 As	7	1	2
3 As	5	1	2
4 As	1	2	0
All of them (5 As)	1	2	1
None	2	6	2

Table 5. Respondent's father working status

	Full-time	Part-time
1 A	9	1
2 As	10	0
3 As	7	1
4 As	3	0
All of them (5 As)	3	1
None	10	2

Table 6. Respondent's mother working status

	Full-time	Part-time
1 A	4	6
2 As	6	4
3 As	6	2
4 As	2	1
All of them (5 As)	3	1
None	8	4

Table 7 provides a preliminary indication of the respondents' level of effort. 40.4% of those who scored As studied less than three hours per day while 12.8% of the respondents who have studied between 3 – 6 hours per day ended up with no As at all.

Table 7. Time spent to study

	Less than 3 hours	Between 3 – 6 hours
1 A	5	5
2 As	7	1
3 As	5	1
4 As	1	2
All of them (5 As)	1	2
None	2	6

The following two tables (Tables 8 and 9) provide some indications upon the respondents' nature of ability to perform as high performers. For instance, Table 9 indicates that those students who scored at least an A (68.8%) in their first year examination were able to study the subjects which they did not prefer (although, 32% of them dislike what they were studying). On the other hand, Table 9 further indicates respondents' responses on their abilities to keep on working with their studies.

Table 8. Ability to study subject (s) that I do not like

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Not very typical of me	1	3	2	1	1	7
Somewhat typical of me	0	2	3	2	0	1
Fairly typical of me	9	5	3	0	4	4

Table 9. Ability to fully concentrate when studying

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Not at all typical of me	0	0	1	0	0	1
Not very typical of me	1	3	2	1	1	7
Somewhat typical of me	7	2	1	0	3	2
Fairly typical of me	2	5	4	2	4	2

Table 10 indicates the nature of the respondents' ability to keep on working when subject is dull (i.e., 89.4% of them did keep working on the subject even when it's dull and not interesting) and 76.2% of these people have scored at least an A in the first year of their examinations.

Table 10. Ability to keep on working even when subject is dull

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Very often	9	9	7	3	4	10
Rarely	1	1	1	0	0	2

On the other hand, 31.9% of the sample argued that they have always been up-to-date with their coursework (even though 21.3% of them were generally lagging behind). Only 1 out of 4 (25%) of those who have scored all As was in the habit of borrowing recommended textbooks (see Table 11) while 80.9% of the sample has not been borrowing any as specified in their subject guides. Moreover, only 36.1% of those who have at least an A in their first year examination has never prepared for the lectures in advance. However, 58.3% of those who have no As indicated that they have been preparing for the lectures in advance (see Table 12).

Table 11. Effort to borrow the recommended textbook

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Always	0	4	4	2	0	1
Very often	3	4	3	1	1	9
Rarely	1	2	1	0	3	2

Table 12. Effort to prepare lecture in advance

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Very often	0	0	3	0	0	1
Sometimes	3	5	3	3	3	7
Rarely	1	1	0	0	0	0
Never	6	4	2	0	1	4

To appreciate the respondents' level of effort further, we asked them how seldom they have missed their lectures. 4.3% of the sample has missed their lectures significantly while 77.1% of them do miss their lectures from time-to-time. The respondents have also been given an opportunity to indicate how worried they were about their studies. Table 14

indicates that 21.3% of the respondents generally do worry (seriously) about their studies. On the contrary, 25.5% of them do not fear (i.e. rarely) about their studies.

Table 13. Frequency of missed lectures

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Very often	1	2	0	0	0	2
Sometimes	8	7	5	3	4	9
Rarely	0	0	3	0	0	1
Never	1	1	0	0	0	0

Table 14. Worry about studies

		# of As in first year					
		1A	2As	3As	4As	All of them	None
Very	often	2	3	2	0	1	2
		2	1	2	2	0	4
Sometimes		4	0	1	1	3	5
Rarely		2	6	3	0	0	1
Never							

The following three tables (Tables 15, 16 and 17) indicate the significance of support of their parents, lecturers and colleagues in relation to their academic achievements. 42.6% of the respondents believed that it is crucial to have the support from their parents while 72.3% of them believed that it was also important to have the support from their lecturers. Additionally, 95.7% of the respondents believed that was also vital to have some backing from their colleagues. Moreover, Table 18 indicates that 63.8% of the sample perceived that they have more than sufficient financial support.

Table 15. Parents' support matters

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Very important	3	3	3	1	0	2
Important	3	4	1	1	2	4
of little important	4	3	4	1	2	6

Table 16. Lecturers support matters

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Very important	0	0	0	0	0	1
Important	7	8	8	1	3	6
of little important	3	2	0	2	1	5

Table 17. Colleagues' support matters

	# of As in first year					
	1A	2As	3As	4As	All of them	None
Very important	9	9	7	3	4	11
Important	1	0	0	0	0	1
Of little important	0	1	1	0	0	0

Table 18. Financial support (Sufficiency)

	# of As in first year					
	1A	2As	3As	4As	All of them	None
More than sufficient	7	5	4	3	3	8
Sufficient	3	5	4	0	1	4

To further appreciate the correlation between the items of the key constructs (i.e., ability, effort and support), Spearman's rho correlation was performed to fully measure the degree of their associations.

Table 19. Degree of associations between the items used in measuring the students' ability.

Items (Ability)	1	2	3	4	5
Trouble in figuring out what I s significant (1)	1.000	0.398**	0.817**	0.485**	0.204
Able to study subject which I don't like (2)	0.392**	1.000	0.805**	0.805**	0.912**
Unable to summarise what I hear or read (3)	0.817**	0.805**	1.000	0.409**	0.590**
Concentrate fully when studying (4)	0.485**	0.501**	0.409**	1.000	0.524**
Hard to stick to study's schedule (5)	0.204	0.901**	0.590**	0.524**	1.000

*. Correlation is significant at the 0.05 level (2-tailed).

**.. Correlation is significant at the 0.01 level (2-tailed).

The items (Table 19) developed measure 3 areas of student's ability, i.e., in dealing with her subject (1-3), her general studies (4) and her timetable management abilities (5). From the table, one might argue that there is a relatively strong relationship between students' ability (in determining what was significant for her lecture) and her ability to summarise what she heard or read about her studies. Moreover, there is a relatively strong relationship between one's ability to summarise what she heard or read about her studies and her ability to study any subjects she did not prefer. Table 20 indicates the degree of association between the items used to measure the students' effort. The items developed measure student's effort in relation to her subject including its coursework, her attitude towards the lectures and her general studies.

In addition, based upon the same table, one could argue that there is a relatively significant relationship between one's willingness to keep her coursework up-to-date and her keenness in reading the textbook which has been assigned. On the contrary, there is a weak association between one's desire to borrow the recommended textbook and her willingness to

prepare for her lecture well in advance. Moreover, there is a relatively significant relationship between those who came to their lectures unprepared and those who missed their lectures frequently. However, there is a strong relationship (0.858**) between those who missed their lectures (frequently) and those who have purchased the recommended textbook for their lectures.

Table 20. Degree of associations between the items used in measuring the students' effort.

Items (Ability)	1	2	3	4	5	6	7	8	9	10
Keep on working even when the subject is dull (1)	1.00	0.22	-0.11	-0.12	-0.152	0.39	0.47	-0.159	0.277	0.25
Up-to-date with coursework (2)	0.22	1.00	-0.30*	0.00	0.32*	0.28*	0.49**	0.58**	-0.01	0.12
Borrow the recommended textbook (3)	0.11	0.30*	1.00	0.31*	-0.21	0.40**	-0.20	-0.25	0.06	0.22
Come to lecture unprepared (4)	-0.12	0.00	0.31*	1.00	0.66**	0.22	0.56**	-0.14	0.24	0.20
Miss lecture frequently (5)	0.15	0.32*	-0.21	0.66**	1.00	0.40**	0.85**	0.17	0.03	0.07
Prepare for the lecture in advance (6)	0.03	-0.28*	0.40**	0.22	0.40**	1.00	0.56**	-0.70	0.35*	0.70
Purchase the recommended textbook (7)	0.04	0.49**	-0.20	0.56**	0.85**	0.56**	1.00	0.21	-0.02	0.00
Read assigned textbook (8)	0.15	0.58**	-0.25	0.14	0.17	-0.76	0.21	1.00	-0.06	0.01
Translate lecture notes into own words (9)	0.27	-0.01	0.06	0.24	0.03	0.35*	-0.02	0.06	1.00	0.14
Worry about studies (10)	0.25	-0.12	0.22	0.20	0.07	0.70	0.00	0.01	-0.14	1.00

*. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 21. Degree of associations between the items used in measuring the students' support.

Items (Ability)	1	2	3	4	5	6	7	8	9	10
Set high standards by parents (1)	1.00	0.60**	0.27	0.37**	-0.17	0.27	-0.08	-0.157	0.09	0.28

Parents' support availability (2)	0.60**	1.00	0.75**	-0.31*	0.47**	0.06	-0.32*	-0.163	-0.134	0.28
Parents' support matters (3)	0.27	0.75**	1.00	0.38**	0.55**	0.09	-0.31	-0.18	-0.03	0.2
Set high standards by lecturers (4)	0.37**	-0.31*	0.38**	1.00	0.52**	0.45**	0.15	0.31*	-0.08	0.49**
Lecturers' support availability (5)	0.17	0.47**	0.55**	0.52**	1.00	-0.35*	0.31*	0.10	-0.04	-0.32
Lecturers' support matters (6)	0.27	0.06	0.09	0.45**	0.35*	1.00	0.43**	-0.14	0.06	-0.12
Colleagues' support availability (7)	0.08	-0.32*	-0.31*	0.15	0.31*	0.43**	1.00	0.72**	0.12	-0.12
Colleagues' support matters (8)	0.15	-0.16	-0.18	0.31*	0.10	-0.14	0.72**	1.00	0.34*	-0.26
University support availability (9)	0.09	-0.13	-0.03	-0.08	-0.04	0.06	0.12	-0.34*	1.00	0.15
University support matters (10)	0.28	0.28	0.26	0.49**	0.32*	-0.12	0.12	-0.26	0.15	1.00

*.Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table 21 indicates the degree of associations between the items used to measure the students' support (i.e., parental, lecturers, colleagues, financial and university-wide support). There is a significant relationship between parental expectation of their children's academic achievement and the availability of their support. There is a strong relationship between the availability of parental support and those who believed that parental support was important. Moreover, one might argue that there is a significant relationship between the availability of lecturers' support and those who believed that lecturer's support was important. Meanwhile, there is only a relatively weak correlation (negative) between those who believed in the importance of support (at the university level) with lecturers' high expectation of their students' academic achievement.

Discussion

The main purpose of this exploratory study was to examine the students' nature of high academic achievement through the employment of the High Performance Equation (that consists of ability, effort and support) as proposed by Schermerhorn, Jr, (1984). The study was conducted at Universiti Malaysia Sabah, Labuan Faculty of International Finance. Basic cross tabulations and Spearman's rho were used to measure the nature of the association of the proposed constructs.

In terms of ability, we learned that there was only a weak correlation between one's ability to study the subject a student did not prefer. This indicates that those who were able to study any given subjects (whether they prefer it or not) would not have any difficulties in

understanding the subjects. On the contrary, there was a strong correlation between those who have difficulties in determining what was significant in their subjects and one's ability to stick to his or her study's roster. This indicates that those who were having difficulties in understanding their subjects might also be facing difficulties in managing their studying time effectively.

In terms of effort, we learned that there was a strong correlation between those who have missed their lectures (frequently) and their effort in purchasing recommended textbooks. Similarly, there was also a correlation between those who came to lecture unprepared and their effort in purchasing recommended textbooks. The study does also indicate a correlation between those who kept their coursework up-to-date and their effort in purchasing recommended textbooks. For this reason, one could argue that those who were away from their lectures (frequently) would increase their effort in keeping their coursework and reading up-to-date.

Perhaps the most interesting determinants between students who are high and who are low in academic achievement involves the support they received. There is a relatively strong correlation between those students who have to fulfil their parent's high expectation and the availability of parental support. One could argue that for performance not to be marginalised, both parties (parents and students) have to rely upon each other. We also found that there was a positive relationship between those lecturers who have set high expectations on their students' performance and the availability of their support. For this reason, one may argue that lecturers should only expect their students to work hard only when they could provide adequate amount of support.

Conclusions and directions of future research

Schermerhorn, Jr. (1984) claimed that a sense of competency is nonetheless a natural motivator at university as well as at home. The all-important motivational drivers (i.e., ability, effort and support) comes from within and around a university student. Once aroused, it goes a long way toward encouraging hard work. Unfortunately, most university students will do what's easiest and avoid hard work.

One might criticise the proposed equation has limited use, as it tends to be more valid for predicting situations where effort-performance is clearly perceived by the student. However, rather than invalidating the model, this criticism can be used in support of the proposed model, for it explains why a large segment of the students exerts a minimal level of effort in carrying out their responsibilities.

The study has made a significant first step towards investigating the nature of the determinants believed to have influenced the student's high academic performance. It has provided some points for the university to ponder with, in its attempt to generate more high performing students academically. The findings of this study will be the empirical bases for further investigations into student's need for high achievement. In addition to the small sample size, the findings of this study are limited to the constructs proposed by the model that we have selected (i.e., the High Performance Equation). Nonetheless, this model offers a parsimonious means to understand the phenomenon of students' high academic performance at universities in Malaysia. For instance, if the strength of high academic performance could be measured as a valid construct, and this construct would relate to effort, invested in studying, it would be a worthwhile construct, and this construct of help to advise students and it would be helpful in admission screening processes. Future research should observe further the equation as well as its findings.

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