Measuring Student Learning Approaches and Generic Skills: A Multi-Group Analysis of Gender Differences

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Abstract
The present study sought to measure student learning approaches and generic skills and to determine the influence of learning approaches on the undergraduates' generic skills. By utilizing structural equation modeling (SEM), the study aimed to identify if there are any gender differences in the relations. The study adapted the Revised Approaches to Studying (RASI) (Duff, 1997) in order to measure the learning approaches and the Course Experience Questionnaire (CEQ) (Wilson & Lizzio, 1997) to tap into the students' generic skills. A total of 233 undergraduates from various religious studies disciplines took part in the survey. The study utilized purposive sampling in the data collection in which only final year students were sampled. Using multi-group analysis via SEM, the data showed that the models for boys and girls differed in which the girls' surface approach negatively influenced their generic skills. Unlike the girls, the boys' strategic and surface approaches are related to generic skills, each having a positive and negative relationship respectively. Interestingly, the boys' model also accounted for a higher explained variance (47%) compared to that of the girls' (23%). A model of the relationship between the learning approaches and generic skills used was subsequently proposed. The study uncovered how the boys' and girls' learning approaches may influence the teaching and learning in the classroom and on students' generic skills, subsequently graduate employability. A number of suggestions have been forwarded so as to escalate the use of generics skills among the students of various religious studies disciplines and those of girls in particular.

Keywords: generic skills; learning approaches; multi-group analysis; undergraduates

Introduction
The matching of graduate quality with the requirements of employers has become one of the central challenges faced by universities around the world and it has caused worries among certain quarters (Masura, Kamsuria, Sufian & Nor Faridatul Ainun, 2012). The importance of generic skills related to the students' employability is undeniable. Generic skills have become one aspect of job competency which enables graduates to be highly valued by their respective employers (Hazilah, Johari, Zaihosnita, Saidah & Hamizah, 2013). In addition, a number of studies have indicated that the employability of a graduate does not solely depend on academic excellence alone but also on

a number of other factors such as practical and soft skills (Beard &, Schwieger & Surendran, 2007; Mariana, 2008; Mohamad Sattar, Md. Yusof, Napsiah, Muhammad Rashid, & Rose Amnah (2009); Nik Azma, Rahmah & Ishak, 2011; Yassin et al., 2008).

In Malaysia, the studies on the soft skills, sometimes known as generic skills, among students in higher learning institutions suggest that much needs to be done in order to promote these sought-after skills (Roselina Shakir, 2009; Ruhizan M. Yasin, Saemah Rahman, Ramlee Mustapha & Kamarudin Tahir, 2011). As a result, universities need to know what the antecedents of generic skills development are and how they can promote the antecedents of generic skills among the students while they are still in their respective institutions. One of the antecedents, and as such the main focus of this study, is learning approaches. A number of studies have linked learning approaches to academic achievement and performance (Biggs, Kember, & Leung, 2001; Chamorro-Premuzic & Furnham, 2008; Dart, et al., 2000; Duff, Boyle, Dunleavy & Ferguson, 2004; Fenollar, Roman & Cuestas, 2007). On the contrary, there appears to be inconclusive evidence relating learning approaches and generic skills development thus far (Lizzio et. al, 2002).

Furthermore, it is important to note that a glance at the review of the literature suggests that gender differences in learning continue to exist and are still prevalent today. Boys and girls are said to learn differently (Gurian & Stevens, 2004; Noble, Brown & Murphy, 2001). Other studies provided us with inconclusive findings on the types of learning approaches utilized by boys and girls, with some of the studies showing the girls preference for the surface approach to learning (Byrne et al., 2002; Hassal & Joyce, 2001). Other studies showed that boys utilize deep learning more than girls (Ahmed, Ahmed, Waheed, Shoaib & Khan, 2014 & Lie & Angelique, 2007). Studies on generic skills, on the other hand, have painted us a different picture. Boys are shown to have higher generic skills compared to girls (Abdul Malek Abdul Karim et al., 2012).

The present study thus focuses on how learning approaches are related to generic skills and whether the influence differs for boys and girls. As such, multi-group structural equation modeling analysis adds to the insights on the depth of this study. The findings will provide us with the idea approach to improving the students' generic skills, particularly those of girls.

Review of Literature

Generic Skills
A growing body of research has emerged in relation to the issue of developing generic skills among students in higher education. According to Lublin (2003), generic skills are the skills required by the students in order to ensure that they are visionary and competitive enough to face the job market. Rosima, MohdIzham and Nora (2013) revealed that the employers surveyed in their study are dubious about hiring graduates due to their inadequacy in terms of the generic skills that the students possess. There are currently a number of terminologies used as a referent to generic skills within the research community. Other terms used interchangeably include employability skills, transferable skills, non-technical skills, key skills, essential skills and 21st century skills, to name a few. These skills are thought to be relevant both at the employment entry level and among established employees (Suarta, Suwintana, Sudhana & Hariyanti (2017).

Subsequently, when addressing the issue of a lack of generic skills among the students from higher learning institutions, the Malaysian Ministry of Higher Education developed a framework called the Malaysian Qualification Framework (Malaysian Qualification Agency, 2006). As such, the framework presented the guidelines and subsequently listed 8 elements to be involved in learning outcomes,

namely: (1) knowledge, (2) practical skills, (3) skills and social responsibilities, (4) ethical, moral and professionalism, (5) communication, leadership and teamwork, (6) critical thinking, problem solving and scientific skills, (7) information management and lifelong learning, and (8) management and entrepreneurship skills. Nevertheless, only two of the learning outcomes are related to the academic domain, namely i.e. knowledge and practical skills (Sharifah Azizah & Haslinawati, 2018).

Within the Malaysian context, the concept of employability focuses on three aspects namely the ability to (1) gain initial employment, (2) to maintain employment and make transitions between different jobs and roles within the same organization in order to meet new job requirements and (3) to obtain new employment if required (Sirat et al., 2012). As such, in order to meet the terms of the aforementioned concept of employability, graduates need to possess the attributes as delineated within MQF.

Learning Approaches
The students' learning approach is about describing and assessing their learning processes (Entwistle et al., 2001). The first proponents of the learning approach were Marton and Saljo (1976). They coined the concept and further categorized learning approaches into the surface and deep approaches respectively. Biggs (1987) and Entwistle (1987) asserted that the basic difference between both deep and surface learning approaches is that the deep approach is aimed towards the intention to understand. Thus students who apply the deep approach in learning are said to be intrinsically motivated while at the same time, they enjoy the learning tasks. Surface approach individuals, on the other hand, are extrinsically motivated by avoiding personal understanding and learning through minimal effort. It was Entwistle (1987) who added the third approach – the strategic approach - to Martin and Saljo's (1976) existing framework. Entwistle contended that the students who adopt the strategic approach in learning focus on achieving well in terms of the academic content (i.e. deep approach) and the demands of the assessment system.

Some studies on learning approaches have claimed various things on the relationship between learning approaches and generic skills (Goh, 2005; Lizzio, Wilson & Simon., 2002; Ryan, Irwin, Bannon, Mulholland, & Baird, 2004). It has been proposed that learning approach impacts on the learning outcome since the learning approach is an indicator of quality learning (Biggs, & Tang, 2007). According to Ingleton (1995), within the learning environment, students bring about meanings through their experiences in social settings, ethnicity and gender among others. As a result, it is pertinent to examine the relations between learning approaches and generic skills, particularly in relation to gender differences. As such, modeling the relations between the two constructs and comparing the relations in both the boys' and girls' models will shed a light on how universities can prepare and help to promote generic skills while the students are still on campus.

Gender Differences in Generic Skills and Learning Approaches
Reviewing the role of learning approaches in explaining gender differences, it was found that the girls outperformed boys in terms of the surface approach to learning (Byrne et al., 2002; Hassal & Joyce, 2001) despite Koh and Koh's (1999) study that claimed that the boys in their study utilized the surface approach more than girls. A recent comparative study conducted in two Pakistani universities by Ambreen and Nawaz (2017) showed that there were no differences in the learning approaches of boys and girls while Ahmed, Ahmed, Waheed, Shoaib and Khan (2014) and Lie and

Angelique (2007) contended that the boys used more deep approaches. A meta-analysis by Severians and Dam (1994) on 26 studies focused on learning approaches concluded that girls learn for the sake of learning while boys prefer abstraction and conceptualization.

The generic skills, on the other hand, provide us with mixed findings. However, in general, boys are said to have obtained higher levels of generic skills compared to girls. A large-scale national level study by Abdul Malek et al (2012) involving 10,140 students in both Malaysian public and private universities pointed out that boys outperformed girls in all generic skills except in team-work and moral and professional ethics. The study attributed this finding to the boys' inclination to individualistic traits and aggressiveness which caused their lower scores in team-work. Kamarul, Farah, Hasnah, Manoriza and Zairiniah's (2017) investigation, on the other hand, illustrated the girls' dominance in generic skills.

Based on the research grounds discussed above, it is envisaged that the students' learning approaches will have a positive influence on generic skills. Therefore in order to fill in the research gap mentioned earlier, the primary focus of the present study was to examine the relations between the three types of learning approaches on the student's generic skills and whether the models for boys and girls differed significantly. Since there appeared to be current trends in academia that address the issue of generic skills development, it is therefore pertinent to examine how the learning approaches and generic skills are predicted so then efforts can be made to improve the generic skills development. As such, the aim of this study was to develop not only a model that can explain the two constructs understudied but also to develop individual models for both genders, should they differ.

Research Questions
Specifically, the following research questions have been addressed:
RQ1: What is the level of generic skills and what are the top three dominant generic skills?
RQ2: Are there significant differences between the overall generic skills and specific generic skills based on gender?
RQ3: What is the dominant learning approach among the students?
RQ4: Are there any significant differences between the surface, deep and strategic learning approaches based on gender?
RQ5: Do the models for learning approaches and generic skills differ between boys and girls?

Hypothesis
H1: There are significant differences in the surface, deep and strategic learning approaches based on gender.
H2: The models used for the learning approaches and generic skills differ between boys and girls.

Method
Research Framework
Biggs 3Ps model is the underpinning framework utilized in this study. Biggs (1979) adapted Dunkin and Briddle's (1974) model of Presage, Process and Product. According to Biggs (1979), presage consists of the students' learning experience before learning takes place. Process refers to the strategies used by the students when the learning activities are taking place while the product

encompasses the outcome obtained as a result of the learning activities that took place. In the present study, only two (i.e. process and product) out of the 3Ps framework will be scrutinized. In other words, the student learning approach involves both the process and generic skills within the product (outcome).

Participants

A total of 233 students (of which 98 boys and 135 girls) from various religious studies disciplines from two institutions of higher learning in Malaysia took part in the survey. The study chose students from religious studies disciplines due to fact that the employability of students from this collective discipline of studies has been disputed (Razali, 2009). The study used purposive sampling in which only final year students from the institutions were sampled. This was because students from this age group (between 22 - 25 years of age) were thought to have been in the respective institutions for at least three years and were thus in a better position to assess their own specific generic skills and learning approaches.

Measures

The study utilized the Course Experience Questionnaire (CEQ) (Wilson & Lizzio, 1997). From the 15 items used, only 6 came from CEQ and the rest were self-formulated based on the extensive literature review conducted. Within the generic skills items, the skills include problem solving, analytic skills, teamwork, confidence in tackling new problem, written communication and the ability to plan one's own work (Lizzio, Wilson & Simons, 2002). The self-formulated items included skills such as oral communication, information management, seeking new knowledge, entrepreneurship, business, ethics, community responsibilities, leadership and monitoring. These skills measured the process skills relevant to employability and lifelong learning (Lizio et al., 2002). The Revised Approaches to Studying Inventory (RASI) (Duff, 1997) was another instrument used to tap into the students' learning approaches. The instrument consisted of 30 items which tested the students' surface, deep and strategic learning approaches. Both instruments do not contain any negatively worded items. All items made use of a 5-point Likert scale.

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 22.0 and Analysis of Moment Structures (AMOS) version 22.0 were the two software programs of choice used in the data analysis. Data screening was done to check the data input. Both reliability and psychometric tests were conducted on the instruments. For both instruments and the dimensions contained therein, the Cronbach's alpha results were all above 0.70 – thereby attesting the internal consistency of the constructs understudied. The factor loadings and the internal consistency measured confirmed the convergent validity of the instruments. Factor correlations below 0.8 imply the testimony of the discriminant validity of the instrument (Brown, 2006). In the measurement model used for the learning approaches as well as for generic skills, the researcher decided to use bundled items as proposed by Bandalos (2002). For instance, the generic skills instruments consisting of 15 items were merged into three bundles, each containing 5 items. The same was done for the learning approaches instruments. Deep learning items consisting of 10 items were reduced into 3 bundles. The same was done with the surface and strategic learning approaches.

Results
Research Questions 1 and 2
Level of generic skills and dominant and least dominant skills
From the descriptive analysis conducted, the level of generic skills was able to be ascertained. The levels of generic skills for both boys and girls are moderate at (M=3.36: SD= 0.46) and (M=3.22; SD= 0.39) respectively. Based on the independent sample t-test analysis conducted, it was found that the boys' overall generic skills are significantly higher than the girls' at t (1.86) =2.34, p<0.05. Table 1 below presents the findings in detail.

Table 1. Overall generic skills level and gender differences

Variable	M	SD	Level	t	df	p
Boys	**3.36**	.46	Moderate	2.34	186.72	**.02***
Girls	3.22	.39	Moderate			

  * p<.05

Scrutinizing each of the generic skills examined in this study further, the results revealed that the most dominant generic skill was community responsibility (M=4.11; SD=.63) whilst the least dominant was analytical skills (M=3.09; SD=.85). Table 2 below lists the top three most dominant and bottom three least dominant generic skills.

Table 2. Mean score for elements of generic skills

Elements of Generic Skills (top three and bottom three scores on generic skills)	M	SD	Level
(1) Community responsibility	4.11	.63	high
(2) Seeking new knowledge	4.07	.62	high
(3) Ethics	4.02	.60	high
(4) Leadership	3.29	.84	moderate
(5) Oral communication	3.24	.94	moderate
(6) Analytical	3.09	.85	moderate

Differences in the specific generic skills based on gender
Based on the independent sample t-test results as illustrated in Table 3 below, it was subsequently found that there were significant differences across the four specific generic skills among boys and girls.

As can be seen in the results, the boys outperformed girls in each of the three skills namely problem solving (M=3.55, SD=.73), analytical (M=3.28, SD=.78) and confidence in tackling new problems (M=3.46, SD=.69). Nevertheless, boys fell behind the girls on written communication skills (M=3.63, SD=.96). All the differences are significant at p<.01.

Table 3. Significant gender differences for specific generic skills

Elements of Generic Skills	Boys N=98		Girls N=135		t	df	p
	M	SD	M	SD			
(1) Problem solving	**3.55**	.73	3.29	.75	2.65	231	.009**
(2) Analytical	**3.28**	.78	2.95	.87	2.96	220.11	.03*
(3) Confidence in tackling new problems	**3.46**	.69	3.24	.82	2.15	226.13	.03*
(4) Written communication	3.63	.96	**3.71**	.79	2.14	231	.03*

*p<.05 **p<.01

Research Questions 3 and 4

Types of Learning Approaches and Gender differences

A descriptive analysis was conducted in order to determine the different types of learning approach utilized by the boys and girls in this study. An independent sample t-test was conducted in order to ascertain the differences between the learning approaches utilized by both boys and girls.

In terms of the learning approaches, the boys' surface learning approach (M=3.45; SD=.55) is significantly lower than the girls' (M=3.69; SD=.45) while deep learning is favored by boys. The boys' deep learning (M=3.80; SD=.36) is significantly higher than that of the girls (M=3.68; SD=.43). However, the boys' (M=3.63; SD=.46) strategic learning approaches do not differ significantly from those of the girls (M=3.68; SD=.45).

Table 4. Types of learning approaches and gender differences in relation to the learning approaches

Variable	Boys (N= 98)		Girls (N=135)		Level	t	df	p
Learning approaches	M	SD	M	SD				
(1) Surface	**3.46**	.55	3.69	.49	Moderate (boys) high (girls)	-3.37	231	**.001**
(2) Deep	**3.79**	.36	3.68	.43	High (both boys and girls)	2.16	231	**.03***
(3) Strategic	3.63	.46	3.68	.45	Moderate (boys) high (girls)	.76	231	.45

**p<0.01 * p<.05

Research Question 5

Simultaneous multi-group analysis of boys' and girls' generic skills and learning approaches

Heeding the call from Chiou, Liang and Tsai (2012) who suggested that more studies be conducted on gender differences pertaining to learning approaches, this study proposes modeling the boys' and girls' generic skills and learning approaches. To do this, further analysis using structural equation modeling was conducted in order to determine whether the boys' and girls' model of generic skills and learning approaches differed and whether the model fitted both groups.

The findings based on the simultaneous multi-group analysis indicated that both the boys' and girls' models differ. The values for $c^2 = 1.83$, df=86, p<.01 while the CFI and RMSEA values indicate an acceptable model fit (.90 and .06 respectively). While the boys' model showed two significant pathways from the surface and strategic learning approaches to generic skills, the girls' model showed a different picture. Only the surface approach presented a significant pathway to generic skills for the girls' model. There were no relations between the deep approach and generic skills for the boys' model. Interestingly, there were no relations between the deep and strategic approaches to generic skills for the girls' model estimated parameters. Table 5 below provides the parameter estimation based on gender (male and female).

Table 5. Parameter Estimation for the Boys and Girls' Groups

Parameter	β	CR	p value	R^2
Boys				
Generic skills				.47
Deep--> GS	.21	1.43	.15	
Surface--> GS	-.33	-2.66	.008*	
Strategic--> GS	.45	2.67	.007*	
Girls				
Generic skills				.23
Deep--> GS	-.14	-.16	.87	
Surface--> GS	-.47	-1.75	.08*	
Strategic -->GS	.67	.63	.53	

*p<.05 **p<.01 ***p<.001

Note: β = standardized regression weight: CR=critical ratio

Deep=deep approach; surface=surface approach; strategic=strategic approach; GS=Generic skills

Based on the parameter estimation delineated above, the parameter with the highest regression weight for the boys model was the strategic approach to generic skills (β =.45) while the lowest regression weight was from the deep approach to generic skills (β=.21). The path of the deep approach to generic skills is not significant. On the other hand, for the girls' model, the only significant path is from the surface approach to generic skills. The other two paths are not significant. The variance explained for the boys' model is R^2=.47 (47%) while the girls model managed to produce R^2=.23 (23%).

Discussion and Conclusion

Returning to the five research questions addressed by this study, the main findings have been delineated below.

(1) The total sample in this study scored moderately in generic skills with the three most dominant skills being community responsibility, seeking new knowledge and ethical skills respectively.

(2) Boys' generic skills are significantly higher than those of the girls.

(3) Boys outperform girls in problem solving skills, analytical skills and tackling new problem skills whereas written communication skills are favored by girls.

(4) Girls score higher in the surface approach while boys score higher in the deep approach. On the contrary, there is no difference in the boys' and girls' strategic approach.

(5) For multi-group analysis, the boys' and girls' models differ. For boys, the surface approach contributes negatively but the strategic approach contributes positively to the development of generic skills. The deep approach is not significantly related to generic skills.

(6) For girls' model, only the surface approach is related to generic skills negatively. The other two approaches are not related significantly to generic skills either way.

(7) In terms of the variance explained, the contribution of learning approaches to generic skill development is higher for the boys' model (R^2=47%), indicating that the effect size is considerably large as opposed to the girls' model (R^2=23%).

This study has provided us with evidence that a lot needs to be done to improve the current levels of generic skills among both genders, especially girls. As such, more girls are going to be involved in the job market each year, leading to higher unemployment should they continuously show a shortage in the skills required by prospective employers.

Scrutinizing the bottom three generic skills as revealed by the sample are (1) leadership, (2) oral communication and (3) analytical skills. These seem to be among the most sought-after skills demanded by employers. A study by Hazilah et al (2013) mentioned that among the comments made by employers on new graduates, there is a lack of communication skills in the workplace and the inability to present information clearly. To address the above problems of inadequacy in relation to specific elements of generic skills, especially among girls, Abdul Malek et al (2012) suggested that girls should be encouraged to assume leadership roles not only in classroom presentations but also in extra-curricular projects. This is in addition to engaging them in problem-based learning projects, case studies and industrial attachments. They also suggested that higher learning institutions in Malaysia should replicate a US high school modular integration of skills in regular classrooms (Gamble, 2006 as quoted in Abdul Malek et al., 2012).

On the other hand, a qualitative study by Tang, Tan and Uma Devi (2015) revealed that the expert teachers they interviewed attributed the failure in generic skills development to an insufficient period of training. They also related the problem to a big class size and academic focus classrooms. As such, institutions of higher learning should ensure that the training is done earlier before their students graduate in order to embed the skills within the curriculum and in teaching and learning. The size of each classroom should also be considered when implementing teaching and learning. Smaller classrooms are not only more manageable but also easier to monitor in terms of the progress in skills development.

A lot of work has been done by universities to link university teaching and learning and the relevant industries. The importance of the links between academia and industry is undeniable as both parties work towards enhancing graduate employability through smart partnerships (New Straits Times, January 23, 2019). The links between the university and industry need to be assumed way before the graduation date and must be done with close monitoring so as to ensure that the students prepare themselves ahead of time before delving themselves into the "simulation" workforce, better known as industrial training. This can be done as early as the second year of the students' studies and later on during their final year. As a result, the continuity of such an effort can be observed and the output later harvested.

Another important point to note in terms of gender differences is the use of a surface approach, better known as rote learning, especially among girls. Ambreen and Nawaz (2017) subsequently criticized Western education that has a negative opinion of rote learning. They commented on the essentials of rote learning in Eastern society, and that as such, skills support deeper understanding and critical thinking. Having said that, the opposite was found in this study. The surface approach is inversely related to generic skills and the girls scored high in surface learning. The fact that the girls scored highly may be attributed to their discipline of choice (religious studies) which require lots of memorization of the Quran and its contents. According to Sinhaneti and Kyaw (2012), rote learning does not necessarily involve the meaningless repetition of words. It is a useful strategy in vocabulary

acquisition. However, the surface approach may be necessary during the acquisition of knowledge because it could help to facilitate a deeper understanding of the content. Nevertheless, students must be well-equipped with elements of generic skills once they step into the job sector. Billing (2007) cautioned that even though generic skills are transferable, guiding students towards generic skill development may not happen overnight as it involves a change in attitude, values and knowledge.

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