International Journal of Education, Learning and Development
Vol. 9, No.3, pp.19-33, 2021
Print ISSN: 2054-6297(Print),
Online ISSN: 2054-6300(Online)

PARTICULAR ADMISSION TEST AND PERCEPTION ON ASSESSMENT METHOD: DOES IT INFLUENCE THE ACADEMIC PERFORMANCE IN PROBLEM-BASED LEARNING OF MEDICAL COURSE?

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ABSTRACT: *Academic performance has an essential impact in predicting the success of an educational program. This study was performed to identify the impact particular admission test and student perception on assessment method to academic performance in term of grade point average (GPA). A cross-sectional study design was conducted on 158 medical students at University of Islam Bandung to participate in taking a quantitative survey. A questionnaire was adapted from a student perception of assessment questionnaire (SPAQ). Data analysis used the Chi-square test and Mann Whitney test. The majority of students have a good perception of the assessment method (88.6%). Admission test through special interest and abilities influence academic achievement with a p-value of 0.004. The assessment system is quite effective in assessing the learning outcome. This is due to the perception of the assessment method is more related to student learning approaches than academic achievement.*

KEYWORDS: admission test, perception, academic performance, GPA

INTRODUCTION

Assessment of the student's performance is critical because it can be an indicator of the achievement of students learning outcomes. The faculty must continually review the assessment system that has been running and if it is necessary to make modifications based on the philosophy of the Problem-Based Learning (PBL) to be useful according to its purpose. In case to better implement the PBL, it is essential to have a systematic assessment that is well enforced by the Education Program Manager to provide objective evaluation for the student (Brown, 2006). In assessing the students, the principles of fair assessment should be an emphasis with the weight point on 1) the development and selection of appropriate assessment methods, 2) collects research information, 3) determination and performance scoring of students, 4) Summary and interpretation of results, and 5) The report of the assessment results (Rogers, 1985). Assessment in medical education should be able to assess complex competencies, thus requiring quantitative and qualitative information from different sources and professional evaluations (Rogers, 1985; Van Der Vleuten & Schuwirth, 2005). Proper assessment must fulfil the principles of validity, reliability, practice-ability, and utility. Reliability refers to the consistency of research results means use whenever you need

to make consistent results (Lynch, Surdyk, & Eiser, 2004; Van Der Vleuten & Schuwirth, 2005). While efficiency is the principle that the assessment should be readily acceptable from the practicality, cost-effective, and feasibility (Holmboe, Sherbino, Long, Swing, & Frank, 2010). Evaluation of the learning process conducted at the educational phase in medical faculty UNISBA, including the writing test-multiple choice question or MCQ, structured objective oral analysis (SOCA), and Objective Structured Clinical Examination (OSCE). Based on the data, the authors are interested in identifying the effectiveness of the assessment system that has running in evaluating the ability of students, measuring the success of competency achievement, and knowing the factors that influencing student's academic progress. Academic performance was the grade point average in the required medicine program at each of the end of the academic year (Chisholm, Cobb, & Kotzan, 1995). Kenneth's study in the Texas Tech doctor of pharmacy program found some factors in terms of taking advanced courses in biology, prepharmacy GPA, and the attainment of a prior college degree were an essential factor that influences academic performance (McCall, Allen, & Fike, 2006).
University admission tests, in particular for degree courses in medicine, has been widely discussed in some countries, including in Indonesia. In general, medicine course consists of academic phase and clinical phase. There are 2 medical institutions namely private and government institution. University admission test for medicine bachelor generally used a computer-based written test, yet in some private university have a different test. In Indonesia, there is a particular test to enroll medical faculty, in terms of special interest and ability test. This study is aimed to determine whether particular admission test and perception regarding assessment method influence academic performance.

THEORETICAL UNDERPINNING

Problem Based Learning versus Admission test

Some literature shows that problem-based learning (PBL) has four main objectives, namely: 1) to apply the knowledge base, 2) to build the clinical assessment and decision-making skills, 3) to encourage self-learning and 4) to Improve collaboration (Elizondo-montemayor, 2004; KL & Pallath, 2011). The PBL method, according to Albanese, can improve the ability of diagnostic reasoning students, and the PBL is also considered to increase student satisfaction. Tutorial plays an essential role in achieving the above objectives, with the guidance of the tutor/lecturer and cooperation between them, students will build their knowledge structure or better known with constructive learning theory and learning Contextual (Albanese & Mitchell, 1993).

Admission test of higher education was divided into 4 components: cognitive test, non-cognitive test, written test, and interview (Prideaux et al., 2011). There are various admission test that used in some countries such as MCAT in USA (Prideaux et al., 2011), UKCAT in united Kingdom (Sartania, McClure, Sweeting, & Browitt, 2014), BMAT in ASEAN countries, HPAT in Ireland (Kelly et al., 2013), and UMAT in Australia (Migliaretti et al., 2017).

High-stakes assessment in terms of assessment for selection can be applied to the admission test. These include a) proceeding from a clear blueprint of the content for

selection; b) using evidence from psychometric studies and a theory base to inform the selection process; c) developing congruity between selection, curriculum and assessment; d) using clear standard-setting and decision-making procedures; and e) providing a focus on the impact of selection (a variant of the adage that assessment drives learning) (Prideaux et al., 2011). A study conducted by Sartania in Glasgow, UK found that admission test can be a predictive in good performance during medical school (Sartania et al., 2014). Similar with Kelly's study in Ireland stated that admission test give a contribution in achieving the academic performance, even though just 23% in supporting them (Kelly et al., 2013).

Assessment Method in Medical Education

There was literature that defines assessment as a systematic process of collecting and interpreting information about individuals who are aiming to determine their ability or achievement from the instruction process. In a broader context, the assessment is the process of collecting and interpreting information used to see students progress on achieving knowledge, skills, attitudes and behaviours learned or needed and to informing a variety of personals that make educational decisions (instructional, diagnostic, placement, promotion, graduate, curriculum plan, program development, policy) about students (Epstein, 2007; Reinert, 2013). While the tutors with the students to become knowledgeable about the entire curriculum students, recognize that their grades will depend only on their performance in assessment tasks, which focus on particular selected aspects of the curriculum (Fallows & Chandramohan, 2010).

Model of measurement is concerned with the relative, reliable performance of students on a decontextualized, standardized task which is perceived to be valid indicators of the assessing factor (MacLellan, 2001). Assessment is an essential determinant that affects the way students learn and subsequently determines the learning outcomes. Another criterion of evaluation tends to be students' definition of the 'fairness' of an assessment method. From students' perspective, assessment has a positive effect on their learning and is 'fair' when it: (1) relates to authentic tasks; (2) represents reasonable demands; (3) encourages students to apply knowledge to realistic contexts; (4) emphasizes the need to develop a range of skills; and (5) is perceived to have long-term benefits (Struyven, Dochy, & Janssens, 2005).

Some Factors Influencing Student's Academic Performance

Student's academic performance was the achievement of learning results and indicated by the grades awarded. Some similar ways consider academic success (Chisholm et al., 1995; Fallows & Chandramohan, 2010). First, the marks arising from the self-, peer, and tutor assessments can be compared before combination to derive the final grade for this assignment. Second, the category for this assignment can be compared with the students' performance in the second assignment for the module. Third, the committee of assessment compares grades for this module (both tasks) with those achieved by the same students in a second equivalent module (Fallows & Chandramohan, 2010). One study conducted by McCall showed that predictors of academic success in pharmacy school included American College Test scores, Pharmacy College Admission Test (PCAT) scores, grades in specific prepharmacy courses, prepharmacy grade point average, personal interview scores, Myers-Briggs Type Indicator, California Critical

Thinking Dispositions Inventory and Skills Tests, and a prior 4-year college degree (McCall et al., 2006).

METHODOLOGY

Study Participants

The 158 students from batches 2015, 2016, and 2017 were selected and invited to participate in the quantitative study. Upon receiving a consent, they were asked to fill out a Students Perception of Assessment Questionnaire (SPAQ). The 30-items questionnaire was distributed to 158 medical students of UNISBA for two months from November to December 2018.

Study Procedures and Instrument

A pre-tested performance captures the demographic data, admission test, the value of GPA (grade point average), and perception of the assessment system among the undergraduate medical students of medical faculty, Universitas Islam Bandung (UNISBA).The modified version of the Student Perception of Assessment Questionnaire (SPAQ) was used to assess the perception of the student regarding assessment running. The result of Cronbach's Alpha score found to be highly consistent in the amount of 0.882. To validate the construct of an assessment tool, exploratory factor analysis was conducted on 90 medical students before taking the true survey. Sample of EFA used a participant to item ratio of 3:1. Therefore, a 30-item questionnaire at a 3:1 subject to item ration yielded in a sample size of 90 (Anthoine, Moret, Regnault, Sbille, & Hardouin, 2014). Exploratory factor analysis (EFA) has been used to investigate the latent factor of a set of indicator variables (Clark & Bowles, 2018) in terms of assessment perception. As a review the psychometric properties, EFA identified which factors or domains will be inserted to assess the perception regarding assessment method. In this regard, even though those items in SPAQ had been arranged yet it was needed a construct validation as will used in the other place. In conducting exploratory factor analysis (EFA), some items or subscales that had factor loading is above 0.5 will be grouped in the same factor or domain.

The student perception of assessment questionnaire (SPAQ) consisted of 30 questions with 5 domains, namely 1) congruence with planned learning (6 items), 2) authenticity (6 items), 3) student consultation (6 items), 4) transparency (6 items), and 5) diversity (6 items) (Waldrip, Fisher, & Dorman, 2001). The respondents rate the degree of their agreement on a five-point Likert-scale from strongly disagree to strongly agree. The students were provided 15-20 minutes to complete these questionnaires.

Sample Size

Sample size for this study used purposive sampling and was determined based on an estimation proportion population as formulated following:

$$n = \frac{z^2_{1-\alpha/2} P(1-P)N}{d^2(N-1) + z^2_{1-\alpha/2} P(1-P)}$$

N: amount of people (779)
n: amount of sample that needed
$Z_{1-\alpha/2}$: confidence interval 95% (1,96)
P: anticipated population proportion (0.53)
d: absolute precision required = 0,07

Based on the formulation above, 158 medical students were chosen to participate in this study.

Data Analysis

Exploratory factor analysis was performed using SPSS version 21 to extract five domains. The extraction method of the principal component analysis with the Orthogonal rotation method was then chosen to simplify and describe the data structure (Boerebach & Lombarts, 2014; Stalmeijer, Dolmans, Wolfhagen, Muijtjens, & Scherpbier, 2009). To confirm the data extraction that is suitable for inclusion in the same factor, Varimax rotation with Kaiser normalization (Costello & Osborne, 2005), is conducted. Before conducting exploratory factor analysis, Kaiser Meyer Olkin (KMO) and Bartlett's test of sphericity was performed to get the sample adequacy. The construct validity of the instrument had been tested on adequate sample size as the KMO value was 0.709 (> 0.50), and Bartlett's test of sphericity was $p<0.001$ ($X^2=1155.57$) . The data collected of true survey were tabulated and analyzed by using the Statistical Package for Social Sciences (SPSS) version 21.0. The presenting of results in terms of numbers and proportions. The Chi-square test and Mann Whitney test, along with its 95% confidence interval (CI), were used and then proceeded with Dunnett's Posthoc *multiple comparison* test for comparison purposes. In this study, a p-value <0.05 was considered statistically significant.

Operational Definition of Variable

The variables of this study were identified based on the definition variable following. Gender was defined as generally conceived as a set of characteristics or traits that are associated with specific biological sex (male or female). The age is the period someone has been alive, or something has existed (<20 years old and >20 years old). Student's perception was recognition and interpretation of students regarding sensory information and how they respond to the data (in this study perception of assessment method). Academic achievement was the result of students' academic performance in terms of GPA and was categorized as low if it has a GPA < 2.60, called moderate if it has GPA between 2.60 to 3.00 and high if it has GPA > 3.00.

Perception of assessment was divided into five domains (original tool), namely congruence with planned, diversity, authenticity, student consultation, and transparency. Congruence with planned was defined the extent to which assessment tasks align with the goals, objectives, and activities of the learning program. Diversity is multiple, varied assessment tasks are employed. Authenticity refers to the extent to which assessment tasks feature real life situations that are relevant to the learner. Whilst student consultation was defined the extent to which students are consulted and informed about the forms of assessment tasks being employed. Transparency is how the purposes and forms of assessment tasks are well defined and clear to the student (Waldrip et al., 2001).

Ethical Consideration

The study protocol complied with the Helsinki Declaration, and the Joint Committee approved it of Research and Ethics of the medical faculty of Universitas Islam Bandung (UNISBA) in Bandung, Indonesia. Informed consent was obtained from every respondent before data collection, and confidentiality of all responses was maintained throughout this study.

RESULT/FINDINGS

Based on the EFA result depicted that all 30-items were well constructed yet amount of factor in the original tool has changed to 9 factor solutions. The strength of these factors was supported by 68.57% of the total variance explained after eleven iterations. The result of factor matrix can be seen in Table 1.

Table 1. Pattern matrix of the Varimax rotation method for the 30 items of 90 participants

	Component Matrix*								
Item	F1	F2	F3	F4	F5	F6	F7	F8	F9
q1						.643			
q2						.821			
q3						.520		.455	
q4								.789	
q5								.824	
q6									.856
q7									.521
q8		.587							
q9		.568			.468				
q10		.691							
q11		.772							
q12		.685							
q13							.750		
q14							.580		
q15	.591								
q16	.638								
q17							.546		
q18									
q19				.724					
q20				.682					
q21			.860						
q22			.819						
q23					.700				
q24					.808				
q25				.610					
q26				.528					
q27	.791								
q28	.590		.467						
q29	.541								
q30	.607								

*F1: Diversity
F2: Authenticity
F3: Transparency
F4: Clarity of assessment task
F5: Transparency
F6: Congruence with planned learning
F7: Students' consultation
F8: Conformity with learning task
F9: Real context

Table 1 indicated the items that were grouped into the same component based on factor loading value more than 0.5. For example, items of q15, q16, q27, q28, q29, and q30

were clustered in the same component as factor 1-diversity as they have a factor loading of more than 0.5. Other items were all classified in the same manner, except for items of q21, q22 were combined to q23 and item q24 because those items have the similarity to assess the transparency in which the purposes and forms of assessment tasks are well defined and clear to the student. Therefore, the result of psychometric properties in this exploratory factor analysis just remained eight factors in terms of diversity, authenticity, transparency, clarity of assessment task, congruence with planned learning, students' consultation, conformity with learning task, and the real context.

Table 2 shows the socio-demographic information of the medical students (n = 158). It was observed that a majority of the students are females (72.15%), with the age group was dominated by the age of fewer than 20 years old. The Year 2 students (31.01%) are those who had sat for their end of the second semester summative examination while the Year 3 students (32.27%) are those who had taken their fourth summative examination. The proportion of level students was slightly similar, yet student level 4 is the greatest number among them (58). The student of year 4 (36.71%) are those who had taken an examination for a whole core module of medicine. The amount of student who taken regular admission test was more than PMDK taken (specific interest and ability test) with the ratio of 4:1 due to allocation for PMDK test was limited of 20% from all new students accepted. This study also depicted that achievement of academic in terms of GPA value was dominated by the group of high achievement (52.53%). This result showed that academic performance of medical students in our faculty have obtained good achievement.

Table 2. Characteristic of Demographic Data of Students (n=158)

Characteristic		**Frequency**	**Percentage**
Gender	male	44	27.85%
	female	114	72.15%
Age group	<=20 years old	86	54.43%
	>20 years old	72	45.56%
Admission test	Particular/PMDK	35	22.15%
	Regular	123	77.85%
Student level	Year 2	49	31.01%
	Year 3	51	32.27%
	Year 4	58	36.71%
GPA	Low Moderate High	12 63 83	7.59% 39.87% 52.53%
Total		**158**	**100%**

Summary of result findings

Based on Table 3 demonstrated that the comparison of student's academic performance in terms of GPA categorization was increased in line with student level and moderate to a good perception of the assessment method. A majority of student gender, both male and female, had moderate to high academic performance (>90%). All age groups showed that they have a high academic achievement (>50%). Both age groups had achieved the same grade of academic achievement on a moderate level, yet the age

group of > 20 years old was lesser delivered the low academic performance than group of the younger student (5.6%). There was no significant difference between the academic performance of the younger medical students as compared to the older medical student counterparts (p = 0.674).

Table 3. Predictor factor that influencing the student's academic performance (n=158)

Variables		Academic performance			p-value
		Low	Moderate	High	
Gender	male	9.1%	45.5%	45.5%	0.539
	female	7.0%	37.7%	55.3%	
Age group	≤20 years old	9.3%	39.5%	51.2%	0.674
	>20 years old	5.6%	39.4%	54.9%	
Admission test	Particular	5.7%	17.1%	77.1%	0.004
	Regular	8.1%	46.3%	45.5%	
Student level	Year 2	14.3%	28.6%	57.1%	0.014
	Year 3	3.9%	56.9%	39.2%	
	Year 4	5.2%	34.5%	60.3%	
Perception of the assessment method	Less	16.7%	0.0%	83.3%	0.042
	Moderate to good	7.2%	41.4%	51.3%	

Similar with the student gender, there was no significant difference between the academic performance of male and female students (p value=0.539). Seniority in terms of student level was found to be significantly associated with the achievement of high academic performance. More advanced level of the student, so the academic performance of students was increased. The condition is due to the high level of students was much more exposed to a learning experience. The more experiencing student, they will more prepare to complete the task of assessment; therefore, they got an excellent mark. In competency-based curriculum, the body of knowledge was grouped in the learning module based on organ system, such as gastrointestinal system, respiratory system, cardiovascular system, neurobehaviour system, female reproductive system, genitourinary system, endocrine and metabolism system, hemato-oncology system, immunology system, tropical medicine system, and so on. Learning based on the module system enabled medical student to command the competencies systematically in terms of knowledge, skill, and attitude in the thematic pattern.

Table 4 also indicated there was a significant difference between the academic performance of the admission test through PMDK compared with the regular test (p value=0.004). It was observed that the less perception of the assessment method influenced low academic performance. Therefore, there was a significant difference between academic performance on the student that has moderate to good impression compared with those who have less opinion (p value= 0.042). Similar to the student

level, year 4th student tends to have high academic performance as compared to students of year 2 and year 3 (p value= 0.014).

DISCUSSION

It was observed that most of the respondents in this study had achieved high academic performance on the specific interest admission test (77.1%), year 4th students (60.3%), and age > 20 years old (54.9%) regardless of their gender and perception of the assessment method. This result in line with Liew's result study in International Medical University Malaysia that reported the high achievers of the medical student was female and the age of more than 20 years old (Liew, Sidhu, & Barua, 2015). The student that used an in-depth approach to learning tends to have an academic performance was higher than the superficial approach. Similar to the result of Chisholm et al., they reported that admission test to college pharmacy at Georgia University and score mark of pre-university have been predictor to the academic success of first-year pharmacy students (Chisholm et al., 1995). This is due to the admission test through PMDK was the tighten selection to enroll medical faculty relied on score mark of senior high school, clustering of the school, intrinsic motivation, and mini-multiple interviewed by the admission committee. This finding is aligned with Migliaretti' study in Turin, Italy that the admission test appeared to be a good predictor for the academic performance of medical students (Migliaretti et al., 2017). The type of admission test can be classified into cognitive, non-cognitive, written test, and interviews. This study showed that the student who took specific interest admission test have the higher academic achievement than the other test, the possible explanation is due to this admission test encompasses not only cognitive test but also taken non-cognitive and interview methods.

The students that enroll through the test of special interest and abilities tend to have more engagement than other test. This is due to the high intrinsic motivation and strong interest. Student engagement is defined as the time and energy that student devote to educationally purposeful activities and the extent to which the institution gets students to participate in activities that promote student success (Wilson, 2010). If students gather a need to understand the material in order to successfully undergo the assessment task, they will engage in deep learning. Conversely if they perceive the assessment instrument to require rote learning of information, they will be unlikely to engage with the higher level objective which may well have been intended by educational program (MacLellan, 2001). This study was in line with Keneth's study that proposed some factors such as preadmission GPA, the advance course in Biology, and preadmission score to become a significant factor that influencing the student academic performance (McCall et al., 2006). Therefore, the result of this study can be a reference for the admission committee of a new medical student.

Another concern in assessment system was the effectiveness of assessment. This could be seen on the utility an approaching method. An assessment was considered effective as it consists of some components in terms of valid, reliable, having an educational impact, and acceptable (Holmboe et al., 2010). This study indicated that assessment method has conformity with curriculum delivery; the moderate to high academic achievement of most medical students has obtained 92.41%. Assessment approaches

refers to the mechanism through which the grading reasoning is made (Fallows & Chandramohan, 2010). Differ with assessment approach, assessment process embody all stages from the setting of the assessment task through to confirmation of the grade and stipulation of feedback to the student (Fallows & Chandramohan, 2010; Holmboe et al., 2010). Besides, the good assessment has three criteria have to be met, including the extent to which assessment tasks tied up with the educational objective, the extent to which the items focused on the student understanding, and the extent to which assessment provided the instructional design (Waldrip et al., 2001). In the other word, the effectiveness of assessment method is an overview the success of student academic achievement, curriculum aptitude in delivering learning outcome, and the fulfilment toward specified competencies. Therefore, an effective assessment potentially reduce dependence on educational role solely as a proxy for competence- a characteristic that depicts most current medical education programs (C. L. Carraccio & Englander, 2013; Holmboe et al., 2010). In medical education, competency-based education was defined as an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from a perspective of the societal and patient needs (C. Carraccio et al., 2016; C. L. Carraccio & Englander, 2013).

Relates to assessment of learning, student generally deemed that the relevance of the assessment task and examination load were very beneficial in driving their learning. It was understandable, since the student has good perception regarding assessment, this will influence their academic performance (Symons, 2010). Here, assessment task was defined as the item of work in which the student is asked to undertake (Fallows & Chandramohan, 2010). In this regards, student perception of clarity of assessment task and congruence with planned learning come into sight more leaning toward their goals in the undertaken examination. Perception is the end product of the interaction between stimulus and internal hypotheses, expectations, and knowledge of the observer (Démuth, 2012). Perception regarding assessment method denoted some expectation and knowledge of students, and how they respond to the assessment task and experiencing is going through. How student respond to the assessment task enable them to select the learning approach. Supposing in the strategic approach, students intend to achieve the highest scores possible. This approach involves good time management and study organization. Consequently, they extend more attention to the content and assessment requirements (Liew et al., 2015). In the other word, goal-oriented approach will drives learning subsequently assigns the academic achievement (Ginns, Prosser, & Barrie, 2007; Liew et al., 2015). According to Harris and Bell' s study that students often modify their learning approaches in order to conquer the assessment demands (Liew et al., 2015).

There are three assessment approaches used in the medical education work in terms of tutor assessment, peer-assessment, and self-assessment (Elizondo-montemayor, 2004; Fallows & Chandramohan, 2010). In this study, we took self-assessment as an approach method due to consideration of the formative way to gain student in reflecting on their abilities, performance, and attitudes (Elizondo-montemayor, 2004). Therefore, it is still needed the perception of tutor and peer to compare with the result findings in the further studies.

However, some limitations of this study are worthy of carefully weighed here including collection of the survey data has quite a long distance away from the examination, analysis of student perception was conducted overall component, not any domain (8 components). The assessing of each factor in the perception needs to be confirmed in further studies, so that we could identify which factor in the perception that influencing the academic performance.

Implication to Research and Practice

This study has contribution to selection process in undergraduate medical student. Based on the result, it should more give allocation toward number of student enrollment. Whereas admission test does not provide direct supporting in graduates performance due to it may not measure domains in university exit exams. However, we need to ponder its added value to academic achievement during medical course.

CONCLUSION

This study revealed that the admission test through PMDK (particular interest and ability test) and moderate to good perception regarding the assessment method, and a higher level of student contribute significantly towards the achievement of student academic. Based on the result of this study, we concluded also that different gender and age of student did not contribute significantly to the student's academic performance.

Future Research

We suggested future work will investigate the other factor shared that influence the student's academic performance of medical faculty UNISBA and more elaborate each domain of perception.

Compliance with Ethical Standards: The authors declare that there is no conflict of interest.

Acknowledgements: We would like to thank the Medical Faculty- Universitas Islam Bandung (*UNISBA*) for their fundraising in this study. Our special gratitude goes to the Last Dean of Medical Faculty, UNISBA, Prof. Dr Ieva B. Akbar, dr.AIF and medical students that participated in this study.

References (Font Size=10)

Albanese, M. A., & Mitchell, S. (1993). Problem based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine: Journal of the Association of American Medical Colleges*, *68*(1), 52–81.

Anthoine, E., Moret, L., Regnault, A., Sbille, V., & Hardouin, J. B. (2014). Sample size used to validate a scale: A review of publications on newly-developed patient reported outcomes measures. *Health and Quality of Life Outcomes*, *12*(1), 1–10. https://doi.org/10.1186/s12955-014-0176-2

Boerebach, B. C. M., & Lombarts, M. J. M. H. (2014). Confirmatory Factor Analysis of the System for Evaluation of Teaching Qualities (SETQ) in Graduate Medical Training, 1–12. https://doi.org/10.1177/0163278714552520

Brown, N. (2006). Assessing professional and clinical competence: the way forward. *Advances in Psychiatric Treatment*, *12*(2), 81–89.

https://doi.org/10.1192/apt.12.2.81

Carraccio, C., Englander, R., Van Melle, E., ten Cate, O., Lockyer, J., Chan, M.-K., … Snell, L. S. (2016). Advancing Competency-Based Medical Education. *Academic Medicine*. https://doi.org/10.1097/acm.0000000000001048

Carraccio, C. L., & Englander, R. (2013). From flexner to competencies: Reflections on a decade and the journey ahead. *Academic Medicine*, *88*(8), 1067–1073. https://doi.org/10.1097/ACM.0b013e318299396f

Chisholm, M. a, Cobb, H. H., & Kotzan, J. a. (1995). Significant factors for predicting academic success of first-year pharmacy students. *American Journal of Pharmaceutical Education*, *59*, 364–370. Retrieved from http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=pubmed&cmd=Retrieve&dopt=AbstractPlus&list_uids=5176326152384175023related:r1ts0jUB1kcJ

Clark, D. A., & Bowles, R. P. (2018). Model Fit and Item Factor Analysis : Overfactoring , Underfactoring , and a Program to Guide Interpretation to Guide Interpretation. *Multivariate Behavioral Research*, *0*(0), 1–15. https://doi.org/10.1080/00273171.2018.1461058

Costello, A. B., & Osborne, J. W. (2005). Best Practices in Exploratory Factor Analysis : Four Recommendations for Getting the Most From Your Analysis. *Practical Assessment Research & Evaluation*, *10*(7), 1–9.

Démuth, A. (2012). *Perception Theories*. *Applications of Case Study Research*. Retrieved from http://issafrica.org/crimehub/uploads/3f62b072bd80ab835470742e71a0fcb5.pdf%5Cnhttp://www.cdc.gov/ViolencePrevention/pdf/SchoolViolence_FactSheet-a.pdf%5Cnwww.sace.org.za

Elizondo-montemayor, L. L. (2004). Formative and Summative Assessment of the Problem- Based Learning Tutorial Session Using a Criterion- Referenced System. *The Journal of IAMSE*, *14*(January 2004), 8–14.

Epstein, R. M. (2007). Medical education - Assessment in medical education. *New England Journal of Medicine*, *356*(4), 387–396. https://doi.org/10.1056/NEJMra054784

Fallows, S., & Chandramohan, B. (2010). Multiple Approaches to Assessment: Reflections on use of tutor, peer and self-assessment. *Teaching in Higher Education*, *6*(2), 229–246. https://doi.org/10.1080/13562510120045212

Ginns, P., Prosser, M., & Barrie, S. (2007). Students' perceptions of teaching quality in higher education: The perspective of currently enrolled students. *Studies in Higher Education*, *32*(5), 603–615. https://doi.org/10.1080/03075070701573773

Holmboe, E. S., Sherbino, J., Long, D. M., Swing, S. R., & Frank, J. R. (2010). The role of assessment in competency-based medical education. *Medical Teacher*. https://doi.org/10.3109/0142159X.2010.500704

Kelly, M. E., Regan, D., Dunne, F., Henn, P., Newell, J., & O'Flynn, S. (2013). To what extent does the Health Professions Admission Test-Ireland predict performance in early undergraduate tests of communication and clinical skills? - An observational cohort study. *BMC Medical Education*, *13*(1), 1–11. https://doi.org/10.1186/1472-6920-13-68

KL, S., & Pallath, V. (2011). Initial Experiences of Developing an Assessment Scheme for Problem Based Learning Module in An Undergraduate Preclinical

Curriculum. *WebmedCentral MEDICAL EDUCATION*, *2*(1), 1–11.

Liew, S. C., Sidhu, J., & Barua, A. (2015). The relationship between learning preferences (styles and approaches) and learning outcomes among pre-clinical undergraduate medical students Approaches to teaching and learning. *BMC Medical Education*, *15*(44), 1–7. https://doi.org/10.1186/s12909-015-0327-0

Lynch, D. C., Surdyk, P. M., & Eiser, A. R. (2004). Assessing professionalism: A review of the literature. *Medical Teacher*, *26*(4), 366–373. https://doi.org/10.1080/01421590410001696434

MacLellan, E. (2001). Assessment & Evaluation in Higher Education Assessment for Learning: The differing perceptions of tutors and students. *Assessment & Evaluation in Higher Education*, *26*(4), 307–318. https://doi.org/10.1080/02602930120063466

McCall, K. L., Allen, D., & Fike, D. S. (2006). Predictors of Academic Difficulty in a Doctor of Pharmacy Program. *American Journal of Pharmaceutical Education*, *70*(5), 1–7.

Migliaretti, G., Bozzaro, S., Siliquini, R., Stura, I., Costa, G., & Cavallo, F. (2017). Is the admission test for a course in medicine a good predictor of academic performance? A caseâ control experience at the school of medicine of Turin. *BMJ Open*, *7*(11), 1–6. https://doi.org/10.1136/bmjopen-2017-017417

Prideaux, D., Roberts, C., Eva, K., Centeno, A., Mccrorie, P., Mcmanus, C., … Wilkinson, D. (2011). Assessment for selection for the health care professions and specialty training: Consensus statement and recommendations from the Ottawa 2010 conference. *Medical Teacher*, *33*(3), 215–223. https://doi.org/10.3109/0142159X.2011.551560

Reinert, A. (2013). Assessment in Medical Education - A Primer on Methodology. *College of Physicians and Surgeons , Columbia University*.

Rogers, W. T. (1985). Principles for Fair Student Assessment Practices for Education in Canada. *Canadian Journal of School Psychology*, *9*(1), 110–127. https://doi.org/10.1177/082957358500900111

Sartania, N., McClure, J. D., Sweeting, H., & Browitt, A. (2014). Predictive power of UKCAT and other pre-admission measures for performance in a medical school in Glasgow: A cohort study. *BMC Medical Education*, *14*(1). https://doi.org/10.1186/1472-6920-14-116

Stalmeijer, R. E., Dolmans, D. H. J. M., Wolfhagen, I. H. A. P., Muijtjens, M. M., & Scherpbier, A. J. J. A. (2009). The development of an instrument for evaluating clinical teachers : involving stakeholders to determine content validity. *Medical Teacher*, *30*(August 2016), 272–277. https://doi.org/10.1080/01421590802258904

Struyven, K., Dochy, F., & Janssens, S. (2005). Students' perceptions about evaluation and assessment in higher education. *Assessment & Evaluation in Higher Education*, *30*(4), 331–347. https://doi.org/10.1080/0260293042000318091

Symons, R. Y. (2010). Taxonomy for analysing qualitative data from the Student Course Experience Questionnaire (SCEQ). University of Sydney.

Van Der Vleuten, C. P. M., & Schuwirth, L. W. T. (2005). Assessing professional competence: From methods to programmes. *Medical Education*, *39*(3), 309–317. https://doi.org/10.1111/j.1365-2929.2005.02094.x

Waldrip, B. G., Fisher, D. L., & Dorman, J. P. (2001). Students' Perceptions of

Assessment Process: Questionnaire Development and Validation, 561–568.

Wilson, E. C. A. (2010). *Factors that predict students ' educational experience at a Midwestern research university : A comparative study of STEM and non-STEM majors by Emerald Corrine Amanda Wilson A thesis submitted to the graduate faculty in partial fulfillment of the requirem*. Iowa State University.