Validating the Behavioural Academic Confidence Scale for Indonesia College Students

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The purpose of this study was to validate Academic Behavioural Confidence (ABC) scales for students in Indonesia. Academic behavioural confidence scales are useful to help teachers understand their students and organize effective learning models. The scale of academic behavioural confidence originally consists of 24 items, which comprise of six components namely: grade, studying, verbalizing, attendance, understanding, and requesting. The participants of this study were students at a private university in Semarang. The total number of research participants amounted to 753 students. Exploratory factor analysis found a different component when compared to the findings of the previous study, namely the understanding component. Thus, in this study, four components formed the scale of academic behavioural confidence: grade, verbalizing, studying, and understanding.

Key words: *Academic behavioural confidence, Scale validation, College Students.*

Introduction

Academic behavioural confidence (ABC) is a construct that refers to a student's belief that they can perform competently in certain learning situations (Hlalele & Alexander, 2011). Academic Behavioural Confidence is conceptualized as a way for students to behave insofar as they have strong beliefs, firm beliefs, or certain expectations in their abilities that are determined by academic self-efficacy (Mary & Shalini, 2013; Sander & Sanders, 2009). Academic Behavioural Confidence is a combination of self-efficacy and academic self-concept (Sander & Sanders, 2006). The preparation of the constructs of confidence in the context of higher education is very important because it is very possible that the experience of education in

universities will affect self-esteem when academic challenges are faced and met or vice versa (Sander & Sanders, 2006).

Academic behavioural confidence is a variant of academic self-efficacy, referring to cognitive assessments that relate specifically to the expectation of competence to do something related to future academic-related behaviour in undergraduate students such as: attending college, independent study etc. (Nicholson, Putwain, Connors, & Hornby-, 2013). Academic behavioural confidence is related to a student's confidence and belief in their capacity to respond to the demands they face in college and to meet expectations (Sander & Sanders, 2003). Academic behavioural confidence is a variant of self-efficacy. It is related to cognitive assessment, and focuses on the expectations of their academic competencies in the future (such as attending lectures, studying independently, etc.) (Ochoa & Sander, 2012). However, one thing that might be different from self-efficacy, academic behaviour beliefs are not different beliefs in competencies in different academic domains, and the difference lies in learning behaviour (Sander, Arias, Stevenson, & Jones, 2011).

Academic performance in students is an area that continues to be researched and developed. Studies have understood confidence as a predictor of academic achievement and has been proven to predict academic achievement in mathematics and English, because it is related to a student's metacognitive skills. Even variable confidence is a better predictor than self-concept, self-efficacy, and anxiety (Stankov, Lee, Luo, & Hogan, 2012). Given the importance of the role of self-confidence in student academic performance, it is necessary to develop a scale that measures the domain of self-confidence (Hlalele, 2012; Hlalele & Alexander, 2011). So far, in Indonesia, a scale that expresses student confidence based on academic measurement attributes has not been found or developed.

Developing the ABC scale is imperative as it can serve as a survey instrument to assess the beliefs of students regarding whether they have anticipated learning behaviours in relation to their academic assignments (Sander & Sanders, 2007). The ABC Scale was first developed through 24 items that measure self-confidence in the academic context in 2003 as a derivative of the parent concept of self-efficacy (Bandura, 1977; Sander & Sanders, 2003).

The development of the ABC scale was previously carried out on 284 student participants from two majors namely psychology 102 and medicine 182, resulting in internal reliability of 0.88 (Sander & Sanders, 2007). Previous research involving 865 research participants resulted in 24 items analysed, and exploratory and confirmatory factors resulted in a reduction of 17 items and other items, which were divided into four factors: value, verbalization, learning, and attendance (Sander & Sanders, 2009). The scale adaptation conducted in Spain among 2056 students majoring in psychology from three academic years 2003, 2004 and 2005, found that,

in the ABC grade, studying and Verbalizing subscales were significantly correlated with the deep approach to learning as predictors (Sander et al., 2011).

Academic Behavioural Confidence (ABC) is a construct that refers to students' beliefs that they can perform competently in certain learning situations (Sander & Sanders, 2007). Self-confidence plays an important role in learning on campus. Students with a higher level of academic confidence are shown to perform high in postgraduate students (Shaukat & Bashir, 2015). Previous research in Turkey involving 577 undergraduate students found 16 valid items in exploratory and confirmatory factor analysis on three factors, namely planning, verbalizing, and assessment (Shaukat & Bashir, 2015). Research involving 169 students using the ABC scale, which did not test the measuring instrument because it has been adopted in previous studies (S N Matoti & Junquiera, 1992; Sheila N Matoti & Matoti, 2011), found significant differences between different age groups. While gender was not found to be significant difference, a high level of academic behaviour confidence was found for respondents overall (Shaukat & Bashir, 2015).

Some studies use academic behavioural confidence to measure self-efficacy in an academic context (Ochoa & Sander, 2012; D. Putwain, Sander, & Larkin, 2012): Internal consistency academic behavioural confidence 0.89, with internal consistency of each scale factor, namely studying (0.740), understanding (0.74, attendance (0.70), grade (0.72), verbalization (0.60), clarifying (0.53) on 14 items analysed (Shaukat & Bashir, 2015). Other studies also explain the internal consistency of three factors formed separately, namely grades (0.79), verbalizing (0.74), and studying (0.70), which have predictive validity when correlated with academic performance in 206 undergraduate psychology students (D. Putwain et al., 2012).

The purpose of this study was to validate the scale of academic behavioural confidence in a sample of college students in Indonesia using exploratory factor analysis. Factor analysis is an interdependence technique which determines the underlying structure among the variables in the analysis. In factor analysis, the variable plays a key role in any multivariate analysis (Hair, Black, Babin, & Anderson, 2014). Exploratory factor analysis (EFA) has become one of the standard methods and is most widely used to demonstrate the construct validity of a measurement instrument (Fayers, Hand, Cancer, Office, & Keynes, 1997). The purpose of using Exploratory factor analysis (EFA) is to analyse interdependencies between observed variables and underlying theoretical constructs, often called factors so that the structure underlying the observed variables can be found (Jung & Lee, 2011).

Method

Participants

The participants of the study were 753 undergraduate students of a university in Semarang Indonesia. 246 (32.9%) participants were male and 505 were female (67.1%). The participants of this study came from four majors namely Psychology 415 (55.1%), Communication Science 125 (16.5%), English Education 59 (7.8%), Islamic Education 154 (20.5%), and were taken from four different stages of academic progression: freshmen 197 (26.2%)), sophomore 239 (31.7%), junior 291 (38.6%), and senior 26 (3.5%).

Instrument

The academic belief behaviour scale (Academic Behavioural Confidence) was first published as an academic confidence scale (Academic Confidence Scale), and consisted of 6 components (Sander & Sanders, 2003). Scale re-naming is done because the new scale focuses on confidence in actions and plans related to academic studies (Sander & Sanders, 2009).

24 item ABC (Academic Behavioural Confidence) scale (Kirikkanat, Soyer, & Counseling, 2015; Sander & Sanders, 2009), is used to measure the extent of student confidence when undergoing the learning process (Sander, 2009; Sander & Sanders, 2007). Scale response using a Likert model with a rating of 0 for responses, which indicates not at all confident, until 4, which indicates very confident.

Procedure

The primary purpose of exploratory factor analysis (EFA) is to group variables that are highly correlated with each other but also relatively uncorrelated with other variable. These groups are then considered as potential evidence of the structure of the underlying factors (Fayers et al., 1997). The process of adaptation of Academic Behavioural Confidence in this study is to use double translation from two experts who already have an understanding of the construct first. The next step is to discuss with experts to compare and determine the translations used from the two translations if differences between the two translation items were found. The scale translation process is done in one round, namely double translation, which then summarizes the results of the translation from the previous double translation. The translation process is carried out only in one round because there is no difference essentially between the translation results from the two translators (Keeney, Hasson, & Mckenna, 2011). After obtaining translation results that are in agreement, the next step is to fill the scale by the study participants obtained by the random cluster method. Scales that have been filled and collected are then

scored and then tabulated and analysed. Exploratory factor analysis in this study uses SPSS 25 software.

Result and Discussion

The construct validity of the academic behavioural confidence scale was tested by exploratory factor analysis. Construct academic behavioural confidence was tested in exploratory factor analysis research taken from the original version scale. This research determines whether the scale used in different contexts can produce the same results, because some of the things expressed regarding items on the ABC scale are possible problems that only apply in specific contexts. Each scale adaptation process in a different context will produce a construct that is not always the same (Kirikkanat et al., 2015). Before an exploratory analysis is carried out the reliability test measures the level of consistency of a measuring instrument, which needs to account for time periods so that measurements are made at a reliable time point (Hair et al., 2014). A commonly used measure is internal consistency, which needs consistency between variables on the scale that is calculated (Churchill, 1979). The reason for internal consistency is that individual items or scale indicators must all measure the same construct and are thus interrelated (Hair et al., 2014). The overall value of the item to the total (rix) of the entire item range is 0.338-0.596, which means that all items have a total coverage value of 0.3 received in favour of the sponsored Limit (Robinson, Shaver, & Wrightsman, 1991). The next diagnosis is to see internal consistency $\alpha = 0.887$, which means that the ABC scale can be relied upon in carrying out its measuring function. This study examines whether the item loading of the subscale corresponds to the item loading in the original version. Items consisting of five subscales, namely grades, verbalising, studying, attendance and understanding total as many as 24 items, which are analysed as the subject of exploratory factor analysis rotation. The Bartlett test of sphericity is a statistical test for the overall significance of all correlations in the correlation matrix (Hair et al., 2014). The KMO measures of sampling adequacy were 0.910 more than 0.80 which means they are meritorious (Hair et al., 2014) and Bartlett's Test of Sphericity was significant ($p < 0.001$), which finds them in range of being superb. Thus, it is believed that the sample size is adequate for factor analysis. The anti-image correlation matrix is a partial correlation matrix between variables after factor analysis, which shows the extent to which these factors explain each other in the results (Hair et al., 2014). Diagonals contain a measure of sampling adequacy for each variable, and off-diagonal values are a partial correlation between variables. The diagonal of the anti-image matrix element is all item range 0.860-0.940 (all above 0.5). Scree plot shows the number of factors formed in exploratory factor analysis on the ABC scale, which is four factors as shown in Figure 1.

Figure 1. Scree Plot EFA ABC Scale
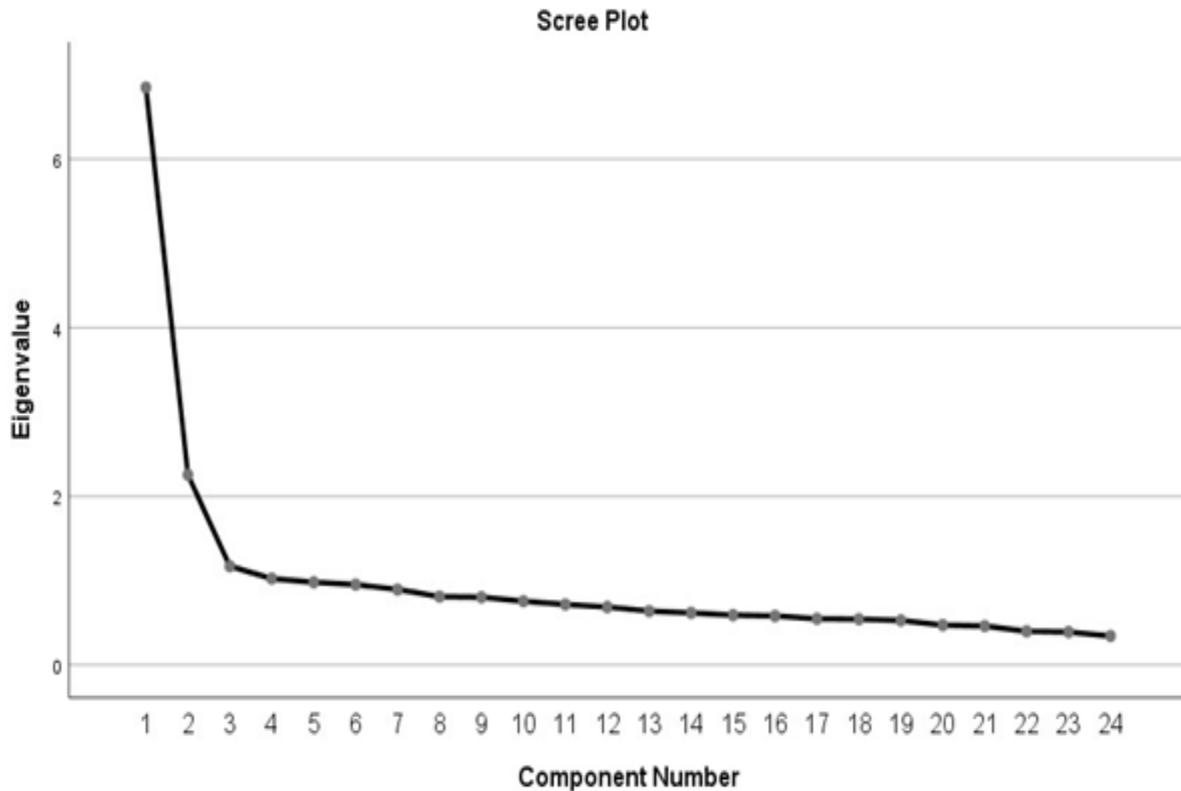
The results of exploratory factor analysis with Oblimin rotation produced four factors. The first factor has eigenvalues of 6.850 and can explain 28.541% of the data variance. The second factor has eigenvalues 2.256 and can provide an increase of 9.399% to the data variance. The third factor has eigenvalues 1.171 and can provide an increase of 4.877% to the data variance. The fourth factor has eigenvalues 1.023 and can add an additional 4.263% to the data variance. After the four factors of the Academic Behavioural Confidence scale are formed, the next step is to give names to four factors based on the items collected on each factor.

Table 1: Pattern Matrices of the ABC Scale of EFA

Item		Grades	Verbalising	Studying	Understanding
1	Learn effectively and independently	0.662			
2	Able to work on exam questions with the best results	0.653			
7	Achieve good academic performance in each lecture assignment	0.639			
4	Manage the workload of the lecturer so that they meet the deadline for collection	0.555			

20	Pass the exam without revision (remedial)	0.554			
19	Take advantage of all study opportunities to get a degree at university	0.516			
21	Plan the schedule revision appropriately	0.503			
18	Come to college on time	0.454			
10	Ask the lecturer about the material described during a lecture		0.690		
11	Understand the course material outline and discuss with the lecturer		0.655		
8	Engage in academic discussions with college friends in their spare time		0.643		
12	Follow the themes and discussions in the lecture		0.623		
9	Ask for an explanation of course material delivered by the lecturer in person		0.617		
5	Give presentations in small group discussions on my initiative		0.609		
3	Answering or responding to questions raised by lecturers during lectures		0.591		
6	Always attend scientific discussion activities (seminars, workshops, conferences and FGD)		0.425		
17	Ask for help (friends/seniors/lecturers) to explain if I do not understand the course material			0.689	
16	Write assignments according to the required writing style			0.646	
22	Keep the spirit of completing all college assignments	0.430		0.596	
24	Attend tutorial activities			0.538	
23	Produce the best paper in college assignments	0.452		0.504	
15	Produce college assignments following specified standards	0.413		0.441	

13	Prepare myself well in tutorial activities (study first)				0.679
14	Read the material recommended by the lecturer				0.629

Item numbers 1, 2, 7, 4, 20, 19, 21, and 18 form the first factor which is grades, and has a factor loading load ranging from 0.454-0.662. Item number 10, 11, 8, 12, 9, 5, 3, and 6 form the second factor, which is verbalizing, and has a loading factor ranging from 0.425 to 0.690. Item numbers 17, 16, 22, 24, 23, and 15 form the third factor, which is studying, and has a factor load ranging from 0.441-0.689. Item number 13 and 14 form the fourth factor, understanding, which has a loading factor ranging from 0.629 to 0.629 (see table 1). The determination of the loading factor criteria depends on the number of study samples for the study sample above 350 for the loading factor criteria used ≥0.30 (Hair et al., 2014). The results of this study differ from previous studies, which used 17 items divided into four domains: achievement (grades), engaging in independent learning (attending), attending lectures and other teaching sessions (attendance), and discussing or presenting course material with peers and teaching staff (verbalizing), with the internal consistency of each domain range 0.71-0.82 (D. W. Putwain & Sander, 2016).

Like previous research, there are four factors formed, but there are differences in the naming of each factor due to differences in the composition of items that make up each factor. Previous research also formed four factors but with different label components namely: grade, verbalizing, studying, and attendance (Sander et al., 2011). While the original scale was formed from six factors, namely grade, studying, verbalizing, attendance, understanding, and requesting (Sander & Sanders, 2009).

Conclusion

This study concludes that four factors are formed from the results of exploratory factor analysis, namely grades, verbalising, studying and understanding. The scale of academic behavioural confidence, which is translated into Indonesian, has proven to have good validity so that it can be used. The development of an academic behavioural confidence scale in the future can use the basis of this research with a different analysis model. In the future, the scale that has been adapted into Indonesian can be used to measure student confidence in an academic context.

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Appendix

ABC Scale in Bahasa Indonesia

Item number	Item
1	Belajar secara efektif dan mandiri
2	Mampu mengerjakan soal ujian dengan hasil terbaik
7	Mencapai kinerja akademik secara baik dalam setiap tugas kuliah
4	Mengatur beban tugas dari dosen agar dapat memenuhi target batas waktu pengumpulan
20	Lulus ujian tanpa revisi (remidi)
19	Memanfaatkan semua kesempatan belajar untuk meraih gelar di universitas
21	Merencanakan revisi jadwal secara tepat
18	Datang kuliah tepat waktu
10	Bertanya kepada dosen tentang materi yang dijelaskan saat kuliah
11	Memahami garis besar materi kuliah dan mendiskusikan dengan dosen
8	Terlibat dalam diskusi akademik dengan teman kuliah diwaktu senggang
12	Mengikuti tema-tema dan diskusi dalam kuliah
9	Meminta penjelasan materi kuliah yang disampaikan dosen secara personal
5	Memberikan presentasi dalam diskusi kelompok kecil dengan inisiatif sendiri
3	Menjawab atau memberikan respon terhadap pertanyaan yang diajukan oleh dosen saat kuliah
6	Selalu menghadiri kegiatan diskusi ilmiah (seminar, workshop, konferensi dan FGD)
17	Meminta bantuan (teman/senior/dosen) untuk menjelaskan jika tidak memahami materi kuliah
16	Menulis tugas sesuai gaya penulisan yang diharuskan
22	Tetap semangat menyelesaikan semua tugas kuliah
24	Mengahadiri kegiatan tutorial
23	Menghasilkan karya terbaik dalam tugas kuliah
15	Menghasilkan tugas kuliah sesuai dengan standar yang ditentukan
13	Mempersiapkan diri secara baik dalam kegiatan tutorial (belajar terlebih dahulu)
14	Membaca materi yang direkomendasikan oleh dosen

Item-Total Statistic

Number of Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
2	.549	.880
7	.596	.879
15	.550	.881
16	.485	.882
20	.434	.883
23	.549	.880
3	.501	.882
5	.504	.881
8	.411	.884
10	.457	.883
1	.462	.883
4	.530	.881
21	.455	.883
22	.468	.882
6	.448	.883
18	.381	.885
19	.514	.881
24	.433	.883
11	.482	.882
12	.383	.885
13	.500	.882
14	.493	.882
9	.354	.886
17	.338	.886