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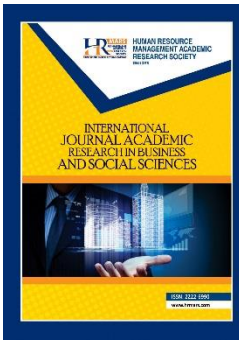
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Reliability Testing on Instrument Development Measuring the Attitude And Perception towards Academic And Personality: Application of the Rasch Model

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Abstract
The purpose of this study is to emphasize on the process of reliability testing for instrument development in measuring the attitudes and perceptions of adolescents towards academic and personality. The testing process is implemented in the form of a quantitative research where data collection is carried out by using questionnaires. The instrument was developed by the researcher under the supervision of experts in the field of psychology. A pilot study of 30 samples was carried out to test the reliability of the instrument. The Rasch Model was used to test the reliability of measurement for each item. A reliability value of .95 for person and .91 for item indicates that the instrument has a high degree of reliability. After aborting the four items misfit, dimensionality testing found that the variance explained by measure for each construct is more than 40 percent. This result shows that the items are highly reliable and suitable for the real data collection.
Keywords*: Attitude, Perception, Instrument development, Reliability test, Rasch Model*

Introduction

The ability to carry out thinking activities is a very important component in human. Human's thinking operates through a mind activity which is centered in the brain. It is this ability that enables human to carry out their roles in this world. This is what differentiates human from other creations. With the ability to carry out thinking activities, human is able to interpret what he sees around him in the form of perceptions, words, emotions, behaviour and actions while interacting with the surroundings and his social world. Perception, emotions, behaviour and actions is a manifestation or reflection of their thinking which is also known as attitude (Ismail, 2011). Hence, this has aroused the interest among researchers to understand both aspects through the discipline of psychology. Consequently, the thinking process and attitude have become significant subjects for research in order to understand

the personality and the reality of man's existence. This study is carried out to discuss the aspects of attitude and perceptions of adolescents in living their daily lives. The observation of the attitudes of adolescents is through their daily behaviours in the aspects of academic and personality whereas the observation of their perceptions is through their opinions.

The aim of this study is to highlight the process of testing reliability for the instrument which has been developed using the Rasch model method. The one-parameter Item Response Theory model or the Rasch model adopts an analysis approach based on a mathematical model which is increasingly being used to validate instruments and reliability tests on the measurement level for each item. It is also a psychometric model to analyse categorized data, such as answers to evaluation or research questionnaires. Apart from being used in the field of psychometrics and education, the Rasch model is also suitable for use in other fields (Wright, 1977) such as in the health profession (Bezruczko, 2005), economic market research (Bechtel, 1985) and others. In the Rasch model, the probability of the stated answer is modeled as a person function and item parameter. As an example, in an education test, the item parameter represents item difficulty whereas the person parameter represents the ability or level of achievement of the persons being evaluated. The higher the ability of a person compared to item difficulty, the higher the probability of a correct response in the item. When the level of attitude of a person is similar to the level of item difficulty, the probability of a 0.5 measured reaction is correct based on the Rasch model.

Although the Rasch model is still new and rarely used in research in the country, there have been some research which employed the Rasch model in testing instrument reliability. Among these are studies conducted by Ghani et al. (2015), whereby a module entitled My Love based on the Islamic perspective was developed as the instrument to help teenagers who were involved in sex before marriage. The testing of reliability in this study is carried out using the Rasch model. The Rasch analysis recorded .95 value of reliability for the person and .80 for the item. Besides these, dimensionality testing shows the variance by measure value to be more than 40%. The real test shows a better outcome for the pre-test which proves the effectiveness of the module.

Latiff (2013) also employed the Rasch model as an approach to test instruments for the research titled Developing Instruments for Evaluating Students' Morals at Institutions of Higher Learning. The study was conducted to develop an instrument to evaluate the morals of students at local universities. Testing of reliability for the study was carried out using the Rasch model method. The Rasch analysis recorded .96 value of reliability for the person and .93 for the item value. Apart fom this, the dimensionality testing shows the variance by measure value to be more than 40%.

Fundamental of the Research

The explanation of the basic concept for this study is important for the development of an instrument. This study encompasses three basic concepts which must be understood, which is, attitudes, perceptions and the aspects of academic and personality. The discussion shall focus on the context and needs of the study. Other than these, the details regarding the formation process and the relation between the three concepts are also discussed.

Concept of Attitude

Attitude is a crucial concept in the study of social psychology. The attitudes portrayed by Man is the result of various types of social behaviours which almost everyone has experienced such as prejudiced behaviour, discrimination, prosocial and others. According to Petty and Caciopo (1986), attitudes are a general lasting evaluation about Man, objects or certain issues. Attitudes are a lasting factor because attitudes do not change over time. According to Desa (2004), attitude is the positive or negative feelings an individual has towards an aspect. This feeling determines various social behaviours which are manifested towards certain individuals or groups. Those behaviours are prejudicial acts, discrimination and prosocial acts and others. Wan Ahmad (2008), attitude is a mental process that is thinking, feeling or making judgements towards an object or a certain situation.

Ismail (2011) states that in general, attitude is something that assumes the form of social judgement which can be present in a person and can be measured. Attitude is made up of many elements. The elements are affective, conative and cognition. This theory is known as the ABC model about attitude (Breckler, (1984). According to Breckler, the affective elements are the positive or negative emotions or feelings towards a certain matter. Elements of conation or behaviour involve the intentions of a man in carrying out something or showing a certain behaviour which directly reflects his attitude. The cognition element deals with the way men think and interpret certain stimulus to build the attitude which agrees with the present emotions and behaviours. Therefore, a certain attitude is a composition of emotions, behaviours and cognition and these interact with each other. (Ciccarelli, 2006).

Concept of Perception

Perception is understood as the concept where two individuals look at the same stimulus but will produce different understanding. For example, when two indiviuals look at the clouds, one of them may think that the cloud looks like a horse, whereas the other one might think that it looks like a bull (Ciccarelli, 2006). Sunaryo (2004) states a few conditions for the process of forming a perception namely; 1) the object exists; 2) the existence of attention from the perceiver which is the first step in forming of a perception; 3) the existence of senses (receptors) which act as the medium to receive stimulus; 4) the existence of sensory nerves that send stimulus to the mind where it is being processed to create the response. According to Atkinson dan Hilgard (1983), perception is different from the senses. The perception is a phenomenon that shows a relation between stimulus that a person receives and his experiences. Perception is rather complex compared to the senses because perception is a phenomenon influenced by high order processes.

Perception is a process of knowing objects and incidents which are objective by using the senses. Sugihartono (2007) states that perception is the ability of the brain to interpret stimulus or the process to interpret stimulus which enter Man's senses. According to Thoha (2003), there are two factors affecting the perception of a person: 1) Internal factors: feelings, attitudes and individual personality, bias, hope and desires, focus, learning process, physical state, psychological disorders , values, interests and motivation; 2. External factors: family background, gained information, knowledge and the surroundings, intensity, evaluation, opposites, repetitive movements, new matters and habits or familiarity towards an object.

Aspects of Personality and Academics

Based on the context of the study, the attitudes and perceptions of adolescents are observed from the achievements in academic and personality aspects. The researcher is of the opinion that academic and personality aspects are suitable to be observed in the context of a teenager's life. Kamus Dewan (2005) defines the word academic as having qualities of or contains knowledge. Positive achievements in the academic aspect is directly related to the learning situation at the educational institution. Learning in this context refers to the formal learning which involves teaching of knowledge at school or institutions of higher education. In this context, academic achievements do not refer to the understanding of academic achievements as gained knowledge or skills that are being developed in the school subjects, usually, these are fixed by test scores or any markings given by the teachers or both.

The second aspect to be studied among the youths at Kampong Bharu is the personality. With reference to the 4th. Edition of Kamus Dewan (2005), personality means character: the main thing is to seek knowledge and equipping the process of building one's personality or an exemplary individual. Personality is also known as the behaviour and character. The personality is the deciding factor to behaviour within the individual from the surroundings (Ramli, 1986). Personality encompasses the meaning of character, morals and ethics reflected in mannerisms and good behaviour, tactful and being true which should be possessed by someone who gives goodness to himself and others. It is a condition or a character within the self or the established emotions in man that makes it easy to exhibit good or bad behaviours and actions without thinking or planning, (Yasin, 1992). Hence, it can be concluded that the personality refers to attitude or manners which are ingrained in a person.

The academic aspect to be observed is through the student progress withn regard for the aims and objectives of the curriculum which are oriented by the efforts and commitments as a student (Garrisson, et al., 1964). Within the context of this study, perception to be analysed in the academic aspect is the teenagers' perception towards the importance of education in life, whereas the attitude observed in this aspect is related to academics such as the attitude of a student towards learning and helping each other in it. However, the personality aspects will focus on evaluating the teenager's responsibility as a child to the parents and also as a a social citizen. This is because responsibility towards the parents and others is very parallel with the lives of those who are under parental care and living in a traditional neighbourhood. Based on the context of the study, the aspect of perception to be studied is the teenager's perception towards good personality and the attitude under study is the attitude related to an outstanding teenager such as respect for parents, responsibility and honesty.

Methodology

Through the survey approach, data is collected using an instrument administered by the researcher at the location of the study. This approach is effective in acquiring information from respondents apart from observing their behaviours. The approach employed for obtaining data for this study is through the use of a questionnaire form. The questionnaire is a set of planned questions with spaces for answers distributed to the respondents in order to gain information from the respondents

pertaining to the objectives of the study. As a result of the data collection, the research findings will be presented in the form of a descriptive statistic analysis.

Preparation of the Instrument

The researcher has designed an instrument in the form of a questionnaire. Bahasa Malaysia is used as the medium for acquiring information and data in the questionnaire form. A construct framework and a sub-construct framework for the instrument is designed by the reasearcher guided by experts in the field of psychology. The researcher then conducts a decision-making process and arrangement of items for every sub- construct built. There are 2 main constructs in the instrument, i.e 1) perception and 2) attitude. There are 16 sub-constructs in this instrument i.e 1) academic perception 2) personality perception 3) academic attitude 4) assisting in studies 5) character-personality (respect for parents) 6) (responsibility) and 7) honesty.

Table 1: Total Items per construct

Section	Konstruk Construct	Jumlah Item Total Items	Pernyataan Item Statement Item
1	Perception towards Academic and Personality	6	P1>P6
		6	P7>P12
2	Attitude towards Academic and Personality	10	S1.1>S1.10
		12	S2.1>2.12

The questionnaire form used in this study is divided into 2 sections, namely section I and section II. The following are the details for each section in the questionnaire form:

Section 1: Perception

The section for perception is divided into 2 dimensions. Each dimension is constructed to measure the fixed variable. The 2 dimensions for the perception section are I) attitude towards academic achievement and 2) attitude towards personality. There are 12 constructs in this section. Measurement of the variable for this section is based on a 4 point Likert interval scale, namely:

1. Strongly Disagree
2. Disagree
3. Agree
4. Strongly Agree

Section II: Attitude

The section for attitude is also divided into 2 dimensions. Every dimension is constructed to measure the fixed variable. The 2 dimensions for attitude are 1) attitude towards academic achievement and 2) attitude towards personality. There are 22 constructs in this section. Measurement of the variable for this section is based on a 4 point Likert interval scale, namely:

1. Never
2. Sometimes
3. Frequently
4. Always

The following is detailed information for the development framework for the instrument prepared:

Table 2: Instrument Framework for the Study

CONSTRUCT	SUB CONSTRUCT	STATEMENT OF ITEMS
Perception	Academic Perception	**P1** Education is the most important thing in life.
		P2 A hardworking student can be guaranteed a successful life in the future.
		P3 Playing truant from school and from class will affect me badly.
		P4 The university is a place for people who are successful.
		P5 The degree is proof of success in life.
		P6 I shall further my studies upon completion of my studies.
	Personality Perception	**P7** Young people must respect the old.
		P8 A child is required to repay his parents' deeds.
		P9 A good son always thinks of his parents first.
		P10 Those who have discipline are successful.
		P11 Everyone likes to be friends with good people.
		P12 People who are honest live peaceful lives.
Attitude	Acedemic Attitude (Excellent Student)	**S1.1** I feel happy studying at school / a learning institution.
		S1.2 I give my fullest attention when teacher is teaching.
		S1.3 I shall ask questions if I do not understand what is being taught.
		S1.4 I obey my teacher's instructions.
		S1.5 I do my revision / read books at home.
		S1.6.I complete all my homework / coursework.
	Academic Attitude	**S1.7** I advise my friends who make noise in class.

	(Helping in Studies)	**S1.8** I invite my friends to study together .
		S1.9 I share my knowledge with my friends..
		S1.10 I help my friends in their studies.
	Personality Attitude (Respect for Parents)	**S2.1** I interact with my parents with respect and politeness.
		S2.2 I obey my parents.
		S2.3 I help my parents with the husehold chores.
		S2.4 I put my family first before others.
	Personality Attitude (Responsible Attitude)	**S2.5** I greet others with *Assalamu'alaikum.*
		S2.6 I help those who are in need.
		S2.7 I give advice to my friends who do wrong.
		S2.8 I advise those younger than me about good matters.
	Personality Attitude (Honesty)	**S2.9** I perform my *solat* without being asked by my parents.
		S2.10 I help others without expecting to be reawrded..
		S2.11 I copy in the examinations.(-)
		S2.12 I lie to my parents and my friends. (-)

Pilot Testing

Prior to the distribution of the questionnaire forms to the respondents, a pilot testing was conducted to test the reliability of items in the questionnaire. According to Polit. et al., (2001), a pilot study refers to the smaller version of the study or a trial which is carried out as a preparation for a larger scale study. Apart from the study trial, the pilot study can be carried out as a platform to test the reliability of an instrument. Reliability refers to the consistency of one measurement to another measurement. It is the result of the analysis gained from an instrument (Linn dan Miller, 2005). A test is said to be consistent when a measure of a test will gain the same results in another test administered at a different time.

The pilot testing which was carried out to provide room for improvement of the instrument and to be used in the study by giving the opportunity to respondents to offer comments or suggestions. The pilot testing in this research is carried out on a group of teenagers who are representative of the actual group of respondents. A set of 30 questionnaire forms are distributed for the purpose of the study. The respondents are students who are chosen on a random basis. The data collected will be fed into the *Statistical Package for The Social Sciences* (SPSS) and later to be analysed using the '*Winsteps*' software. Through this test, items which have been identified as problem items will be aborted from the instrument before the instrument is given to respondents of the study for data collection.

Discussion

This section will illustrate the process of reliability testing using the Rasch model on the instrument that was developed. Data from the pilot testing is used for this reliability test.

Person and Item Fit

The value or level of reliability is further reinforced by the high overall individual reliability (person fit) that is .95 (Aziz, et al., 2008; Bond & Fox, 2007; Linacre, 2005) which is almost 1.0. In fact, according to Wright & Masters (1982), the estimated repetition for the whole item if administered to another set of respondents with the same criteria will produce a high result outcome. The item separation index showed a well-accepted value as the value that exceeds 2.0 index (Bond & Fox, 2007).

Tabel: 3: *Person fit* and *item fit*

TABLE 3.1 Pilot Test Data.sav ZOU239WS.TXT Apr 22 12:37 2015
INPUT: 30 PERSON 70 ITEM REPORTED: 30 PERSON 34 ITEM 4 CATS WINSTEPS 3.72.3

SUMMARY OF 30 MEASURED PERSON

TOTAL		MODEL	INFIT		OUTFIT	
SCORE	COUNT	MEASURE	ERROR	MNSQ	ZSTD	MNSQ	ZSTD
MEAN	216.0	70.0	1.52	.21	1.01	-.2	.99	-.2
S.D.	23.2	.0	1.06	.06	.40	2.3	.39	2.0
MAX.	276.0	70.0	5.36	.52	2.02	5.0	1.91	4.4
MIN.	165.0	70.0	-.29	.18	.52	-3.5	.46	-3.0

REAL RMSE .23 TRUE SD 1.04 SEPARATION 4.52 PERSON RELIABILITY .95
MODEL RMSE .21 TRUE SD 1.04 SEPARATION 4.85 PERSON RELIABILITY .96
S.E. OF PERSON MEAN = .20

PERSON RAW SCORE-TO-MEASURE CORRELATION = .97
CRONBACH ALPHA (KR-20) PERSON RAW SCORE "TEST" RELIABILITY = .95

SUMMARY OF 34 MEASURED ITEM

	TOTAL SCORE	COUNT	MODEL MEASURE	ERROR	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD
MEAN	92.6	30.0	.00	.31	1.01	.0	.99	.0
S.D.	12.1	.0	1.15	.08	.29	1.1	.30	1.0
MAX.	118.0	30.0	2.38	.73	2.08	2.4	1.81	2.1
MIN.	63.0	30.0	-3.54	.27	.47	-2.7	.47	-2.0

REAL RMSE .35 TRUE SD 1.10 SEPARATION 3.18 ITEM RELIABILITY .91
MODEL RMSE .32 TRUE SD 1.11 SEPARATION 3.46 ITEM RELIABILITY .92
S.E. OF ITEM MEAN = .14

Item Polarity

The polarity analysis or the item match is an indicator used to show the items for each construct acts in the direction that the construct is measured. Item polarity also acts as the prior validation for each construct. (Petty dan Cacioppo, 1986; Linacre, 2005). Measurements that show a positive value for all items indicate that all items that are displayed act in the same direction to measure the construct that was built. If a negative index is found for an item, that item needs to be re-assessed whether to retain or abort it. The point measure correlation (PT-MEASURE CORR) value must never be negative (Linacre, 2005). Any value that is negative or below 0.2 for the construct needs to be aborted because it does not measure any construct. However, Bond & Fox (2007) state that as long the value is positive, it can be accepted. The analysis shows that all items for every construct meet the condition and are accepted because they are positive. This shows that all constructs are parallel in order to measure what is to be measured.

Table 4: Item Polarity for Perception Construct

TABLE 26.1 Pilot Test Data.sav ZOU765WS.TXT Apr 22 12:46 2015
INPUT: 30 PERSON 12 ITEM REPORTED: 30 PERSON 12 ITEM 4 CATS WINSTEPS 3.72.3

PERSON: REAL SEP.: 1.59 REL.: .72 ... ITEM: REAL SEP.: 3.38 REL.: .92

ITEM STATISTICS: CORRELATION ORDER

|ENTRY TOTAL TOTAL MODEL| INFIT | OUTFIT |PT-MEASURE |EXACT MATCH| |
NUMBER SCORE COUNT MEASURE S.E. |MNSQ ZSTD|MNSQ ZSTD|CORR. EXP.| OBS% EXP%| ITEM
7 118 30 -2.77 .74|2.10 1.5|1.61 .8| .11 .17| 96.6 93.1| P7SAHSIA
6 112 30 -1.10 .42|1.47 1.5|1.54 1.2| .15 .34| 65.5 73.1| P6AKADEM
8 117 30 -2.32 .62| .93 .0| .65 -.2| .26 .21| 89.7 89.8| P8SAHSIA
1 115 30 -1.72 .50| .88 -.2| .67 -.4| .33 .27| 82.8 83.2| P1AKADEM
9 105 30 -.12 .34| .94 -.1| .89 -.3| .41 .44| 51.7 64.7| P9SAHSIA
10 82 30 2.01 .28|1.12 .6|1.09 .5| .43 .59| 48.3 53.3| P10SAHSI
12 83 30 1.93 .28| .97 .0| .94 -.2| .51 .59| 65.5 53.0| P12SAHSI
3 104 30 .00 .34|1.00 .1|1.03 .2| .51 .45| 55.2 64.0| P3AKADEM
2 111 30 -.93 .40| .63 -1.4| .49 -1.4| .54 .36| 72.4 71.4| P2AKADEM
11 95 30 .92 .30| .99 .1| .93 -.2| .56 .53| 58.6 57.9| P11SAHSI
4 84 30 1.85 .28|1.02 .2|1.01 .1| .65 .58| 62.1 52.6| P4AKADEM
5 79 30 2.24 .28| .84 -.6| .85 -.5| .72 .61| 58.6 53.7| P5AKADEM
MEAN 100.4 30.0 .00 .40|1.07 .1| .98 .0|	67.2 67.5|
S.D. 14.4 .0 1.71 .14| .36 .8| .32 .6|	14.6 14.1|

Table 5: Item Polarity for Attitude Construct

TABLE 26.1 Pilot Test Data.sav ZOU268WS.TXT Apr 22 12:47 2015
INPUT: 30 PERSON 22 ITEM REPORTED: 30 PERSON 22 ITEM 4 CATS WINSTEPS 3.72.3

PERSON: REAL SEP.: 2.96 REL.: .90 ... ITEM: REAL SEP.: 2.45 REL.: .86

ITEM STATISTICS: CORRELATION ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MODEL MEASURE	S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	EXACT MATCH EXP.	OBS%	EXP%	ITEM
21	99	30	-1.15	.32	1.09	.5	1.12	.5	.33	.52	50.0	61.7	S2.11
19	98	30	-1.04	.32	2.03	3.4	2.00	2.6	.33	.53	53.3	61.1	S2.9
22	97	30	-.94	.32	.62	-1.8	.69	-1.0	.43	.54	70.0	60.5	S2.12
12	94	30	-.64	.31	.97	-.1	1.05	.3	.49	.55	53.3	59.7	S2.2
11	99	30	-1.15	.32	.65	-1.6	.83	-.4	.51	.52	70.0	61.7	S2.1SIKA
1	90	30	-.25	.31	.96	-.1	.97	.0	.53	.57	70.0	59.7	S1.1SIKA
20	97	30	-.94	.32	1.24	1.0	1.11	.5	.54	.54	70.0	60.5	S2.10
15	79	30	.83	.32	1.45	1.7	1.33	1.2	.57	.60	46.7	61.0	S2.5
9	89	30	-.15	.31	.64	-1.7	.64	-1.5	.58	.57	76.7	59.6	S1.9
8	77	30	1.04	.32	1.21	.9	1.20	.8	.58	.60	53.3	62.2	S1.8
7	68	30	2.05	.35	1.27	1.0	1.27	1.0	.58	.59	63.3	67.4	S1.7
2	79	30	.83	.32	.90	-.3	.85	-.5	.58	.60	66.7	61.0	S1.2
6	86	30	.14	.31	.98	.0	.95	-.1	.58	.58	53.3	59.4	S1.6
16	78	30	.94	.32	.87	-.5	.90	-.3	.59	.60	70.0	61.2	S2.6
5	80	30	.73	.32	1.06	.3	1.04	.2	.60	.59	60.0	60.8	S1.5
13	83	30	.43	.31	1.07	.4	.99	.0	.62	.59	63.3	59.1	S2.3
10	88	30	-.05	.31	.68	-1.4	.66	-1.4	.64	.58	76.7	59.6	S1.10
3	80	30	.73	.32	1.10	.5	1.04	.2	.64	.59	60.0	60.8	S1.3
14	102	30	-1.47	.33	.87	-.5	.80	-.4	.65	.50	63.3	63.1	S2.4
4	91	30	-.35	.31	.75	-1.1	.71	-1.1	.69	.56	70.0	59.6	S1.4
18	90	30	-.25	.31	.78	-.9	.73	-1.0	.70	.57	76.7	59.7	S2.8
17	81	30	.63	.32	.80	-.8	.73	-1.0	.77	.59	66.7	60.5	S2.7
MEAN	87.5	30.0	.00	.32	1.00	-.1	.98	-.1			63.8	60.9	
S.D.	8.9	.0	.89	.01	.31	1.2	.30	.9			8.8	1.7	

Dimensions

The Principal Component Analysis is applied to determine an item that is unidimensional or otherwise. An item that is unidimensional is an item that measures one single ability (Bond & Fox, 2007; Linacre, 2005). According to Linacre (2005), the level of variance explained by measure ought to be more than 40% so that the dimensionality of items in each construct is in good order.

Table 6: Item Dimensionality for Perception Construct

TABLE 23.0 Pilot Test Data.sav ZOU551WS.TXT Apr 9 11:46 2015
INPUT: 30 PERSON 12 ITEM REPORTED: 30 PERSON 12 ITEM 4 CATS WINSTEPS 3.72.3

Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)

	-- Empirical --		Modeled	
Total raw variance in observations =	26.2	100.0%	100.0%	
Raw variance explained by measures =	14.2	54.2%	54.5%	
Raw variance explained by persons =	4.6	17.4%	17.4%	
Raw Variance explained by items =	9.7	36.9%	37.1%	
Raw unexplained variance (total) =	12.0	45.8%	100.0%	45.5%
Unexplned variance in 1st contrast =	2.2	8.5%	18.5%	
Unexplned variance in 2nd contrast =	2.0	7.7%	16.7%	
Unexplned variance in 3rd contrast =	1.4	5.2%	11.3%	
Unexplned variance in 4th contrast =	1.2	4.8%	10.4%	
Unexplned variance in 5th contrast =	1.1	4.4%	9.5%	

Table 7: Item Dimensionality for Attitude Construct

TABLE 23.0 Pilot Test Data.sav ZOU268WS.TXT Apr 22 12:47 2015
INPUT: 30 PERSON 22 ITEM REPORTED: 30 PERSON 22 ITEM 4 CATS WINSTEPS 3.72.3

Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)

	-- Empirical --		Modeled	
Total raw variance in observations =	39.2	100.0%	100.0%	
Raw variance explained by measure =	17.2	43.9%	43.6%	
Raw variance explained by persons =	7.4	19.0%	18.9%	
Raw Variance explained by items =	9.8	24.9%	24.7%	
Raw unexplained variance (total) =	22.0	56.1%	100.0%	56.4%
Unexplned variance in 1st contrast =	4.0	10.2%	18.1%	
Unexplned variance in 2nd contrast =	2.7	7.0%	12.4%	
Unexplned variance in 3rd contrast =	2.6	6.7%	11.9%	
Unexplned variance in 4th contrast =	1.9	4.9%	8.7%	
Unexplned variance in 5th contrast =	1.7	4.4%	7.8%	

An analysis of the test shows the dimensionality value for the perception construct and the attitude construct to have exceeded the fixed 40%. This indicates the presence of multidimensional items that measure dimensions extensively in the construct factor. These items are considered problematic. The problem items are identified by conducting an item match test or item infit.

Item Infit

An analysis using the Rasch model is able to estimate the degree of suitability and match of those items that measure a hidden variable. The suitability and match of an item may have an influence on the level of reliability of an instrument. The item matching test is aimed at verifying the match for every item. According to Bond and Fox (2007), an item with an MNSQ infit value or outfit of more than 1.4 logit show that the logit is not homogen with the other items in a one-scale measurement. However, an MNSQ infit or outfit of less than 0.6 logit is an indication of the presence of overlapping of one item to another. Items whcih are out of range of (0.6<x<0.14) need to be aborted in so as to improve the quality of an instrument.

Tablel 8: Infit item value for the perception construct

TABLE 10.1 Pilot Test Data.sav ZOU434WS.TXT Apr 9 10:00 2015
INPUT: 30 PERSON 12 ITEM REPORTED: 30 PERSON 12 ITEM 4 CATS WINSTEPS 3.72.3

PERSON: REAL SEP.: 1.59 REL.: .72 ... ITEM: REAL SEP.: 3.38 REL.: .92

ITEM STATISTICS: MISFIT ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MODEL MEASURE	S.E.	INFIT MNSQ	ZSTD	OUTFIT MNSQ	ZSTD	PT-MEASURE CORR.	EXP.	EXACT MATCH OBS%	EXP%	ITEM
7	118	30	-2.77	.74	2.10	1.5	1.61	.8	A .11	.17	96.6	93.1	P7SAHSIA
6	112	30	-1.10	.42	1.47	1.5	1.54	1.2	B .15	.34	65.5	73.1	P6AKADEM
10	82	30	2.01	.28	1.12	.6	1.09	.5	C .43	.59	48.3	53.3	P10SAHSI
3	104	30	.00	.34	1.00	.1	1.03	.2	D .51	.45	55.2	64.0	P3AKADEM
4	84	30	1.85	.28	1.02	.2	1.01	.1	E .65	.58	62.1	52.6	P4AKADEM
11	95	30	.92	.30	.99	.1	.93	-.2	F .56	.53	58.6	57.9	P11SAHSI
12	83	30	1.93	.28	.97	.0	.94	-.2	f .51	.59	65.5	53.0	P12SAHSI
9	105	30	-.12	.34	.94	-.1	.89	-.3	e .41	.44	51.7	64.7	P9SAHSIA
8	117	30	-2.32	.62	.93	.0	.65	-.2	d .26	.21	89.7	89.8	P8SAHSIA
1	115	30	-1.72	.50	.88	-.2	.67	-.4	c .33	.27	82.8	83.2	P1AKADEM
5	79	30	2.24	.28	.84	-.6	.85	-.5	b .72	.61	58.6	53.7	P5AKADEM
2	111	30	-.93	.40	.63	-1.4	.49	-1.4	a .54	.36	72.4	71.4	P2AKADEM
MEAN	100.4	30.0	.00	.40	1.07	.1	.98	.0			67.2	67.5	
S.D.	14.4	.0	1.71	.14	.36	.8	.32	.6			14.6	14.1	

Table 9: Infit item for attitude construct

TABLE 10.1 Pilot Test Data.sav ZOU268WS.TXT Apr 22 12:47 2015
INPUT: 30 PERSON 22 ITEM REPORTED: 30 PERSON 22 ITEM 4 CATS WINSTEPS 3.72.3

PERSON: REAL SEP.: 2.96 REL.: .90 ... ITEM: REAL SEP.: 2.45 REL.: .86

ITEM STATISTICS: MISFIT ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MODEL MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM
19	98	30	-1.04	.32	2.03	3.4	2.00	2.6	A .33	.53	53.3	61.1	S2.9
15	79	30	.83	.32	1.45	1.7	1.33	1.2	B .57	.60	46.7	61.0	S2.5
7	68	30	2.05	.35	1.27	1.0	1.27	1.0	C .58	.59	63.3	67.4	S1.7
20	97	30	-.94	.32	1.24	1.0	1.11	.5	D .54	.54	70.0	60.5	S2.10
8	77	30	1.04	.32	1.21	.9	1.20	.8	E .58	.60	53.3	62.2	S1.8
21	99	30	-1.15	.32	1.09	.5	1.12	.5	F .33	.52	50.0	61.7	S2.11
3	80	30	.73	.32	1.10	.5	1.04	.2	G .64	.59	60.0	60.8	S1.3
13	83	30	.43	.31	1.07	.4	.99	.0	H .62	.59	63.3	59.1	S2.3
5	80	30	.73	.32	1.06	.3	1.04	.2	I .60	.59	60.0	60.8	S1.5
12	94	30	-.64	.31	.97	-.1	1.05	.3	J .49	.55	53.3	59.7	S2.2
6	86	30	.14	.31	.98	.0	.95	-.1	K .58	.58	53.3	59.4	S1.6
1	90	30	-.25	.31	.96	-.1	.97	.0	k .53	.57	70.0	59.7	S1.1SIKA
2	79	30	.83	.32	.90	-.3	.85	-.5	j .58	.60	66.7	61.0	S1.2
16	78	30	.94	.32	.87	-.5	.90	-.3	i .59	.60	70.0	61.2	S2.6
14	102	30	-1.47	.33	.87	-.5	.80	-.4	h .65	.50	63.3	63.1	S2.4
11	99	30	-1.15	.32	.65	-1.6	.83	-.4	g .51	.52	70.0	61.7	S2.1SIKA
17	81	30	.63	.32	.80	-.8	.73	-1.0	f .77	.59	66.7	60.5	S2.7
18	90	30	-.25	.31	.78	-.9	.73	-1.0	e .70	.57	76.7	59.7	S2.8
4	91	30	-.35	.31	.75	-1.1	.71	-1.1	d .69	.56	70.0	59.6	S1.4
22	97	30	-.94	.32	.62	-1.8	.69	-1.0	c .43	.54	70.0	60.5	S2.12
10	88	30	-.05	.31	.68	-1.4	.66	-1.4	b .64	.58	76.7	59.6	S1.10
9	89	30	-.15	.31	.64	-1.7	.64	-1.5	a .58	.57	76.7	59.6	S1.9
MEAN	87.5	30.0	.00	.32	1.00	-.1	.98	-.1			63.8	60.9	
S.D.	8.9	.0	.89	.01	.31	1.2	.30	.9			8.8	1.7	

Based on the item match test that was carried out, 2 items for perception and 2 items for attitude are found to be out of the fixed range (0.6<x<0.14). These items are known as items that are misfit or problem items. Items which are out of range need to be aborted in order to increase construct dimensionality which will also increase the reliability of the instrument.

Dimensions After Aborting 4 (misfit)

After the problem items or misfits have been identified, the items are then removed. A dimensionality test is again carried out to ensure an upgraded construct quality after the problem items have been removed. According to Linacre (2005), 'variance explained by measure' must be more must than 40% to ensure the dimensionality of items in a construct is in good order. Based on the second diemnsionality test, an increase is present in the 'variance explained by measure' value in both constructs. The results of the analysis is shown in Table 10 and Table 11.

Table 10: Item Dimensionality for Perception Construct after Aborting 2 Misfit Items

TABLE 23.0 Pilot Test Data.sav ZOU376WS.TXT Apr 9 12:21 2015
INPUT: 30 PERSON 10 ITEM REPORTED: 30 PERSON 10 ITEM 4 CATS WINSTEPS 3.72.3

Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)

	-- Empirical --		Modeled	
Total raw variance in observations =	21.8	100.0%	100.0%	
Raw variance explained by measures =	11.8	54.0%	54.9%	
Raw variance explained by persons =	4.3	19.6%	19.9%	
Raw Variance explained by items =	7.5	34.4%	35.0%	
Raw unexplained variance (total) =	10.0	46.0%	100.0%	45.1%
Unexplned variance in 1st contrast =	2.0	9.3%	20.2%	
Unexplned variance in 2nd contrast =	1.6	7.5%	16.3%	
Unexplned variance in 3rd contrast =	1.3	6.1%	13.3%	
Unexplned variance in 4th contrast =	1.2	5.3%	11.6%	
Unexplned variance in 5th contrast =	1.0	4.5%	9.8%	

Table 11: Item Dimensionality for Attitude Construct after Aborting 2 Misfit Items

TABLE 23.0 Pilot Test Data.sav ZOU153WS.TXT Apr 22 13:08 2015
INPUT: 30 PERSON 20 ITEM REPORTED: 30 PERSON 20 ITEM 4 CATS WINSTEPS 3.72.3

Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)

	-- Empirical --		Modeled	
Total raw variance in observations =	37.1	100.0%	100.0%	
Raw variance explained by measures =	17.1	46.1%	45.8%	
Raw variance explained by persons =	7.9	21.2%	21.1%	
Raw Variance explained by items =	9.2	24.9%	24.8%	
Raw unexplained variance (total) =	20.0	53.9%	100.0%	54.2%
Unexplned variance in 1st contrast =	3.9	10.5%	19.6%	
Unexplned variance in 2nd contrast =	2.7	7.2%	13.4%	
Unexplned variance in 3rd contrast =	2.4	6.5%	12.1%	
Unexplned variance in 4th contrast =	1.7	4.6%	8.6%	
Unexplned variance in 5th contrast =	1.5	3.9%	7.3%	

Research Instrument After Validating Validity And Reliability

After the instrument has undergone testing for validity and reliability using the Rasch Model, 4 out of 34 items are aborted. Those items do not fit with other items and thus can be considered problematic. The table below gives the details about those items that have been aborted:

Table 12: Information on aborted items for each construct.

Construct	Number of Items Before Being aborted	Number of Aborted items	Statement of Aborted Items	Number of items after being aborted
Perception Towards Acdemic and Personality	6	1(P6)	I continued my studies after I finished schooling.	5
	6	1(P7)	Young people need to respect the old.	5
Academic and Personality Attitude	10	-	-	10
	12	2 (S2.5& 2.9)	1) I greet everyone with *Assalamu'alaikum*.	
			2) I perform my *solat* without being asked by my parents.	10

Conclusion

The result of the reliability test for the instrument recorded a reliability value of .95 for Individual and .91 for Items. Thus, indicating that the instrument has a high reliability. Besides, testing on dimensionality found that the 'variance explained by measure' value for both constructs is more than 40%. The findings from the *item infit* test shows 2 out of 12 perception items and 2 out of 12 attitude items are *misfit*. Therefore, as many as 4 items from the overall number of 30 items have been aborted from the instrument. The dimensionality test is conducted again to ensure improvements in the construct quality after the problem items are aborted. Based on the dimensionality test which was run for the second time, an increase is found in the 'variance explained by measure' value in both constructs inducing each item in every construct to be unidimensional. Hence, the analysis shows that the instrument has high item reliability and high item validity thus enabling it to be used in the real data collecting process.

This study shows the ability of the method, that is Rasch Model, to assist in the validation process of the survey instrument development. Its ability to measure the realibility of the newly developed items using a small sample size surely would be a great benefit to any researchers who develop their own instruments especially in the phase of conducting the pilot testing. By applying this method, the researcher would be able to identify the misfit item statement in the instrument. It helps the researchers to identify and decide whether the item needs to be revised or dropped from the instrument or if the items are good but the respondents did not respond accordingly to the items. Thus, Rasch Model has made it possible for social scientists to perform regulated measurement where human is at the core of the matter.

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