REASSESSING SELF-ASSESSMENT OF ABILITY: POSSIBLE INFLUENCE OF METACOGNITION.

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ABSTRACT

This study was conducted to investigate the accuracy of self-report assessment in measuring cognitive ability, and its relationship with academic achievement and metacognitive skills. In order to do this, results of cognitive ability tests were compared to responses from self-report assessments of matched domains of ability. The discrepancy between tested and self-reported responses was then compared to academic achievement, and possible connection with metacognitive skills was examined. The study adopted a quantitative approach using cross-sectional descriptive research design. A self-report assessment of cognitive ability was developed to measure verbal, number and spatial ability by adapting several items from the MIDAS, (Shearer, 1996) and the SDQIII (Marsh, 1989) inventories. All measures were translated into the Malay language. Several sets of cognitive ability tests were used to get an objective measure of the matched abilities. The tests include a set of test that was self-developed (vocabulary test), extracts from SPM Bahasa Malaysia paper II examination as well as several tests from the Kit of Factor-Referenced Cognitive Tests (Ekstrom, French, Harman & Dermen, 1976). University achievement was measured by the students' cumulative grade point average (CGPA). A total of 465 second year UTM students from an engineering degree programme were involved in the study. Results indicate that the accuracy of self-assessment can be questioned and possible connection with metacognitive skills was suggested.

INTRODUCTION

Investigating the ability of students in determining academic success is no doubt important, but in practice, intelligence or ability tests are not a normal part of the national educational practice in many countries outside the United States. What is more, attributing success or failure to cognitive ability or intelligence alone may only confirm ability or deficits (Keogh & Becker, 1973). It does not really provide information that would be helpful for interventions. The main contribution of intelligence tests should not be used to make predictions but to assist students, so much so that the American National Commission on Testing and Public Policy Testing has called for the transformation of testing in America from a gatekeeper to that of a facilitator (Harrington, 1995). The commission stated that testing programmes must change from an over-reliance on objective tests to alternative forms of assessment that help people become aware of and develop their talents.

Another measure of cognitive ability is via self-assessment. Compared with intelligence testing, self-report assessment is cheaper, less time intrusive, and less affected by test anxiety and sickness, making it more possible for practical use. Moreover, it can be used to tap more ability areas than aptitude tests. The assessment is normally based on personal experience in certain activities of designated abilities, and covers aspects that are related to the cognitive, the conative and the psychomotor domains.

Self-report is a form of measurement, which requires subjects to fill out a questionnaire or answer a series of questions. Self-report assessment of cognitive ability involves reflecting on past achievements, critically evaluating present performance and planning future goals (McAlpine, 2000). Items would cover overt (actions) as well as covert (cognition and conation) behaviours. Three different self-report assessment formats have been used (Harrington, 1995). These can take the form of a listing of abilities with definitions and directions to indicate best or strongest areas, a Likert scale for a group of abilities, or different examples of applications of ability on which individuals rate their performance level from high to low.

Compared to intelligence tests, self-report data is economical, easy to collect and easy to work with. Although the use of self-report has a long history in educational and psychological practice and research, its use to measure cognitive ability is quite new, as intelligence tests have for many years dominated the field of ability measurement. Reasons for the interest in self-report assessment of cognitive ability in education can be seen from two perspectives. Firstly, researchers may be interested to see whether self-report assessment can be used as proxy for an intelligence test. If this could be proven, self-report would be of immense value and could be used as an economical alternative for intelligence testing. Secondly, practitioners, especially educators and counsellors are aware of some of the negative impacts IQ tests may have on students. Self-report assessment of ability has been introduced to help people become aware of and develop their ability and talents.

Many scholars (e.g. Bandura, 1986) believe that human beings are uniquely able to take themselves as the object of their own thoughts. Through self-reflection individuals think consciously about themselves, form images and concepts of what they are like and evaluate their own experiences, characteristics, capabilities and thought processes. Although it seems that people are quite accurate in their assessments of themselves, researchers are reluctant to use self-report measures of cognitive ability (DeNisi & Shaw, 1977). This reluctance seems to arise from beliefs that self-evaluations are subject to a great deal of error resulting from self-enhancement desires and people cannot analyse themselves objectively enough to give accurate information (West & Mabe, 1982).

Studies that have looked into the accuracy of self-report assessment examined the external or concurrent validity of ability self-report (as compared to objective ability tests), and have found mixed evidence. While Westbrook, Buck, Sanford and Wynne (1994) (as cited in Harrington, 1995) demonstrated that it is possible to get acceptable reliability and validity coefficients for self-ratings which approach the size of the validity coefficients reported for objective measures of ability, other studies have only found low to moderate concurrent validity of self-report assessment with objective measures (e.g. Ackerman, Beier & Bowen, 2002, and DeNisi & Shaw, 1977).

Paulhus, Lysy & Yik (2000) found validity values for self-report measures of intelligence failed to exceed 0.30. Other studies also suggest that self-report measures of intelligence are not useful as proxies for intelligence or cognitive ability tests. Reynolds & Gifford (1996) found the validity coefficient for the general population sample to be 0.38, and the validities do not exceed 0.30 in college samples (cited in Paulhus, Lysy & Yik, 2000).

Using a slightly different approach to test the accuracy of self-assessment of ability, Kruger & Dunning (1999) found that certain people tend to overestimate or underestimate their ability. They investigated the likelihood of people holding overly favourable views of their abilities across three domains: humour, logical reasoning and English grammar in four separate studies. A total of 65 students participated in the first study (humour), 44 in the second study (logical reasoning), 84 in the third study (English grammar) and 140 in the fourth study (logical reasoning). The participants were asked to provide an estimated percentile rank of their ability in comparison to their peers relating to the subject concerned after a test of domain knowledge in each study.

Significant correlations were found between self-ratings of ability and the measures of actual ability for humour ($r = 0.39$, $p<0.001$) and English grammar ($r = 0.54$, $p<0.0001$) and for logical reasoning in study 4 ($r = 0.38$, $p<0.0001$), but not for logical reasoning in study 2. The participants were also divided into four groups based on their performance in each domain knowledge test. Kruger & Dunning found that on average, the participants overestimated their ability, but those whose test scores fell in the bottom quartile overestimated their ability to the greatest extent. Participants falling in other quartiles overestimated their ability much less than did those in the bottom quartile. Interestingly, participants in the top quartile underestimated their abilities. Table 1 shows the differences in percentile rank between actual test scores and perceived ability in four studies.

Actual test score (percentile rank)	**Perceived ability (percentile rank)**	**Paired t test**
Humour (Study 1)		
Bottom quarter		
12^{th} percentile	58^{th} percentile	t(15) = 10.33, p<0.0001
Top quarter		
86^{th} percentile	75^{th} percentile	t(15) = -2.20, p<005
Logical reasoning (Study 2)		
Bottom quarter		
12^{th} percentile	68^{th} percentile	t(10) = 17.2, p<0.0001
Top quarter		
86^{th} percentile	74^{th} percentile	t(12) = -3.55, p<0.05
English grammar (Study 3)		
Bottom quarter		
10^{th} percentile	67^{th} percentile	t(16) = 13.68, p<0.0001
Top quarter		
89^{th} percentile	72^{nd} percentile	t(18) = -4.73, p<0.0001
Logical reasoning (Study 4)		
Bottom quarter		
13^{th} percentile	55^{th} percentile	t(36) = 10.75, p<0.0001
Top quarter		
90^{th} percentile	76^{th} percentile	t(27) = -3.00, p<0.001

Table 1: Self-ratings of abilities and actual test performances for bottom- and top-quartile participants.

In study 3, the bottom (n=17) and top-quartile (n=19) performers from that study (English grammar) were invited back after four to six weeks of the first phase of the study. Each group was given the tests that had been completed by their peers in the first phase of the study to grade by indicating the number answered correctly. After that, the participants were shown their own test again and were asked to re-assess their ability and performance in the test relative to their peers. Bottom quartile participants were found to be less able to judge the competence of others. The correlation between the grade given by the participants and actual test scores was 0.37 for the bottom-quartile participants and 0.66 for the top-quartile participants, $t(34) = 2.09$, $p<0.05$. Results on the reassessment of ability show that bottom-quartile participants failed to gain insight into their own performance after seeing the more competent choices of their peers. In fact, they tended to raise their already inflated self-estimates (but not significantly). On the other hand, top-quartile participants raised their estimates of their own grammar ability, $t(18) = 2.07$, $p = 0.05$. Kruger & Dunning claimed that incompetent individuals lack the metacognitive skills that enable them to assess their own or even others' performance. They can't tell how poorly they are performing, and as a result, they come to hold inflated views of their ability. Nevertheless this claim was not supported by any evidence.

Previous studies discussed above raise concerns on the use of self-report assessment of ability as well as our ability to give accurate ratings of our own ability. In Krugger and Dunnings' (1999) study, they found that higher achievers tend to overestimate their ability while lower achievers tend to overestimate their ability, but the tendency of the non-accurate assessment is more prevalent amongst the lower achievers. Possible connection with metacognitive skills was assumed but no further investigation was done to support this idea. This study was conducted to continue the line of investigation into the accuracy of self-report assessment in measuring ability, as well as possible link with academic achievement and metacognitive skills.

It was assumed that the more accurate one's perception of ability, the better their academic achievement, and metacognitive skills was assumed to mediate this association. Findings from this study would not only provide evidence regarding the validity of self-report assessment of ability but would also shed some light regarding the role of metacognition in influencing perception of one's ability and the possible outcome on academic achievement.

METHODOLOGY

A quantitative approach using cross-sectional descriptive research design was used. A total of 465 second year UTM students from an engineering degree programme were involved in the study. A set of questionnaire that includes an ability self-report assessment as well as metacognitive skills were given before a set of tests on cognitive ability were administered to ensure that the participants were not influenced by their perceptions on how well they performed in the ability tests in answering the self-report. Both assessments were done in classrooms during tutorial hours but they had to be administered in two separate occasions due time constraints. The total number of participants involved was 465. There were participants who did the ability tests only (n=125) or the objective tests only (n=40). Nevertheless, 295 participants took both the tests and questionnaires. The participants were between 18 to 21 years old and they included male and female students from several electrical engineering programmes at the University Teknologi Malaysia.

The self-report assessment of cognitive ability was developed by adapting several items from the MIDAS, (Shearer, 1996) and the SDQIII (Marsh, 1989) inventories. Three domains of ability were measured: verbal, number and spatial. All measures were translated into the Malay language.

Several sets of cognitive ability tests were used to get an objective measure of the verbal, spatial and number abilities. Verbal ability was tested using vocabulary, comprehension, topics and word endings tests. These tests measure four aspects of verbal ability, namely vocabulary, comprehension, ideational fluency and word fluency. The vocabulary test was developed to measure students' ability to understand the Malay language by testing knowledge of word meaning. As there is no standardised vocabulary test in the Malay language, the vocabulary test was self-developed using a dictionary sampling method. Comprehension skills were measured by using a comprehension section from a Malay Language examination paper of the Malaysian Certificate Education examination. Ideational and word fluency were tested respectively by the translated version of the topics test (FI-1) and word endings test (FW-1) that were taken from the Kit of Factor-Referenced Cognitive Tests (Ekstrom, French, Harman & Dermen, 1976). The reliability index for the topics test presented in the tests manual based on a study using 189 high school males was 0.81 while the internal validity coefficient found for the Malay version in this study was 0.79. The reliability index for the word endings test based on a study on 181 college students was 0.70 (Ekstrom, French, Harman & Dermen, 1976) and the internal consistency reliability score for the Malay version was 0.73.

Number ability was measured using the subtraction and multiplication test (N-3) of the Kit of Factor-Referenced Cognitive Tests. The reliability index reported based on a study using 294 sixth graders was 0.92 (Ekstrom, French, Harman & Dermen, 1976). The reliability index found in this study was 0.91.

Spatial ability was represented by spatial visualization and spatial orientation. Spatial visualization was measured by the paper folding test (VZ2) from the Kit of Factor-Referenced Cognitive Tests. The reliability indexes for the test presented in the test manual based on several studies on 288 to 300 male and 317 to 329 female high school students, 82 army enlistees and 46 college students ranged from 0.75 to 0.84 (Ekstrom, French, Harman & Dermen, 1976). The internal reliability index found in this study was 0.79. Spatial orientation was measured by card rotation (S1). This test was also taken from the Kit of Factor-Referenced Cognitive Tests. The reliability indexes for the card rotation test based on separate studies on 288 to 300 male and 317 to 329 female high school students, 99 female college students, and 46 college students were between 0.80 to 0.89 (Ekstrom, French, Harman & Dermen, 1976), and 0.74 in this study.

Academic achievement was measured by students' cumulative grade point average (CGPA) while the metacognitive learning strategies sub-scale from The Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia & McKeachie, 1991) was used to represent metacognitive skills. It was believed that the likelihood of over or underestimation is thought to be less in self-report items related to metacognitive skills compared to perception of ability. This is mainly because the two self-reports are different in terms of the way they construct their items. Items in the ability self-report were questions relating to students' performances (sample item: 'I have always done well in mathematics classes') in certain areas. Items related to the metacognitive learning strategies are about students' behaviour relating to metacognitive learning behaviour (sample item: 'before I study new course material thoroughly, I often skim it to see how it is organised'). Extraneous factors such as students' ability to process the right information to represent performances in certain areas, differences in students' reference groups and social desirability may be influencing students' responses to items related to the ability self-assessment more than to items related to the metacognitive strategies.

RESULTS AND DISCUSSIONS

In order to examine the accuracy of self-report compared to objective tests, variables representing the differences between tested and self-reported abilities were created, by constructing standardised residual variables through the 'save' option in simple regression analyses, predicting tested ability using the matched aspect of ability self-report. Standardised scores were used in order to give equal weights to the tested and self-rated ability scores for the purpose of comparison between the two measures. Negative scores indicate overestimation while positive scores indicate underestimation. The closer the standardised residual discrepancy is score to zero (0), the more accurate the perception of ability.

The standardised residual values for the three aspects of ability ranged between -3.2 to 1.7 (number), -2.9 to 2.3 (verbal) and -3.5 to 1.9 (spatial). Nevertheless, most of the residuals were within the range between -2.00 to 2.00. The distributions of the standardised residual values for the three aspects of ability are as below (figure 1).

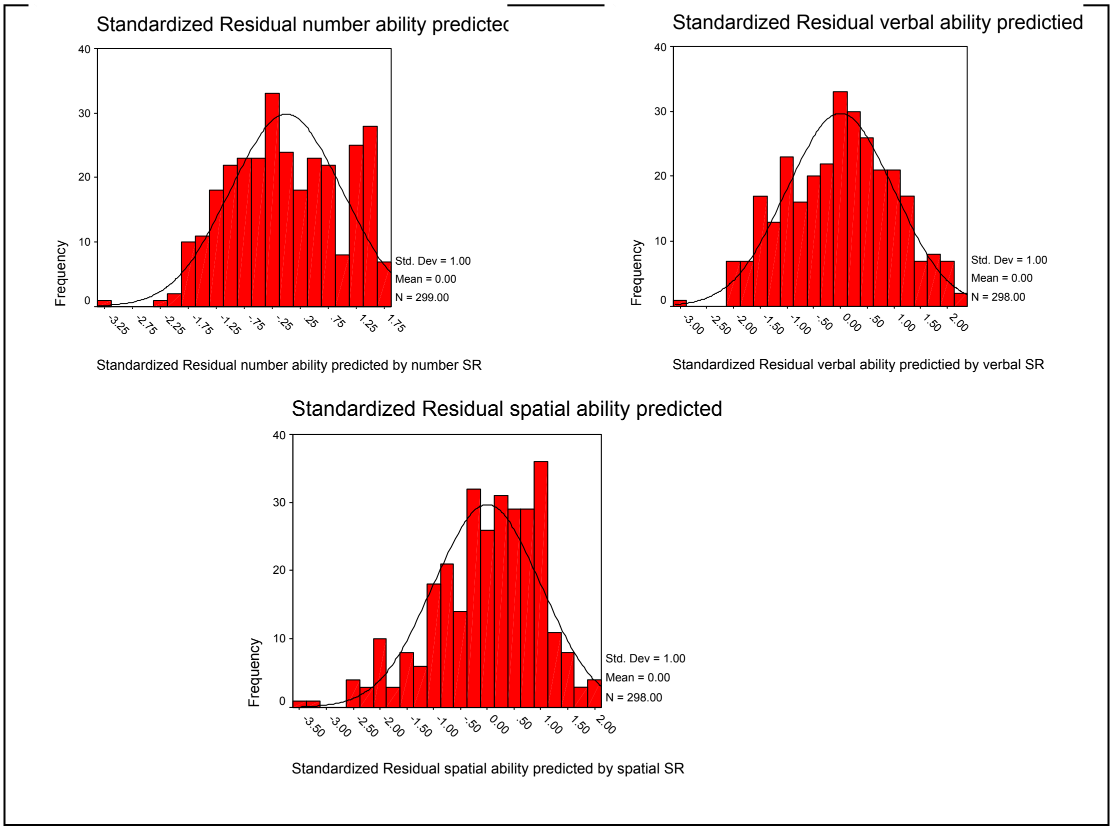


Figure 1: Distribution of standardised residual values for all domains of ability

Three discrepancy groups were then formed for each aspect of ability: low, moderate and high. The standardised (z) distribution instead of percentile scores was used as the cutting points in order to give a more accurate picture regarding the discrepancy between tested and self-rated ability. Participants with standardised residual scores from lowest to –0.25 were categorised into the low/ overestimate group, participants with scores between -0.24 to 0.25 were categories into the moderate/ most accurate group, while participants with score of 0.26 and above were categorised into the high/ underestimate group.

	Overestimate	Most accurate	Underestimate
Number ability	121 (41.02%)	51 (17.29%)	123 (41.69%)
Verbal ability	115 (39.12%)	59 (20.07%)	120 (40.82%)
Spatial ability	105 (35.96%)	56 (19.18%)	131 (44.86%)

Table 2: Distribution of sample based on ability discrepancy for each domain of ability.

The table above (table 2) shows that in all aspects of ability, about 20.9 to 24.1% of the participants overestimated their ability while 23.9 to 26% of them underestimated their ability. About 10.1 to 11.7% had the most accurate estimation of their ability.

Accuracy in self-assessment and academic achievement

It was assumed that the more accurate one's perception of ability the better the achievement, and therefore would lead us to expect a curvilinear relationship between the accuracy in perception of ability and achievement.

The mean scores of course performance and GPA for the three discrepancy groups were compared using one-way ANOVAs. The results are presented in the table below (table 3). The mean scores indicate that in all aspects of ability discrepancy, students who overestimated their ability were the poorest in terms of academic achievement (both measures). The group that achieved the best was less clear as there was no clear pattern between the most accurate/moderate group and underestimate/high groups in terms of their achievement.

Aspects of discrepancy	**Low GPA**	**Moderate GPA**	**High GPA**	**Significant differences (CP)**	**Significant differences (GPA)**
Number discrepancy	3.07	3.27	3.36	*F = 12.184; df= 2,286; p<0.001*	F = 10.723; df = 2,288; p<0.001
Verbal discrepancy	3.18	3.26	3.27	*F = 1.794; df= 2,285; p>0.05*	F = 0.882; df= 2,287; p>0.05

Spatial discrepancy	3.18	3.33	3.25	*F = 2.068; df= 2,283; p>0.05*	F = 1.691; df= 2,285; p>0.05

Table 3: Mean scores for course performance and GPA and ANOVA results

Results from the ANOVA tests show that significant differences between the discrepancy groups were only found for the dimension of number ability. Post hoc tests' (Tukey test) results indicate that for both measures of academic achievement, students from the high/underestimate group achieved the best. These students were statistically different in their course performance and GPA from the low/overestimate group (mean difference = 6.96, p <0.001; and mean difference = 0.29, p<0.001 respectively). They also scored significantly higher than the moderate/ most accurate group in course performance (mean difference = 4.89, p<0.05), but such result was not found for GPA. The high/underestimate group was not significantly different from the moderate/ most accurate group (mean difference = 0.09, p>0.05) in their GPA scores. The moderate/most accurate group was not different in terms of their course performance from the low/overestimate group (mean difference = 2.07, p>0.05), but the two groups were significantly different in terms of their GPA scores (mean difference = 0.21, p<0.05). These findings will be better summarised by these figures below.

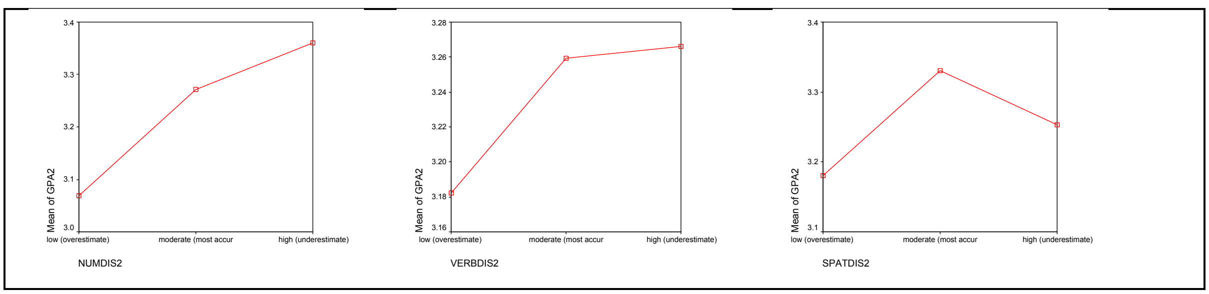


Figure 2: Means plots of academic achievement (GPA scores) for number, verbal and spatial ability discrepancy groups.

The above figures show that the assumptions were not entirely supported. Although not all mean differences were statistically significant, from the figure, most associations were linear (especially within number and verbal ability domains). In many cases, students who underestimated and those who perceived their ability most accurately were similar with each other. They were better than those who overestimated their ability in terms of their academic achievement and metacognitive skills. Students who overestimated their ability (in all domains of ability) were clearly the poorest in academic achievement.

Accuracy in self-assessment and metacognitive skills

Metacognitive skills are assumed to mediate the association between accuracy in perception of ability and academic achievement, therefore, similar pattern of relationship is also expected between accuracy in perception of ability and metacognitive skills. The assumption that accuracy in ability perception is linked to metacognitive skills was tested next. Metacognitive learning strategies were used to represent metacognitive skills. A series of ANOVA's were conducted to investigate the mean differences in metacognitive learning strategies between the three discrepancy groups.

The mean scores for the different discrepancy groups indicate that for number and spatial ability, students who were most accurate in their ability perception reported the highest metacognitive learning strategies scores. As for verbal ability, students who underestimated their ability reported the highest metacognitive skills. Students who overestimated their ability reported the lowest metacognitive learning strategies in all aspects of ability, however students who underestimated their spatial ability were also low in terms of their metacognitive skills.

Aspects of discrepancy between ability test and self-rated ability	**Low**	**Moderate**	**High**	**Significant differences (metacognitive learning strategies)**
Number discrepancy	57.24	61.51	60.39	F = 5.477; df= 2,292; $p<0.01$
Verbal discrepancy	57.99	59.75	60.40	F = 1.993; df= 2,291; $p>0.05$
Spatial discrepancy	58.75	62.75	58.92	F = 3.984; df= 2,289; $p<0.05$

Table 4: Mean scores of metacognitive learning strategies for each discrepancy group and ANOVA results.

Results from the ANOVA tests (table 4) revealed that significant differences in metacognitive learning strategies were only found for number and spatial discrepancy groups. In both cases, students with most accurate perception of ability (moderate group) had the highest metacognitive skills score. Results from post hoc tests (Tukey test) indicate that for number ability, the moderate group was significantly different from the low/overestimate group (mean difference = 4.27, $p<0.05$), but was not significantly different from the high/underestimate group (mean difference = 1.12, $p>0.05$). The high/underestimate group had a significantly higher mean metacognitive skills score than the low/overestimate group (mean difference = 3.15, $p<0.05$). As for spatial discrepancy, the most accurate/moderate group was significantly higher in metacognitive skills compared to the overestimate (mean difference = 3.99,$p<0.05$) and underestimate (mean difference = 3.83, $p<0.05$) groups. Metacognitive skills of the overestimate and underestimate groups for the spatial ability dimension were not statistically different (mean difference 0.16, $p>0.05$). There was no significant difference between the verbal discrepancy groups in their metacognitive skills. The figures below can clearly illustrate the pattern of metacognitive skills for the different discrepancy groups.

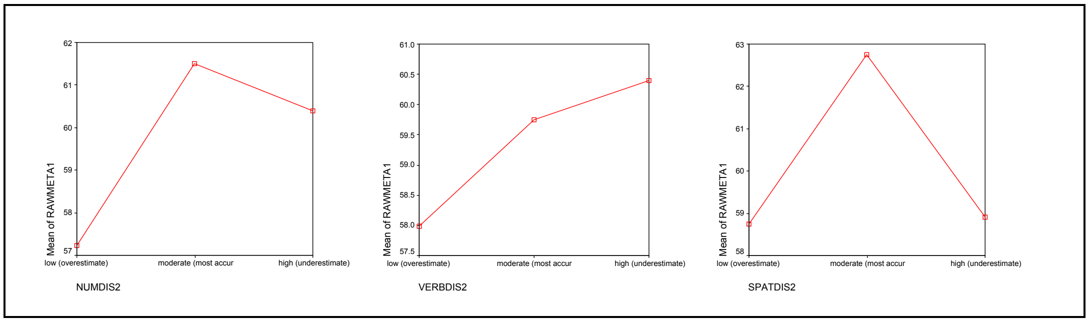
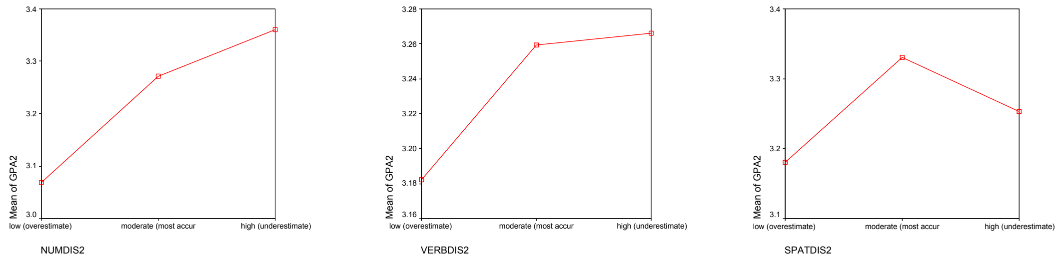
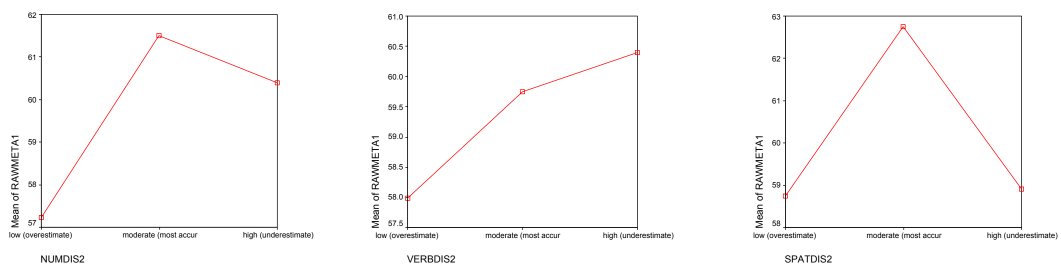


Figure 3: Means plots of metacognitive skills scores for number, verbal and spatial ability discrepancy groups.

Similarity in the pattern of association within each ability domain, especially between discrepancy group and academic achievement, and between discrepancy group and metacognitive skills may suggests that metacognitive skills mediates the association between accuracy in perceived ability and academic achievement (see figure 4). Metacognitive skills might have influenced the ability to monitor and judge personal progress, i.e., the processes involved in forming perceptions of ability. Lack of metacognitive skills may have led some students to have excessive and unjustified satisfaction, pleasure and judgement in their attainments. As a result, it makes the students feel complacent and do not put enough effort into tasks. This is probably what had happened amongst the students who overestimated their ability. Students with better metacognitive skills were more accurate in their perception, but they sometimes underestimate their ability probably due to factors associated with importance of the tasks and/or achievement motivation. Being accurate as well as underestimating one’s ability was found to be an advantage. Perhaps being accurate in perception of ability allows students to match their efforts to the tasks in appropriate ways, while students who underestimate their ability put extra efforts than actually needed into their tasks (in most cases, students who underestimate achieved better than the most accurate students).



Means plots of GPA scores for number, verbal and spatial ability discrepancy groups.



Means plots of metacognitive skills scores for number, verbal and spatial ability discrepancy groups.

Figure 4: Mean plots of GPA and metacognitive skills for each domain of cognitive ability discrepancy groups.

It is also important to highlight that significant differences between the discrepancy groups in academic achievement (overestimate, most accurate and underestimate) were found only within the number ability domain. Students who were most accurate and underestimate their ability scored better GPA than students who overestimated their ability.

There are two possible explanations why statistical significance was found only for accuracy in number ability. The first potential explanation is that students who are accurate in perception of number ability may be good in logical and analytical ability, the types of ability that are highly valued in university subjects, especially in engineering.

A more convincing explanation may lie on the differences in availability of clear feedback as well as values that students put on the tasks related to the different aspects of ability. It is easier to be accurate in perception of number ability than in perception of verbal or spatial ability as students have a better basis for judging their performance in number ability. This is mainly because items related to number ability perception are directly related to one's capacity and achievement in a particular subject area, i.e. mathematics. Students can judge their number ability by their level of performance in this subject. Even when the aspects of number ability are not specifically related to a school subject area, for example in items related to the 'everyday skill with maths' sub-scale, students can still have accurate feedback on how well they are in mathematical or maths-related problems as there is almost always a definite answer to all problems. They can know whether their solution is right or wrong. Students are also aware that mathematics is a subject that is highly relevant to success in engineering. Perception on how well they are in this area is more likely to influence the way they behave in handling related tasks. The bases of performance for verbal and spatial ability on the other hand, are less clear. Although verbal ability may be important to students as it is required in all subject areas, unlike number ability, feedback is less clear, and tasks related to these ability domains may not be seen as important for achievement in engineering. Items related to perceived spatial ability are mostly daily tasks and not directly related to achievement in academic subjects. Students may have not seen them as important to university achievement.

CONCLUSION

In summary, the results show that on average, about 80% of the participants either underestimated or overestimated their ability. Statistically significant association between accuracy in ability perception and academic achievement was found particularly for the domain of number ability. Students who were most accurate and underestimated their number ability achieved better compared to students who overestimated their number ability. Metacognitive skills are thought to be mediating this relationship as similar relationship was found between accuracy in number ability perception and metacognitive skills. Although statistical significance was not found for the other aspects of ability, in all cases, students who overestimated their ability were found to perform poorest.

Results from the present study suggest that self-assessment of cognitive ability is not a valid tool to measure actual cognitive ability. In general, lower and higher achievers have similar levels of perceived cognitive ability even though their tested ability levels were statistically lower than the high achievers. As a result, caution should be taken when assessing cognitive ability using self-report, and results based on such measure should not be used to prescribe certain kinds of additional support or student interventions. Although self-report assessment of ability may not benefit educators to distinguish students' achievement at university, it could still be used to understand how students perceive their ability. Academic advisors need to play a role to help their students understand their actual achievement and potential, and to monitor as well as guide their progress.

Another and perhaps a more powerful means to help students realise their ability and potential is through formative assessments. This form of assessment is seldom practised in high education. In general, university education (including UTM's) emphasises on summative and standardized exams, often with high stakes attached. Marking and grading are overemphasized while giving useful advice such as giving useful feedback or comments regarding students' performances are underemphasized. In formative assessment, teachers feed information back to students in ways that enable the student to learn better and engage in a self- reflective process (metacognition). Students express their understanding through classroom dialogues that focuses on exploring understanding, and feedback includes opportunities to improve and guidance on how to improve. Therefore, it provides the immediate, contextualized feedback useful for helping teacher and student during the learning process.

Black and Wiliam (1998) provide strong evidence from an extensive literature review to show that classroom formative assessment, properly implemented, is a powerful mean to improve student learning. These studies range over age groups from 5-year-olds to university undergraduates across several school subjects and over several countries. Many studies also found that formative assessment helps low achievers more than other students thus raise the overall achievement. While it is hard to change the current classroom practices in universities, policy makers and educators should take into serious consideration the benefits of effective formative assessment practice and eventually try to adopt it into higher education practice.

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