

Chapter 18

Relationship between Accuracy in Ability Perception, Academic Performance, and Metacognitive Skills among Engineering Undergraduates: Implications for Higher Education Practice

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ABSTRACT

A quantitative study using cross-sectional descriptive research design was conducted to investigate engineering undergraduates' accuracy in perception of cognitive ability and its relationship with academic achievement and metacognitive skills. A total of 465 second year UTM students from an engineering degree programme were involved in the study. Results of their 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 metacognitive skills. Results indicate that high achievers are more accurate in their perception of their ability compared to students with lower level of achievement. Similar patterns were observed for metacognitive skills where undergraduates with the most accurate perception of ability show the highest level of metacognitive skills. Results also show significant positive correlation between metacognitive skills and academic achievement. Accuracy of one's perception of ability may have something to do with the ability to think about thinking (metacognition). Findings from this study would not only provide evidence regarding

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the role of metacognition in influencing perception of ability and the possible outcome on academic achievement, but more importantly, such information can have an impact on the process of teaching and learning as well as academic advising. Steps in helping students to increase their metacognitive skills and gain more accurate estimation of their ability are suggested.

INTRODUCTION

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. The perceptions or beliefs that people have formed about their abilities will form a sense of self-efficacy which will later influence goals and aspirations. The stronger the self-efficacy the higher the goals people set for themselves and the firmer their commitment to the goals (Bandura, 2004). This will then lead to greater effort and persistence on relevant tasks, and often resulting in better performance (Larsen & Buss, 2008). In other words, what we believe will influence our behaviour which in return will influence the outcome.

While some researchers (e.g. 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-estimations or perceptions on ability 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). Many researchers believe 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 exam-

ined the external or concurrent validity of ability self-report (as compared to objective ability tests), and have found mixed evidence. 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).

In another study, Kruger & Dunning (1999) found that certain people tend to overestimate or underestimate their ability. The research was done to investigate 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

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