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Self-confidence: An Introduction to the Literature and Related Constructs

Day 2 – Parallel IV (10.25-10.55)

Studies of learners' self-confidence have been undertaken primarily by psychology and education researchers, and, interestingly, these have focussed particularly on the subject domain of mathematics. In the 1970's and early 1980's several Mathematics anxiety, attitude and self-efficacy scales were created. From the 1990's an on-going variety of studies have investigated students' self-confidence in their ability in mathematics (and science) in numerous countries around the world, but particularly in the USA, UK and Australia. The current state of affairs is that interest in learners' self-confidence in mathematics (and science) has resulted in increasingly large scale studies around the world (for example one recent study analysed data from 33 nations) and there are various recent studies with tens of thousands of participants, ranging from studies on primary and secondary school children, to specialist and non-specialist undergraduate students. It is generally concluded that students' self-confidence is an important factor in their level of achievement in mathematics (and reciprocally) and that self-confidence impacts considerably on learning in various and, often, complex ways.

Students' self-confidence in their ability in mathematics is generally accepted to be a belief and is closely related to mathematics self-concept and self-efficacy. Fishbein and Ajzen (1975) proposed a causal chain representing the relationship between beliefs, attitudes, intentions and behaviour, thereby also distinguishing between these constructs. Pehkonen and Pietilä (2004) characterised beliefs, attitudes and emotions in terms of speed of formation and stability, intensity, and the level of cognitive involvement in the development of these attributes. These characterisations were encapsulated by calling emotions, attitudes and beliefs respectively hot, cool and cold.

Beliefs, attitudes and emotions are collectively labelled as 'Affect' in Mathematics. However, in some past research the term attitude was used in a wider sense, for example, in Richard Sandman's (1980) Mathematics Attitude Inventory six sub-scales were used to measure a range of different constructs all under the heading of attitude: Perception of mathematics teacher; Mathematics anxiety; Value of mathematics in society; Mathematics self-concept; Enjoyment and Motivation. Whilst motivation is considered a constituent part of affect by some authors, it is generally considered a separate construct.

Bandura's Self-Efficacy Theory (Social Cognitive Theory) (1997) provided a comprehensive exposé of antecedents (mastery experiences, vicarious experiences, verbal persuasion and physiological and affective states) and the outworkings of self-efficacy (on cognitive, motivational, selective and affective processes). Other researchers have then applied and validated Bandura's theory in difference settings.

In this presentation an introduction will be given to the literature regarding self-confidence up to recent publications. An overview will also be given of the respective constructs of Beliefs (including: self-confidence; self-efficacy; and self-concept), Attitudes (including Liking of mathematics and Liking of Statistics), Emotions (for example Mathematics Anxiety) and Motivation (briefly touching upon attribution, goal and expectancy outcome theories). Attendees will have the opportunity for questions and discussion in order to consider the implications for their own HE settings.