CAV08141

Development of a theoretical framework to inform measurement of secondary school student engagement with learning

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Paper presented to the Assessment and Measurement Special Interest Group at the 2008 Annual Conference of the Australian Association for Research in Education: Brisbane.

Abstract

This paper reports on the development of theoretical frameworks to inform a quantitative investigation of secondary school student engagement in classroom learning. A process of inductive analysis was applied to theoretical and empirical literature on student engagement and participation. Material were condensed and summarised leading to the proposal of frameworks with content considered important by the researcher for epistemological and methodological reasons.

The paper commences by examining some of the conceptions of student engagement and participation found in the literature on these topics. Next, Bio-ecological models of intellectual development and engagement are examined and adapted to explain student engagement. A twelve element Bio-ecological view of student engagement is proposed. The key attributes of Flow Theory and how this can be applied in a two dimensional conceptualisation of student engagement are then explored. The two dimensions are *student capability for learning* and *expectations of student learning for understanding*. A series of propositions and expositions are advanced to provide starting point for operationally defining these constructs. *Student capability for learning* was defined in terms of student attributes associated with learning theory constructs - *self-esteem*, *self-concept*, *resilience*, *self-regulation*, and *self-efficacy*. The framework of *expectations of learning for understanding* was based on the six facets of understanding developed by Wiggins and Mctighe (2001) - this provided operational definitions for the sub-constructs comprising this construct.

The paper then presents some of the requirements for objective measurement and how these necessitate the presence of particular features in the theoretical frames that will inform instrument development. Finally, the theory underpinning the conceptualisation of student engagement in classroom learning is re-examined in terms of these requirements.

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The research was conducted as part of an Australian Research Council funded Linkage Project between Curtin University of Technology and the Participation Directorate of the Western Australian Department of Education and Training.

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Introduction

The aim of this paper is twofold. First to explore some of the theoretical assumptions associated with the notion of student engagement in classroom learning. Second, to develop and present theoretical frames that have features compatible with the theoretical requirements for objective measurement.

The construct of engagement

Glanville and Wildhagen (2007, p. 1021) noted that "… engagement is a general concept that includes many specific behaviours and attitudes" and it "… encompasses a range of behaviours and attitudes, with researchers and theorists applying different labels to these behaviours, such as participation, identification, attachment, motivation, and membership". With regard to engagement at school, Glanvill and Wildhagen view this as "… a student's behavioural and psychological involvement in the school curriculum (p. 1021). Similarly, Hughes and Zhang (2006, p. 406) defined classroom engagement to be indicated by "… student effort, attention, persistence, and cooperative participation in learning". Further, Kenny, Blustein, Haase, Jackson and Perry (2006, p. 272) portrayed school engagement as "… positive attitudes toward school, teachers, classmates, and academic learning". Alternatively, Furrer and Skinner (2003, p. 149) considered classroom engagement from the perspective of *relatedness* and as referring to "… active, goal-directed, flexible, constructive, persistent, focused interactions with the social and physical environments". The differences in the meaning of school engagement are further exemplified by Janosz, Archambault, Morizot and Pagani (2008) who drew attention to the development of engagement:

> "School engagement evolves from complex transactions between personal and family characteristics and the school environment. It essentially characterizes both academic (achievement, motivation, involvement in learning activities) and social integration within the school (social isolation/rejection, quality of student-teacher relationships, participation in extracurricular activities)" (p. 22).

In an earlier attempt to provide conceptual clarity, Fredricks, Blumenfeld and Paris (2004) classified the research on engagement three ways:

1. Behavioural - positive conduct, involvement in academic, social or school activities, and in extra-curricular activities;
2. Emotional - positive and negative reactions to teachers, classmates, academics and school; and
3. Cognitive - motivation to comprehend complex ideas and master difficult skills.

They noted that notwithstanding the multiplicity of constructs presented in the literature and the need for a multi-faceted conceptualisation, much research did not take account of this complexity and investigated only one or two of the three facets. Also they expressed concern about a lack of agreement about the precise nature of each facet and this resulting in conceptual overlap and duplication of constructs.

London, Downey and Mace (2007) also proposed a three dimensional conception of engagement. While their research concerned university students, the psychological theory they used is likely applicable in other educational contexts. They proposed that engagement

encompassed the "… institutional, situational and individual factors that may impact any given student" (p. 456). The institutional factors concerned assessment procedures and also the diversity of learning environments. The situational factors were the pedagogical practices of the instructors and the prevailing culture (competition versus collaboration). The individual factors include competence beliefs, concerns and expectations of bias around social identities, and conception and of coping with the context.

The measurement of university student engagement in Australia and Northern America has become widespread as a result of the need for monitoring the 'quality' of student experiences and for quantifying student satisfaction with the services of the university. For example, in Australia, the *Student Engagement Questionnaire* (SEQ) (ACER, 2007) measures six scales:

> "Academic challenge - the extent to which expectations and assessments challenge students to learn;
> Active learning - students' efforts to actively construct knowledge;
> Student and staff interactions - the level and nature of students' contact and interaction with teaching staff;
> Enriching educational experiences - students' participation in broadening educational activities;
> Supportive learning environment - students' feelings of legitimation within the university community; and
> Work integrated learning - integration of employment-focused work experiences into study" (p. 2).

Development of the SEQ was based on USA National Survey of Student Engagement instrument – the *College Student Report*. This instrument has been administered in over 1,200 higher education institutions in the United States and Canada.

Another significant contribution to the theory of engagement comes from an investigation reported by Vibert and Shields (2003). This was based on the notion of student engagement being an ideological term and they used three perspectives to explain engagement. First, when viewed through the *rational/technical* lens, the purpose of education is preparation for the world outside of the school and after schooling. Second, when viewed through the *interpretive/student centred* lens, student "… engagement involves productive students working autonomously and effectively on projects of some particular interest to them and over which they have some control" (Vibert and Shields, 2003, p. 228). Third the *critical/transformative* lens focuses on the transformation of individuals and society as characterised by a critical pedagogy.

Harris (2008) conducted a phenomenographic investigation of teacher conceptions of student engagement. The study suggested six categories:

> "Participating in classroom activities and following school rules;
> Being interested in and enjoying participation in what happens at school;
> Being motivated and confident in participation in what happens at school;
> Being involved in thinking;
> Purposefully learning to reach life gaols; and
> Owning and valuing learning" (p. 65).

Harris (2008) interpreted these categories as concerning behavioural understandings of engagement (the first two categories), a psychological focus (the third category), and an emphasis on cognitive engagement (last three categories).

In a similar way, Wilms (2000, p. 8) identified two components in typical definitions of student engagement: "… a *psychological* component pertaining to students' sense of belonging at school and acceptance of school values, and a *behavioural* component pertaining to participation in school activities". Wilms (2000) also pointed out that research on student engagement can treat engagement as either an independent variable as in studies of the effect of engagement on academic performance, or as a dependent variable in which the influences on engagement are studied.

Ainley (2004) also examined research perspectives on engagement. Two perspectives on motivation and engagement were identified - from the person and from the situation. The person perspective "… concern[s] variables that define a characteristic or set of characteristics identifying individual differences in reactivity, sometimes as broad dispositions, predispositions or orientations, sometimes as transient states" (p. 2). The situation perspective "… embraces research that is looking at broad, global variables such as school systems, whole-school environments, and classrooms as well as research that examines the effects of contextual variables represented by what happens in a single learning episode" (p. 2).

In Australia, a frequently used approach to understanding engagement and participation is to statistically model the interactions between factors proposed as predictors of disengagement or non-participation. These include: national policies and state policies; the local community; the student's family; peers; features of the school and its programs; and attributes of the individual student (Cavanagh and Reynolds, 2007). This approach typically centres on use of demographic data to identify and quantify risk factors and basically describes attributes of the disengaged or potentially disengaged student including his/her background. Profiles of students at risk of disengagement are generated and in conjunction with other data, can be used for the development of preventative and/or remedial programs.

However, Lamb, Walstab, Teese, Vickers, and Rumberger (2004, p. 28) cautioned that "… risk factors combine in a multiplicative fashion". Therefore, these factors need to be considered simultaneously, not separately". In relation to educational outcomes Batten and Russell (1995) noted:

> "It is indeed very difficult to define relationships between risk factors and educational outcomes with precision because the relationships are highly complex, and ultimately, not known. One thing is clear, however: the concept of single cause-effect relationships in this area is a nonsense. … Relationships need to be viewed as forming a dense and complex web of inter-related, interacting, multi-directional forces" (p. 50).

A Bio-ecological view of student engagement

Present in the preceding explanations of student engagement is the influence of attributes of the individual students, peers, teachers, parents, the school, the local community, and perhaps at a macro level, society. One way to understand these influences and the interaction between attributes is through Bio-ecological models of intellectual development and engagement. Bronfenbrenner and Ceci (1994) proposed a Bio-ecological model of intellectual

development with distinctive characteristics including provision for the assessment of mechanisms called *proximal processes*. These processes were described as "… complex reciprocal interaction[s] between an active, evolving biophysical human organism and the persons, objects, and symbols in the immediate environment" (Bronfenbrenner and Ceci, 1994, p. 572). Bronfenbrenner and Ceci (1994) also posited that:

> "The form, power, content, and direction of the proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person, of the environment - both immediate and more remote - in which the processes are taking place, and of the nature of the developmental outcomes under consideration" (p. 572).

In this way it is characteristics of the person, the environment and particular developmental outcome(s) that fuel or energise the proximal processes. Ceci, Rosenbaulum, DeBruyn and Lee (1997) noted that what are termed *distal environmental resources* affect the efficiency of the proximal processes. For example parental monitoring of a child's learning (a proximal process) is more effective when the parent has knowledge of the subject-matter of the child's schoolwork (knowledge is a distal resource). "The distal environment contains the resources that need to be imported into the proximal processes for the latter to work maximally" (Ceci et al., 1997, p. 312). Thus, while the attainment of developmental outcomes depends on characteristics of the context, the context is itself an "… inextricable aspect of cognitive efficiency" rather than being simply the background for cognition (Ceci et al., 1997, p. 317). The distal environment is also important because it can provide stability in the relationships between persons which in turn increases the effectiveness of the proximal processes.

Adaptations of the Bronfenbrenner and Ceci (1994) Bio-ecological framework have been used as theoretical frames in investigations into school engagement and participation. For example: the influences on adolescents' likelihood of staying at school (Marjoribanks, 2002a and 2002b); adolescents' cognitive dispositions, learning environments' affective outcomes of schooling, and young adults' educational attainment (Marjoribanks, 2006); and the influence of socio-demographics, structural family and behavioural factors upon low academic achievement (Boon, 2008). Although the specification of the particular developmental outcomes, the proximal processes and the distal resources that were investigated differed between the studies, the integrity of the Bronfenbrenner and Ceci (1994) Bio-ecological model was maintained.

In cognisance of the distinctive characteristics of the original model (Bronfenbrenner and Ceci, 1994), it is postulated that a Bio-ecological view of student engagement would have the following features:

1. Developmental orientation - engagement attitudes and behaviours are learned and change over time;
2. Developmental outcomes have a learning orientation - specification of developmental outcomes is grounded in theories about learning and child development;
3. Proximal processes centre on learning - specification of proximal processes is grounded in theories about learning and child development;
4. Proximal processes in the classroom are interactive - interactive experiences are primarily between the child, peers and the teacher;

5. Proximal processes centre on the individual student - interactive experiences include extensive and frequent communication involving the individual student;
6. Proximal processes are enduring - continuous support, collaboration and cooperation build and maintain engagement;
7. Proximal processes are progressive - more complex interactions and behaviours develop over time;
8. The effects of proximal processes are mediated by the presence of environmental resources - limited environmental resources lead to lower levels of proximal processes;
9. The efficiency of proximal processes is increased by distal environmental resources such as classroom and school environments that provide learning-oriented and leaner-oriented resources;
10. Progression of proximal processes requires changing the provision and importation of distal resources - instructional design requires selecting resources according to student learning readiness and previous experience with proximal processes;
11. Holistic - engagement is the total of the effects and interaction between proximal processes, distal resources and the individual student; and
12. Complex - simple cause and effect relations are not to be expected.

A Flow Theory view of student engagement

Csikszentmihalyi (1990a) reported that when people described optimal experiences (situations which are highly enjoyable), they often used the term *flow*. According to Csikszentmihalyi and Schneider (2000, p. 97), flow refers to the "… spontaneous, seemingly effortless aspect of such experiences". A recurring aspect of flow experience descriptions is the balance between perceived high levels of challenge and high levels of skill - the task is demanding but the enjoyment of the experience also derives from having the skills necessary to complete the task (Massimini, Csikszentmihalyi and Carli, 1988). Notwithstanding the diverse range of conceptions of engagement and disengagement previously noted, it is plausible that highly engaging activities are challenging and require high level skills. That is, being heavily engaged in an activity could well be a similar experience to flow. Conversely, activities which don't provide a challenge and only require a low level of skill are not likely to lead to the optimal experience of flow. The validity of this premise was investigated in secondary school classrooms by Shernoff, Csikszentmihalyi, Schneider and Shernoff (2003). Engagement was defined as high concentration, interest and enjoyment. They found that classroom engagement was maximised when perceived challenges and skills were high and in balance (Shernoff, 2001). Other investigations into schooling and student engagement using Flow Theory have studied student resilience (Parr, Montgomery and deBell, 1998), student motivation and teachers' instructional practices (Schweinle, Meyer and Turner, 2006), talented students (Whalen, 1998), second language learning (Egbert, 2003), learner motivation and behaviour in distance education (Liao, 2006), and online learners (Shin, 2006).

The relation between challenge and skills that characterises the condition of flow is consistent with a developmental view of learning in which learning in a developing person occurs through a progression of psychological changes. In particular, Vygotsky's notion of the zone of proximal development is in accord with Flow Theory premises. Vygotsky (1978) described the zone of proximal development as "… the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). When applied to instructional design, this can be interpreted as the learner needing to be provided with experiences commensurate with

his/her zone of proximal development. The level of skills possessed by the learner needs to be commensurate with those required to meet the challenge(s) implicit in the task or activity being undertaken by the learner.

From a research orientation, Hekter, Schmidt and Csikszentmihalyi (2007) advocated applying a phenomenological approach when studying flow because flow is an experience which is described by perceptions. Various phenomenological dimensions of flow have been identified in over 30 years of research - these include subjective experiences such as clarity of goals, immediacy and clear feedback, expectations of success, lack of awareness of time, sense of control, concentration task at hand, action-awareness merging and loss of self-consciousness (Csikszentmihalyi and Schneider, 2000; Csikszentmihalyi, 1990b). Within the phenomenological paradigm, investigations of flow have utilised qualitative methodologies (e.g. single subject case studies) and also quantitative methodologies (e.g. application of measurement techniques and statistical analyses).

Quantitative investigations of flow have typically centred on identifying experiences characterised by high challenge and high skill. Challenge and skill are measured and above average levels on the two dimensions indicate flow. Data can be collected using the Experience Sampling Method (ESM) (Hekter, Schmidt and Csikszentmihalyi, 2007) by which data is collected from an individual at regular intervals over a prolonged period. For example every 30 minutes over a seven-day period. The mean level of perceived experiences (the subjective mean) is then calculated for this person and his/her experiences can then be classified relative to this level. Data can also be collected retrospectively by asking subjects about their experiences over a specified period of time and also about particular situations. All these data collection techniques can also be applied to identify other categories or conditions of experiences. For example, the condition of below average challenge and below average skills has been termed *apathy*; low challenge and high skills has been termed *relaxation*; and high challenge and low skills has been termed *anxiety* (Csikszentmihalyi and LeFevre, 1989; Nakamura, 1988). The attributes of these conditions and of flow can be visually represented by plotting measures of challenge and skill on a Cartesian plane – the Experience Fluctuation Model (see Figure 1 below).

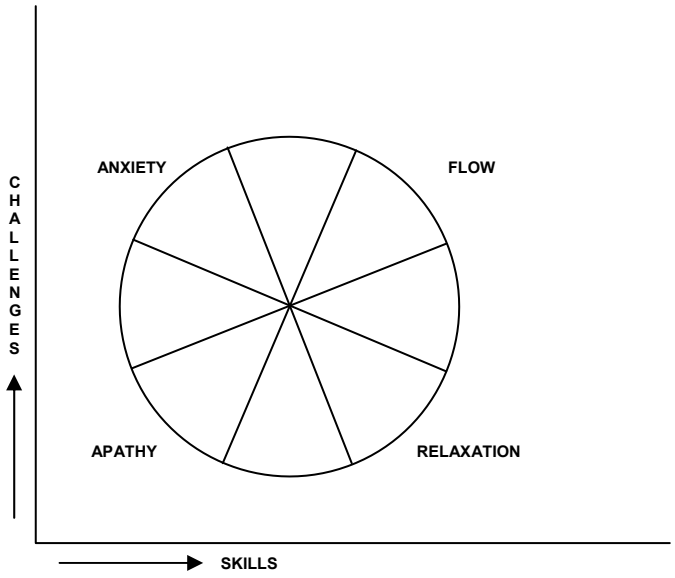

Figure 1: The Experience Fluctuation Model (Csikszentmihalyi and LeFevre, 1989)

While Flow Theory appears to be useful for theorising about student engagement, the viability of its application in empirical investigations is dependent on operationally defining core constructs such as challenge and skills as they are experienced by engaged and disengaged students. The following propositions and expositions provide a starting point for this process.

First, the relation between challenge and skills will vary depending on attributes of the student(s) and also of the situation. This is analogous to correlating the weight and height of persons - the correlation coefficient is not +1.0 because the relation varies from person to person. Tall people are not always more heavy than shorter people nor are short people necessarily lighter than taller people. Accordingly it is proposed that students who are engaged within a particular situation will have a balance between the perceived level of the challenge being faced and their perceived capability to meet the incumbent requirements. Conversely, an imbalance in perceptions will indicate disengagement. Further, engagement increases as challenge and skills increase and a high level of engagement is expected to be an experience similar to the flow condition.

Second, if these constructs are to be measured, multiple indicators are required for each construct and the associated assessment tasks need to vary in the difficulty they present to students. For example if students are surveyed to gauge their self-esteem using a rating scale instrument, the 'affirmativeness' of the items needs to vary so that only the students with high self-esteem will affirm certain items ('difficult' items) whereas other items ('easy' items) will be affirmed by the majority of the respondents.

Third, the skills required to achieve the outcomes expected of the student will vary according to characteristics of the instructional programme including the curriculum, subject area, and year level. The capacity of the students to achieve the expected outcomes will also vary due to differences between individual capabilities. Thus the construct of 'student skills' is a contextually and developmentally complex one which presents a problem for operationally defining the construct and also developing an instrument for measuring it in students. A solution to this problem is to view the skills required of students as a generic capability for learning then to define these capabilities in cognisance of psychological theories of learning. It is proposed that *student capability for learning* will derive from aspects of student *self-esteem*, *self-concept*, *resilience*, *self-regulation,* and *self-efficacy*. Significantly, all these student attributes have been investigated in studies of school participation and student engagement.

Fourth, the contextual and developmental complexity faced when interpreting *skills* from a student learning perspective also complicates developing an operational definition for *challenge* as it is manifest in students. Again a generic construct that will be applicable in most classroom situations and yet differ in degree between different classrooms and different students needs to be identified and defined. Since the outcomes required of students are basically expectations specified by curriculum and instructional designers, using the term *expectations* rather than *challenges* is suggested as more relevant. With regard to operationally defining expectations, a solution lies in hierarchical taxonomies of learning objectives. However a taxonomy in which objectives are classified into distinct and mutually exclusive domains assumes the construct being defined is multi-dimensional and thus may not necessarily be amenable to objective measurement. A hierarchical taxonomy comprising related expectations should be amenable to objective measurement.

Wiggins and Mctighe (2001) developed a six-faceted model of understanding. They proposed that understanding is demonstrated when a student can *explain*, can *interpret*, can *apply*, has *perspective*, can *empathise*, and has *self-knowledge*. While the facets could describe different student abilities and different students could display differing mixes of the facets, all six abilities have been proposed as elements of understanding. Indeed Wiggins and Mctighe (2001, p. 45) stressed that "… understanding is family of related abilities". Conceptualising the expectations of students using this model has additional benefits. First, the model has a hierarchical ordering of descriptors within each facet to assist instructional designers in identifying different levels of understanding. The provision of the hierarchies is consistent with developmental approaches to learning and can also assist in the construction of scales to measure understanding in general or particular facets of understanding. Second, understanding is a fundamental aspect of contemporary conceptions of learning and curriculum: "An emphasis on understanding leads to one of the primary characteristics of the new science of learning: its focus on the processes of knowing" (Bransford, Brown and Cocking, 1999, p. 10). Third, the multi-faceted nature of understanding as defined by Wiggins and Mctighe (2001) should enable describing the *expectations of student learning* in a diversity of learning environments.

In consideration of the preceding propositions, *student engagement in learning* is defined as a balance between the student's *capability for learning* and the *expectations of learning* in a particular learning environment - both *capability* and *expectations* are context specific. Engagement can be when the levels of *capability for learning* and *expectations of learning* are both low but balanced, and also when the levels of *capability for learning* and *expectations of learning* are both high but balanced. Within this theoretical frame it is possible to define other conditions such as disengagement as well as types of disengagement. For example, experiencing *anxiety* about learning can be explained as the condition of low capability for learning in conjunction with high expectations of understanding. In a similar way, experiencing *boredom* can be explained as the condition of low expectations of understanding in conjunction with a higher level of capability for learning.

However, there are some issues in the preceding propositions that require clarification. For example, a student who is engaged in learning is proposed to have a balance between his/her *capability for learning* and the *expectations of his/her learning* - is the presence of such a balance expected to be necessarily manifest as *engagement in learning*? Similarly, can measures of *capability for learning* and *expectations of student learning* be used to predict *engagement in learning* with a high degree of certainty? The nub of these matters lies in how the constructs are defined - a theoretical concern.

The theoretical concern is whether the two constructs (*capability* and *expectations*) and the constituent sub-constructs (the five *learning capabilities* and the six *expectations of learning*) comprehensively and uniquely define engagement. If this is not the case, there may be one or more other constructs that also require inclusion. For example, is a catalytic influence such as a motivational factor required to trigger transformation of balanced *capability* and *expectations* into *engagement*? And, does this transformation require the student to have the skills and knowledge to complete requisite tasks in addition to possessing the attitudinal attributes within the *capabilities*? With regard to a motivational trigger, the *expectations* could be seen as a form of extrinsic motivation while the *capabilities* involve intrinsic motivation. In this way, a motivational affect is already conceptualised in the operational definitions. The veracity of the notion that *engagement* requires additional skills and

knowledge, in conjunction with attitudes, depends on how engagement is conceptualised and also on how this conceptualisation relates to other constructs. Limiting the concept of engagement to affective and perceptual perspectives negates the need for consideration of non-affective attributes. Such a view is consistent with much of the research literature on engagement which consistently emphasises dispositions and pre-dispositions. Also, when the affective attributes include meta-cognitive abilities such as the *learning capabilities* sub-constructs and the *expectations of learning* sub-constructs (the six facets of *learning for understanding*), then the need for specific skills in order to achieve certain outcomes is implicit. This is illustrated by self-regulation and self-efficacy because both comprise dispositions that are motivated by certain outcome expectations. These outcome expectations could include mastery of basic skills. For example, a student is efficacious towards the mastery of manual skills in an industrial arts setting and regulates her behaviour to assist in mastering the skills. In terms of relations to other constructs, as was just exemplified, there is an implicit presence of personal and contextual factors associated with the eleven sub-constructs constituting *engagement in learning*. For this reason, performance is not conceptualised as a characteristic of *engagement in learning* since it is assumed that engagement will improve performance and in turn, improved performance will fuel more *engagement in learning*. Similarly, the innate ability of the student to perform certain academic tasks is an influential factor in performance and can assist in understanding engagement but is not usually included in theories of engagement. The connection of engagement to motivational and performance factors is similar to that illustrated in Figure 2 - *Simplified Model of Flow and Learning*. The two input variables (classroom environment variables and individual learner characteristics) are conceptually similar to *learning capabilities* and the *expectations of learning*. In this model, there is a cyclical relation between individual learner characteristics, motivation to use productive behaviours, and the student's learning.

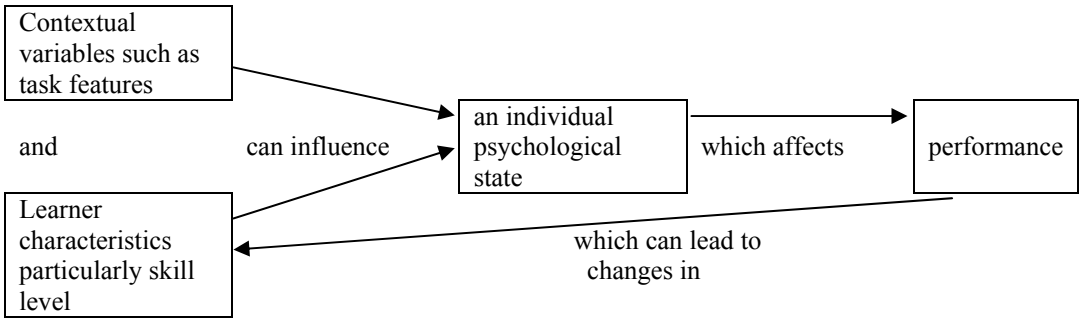

Figure 2: Simplified model of flow and learning (Egbert, 2003, p. 500).

In summary, the application of Flow Theory to conceptualise *student engagement in learning* has produced a two-dimensional representation which enables definition of both engagement and disengagement conditions. However, the complexity of learning environments and the processes of learning presented some definitional problems in this application. Another complicating factor was the need to develop simple conceptions that could eventually be tested by measurement methods which assume the object of measurement is uni-dimensional. For these reasons, limitations were placed on the nature and number of constructs that were hypothesised to constitute *student engagement in learning*.

The following sections present a detailed explication of postulated aspects of *student capability for learning* and *expectations of student learning*.

Identifying aspects of *student capability for learning*

Student capability for learning is postulated to be a combination of abilities associated with *self-esteem*, *self-concept*, *resilience*, *self-regulation*, and *self-efficacy*. The research and literature concerning these constructs is complex due to the proven associations between constructs. For example, between resilience and self-efficacy (Richardson, 2002); and between self-regulation and self-efficacy (Pajares, 2002; Sungur and Tekkaya, 2006; Zimmerman, 1989). Notwithstanding these associations, empirically investigating this conception of *student capability for learning* requires clarification of the nature of the five constructs. The following sections illustrate some of the key assumptions in the five constructs.

Self-esteem and self-concept: Self esteem is a "positive self-image" (Yarworth and Gauthier, 1978), involving the evaluations we make about how worthy we are as human beings. In comparison: **"**Self-concept is an individual's perception of self" and "It is formed through experience with the environment, interactions with significant others, and attributions of one's own behaviour" (Marsh, Smith, Barnes and Butler, 1983, p. 773).

The similarities between the two conceptions were emphasised by Martin (2007) when describing conceptions of selfhood. He proposed a tripartite taxonomy of selfhood that included the *expressive self* as exemplified in studies of self esteem and self-concept. He explained that the original study of these conceptions in school contexts was "… to recognize the uniqueness and emotional experience of children in school settings (Martin, 2007, p. 80). However Martin (2007, p. 81) drew attention to a lack of empirical evidence about "… these self-related thoughts and feelings seem[ing] to be connected in a positive manner to students' academic achievement". Alternatively, he explained the reason why high levels of self-esteem and self-concept are viewed as worthy educational goals is as a consequence of the mediating effect they have on human behaviour. They are also valued because: "Feeling good about, and having positive conceptions of, our selves allows us to express our individuality in ways that benefit both ourselves and our societies" (Martin, 2007, p. 81). The similarities between self-esteem and self-concept are also noted by Marsh, Smith, Barnes and Butler (1983) who advocated not differentiating between the two constructs.

Resilience: Resilience involves the overcoming of the negative effects of risk exposure and coping successfully with resulting traumatic experiences (Luthar, Cicchetti and Becker, 2000), requiring an incidence of both risks and factors that either promote a positive outcome or avoid a negative outcome.

Additionally, resilience is considered to promote "… the capability to adapt better than expected in the face of significant adversity or risk" (Tusaie, Puskar and Sereka, 2007, p. 1). Resilience is contextually dependent, it is "… a complex interplay between certain characteristics of individuals and their broader environments" (Greene, 2002, p. 37). Similarly, Howard and Johnson (1999) indicated that it was a mix of internal and external influences that accounted for resilient behaviour or for a lack of resilient behaviour. Howard and Johnson (1998) also commented on the characteristics of resilient children. They noted that the literature consistently characterised resilient children as having "…social competence, problem solving skills, mastery, autonomy and a sense of purpose and a future" (p. 1).

Self-regulation: Boekaerts and Corno (2005, p. 200) identified two different yet compatible conceptions of self regulation - "… a general disposition that students bring into the classroom" and "… a property of the person-in-situation and attend to domain-specific self-regulatory skills that develop through experience within and across situations". In addition, self-regulated students "are aware of the qualities of their own knowledge, beliefs, motivation, knowledge and cognitive processing - elements that jointly create situated updates of the task on which the students work" (Butler and Winne, 1995, p. 245). The awareness and gaining of information from experiences occurs through a process of feedback which can be internal (e.g. student self-reflection) or external (e.g. from the teacher). In this way, "… students personally initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents, or other agents of instruction (Zimmerman, 1989, p. 329).

Self-regulation is manifest in "… the active monitoring and regulation of a number of different learning processes, e.g. the setting of, and orientation towards, learning goals; the strategies used to achieve goals; the management of resources; the effort exerted; reactions to external feedback; the products produced" (Nicol and Macfarlane-Dick, 2006, p. 199). Pintrich and De Groot (1990) identified three components of self regulation deemed important for classroom performance. These were: "metacognitive strategies for planning, monitoring, and modifying their cognition"; "students' management and control of their effort on classroom academic tasks"; and "the cognitive strategies students use to learn, remember, and understand the material" (Pintrich and De Groot, 1990, p. 33).

Self-efficacy: Self-efficacy, the central construct in Bandura's (1986) social cognitive theory, is defined as people's judgements of their capabilities to produce designated levels of performance. Therefore, people are less likely to engage in tasks that they believe they will be less competent and more likely to perform tasks about which they feel they are capable of accomplishing. People develop their self-efficacy perceptions by interpreting information from their experiences. Bandura (1986) proposed that the most significant source of information comes from the interpreted results of past performance, which he called mastery experiences. These can create a strong sense of efficacy to accomplish comparable tasks in the future. Pajares (1996) considers efficacy beliefs to be a contributor to the time and effort they will spend on an activity, in addition to the level of resilience they develop when faced with adversity. Self-efficacy assessment is considered to be at "…a more micro-analytic level than…other expectancy constructs" (Pajares, 1996, p. 546).

Significantly self-efficacy beliefs are sensitive to contextual factors, are context specific judgments, and require measurement with a high degree of specificity (Bandura, 1986). Through the use of self-regulatory processes (goal-setting, self-monitoring, self-evaluation, and strategy use), student's self-efficacy beliefs influence academic motivation (Zimmerman, 2000).

As was noted earlier, associations between the above five constructs have been well established. In particular, theoretical connections can be found. For example, when Martin (2007) classified conceptions of selfhood assumed in the area of student self-development, in addition to the *expressive self*, he identified the "*managerial self* (mostly, but not only, evident in studies of self-regulation and self-efficacy)" and the "*communal self* (evident in certain formulations of selfhood contained in some work in the areas of situated learning, social cognition, learning communities, sociocultural psychology, hermeneutics, pragmatism, and critical theory" (p. 80). He stated that "… both the expressive and the managerial selves

of educational psychology are united in being constituted predominately of interior processes and functions of individuals" (Martin, 2007, p. 82). Consequently, sufficient commonality will be assumed between the above five constructs in order for aspects of the five to constitute the contextually dependent student attribute of *capability for learning*.

Specification of *expectations of student learning*

The Wiggins and Mctighe (2001) six facets of understanding are explained as follows.

> "When we truly understand, we
> - Can *explain*: provide thorough and justifiable accounts of phenomena, facts, and data.
> - Can *interpret*: tell meaningful stories, offer apt translations, provide a revealing historical or personal dimension to ideas and events; make subjects personal or accessible through images, anecdotes, analogies, and models.
> - Can *apply*: effectively use and adapt what they know in diverse contexts.
> - Have *perspective*: see and hear points of view through critical eyes and ears; see the big picture.
> - Can *empathise*: find value in what others might find odd, alien, or implausible; perceive sensitively on the basis of prior indirect experience.
> - Have *self-knowledge*: perceive the personal style, prejudices, projections, and habits of mind that both shape and impede our own understanding; is aware of what they do not understand and why understanding is so hard" (Wiggins and Mctighe, 2001, p. 44).

Wiggins and Mctighe (2001, pp 76-77) developed a rubric to describe five hierarchical levels of understanding within each of the six facets. For example, showing understanding through demonstrating *perspective* was proposed as ranging from being *uncritical*, to being *aware*, being *considered*, being *through*, to being *insightful* respectively. A student with an *uncritical perspective* is "… unaware of differing points of view; prone to overlook or ignore other perspectives; has difficulty imagining other ways of seeing things; prone to egocentric argument and personal criticisms" (Wiggins and Mctighe, 2001, p. 77). In comparison, a student with an *insightful perspective* "… [has] a penetrating and novel viewpoint; effectively critiques and encompasses other plausible perspectives; takes a long and dispassionate, critical view of the issues involved" (Wiggins and Mctighe, 2001, p. 77).

The specification of what is expected of students' learning is typically expressed in curricula or syllabi. The structure and language of the Wiggins and Mctighe model was developed to inform curriculum development. In particular the notion that the curriculum derives from the desired results (goals or standards) and also from the teaching expected to enable the students to attain the results (Wiggins and Mctighe, 2001). For this reason, the model is anticipated to be useful when specifying *expectations of student learning*.

The objective measurement of student engagement

As was noted earlier, the proposed technique for measuring student engagement in learning will require measurement of *student learning capabilities* and the *expectations of their learning for understanding*. Thus two objective measures require development. With regard to measurement, Wright and Masters (1982) specified four criteria in order for a rating scale instrument to be a measure. These are:

1. Uni-dimensionality - Data measures a single or dominant trait;
2. Qualification - Data can be compared;

3. Quantification - Variables are measured in common units; and
4. Linearity - Data is positioned on a line or scale.

First, if the trait being measured is single or dominant, it is assumed that the constituents or elements comprising different aspects of the trait are very similar and inter-dependent. This would be evidenced by a subject possessing a large amount of the trait to display high levels of all the aspects and vice versa for a subject with a small amount of the trait. The preceding conceptualisations of student learning capabilities and the expectations of their learning for understanding are consistent with this assumption - the elements comprising the construct to be measured are anticipated to be interdependent and could be viewed as sub-constructs.

Second, when instrument scales are used, the qualification requirement can be understood by reference to Guttman (1950) who noted:

> ‘‘If a person endorses a more extreme statement, he should endorse all less extreme statements if the statements are to be considered a scale ... We shall call a set of items of common content a scale if [and only if] a person with a higher rank than another person is just as high or higher on every item than the other person’’ (p. 62).

Compliance with this requirement is greatly assisted by writing items or descriptors that are hierarchically organised according to assumptions about the difficulty of the items or the ordinality of the descriptors. For example, the ordering of the five hierarchical levels of understanding within each of the six facets of the Wiggins and Mctighe (2001) rubric.

Third, quantification and linearity require the data be transformed using a mathematical model such as the Rasch Model (1960) and then be tested by estimation of subject and item statistics.

With regard to the theoretical underpinnings for the measurement of engagement as defined, theoretical frames comprising hypothesised hierarchical descriptions of behaviours were constructed - see Appendix One and Appendix Two.

In Appendix One there are two broad types of learning capabilities - those concerned with the *expressive self* (the sub-constructs of *self-esteem* and *self-concept*) and those concerned with the *managerial self* (the sub-constructs of *resilience*, *self-regulation* and *self-efficacy*). Within each of the five sub-constructs, five descriptors were written for each. These are hypothesised to be hierarchically ordered with the more difficult to demonstrate descriptors at the top and these are expected to be characteristic of only students with a high level of learning capability. The construct of learning capabilities is proposed to be comprised of sub-constructs and when the data are quantified, the data will be combined for a single analysis.

The structure of Appendix Two is similar to that of Appendix One in that it comprises a postulated hierarchical order of descriptors and the construct of *expectations of learning for understanding* comprises six sub-constructs - the six facets described in the Wiggins and Mctighe (2001) model.

Assuming that *student learning capabilities* and the *expectations of their learning* can each be plotted on a linear scale, then these interval data can be subject to mathematical operations to estimate measures of student engagement.

Consistency of the frameworks with Bio-ecological theory

The Bio-ecological view of engagement could simplistically be seen as taking into account attributes of the individual student as well as attributes of the environment (distal resources) in conjunction with the proximal processes. These features are manifest in the theoretical frames presented in Appendix One and Two.

First, the *student learning capabilities* construct concerns an attribute of the student which is expected to be present in most students but to differing degrees. Although this attribute may change with time it is still a characteristic of the individual. Second, in contrast, *expectations of learning* are proposed as largely the result of decisions made independently of the student although ideally decisions about expectations should take into account the capability of individual students. *Expectations of learning* is a distal resource. Similarly, distal resources could also be seen as the context for engagement, a context which is expected to vary between different classrooms and schools. Further, the assumed relation between *learning capabilities* and the *expectations of learning* that is proposed to be student engagement in learning is assumed to result from the interaction between these variables. This interaction is a proximal process, a process that is at the core of teacher instruction and student learning.

The Bio-ecological view was based on Bio-ecological models of intellectual development and engagement. Implicit in these models are the notions of change, growth and development. Consequently, the engagement of a student in learning is expected to vary over time in addition to being subject to contextual influences. Thus measurement of this at one time in one context could provide a restricted view of engagement and the engagement of a particular student.

Conclusion

This paper has examined some of the theoretical explanations of student engagement and proposed that Bio-ecological and Flow Theory conceptions have utility in theorising about the nature of student engagement. It was proposed that a student who is engaged within a particular situation is expected to have a balance between the perceived level of the challenge being faced and his/her perceived capability to meet the incumbent requirements. Measurement of this condition in a classroom context was suggested to require measurement of a student's *capability for learning* and also the *expectations of the student's learning*. Conceptual frameworks comprising constructs, sub-constructs and descriptors were provided. The paper concluded by examining how these frameworks would assist in measuring engagement and also how these were consistent with the underlying theory.

References

ACER. (2007). *Australian survey of student engagement.* Camberwell, Victoria: Australian Council for Educational Research. Retrieved July 17 08 from http://www.acer.edu.au/documents/AUSSE_2007DevelopmentAndMethodology.pdf.

Ainley, M. (2004). *What do we know about student motivation and engagement?* Paper presented at the annual meeting of the Australian Association for Research in Education, Melbourne, November 29-December 2, 2004.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewoods Cliffs, NJ: Prentice-Hall.

Batten, M., & Russell, J. (1995). *Students at Risk: A Review of the Australian Literature 1980 -1994. Research Monograph no. 46.* Melbourne: Australian Council for Educational Research.

Boekaerts, M., & Corno, L. (2005). Self-regulation in the classroom: A perspective on assessment and intervention. *Applied Psychology: An International Review, 54*(2), 199-231.

Boon, H.J. (2008). Risk or resilience? What makes a difference? *The Australian Educational Researcher, 35*(1), 81-102.

Bransford, J.D., Brown, A.L., & Cocking, R.R. (Eds.). (1999). *How People Learn: Brain, Mind, Experience, and School.* Washington, D.C.: National Academy Press.

Bronfenbrenner, U., & Ceci, S.J. (1994). Nature-nurture reconceptualised in developmental perspective: A bioecological model. *Psychological Review, 101*(4), 568-586.

Butler, D.L., & Winne, P.H. (1995). Feedback and self-regulated learning; A theoretical synthesis. *Review of Educational Research 65*(3), 245-282.

Cavanagh, R.F., & Reynolds, P.S. (2007). *Senior secondary school students' risk of disengagement from further education, employment or training*. Paper presented at the 2007 Annual Conference of the Australian Association for Research in Education: Fremantle.

Ceci, S.J., Rosenbaulum,T., DeBruyn, E., & Lee, D.Y. (1997). A bioecological model of human development. In R.J. Sternberg & E.L. Grigorenko (Eds.), *Intelligence, heredity, and environment,* (pp. 303-322). Cambridge, UK: Cambridge University Press.

Csikszentmihalyi, M. (1990a). *Flow: The Psychology of Optimal Experience*. New York: Harper & Row.

Csikszentmihalyi, M. (1990b). Literacy and intrinsic motivation. *Daedalus, 119*(2), 115-140.

Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology, 56*(5), 815-822.

Csikszentmihalyi, M., & Schneider, B. (Eds.). (2000). *Becoming adult: How teenagers prepare for the world of work*. New York: Basic Books.

Egbert, J. (2003). A study of flow theory in the foreign language classroom. *The Modern Language Journal, Vol. 87*(4), 499-518.

Fredricks, J.A., Blumenfeld, P.C., & Paris, A.H. (2004). *Review of Educational Research, 74*(1), 51-109.

Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology, 95*(1), 148-162.

Glanville, J.L., & Wildhagen, T. (2007). The measurement of school engagement: Assessing dimensionality and measurement invariance across race and ethnicity. *Educational and Psychological Measurement, 67*(6), 1019-1041.

Greene, R. R. (Ed.). (2002). *Resiliency: An integrated approach to practice, policy, and research*, Washington, DC: NASW Press.

Guttman, L. (1950). The basis for scalogram analysis. In S. A. Stouffer (Ed.), *Measurement and Prediction, 4,* 60-90. Princeton, NJ: Princeton University Press.

Harris, L.R. (2008). A phenomenographic investigation of teacher conceptions of student engagement. *The Australian Educational Researcher, 35*(1), 57-79.

Hektner, J.M., Schmidt, J.A., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life.* Thousand Oaks, CA: Sage Publications.

Howard, S., & Johnson, B. (1999). Tracking student resilience. *Children Australia, 24*(3), 14-23.

Hughes. J.N., & Duan Zhang, D. (2006). Effects of the structure of classmates' perceptions of peers' academic abilities on children's perceived cognitive competence, peer acceptance, and engagement. *Contemporary Educational Psychology, 32*, 400-419.

Janosz, M., Archambault, I., Morizot, J., & Pagani, L.S. (2008). School engagement trajectories and their differential predictive relations to dropout. *Journal of Social Issues, 64*(1), 21-40.

Kenny, M.E., Blustein, D.L, Haase, R., Jackson, J., & Perry, J.C. (2006). Setting the Stage: Career development and the student engagement process. *Journal of Counselling Psychology, 53*(2), 272-279.

Lamb, S., Walstab, A., Teese, R., Vickers, M., & Rumberger, R. (2004). *Staying on at school: Improving student retention in Australia*. Brisbane: Queensland Department of Education and the Arts.

Liao, L.F. (2006). A flow theory perspective on learner motivation and behavior in distance education. *Distance Education, 27*(1), 45-62.

London, B., Downey, G., & Mace, S. (2007). Psychological theories of educational engagement: A multi-method approach to studying individual engagement and institutional change. *Vanderbilt Law Review, 60*(2), 455-481.

Luthar, S.S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: a critical evaluation and guidelines for future work. *Child Development, 71,* 543-62.

Marjoribanks, K. (2002a). Family background, individual and environmental influences on adolescent's aspirations. *Educational Studies, 28*(1), 33-46.

Marjoribanks, K. (2002b). Environmental and individual influences on Australian students' likelihood of staying in school. *Journal of Genetic Psychology, 163*(3) 368-381.

Marjoribanks, K. (2006). Adolescent's cognitive habits, learning environments, affective outcomes of schooling, and young adult's educational attainment. *Educational Psychology, 26*(2), 229-250.

Marsh, H.W., Smith, I.D., Barnes, J., & Butler, S. (1983). Self-concept: reliability, stability, dimensionality, validity, and the measurement of change. *Journal of Educational Psychology, 75,*(5), 772-790.

Martin, J. (2007). The selves of educational psychology: Conceptions, contexts, and critical considerations. *Educational Psychologist, 42*(2), 79-89.

Massimini, F., Csikszentmihalyi, M., & Carli, M. (1987). The monitoring of optimal experience. A tool for psychiatric rehabilitation. *Journal of Nervous and Mental Disease, 175*(9), 545-549.

Nakamura, J. (1988). Optimal experience and the use of talent. In Csikszentmihalyi, M., & Csikszentmihalyi, I. (Eds.), *Optimal experience - psychological studies on flow in consciousness* (pp. 319-326). Cambridge: Cambridge University Press.

Nicol, D.J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199-218.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543-578.

Pajares, F. (2002) Gender and perceived self-efficacy in self-regulated learning. *Theory into Practice, 41*(2), 116-125.

Parr, D.G., Montgomery, M., & deBell, C. (1998). Flow theory as a model for enhancing student resilience. *Professional School Counselling; 1*(5), 26-31.

Pintrich, P.R., & De Groot, E.V. (1990). Motivational and self-regulated learning components of classroom academic performance**.** *Journal of Educational Psychology, 82*(1), 33-40.

Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Chicago: MESA Press.

Richardson, G.E. (2002). The meta-theory of resilience and resiliency. *Journal of Clinical Psychology, 58*(3), 307-321.

Schweinle, A., Meyer, D.K., & Turner, J.C. (2006). Striking the right balance: students' motivation and affect in elementary mathematics. *Journal of Educational Research, 95*(5), 271-293.

Shernoff, D.J. (2001). *The experience of student engagement in high school classrooms: A phenomenological perspective*. Unpublished doctoral dissertation. University of Chicago.

Shernoff, D.J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E.S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School Psychology Quarterly, 18*(2), 158-176.

Shin, N. (2006). Online learner's 'flow' experience: an empirical study. *British Journal of Educational Technology, 37*(5) 705-720.

Sungur, S., & Tekkaya, C. (2006). Effects of problem-based learning and traditional instruction on self-regulated learning. *The Journal of Educational Research, 99*(5), 307-317.

Tusaie, K., Puskar, K., & Sereika, S.M. (2007). A predictive and moderating model of psychosocial resilience in adolescents. *Journal of Nursing Scholarship, 39*(1), 54-60.

Vibert, A., & Shields, C. (2003). Approaches to student engagement: Does ideology matter? *McGill Journal of Education, 38*(2), 221-240.

Vygotsky, L.S. (1978). *Mind and society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Whalen, S. (1998). Flow and engagement of talent: Implications for secondary schooling. *NASSP Bulletin, 82*(3), 22-37.

Wiggins, G, & Mctighe, J. (2001). *Understanding by design: A brief introduction*. New Jersey: Prentice Hall Inc.

Willms, J. D. (2003). *Student engagement at school: A sense of belonging and participation. Results from PISA 2000.* Paris: OECD.

Wright, B. D., & Masters, G. N. (1982). *Rating scale analysis*. Chicago: Mesa Press.

Yarworth, J.S., & Gauthier, W.J. Jr. (1978). Relationship of student self-concept and selected personal variables to participation in school activities. *Journal of Educational Psychology, 70*(3), 335-344.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339.

Zimmerman, B.J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology, 25,* 82-91.

Appendix One: Framework of leaning capabilities

Learning capabilities	Expressive self		Managerial self		
	Self-esteem	**Self-concept**	**Resilience**	**Self-regulation**	**Self-efficacy**
High The student:	*Has positive self image* Sees very little in self that needs to improve Is highly confident	*Strives to be perfect* Even though he/she knows does very well, still looks for ways to improve Knows self very well	*Has unqualified expectations of coping* Expects will always be OK Doesn't face any unfixable problems	*Takes responsibility for learning* Is in control of my own learning Is very competent	*Has perseverance in face of adversity* Keeps trying when things go seriously wrong Never gives up
4 The student:	*Has confidence to make decisions* Is confident to make choices about how to do things Is confident to make choices about what to do	*Motivated by self reflection* Thinks about self makes he/she feel good Thinking about self helps he/she do better	*Can deal with failure* Things going wrong is not an issue for him/her Believes things will eventually work out well	*Makes improvement in own learning* Is continuously improving Changes how he/she learns	*Has determination* Believes can overcome most difficulties Expect to succeed in difficult situations
3 The student:	*Has pride in self* Is proud of his/her achievements Thinks he/she good compared to others	*Self reflecting* What he/she does shapes his/her view of myself I think about myself when I need to	*Expects success* Expects if he/she works at problems they will be solved Expect to eventually succeed	*Understands own learning* Knows how to learn better Knows how he/she learns best	*Recognises contextual influences* Recognises some situations present more difficulty than others Knows when and where he/she can succeed
2 The student:	*Trusts self to act* Trust self to do what is right for self Has faith in own ability	*At ease comparing self with others* How he/she feel about self comes from how others see he/she I am comfortable comparing myself with others	*Overcomes small setbacks* Considers overcoming small problems is possible for Can deal with small hassles	*Assesses own learning* Learns from mistakes Builds on what he/she can do well	*Has expectations of self* Needs to be successful Doesn't give up easily
Low The student:	*Sees worth in self* Is happy with myself Sees some good qualities in self	*Compares self with others* Compares self with others Checks own progress against that of others	*Is aware of problems* Accepts a little difficulty for is OK Is aware that things go wrong for sometimes	*Thinks about learning* Thinks about own learning Questions self	*Has goal orientation* Hope to achieve his/her goals Sets goals for self that are achievable

Appendix Two: Framework of expectations of learning for understanding

Expectations	Explanation	Interpretation	Application	Perspective	Empathy	Self-knowledge
High The student is expected to:	*Sophisticated* Bring together many ideas to explain something in a new way Develop original (new) explanations of what was taught	*Profound* Show a deep and very clear understanding of the of the work Find simple explanations for complicated things	*Masterful* Find new ways to use knowledge and skills Be flexible in how knowledge and skills are used	*Insightful* Make sure own feelings don't cloud my judgements Carefully and fairly evaluate the views of others	*Mature* Be willing to see things the way others do Seek out views highly different from my own	*Wise* Make serious decisions based on knowing what he/she has learnt Make serious decisions based on knowing what he/she has understood
4 The student is expected to:	*In-depth* Understand the work in a way that is different from what was taught Find connections between different parts of what was learnt	*Revealing* Compare different ways of understanding the work Explain the differences between ways of understanding the work	*Skilled* Use knowledge and skills to perform well in a range of situations Use knowledge and skills to perform well in different situation	*Thorough* Be critical of the views of others in a fair way Balance own views against the views of others	*Sensitive* See things in ways similar to others Develop attitudes similar to others	*Circumspect* Have a clear understanding of both strengths and weaknesses Clearly see the strengths and weaknesses of others
3 The student is expected to:	*Developed* Include a range of my own ideas when explaining what was learnt Explain what was learnt using own words	*Perceptive* Correctly explain to others how work should be done Help others understand why what we are learning is important	*Able* Use skills to perform well in some situations Use knowledge to perform well in some situations	*Considered* Understand the views of others Think carefully about the views of others	*Aware* Know that others feel differently from self Be aware that others see things differently from self	*Thoughtful* Identify what he/she doesn't understand Spend time thinking about what he/she can and can't do
2 The student is expected to:	*Intuitive* Explain what was learnt by including extra information Include some of own ideas when explaining what was learnt	*Interpreted* Show that has correctly understood the work Explain why what was learnt is important	*Apprentice* Use the same ways of doing things in different situations Use routines that help get jobs done	*Aware* Show awareness of differences in what others value Reconsider own point of view after listening to others	*Developing* Force self to make sense of ideas that seem strange to him/her Discipline self to understand attitudes different to own	*Unreflective* Accept that others can help he/she see what he/she need to know Let others tell him/her what he/she needs to know
Low The student is expected to:	*Naive* Use the words of others when explaining things Use the ideas of others when explaining things	*Literal* Repeat what he/she has been told Repeat what he/she has read	*Novice* Use what was learnt with help from others Follow instructions to complete tasks	*Uncritical* Not ignore points of view different from own Use own views to be critical of things or people	*Egocentric* Try to make sense of ideas that seem strange to him/her Try to understand attitudes different to own	*Innocent* Think about what he/she knows Be aware of things he/she should know