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Student Achievement in Developing Countries: A Triarchic Theoretical and Operational Framework

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Models examining the psychological components underpinning student achievement have been constructed and tested in a wide variety of educational settings. Studies examining academic motivation, self-concept, future goal orientation, learning strategies and self-regulation have been conducted in both Western and non-Western cultures, and have recently been extended to minority and under-achieving settings. This research however has yet to be extensively and comprehensively extended to developing world settings. The present study provides an overview of Okagaki's Triarchic Model of Student Achievement, a three-fold model examining the influences of the school, the family and community, and the child, on student achievement. In presenting this model, this paper attempts to provide a theoretical and operational framework in which student achievement can be examined in developing countries. The paper concludes with a discussion of potential research directions and predictions for the examination of student achievement in developing countries.

Okagaki's (2001) triarchic model of student achievement posits that student achievement needs to be investigated within a framework consisting of three main components. Originally developed for use in minority (and often low-achieving and underprivileged) settings, the model examines the characteristics of the school, the family and community, and the child, and how these components influence student achievement. Okagaki's original purpose for developing the triarchic model was to *ensure* that the broader sociocultural and environmental contexts of students in minority cultures were considered to be important in the prediction of student achievement. A consideration of such influences is vital for inclusion in cross-cultural research and Okagaki's triarchic model has been applied to a number of minority groups in the USA including African American, Asian American, European American, Mexican, and Latino students (Okagaki & Frensch, 1998; Okagaki, Frensch & Dodson, 1996; Okagaki & Sternberg, 1993). However this model does not seem to have been applied to groups outside of the USA nor to minority groups particularly from developing countries.

The present investigation is one of the first to apply Okagaki's triarchic model to a culture that is distinct from those that the model has been previously applied to – that of Indigenous Papua New Guinea (PNG). This class of culture is distinguished by three characteristics Being: (1) a majority culture; (2) an indigenous culture (i.e., a group of people who compose the existing descendants of those who inhabited a territory/country and share a common language, culture, spiritual belief system and economic system (Sanders, 1989); and (3) a developing culture whereby people from PNG live in poverty and lack access to basic public services (World Bank, 2004).

The following paper firstly outlines the theory behind the three components of Okagaki's model. Secondly, an overview is provided of the extant research examining this model in minority group settings. Thirdly, relevant research that has been conducted in PNG is discussed. Finally, a discussion is presented which outlines the future of cross-cultural research in majority, indigenous, developing countries and the predictions that can be made based on current evidence and research.

Okagaki's Triarchic Model of Student Achievement

Component 1: Form and Perceived Function of the School

The form of the school

The form of the school has been shown to have an influence on student engagement and achievement. In particular, three main domains have been highlighted by research in which educators can improve learning for student underachievers. The first of these domains, *small-group learning*, has been found to be important in that allowing students to work together in small-group learning centres as opposed to whole class instruction or working independently, greatly facilitates student learning and achievement (Vogt, Jordan & Tharp, 1993). Vogt et al. (1993) proposed that the latter was due to the similarities between small group and peer assisted settings and those settings familiar to students in their own cultural social structure.

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The second domain in which improvements have been made in the form of the school in order to accommodate minority students is in *teacher-student communication*. According to Tharp (1989) in order for teachers to encourage students' participation in classroom discussions, they must adhere to and consider the sociolinguistic conventions of the local culture. Techniques such as increasing the amount of time teachers waited for students to verbally participate, and communication strategies such as overlapping speech have been found to facilitate student involvement in learning. Positive student-teacher relations characterised by open, flexible and honest communication, have also been found to be significantly related to academic resilience in minority students (Borman & Rachuba, 2001).

Perhaps most important is the third domain of creating *continuity* between students' home and school environments. Research has highlighted a number of ways in which discontinuity between home and school environments can interfere with student's school learning, due to teacher-student misunderstandings, and minority students inabilities to discern certain culturally irrelevant situations (Okagaki, 2001). For example, studies among Native American students have found that discontinuity between their home environment, which emphasised sharing, cooperation and group needs, and their school environment, which emphasised competition and grading, inhibited students full learning potential (Sanders, 1987). Hence, continuity between students' home and school environments has been shown to positively relate to student learning outcomes.

Perceived function of education

The perceived function of education has also been shown to be an important factor in student motivation, engagement and achievement. Mickleson (1990) proposed that students' pragmatic beliefs that education will benefit them (as opposed to their abstract beliefs that education is important), are related to school achievement. In her review of the literature Okagaki (2001) reported that there is a relationship between succeeding in education and the belief that this leads to getting a good job, becoming a successful adult, and an increase in economic and social conditions. It has been found that when "education serves a relevant, pragmatic function in an individual's life" (Okagaki, 2001, p. 12) a student will, in turn, be more motivated to achieve. The positive impact of this pragmatic belief in education on student motivation and achievement has been found in a variety of minority settings including amongst Latino students (Suarez-Orozco, 1993).

Increasing student's positive perceptions about the utility of education is vital for a number of reasons. Firstly, studies have shown that despite immense educational inequity in minority (and developing) settings, 'at-risk' minority students are still capable of holding a positive view of education and succeeding in school (Ford & Thomas, 1997). Secondly, studies have documented in a number of minority, underprivileged cultures, the prevalence of ambivalent familial and community attitudes towards the utility of education (Okagaki, 2001; Demerath, 2000). Hence, it is vital for educators to implement interventions in such cultures to change not only attitudes amongst students, but also amongst family and community members as to the value of education in their lives.

Component 2: Family's Cultural Norms and Beliefs about Education and Development

In addition to the way in which students and parents perceive the utility of education in their lives, many cultural norms, beliefs and practices held by communities and families have been shown to have an influence on student engagement and achievement. Parental expectations, beliefs about teaching, goals and personal feelings of academic efficacy have all been shown to influence: student's support networks, the way in which student's learn, and the level of performance student's demonstrate in class (Okagaki, 2001).

Parental expectations, which range anywhere between what level of schooling parents expect their children to reach, to what grades they expect their children to achieve in class, have been shown to have an influence on student outcomes (Okagaki & Frensch, 1998). For example, Okagaki and Frensch (1998) examined the differences in parental expectations of the level of schooling they expected their children to reach, for parents of Asian American, Latino and European American decent. They found that Asian American parents had higher expectations as to: how long their child stayed in school, what level of college they graduate from, and what they considered adequate grades to be, compared to European American and Latino parents. Furthermore, these results were consistent across categories of: what parents ideally wanted their children to achieve, what they realistically expected their children to achieve, and what they would minimally allow their children to achieve. Okagaki suggested that the implications of these findings were that if parental "expectations are to be translated into meaningful improvements in children's school achievement, then educators need to be very clear about what constitutes doing well" (2001, p. 14).

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Parents however, may not only have different expectations about how their child should perform, but also about what the teacher should be teaching their child. Kohn (1969) originally postulated that parents' social contexts influence the goals and values they have for their children, resulting in differing parenting practices, in turn resulting in differences in child motivation, achievement and engagement. For example, Okagaki and Sternberg (1993) found that parents of minority students gave high importance to teaching socially conforming behaviours (over socially autonomous behaviours) to their children. They also rated learning how to complete neat and orderly work just as important (if not more important) as learning basic facts and developing problem-solving skills and creativity. These ratings were different to Western parents' ratings who emphasised the importance of cognitive skills and intelligence. How do these findings relate to student achievement? Okagaki and Sternberg suggest that a positive relation between parental expectations and student achievement will result when there is no discrepancy between the home and school environments. A student is more likely to achieve when both their parents' and their school's educational goals are congruent.

In addition to parental expectations and goals, parental conceptions of intelligence have also been shown to influence student outcomes. Okagaki and Sternberg (1993) found that for minority students (who were also classified as coming from collectivist cultures), *effort* was the most important characteristic of their parents' conceptions of intelligence. Cross-cultural research has found similar findings for students from East Asia who attribute success in school to effort rather than innate ability (Holloway, 1988). Again, differences in parental and school definitions of 'intelligence' and 'success' may have the potential to influence student engagement and achievement in PNG.

Finally, parental perceptions of their own ability (self-efficacy) and the practices they adopt in helping their child have also been shown to play a positive role in predicting student outcomes. Okagaki (2001) suggests that parental involvement influences student achievement via both direct and indirect pathways. The direct pathways involve literal parental engagement with both student homework as well as their involvement in intellectually stimulating activities. This help can be effective depending on the parent's own level of education and self-efficacy. Activities may range from direct assistance with assignments and school exercises, to reading to their child, to testing them for upcoming exams. However, in minority settings particularly and even more so in developing settings, parents own ability and perception of their self-efficacy limits their ability to assist their children along these direct pathways. Parents are still able to assist students, however, even if they are unable to provide effective instrumental help by encouraging, giving indirect help, or holding high expectations. Indirect help, such as time management, creating an academic climate at home, and parental encouragement, has been shown to successfully help immigrant students achieve in Central America (Suarez-Orozco, 1993). Activities involved in these indirect pathways do not require parents to have a high level of education. Rather, they require the parent to take an interest in their child's education and create ways in which the environment their child is raised in can be conducive to productive learning.

Hence both the characteristics of the school and the characteristics of the family and community have been shown to play a vital role in predicting student achievement. However, it is necessary to also examine the third component of Okagaki's model – characteristics of the child – and their influences on student outcomes.

Component 3: Characteristics of the Child

In her model, Okagaki stressed the importance of the role of constructs such as motivation, self-efficacy and social identification as contributing to academic engagement and achievement. A large amount of research, from a variety of disciplines and schools of thought, has looked into the characteristics and traits of students and how they relate to school achievement. A leading proponent in this field, McInerney, has developed a model investigating the relations between students' future-oriented and immediate achievement goals and their relation to student self-regulation, self-concept and performance (see Figure 1). The model emphasises the importance of examining the validity of such a model within the cultural, familial, social and educational context of the student.

Achievement Goals

Stemming from Achievement Goal Theory (Ames, 1992) and Maehr's Personal Investment Model, McInerney, Yeung and McInerney (2001) proposed a hierarchical, multidimensional model of motivation goal orientations that incorporates a wide range of goals assumed to be relevant in both Western and non-Western cultures. This model outlines the relation between nine specific first-order goals - task, effort, praise, feedback, competition, social status, extrinsic, social concern and affiliation - at the base of the

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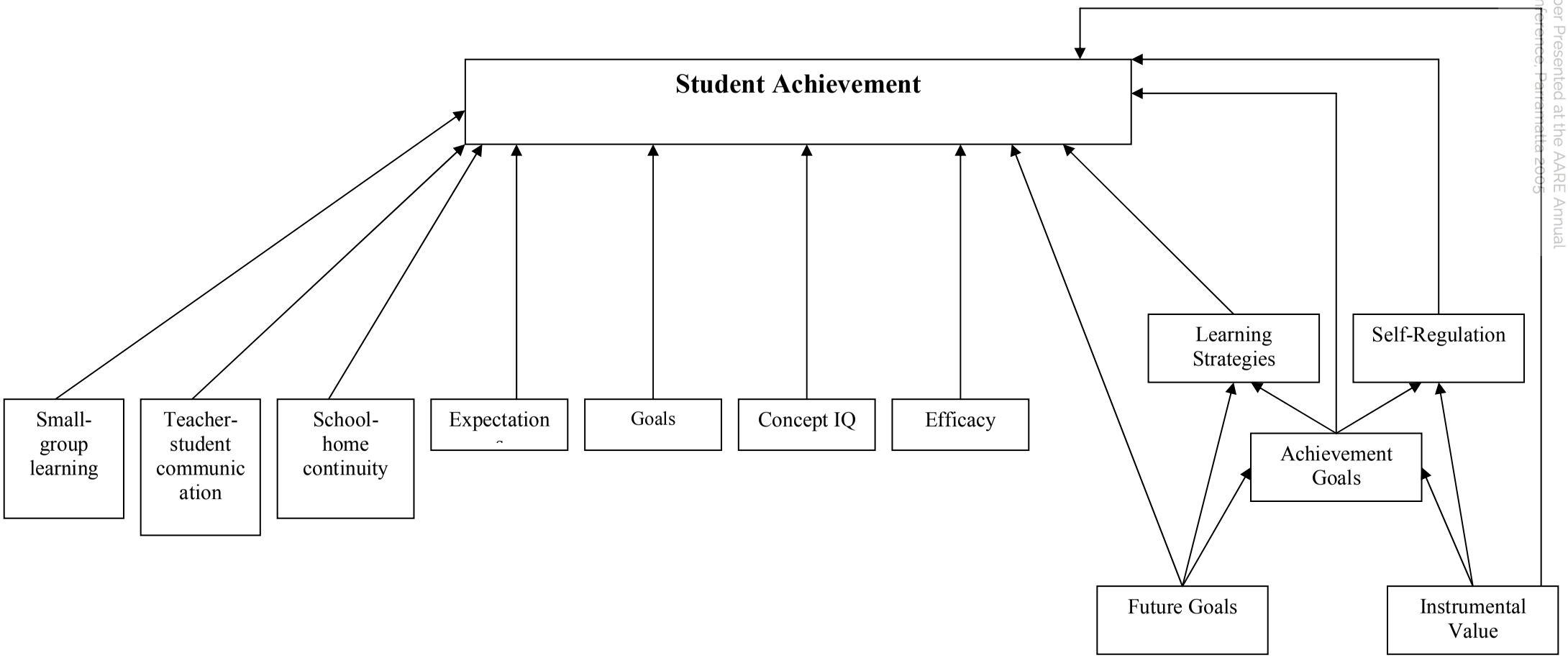

Figure 1. Triarchic Model of Student Achievement

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hierarchy, which can be grouped into three higher order factors - mastery, performance and social. The three general goals come together at the top of the hierarchy to form a higher order general motivational construct. Goal orientations are generally defined as integrated patterns of motivational beliefs that represent different ways of approaching, engaging in, and responding to achievement-related activities (Ames, 1992). Studies using this multidimensional model of motivation have found strong relations between mastery goal orientations, deep learning processes and high academic achievement. Some studies have found a similar relation for social goal orientation—however, paradoxical results are also apparent in the literature (Wentzel, 1996). Some researchers have suggested that an interaction between social and mastery goals positively affects achievement (Covington, 2000); however, the mechanisms underlying this interaction are not yet clear.

The hierarchical model of motivation has been supported by confirmatory factor analysis for both Western and non-Western respondents (McInerney et al., 2001). The model has also been used in a number of studies examining the relation of motivational factors and academic achievement in different cultures, including Indigenous minority groups in Australia and America (McInerney et al., 1997; McInerney & Sinclair, 1992). Watkins, McInerney, Akande and Lee (2003) found that deep (mastery) motivation goal orientations (such as "working hard" and "interest") were good predictors of deep learning strategies amongst both White and Black South-African students. McInerney et al. (1997) found that a positive relation between learning goals and high achievement existed amongst students from three different ethnic cultures—Anglo, Aboriginal (Australian) and Native American (Navajo). Furthermore, much motivational literature has suggested that students from Western societies tend to be more competitive, concerned with individual goals, and seeking power over other students. On the other hand, research has found that students from non-Western backgrounds are less competitive and less power oriented, and that they place higher value on concern for others than their Western counterparts (McInerney et al., 1997).

By drawing upon a number of psychological theories, McInerney proposes that future goal orientation and instrumental value predict students' achievement goals and self concept, and these in turn influence their use of learning strategies and self regulation. The following sections outline the theory behind this model.

Future Goals, Instrumental Value and Achievement Goals

According to Phalet, Andriessen and Lens (2004) schooling is a future-oriented investment across all cultures. Despite mixed evidence from cross-cultural studies on the motivational role of the 'future' in sustaining school engagement and achievement, recent developments in motivational research, future time perspective and goal theory have developed a more "fine-grained motivational theory of future goals" (p. 61).

According to Nurmi, Poole and Kalakoski (1994) people view their personal future in terms of goals, hopes, expectations and concerns. Individuals set these future-oriented goals by "comparing their individual motives to their knowledge and personal perceptions of future possibilities" (Nurmi et al., 1994, p. 472). Stemming from work by Nuttin and Lens (1985), Phalet et al. (2004) posit that the formation of motivational goals in the distant future creates a 'future time perspective' (FTP) in an individual, which in turn strengthens their motivation to strive for such future goals. One would then assume a simple process - the establishment of future goals leads to increased motivation which leads to increased engagement and achievement. However the story is not so simple.

De Volder and Lens (1982) distinguished between two components of future time perspective – cognitive and dynamic – and suggested that they play differential roles. The cognitive aspect refers to the instrumentality of current task goals and their perceived value in reaching future goals. Cognitive FTP refers to one's ability to anticipate both the present value and long term consequences of one's behaviour. The greater an individuals cognitive FTP the more value they place on immediate learning and achievement school tasks as a means for reaching their future goals (Phalet et al., 2004). Alternatively, the dynamic aspect of FTP refers to the value or prevalence an individual places on the goals in the future themselves. Students with a large dynamic FTP place great value on their future goals, even when they are located some distance away in their temporal future.

According to expectancy x value theory, a solid link can now be drawn between an individual's future goals and their achievement. When individuals: (a) have high expectations their immediate behaviour will produce desired outcomes (cognitive FTP); and (b) place a high subjective value on their desired future goals (dynamic FTP), expectancy x value theory says that this will result in higher motivation levels (Feather, 1982).

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A body of research conducted in both Western and cross-cultural student settings has supported the link between future goal orientation, classroom orientation and achievement, although the mechanisms behind this interaction are still empirically unclear (Phalet et al., 2004). De Volder and Lens (1982) found that more motivated students attached more valence to their future goals than less motivated students did. Furthermore, motivated students attached more value to their present tasks and activities as a means for reaching their valued future goals, than did less motivated students.

Expanding upon research examining the relations between future goal orientation, instrumental value and motivational goal orientation, Phalet et al. (2004) proposed an interaction effect. Based on work by Van Calster, Lens and Nuttin (1991) they suggested that perceived instrumental value only increases one's motivation when students have a positive attitude towards their personal future. That is, only when students place a high and positive value on goals in their future will valuing their present tasks and goals have a positive effect for their motivation to strive for these goals. Conversely, for students who have a negative outlook on their future, attaching high perceived instrumental value to their present schooling has been found to actually decrease their level of motivation.

Thus future goal orientation and perceived instrumentality play extremely important roles in predicting motivational orientations, thus contributing to academic engagement and achievement. Furthermore, future goals, instrumentality and motivational orientations have been found to predict students' use of learning strategies and involvement in self-regulated learning. This next section will outline the relations between these factors and how they in turn relate to student outcomes.

Self-Regulated Learning

Learning has been defined as the "complex process of assimilating, structuring, and applying new knowledge and skills" (Phalet et al., 2004, p. 76). In particular, self-regulated learners are capable of choosing appropriate learning goals, are able to use available and appropriate knowledge and skills to direct their learning, and select learning strategies relevant for targeted tasks (Marsh, Hau, Artelt & Baumert, 2004). Furthermore, there is general consensus amongst researchers that the two major components of self-regulated learning are cognitive and metacognitive information processing strategies (Marsh et al., 2004; Weinert, 1994; Boekaerts, 1997). In addition to this however, Weinert (1994) includes the readiness of individuals to form their own goals, students' proactive action and their appropriate interpretation of success and failures, as being vital to self-regulated learning.

An extremely important aspect of self-regulated learning is the effective use and application of 'learning strategies'. Cognitive learning strategies are the cognitive strategies or ways of processing information, students' use when studying (Pintrich, 1989). These cognitive strategies include techniques such as cognitive rehearsal, elaboration, organisation and critical thinking. In addition to these, students employ self-regulatory and resource management strategies, such as time management and effort regulation, to their learning. Biggs (1987) proposed a vital distinction between what he coined 'deep' and 'surface' learning strategies. Similarly, Biggs (1987) proposed that students who adopt surface level learning strategies are motivated by pass-only aspirations and hence develop minimum effort learning strategies, often dictated by rote learning only what is necessary (Biggs, 1987; Tickle, 2001). Alternatively, students who adopt deep learning strategies such as obtaining a broad sophisticated understanding, reading widely and relating new material to an existing context, are hypothesised to be motivated by deep, mastery focused goals. The latter include the desire to work out the meaning of, to master and understand their work (Tickle, 2001), and to achieve a sense of accomplishment from the inherent qualities of the task, such as its challenge, interest or enjoyment (Blumenfeld, 1992; Meece, Blumenfeld & Hoyle, 1988; Biggs, 1987).

Bigg's (1987) distinction between deep and surface learning strategies however, has been criticised by many as being a too narrow interpretation of the vast amount of strategies for learning available for self-regulated learners. Marsh et al. (2004) in their review of the literature on self-regulation highlighted three main cognitive strategies and three main metacognitive strategies available for learners. The cognitive learning strategies include memorisation strategies (e.g., reading material aloud and repeating vital facts and terms), elaboration strategies (e.g., construction and integration of ideas), and transformation strategies (e.g., transferring information from one form to another). In addition to these, the metacognitive strategies generally cover techniques involved in examining and controlling one's learning patterns. The three main metacognitive strategies are planning strategies (e.g., outlining goals and learning targets), monitoring strategies (e.g., ensuring material is understood) and regulation strategies (e.g., adapting learning activity to given tasks and seeking appropriate support).

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The ability to engage in self-regulated learning by applied effective and appropriate learning strategies has been shown to be a valuable learning resource for students of a wide variety of ages and ability (Marsh et al., 2004). Furthermore, self-regulatory processes and learning strategies have been positively linked with academic achievement when students particularly capitalise on: (a) task analysis and goal setting; (b) holding positive self-motivational beliefs; (c) employing self-control and self-observation strategies; and (d) monitoring their performance via self-judgement and self-reaction (Zimmerman & Martinez-Pons, 1990; Zimmerman, 2002; Purdie, Hattie & Douglas, 1996). Studies have also found that the learning and comprehension skills of low-achieving students can be greatly improved when they are coached in self-regulatory techniques and behaviours (Palincsar & Brown, 1984).

In addition to the direct relationship between self-regulated learning strategies and positive student outcomes, future goal orientations and perceived instrumentality have both been shown to not only relate directly to academic achievement, but also positively to self-regulated learning techniques. Using Biggs' (1987) original distinction between deep and surface learning strategies, Phalet et al. (2004) reported a number of findings which found a positive and strong link between future goals, perceived instrumental value and use of deep learning strategies (Lens, Simons & Dewitte, in press; Simons, Lens, Dewitte & Vansteenkiste, 2003). These studies found that when students perceive their current educational tasks as being high in value for reaching their future goals, they score higher on deep learning strategies than on surface.

Thus, research supports the relations posited in McInerney's model of student achievement. Firstly, there appears to be strong support for the relations between holding positive future goals and valuing the instrumentality of immediate learning tasks and (a) motivational orientation, (b) employing effective learning strategies, (c) increased effort and persistence, and (d) positive student outcomes (Phalet et al., 2004). Secondly, there is strong evidence for relations between different motivational orientations and students' use of self-regulatory techniques, learning strategies and academic engagement and achievement (McInerney, 2001). Finally, there is clear evidence supporting the strong link between effective self-regulatory techniques and school performance (Marsh et al., 2004).

The final section of this paper discusses the prevalence of research in Papua New Guinea that has investigated the characteristics of the school, family and child, and highlights suggested areas for future research to underpin a comprehensive understanding of achievement in developing settings.

Research in Papua New Guinea

Research on student achievement in academic settings in Papua New Guinea is limited. The small amount of research that does exist however has briefly examined some of the characteristics of the school, the family and the child, and how they influence student outcomes. This section outlines what research has been conducted in these domains and where research needs to head in the future.

Component 1: Research in PNG

Of the three components of Okagaki's (2001) triarchic model of school achievement, the form and perceived function of the school is the one most investigated in PNG. Research in Papua New Guinea, although limited, has emphasised a similar selection of criteria as being fundamental to a student's learning and achievement potential. Avei (1996) stressed the importance of school curriculum's being formed in conjunction with the communities that students come from and in "educating villagers about education, so that they can take a more meaningful role" (p. 124). Demerath (1999) also pointed out various problems that arise for students, educators and schools concerning the struggle to integrate opposing home and school cultures and the devaluation of traditional/village views and lifestyles.

Communication has also been investigated in Papua New Guinea schools, and research suggests similar findings to the minority studies reported above. Studies have found that the most effective form of communication involves clearly expressing the goals of the school to all students and staff, having approachable, friendly staff members and headmasters, and employing an efficient, yet flexible democratic leadership (Vulliamy, 1987; Weeks, 1990; Sengi, 1996).

Findings regarding the importance of positive, practical perceptions of education pose a large problem for students in developing countries such as PNG. With only 1.5 % of students completing Grade 12 in PNG, 80% of all people living out their lives in the village, and the unemployment rate being so high, it is unlikely that education serves a 'relevant' or 'pragmatic' function in their life. Ethnographic studies by Demerath (1999; 2000) have found that in PNG the "connection between schooling and work [is] so unclear" and that

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there is "enormous frustration among students whose expectations for cash employment have been raised by secondary schooling" (p. 201). Thus the importance of education for getting a job, becoming a successful adult and increasing one's economic and social security becomes irrelevant for students in Papua New Guinea.

Alternatively, Nelson, McInerney and Craven (2004), in their study of students in two village schools and one city school in PNG, found that students in Papua New Guinea were more globally, intrinsically and socially motivated than students in Australia. They suggested that despite limited educational and occupational opportunities, students from PNG still hold strong motivational goal orientations.

Component 2: Research in PNG

Studies in PNG have examined a small number of parental influences that have been shown to affect aspects of student engagement and achievement. Demerath (2000), in his study of Manus villagers in PNG, found a lack of strong parental involvement in students' education, which often left students with the freedom to construct for themselves what schooling meant for them. Their parents often held little or no expectations for their achievement which often resulted in the loss of student motivation for academic engagement.

A study in a village school in Papua New Guinea by Guy (1996) reported large discrepancies between students' home and school environments in expectations that parents and teachers held for students. He found that many parents considered their children's education to be predominately irrelevant for life in the village and they were dissatisfied with the school because it did not support the cultural life and traditions of the village. Whilst teachers were preparing students with skills and knowledge for life in the workforce, parents and communities were emphasising the importance of preparing their children for a village-based subsistence living (Avei, 1996).

Furthermore, in PNG, the main source of support from parents comes from indirect help and encouragement. Many parents themselves are not educated and make their living in the village. Swatridge (1987) investigated the degree of parental involvement in PNG students' academic lives. He suggested that parents were often not involved in their child's schooling due to three reasons – physical and cultural distance between school and home; traditional attitudes; and ambivalence towards the value of education in their child's and their own lives. This lack of parental involvement meant that student's did not have another source to go to for help, further knowledge and support, often leading to higher rates of student disengagement and low achievement (Demerath, 2000).

In addition to this lack of *direct* help amongst PNG families, *indirect* help in the form of time management is also a problem, because a large amount of time outside of school hours is designated to chores, village life and travelling to and from school (Demerath, 1999; 2000; Nelson et al., 2004). The combination of poverty and harsh environmental conditions in PNG means that villages must designate large amounts of time to creating a self-sustaining lifestyle in which education is often not made a priority. Thus students in developing countries tend to not benefit from their parents' involvement and assistance in their education, like a majority of students in developed countries do.

Component 3: Research in PNG

Research on the characteristics of the child in Papua New Guinea is extremely limited. Nelson et al. (2004) confirmed the relations between mastery and social goal orientations and deep learning processes and the relations between performance goal orientations and surface learning processes amongst students from PNG, as has been found in a myriad of other cultures (Watkins, McInerney, Lee, Akande & Regmi, 2002). Furthermore, Demerath (2000) identified certain characteristics of the PNG student (use of language, knowledge, work and aspirations), which in the context of an anti-academic climate, resulted in poor academic engagement and achievement.

Implications for Future Research

Whilst the form and structure of the school and student's perceived perception of education has been the most widely studied component of the triarchic model in Papua New Guinea, to date, no known research has examined the links between these factors and student outcomes. Research in PNG needs to focus on small-group learning, teacher-student communication, school-home continuity and student perceptions about the utility of education, and how they relate to academic engagement and achievement.

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The small amount of research investigating parental beliefs has tended to produce very negative findings – that is, that parents' attitudes are ambivalent, negative and do not offer any hope for the future of education. However, anecdotal evidence offers support for an alternative, positive future for education in PNG, showing positive parental views about the role education can play in contributing to the well-being of their communities. This concept needs to be examined in greater detail in order for culturally sensitive and appropriate guidelines and interventions to be implemented in PNG schools and communities.

Finally, research needs to examine the relations between all three components of Okagaki's triarchic model of student achievement and their relation to student academic engagement and achievement. A model established within a framework that includes characteristics of the school (perceived function and form), the family and culture (norms and beliefs about education and development) and the students themselves, has never been tested in any developing country, let alone Papua New Guinea. Investigating a model that is dependent on both individual and cultural influences on outcomes is vital for a clear understanding of student achievement in majority, indigenous and developing settings.

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Genevieve Nelson graduated with a Bachelor of Psychology (Honours) and conducted her research in the field of motivation and learning processes within educational and cross-cultural psychology. Her interest and passion for the Kokoda Track led her to extend the body of knowledge to this country and she is currently developing a model of educational achievement for students in PNG for her doctorate.
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