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**Why Self-Concept Matters for Teacher Education:  
Examples from Performance, Mathematics and Reading, and Aboriginal Studies  
Research**

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## **Abstract**

There is a revolution sweeping psychology that emphasizes a positive psychology and focuses on how healthy, normal, and exceptional individuals can get the most out of life. Self-concept has been established as one of the most important constructs in of itself in the social sciences and as fundamental to psychological wellbeing. Self-concept is one of the most important constructs in education and as such many educational policies around the world advocate the development of positive self-concepts as an important outcome of schooling. Self-concept has also been demonstrated to be an important mediating factor that facilitates the attainment of other desirable psychological, behavioral, and educational outcomes that underpin human potential. Recently a body of research has demonstrated that specific domains of the multidimensional construct of self-concept positively impact on achievement and also display a causal positive impact on achievement over and beyond prior achievement. As such self-concept theorists advocate that educators seeking to maximise educational outcomes can best enable students' potential by simultaneously enhancing students' self-concept and learning. The purpose of this paper is to provide teacher educators with an overview of recent advances in self-concept theory and research in order to inform their work with student teachers, children, and schools. Firstly, a brief rationale for the centrality of the self-concept construct for teacher education is presented in order to demonstrate that enhancing self-concept is a highly desirable goal and a vital key to wellbeing. Secondly, recent theoretical advances in conceiving self-concept as a multidimensional hierarchical construct are summarized. Thirdly, findings from meta-analyses and key recent research studies are presented to identify important directions in research and practice and to demonstrate the pervasive significance and salience of the self-concept construct for teacher education. Finally, based on a synthesis of the findings from this article the implications of this body of research for theory, research, and practice are discussed.

The purpose of this paper is to provide teacher educators with an overview of recent advances in self-concept theory and research in order to inform their work with teacher education students, children, and schools. Firstly, a rationale for the centrality of the self-concept construct for teacher education is presented in order to demonstrate that enhancing self-concept is a highly desirable goal and a vital key to wellbeing. Secondly, recent theoretical advances in conceiving self-concept as a multidimensional hierarchical construct are summarized. Thirdly, findings from meta-analyses and key recent research studies are presented to identify important directions in research and practice and to demonstrate the pervasive significance and salience of the self-concept construct for teacher education. Finally, based on a synthesis of the findings from this article the implications of this body of research for theory, research, and practice are discussed.

### **A Rationale for the Centrality of the Self-concept Construct for Teacher Education**

*I cannot think of a single psychological problem - from anxiety to depression, to under-achievement at school or at work, to fear of intimacy, happiness or success, to alcohol or drug abuse, to spouse battering or child molestation, to co-dependency and sexual disorders, to passivity and chronic aimlessness, to suicide and crimes of violence - that is not traceable, at least in part, to the problem of deficient self-esteem (Branden, 1994, p. xv).*

These words by Nathaniel Branden, an eminent philosopher and psychologist, attest to the pervasive significance of the self-concept construct. Many researchers (e.g., Sommer & Baumeister, 2002) note that there exists an extensive literature, spanning diverse disciplines and theoretical perspectives, suggesting that high self-concept promotes goals, expectancies, coping mechanisms, and a diverse range of adaptive psycho-social behaviours that facilitate productive achievement, pro-social behaviours, mental health, and community social capital. For example, research has demonstrated that the attainment of a positive academic self-concept mediates positive influences on academic behaviors (e.g., persistence on academic tasks, academic choices, educational aspirations, and subsequent academic achievement; Byrne, 1996; Marsh & Yeung, 1997); critical outcome variables (e.g., subsequent university attendance, bullying, relations with parents, self-concept, locus of control; Marsh & Craven, 2006); gaining part-time employment; reduction in externalising factors (delinquent, aggressive behaviours; Marsh, Parada, & Ayotte, 2004), anxiety, impaired motivation, and poor performance (e.g., Sommer & Baumeister, 2002).

There is also a revolution sweeping psychology, one that emphasises a positive psychology and focuses on how healthy and productive individuals seem to get the most from life (e.g., Dweck, 2006; Seligman & Csikszentmihalyi, 2000). Consistent with this emphasis, positive self-belief is valued as a 'hot' variable that can make good things happen, facilitating the realization of full human capacity in a range of settings (Craven & Marsh, 2008). According to the OECD, self-concept is "closely tied to students' economic success and long-term health and wellbeing" (OECD, 2003, p. 9). Academic self-concept also plays a critical part in students' interest in and satisfaction at school, underpins their academic achievement, and constitutes a very influential platform for young people's pathways beyond school (Marsh & Craven, 2005, 2006). Self-concept has been established as one of the most important constructs in education with many

educational policies around the world advocating the development of positive self-concepts as an important outcome of schooling. Self-concept has also been demonstrated by a body of research evidence to be an important mediating factor that facilitates the attainment of other desirable psychological, behavioural, and educational outcomes that underpin human potential in a wide range of disciplines. Yet the implications of these recent advances for teacher education have not been fully elucidated. This is unfortunate as the self-concept construct is important in itself and has been demonstrated to facilitate a wide range of desirable educational outcomes and as such is fundamental to enhancing teacher education.

Our thesis is that: (a) effective teacher education courses need to include the enhancement of university students' self-concepts alongside the content, skills, and strategies delivered in teacher education; and (b) teacher education students should be taught the rationale for enhancing school students' self-concepts and specific strategies for effectively enhancing students' self-concepts in multiple academic and non-academic domains. Because of the reciprocal relation between self-concept and desirable outcomes, we argue that the enhancement of self-concept is likely to have a long-lasting and potentially more pervasive effect that complements teacher education courses and the immediate effects of schooling interventions. Hence self-concept is a pivotal component in international best practice in teacher education, strengthening both the delivery of teacher education programs and assisting teacher education students implement effective educational interventions in schooling contexts to maximise human potential.

### **Recent Advances in Self-concept Theory**

#### ***The Shavelson, Hubner, and Stanton (1976) Model***

Shavelson *et al.*'s (1976) seminal work has underpinned recent advances in self-concept theory and research. They reviewed theoretical and empirical research of the time, and developed a new theoretical model of the structure of self-concept. They hypothesized that self-concept is: organized or structured; multi-faceted; hierarchically arranged; is stable at the apex of the model, but as one descends the hierarchy, self-concept becomes increasingly situation specific and as a consequence less stable; facets are increasingly differentiated with age; both evaluative and descriptive; and is differentiable from other constructs. General-self appears at the apex and is divided into academic and non-academic components that are divided into more specific components. At the time Shavelson *et al.* (1976) were unable to test their model due to the unavailability of a multidimensional self-concept measurement instrument. However the basic assumption of this model that asserted that self-concept was a multidimensional construct was important for providing a blueprint for the next generation of self-concept research.

#### ***Marsh/Shavelson (1985) Revised Model***

Based on the Shavelson model, Marsh developed the Self Description Questionnaire (SDQ) instruments (Marsh, 1990a, 1990b, 1992). Results of factor analyses of the SDQ instruments provide strong support for the multidimensionality of the self-concept construct. Reviewers (Byrne, 1996; Hattie, 1992; Marsh & Craven, 1997; 2006) expound the multifaceted structure of self-concept and emphasise that self-concept cannot be

adequately understood if its multidimensionality is ignored. Hence the multidimensionality of self-concept posited in the Shavelson *et al.* model is now well established. However, subsequent research has also led to revisions in the model (Marsh, Byrne, & Shavelson, 1988; Marsh & Shavelson, 1985; Vispoel, 1995).

Verbal and mathematics achievement are substantially correlated, however, near zero correlations are present for verbal and mathematics self-concept. These findings have led to the revision (Marsh, Byrne, & Shavelson, 1988; Marsh & Shavelson, 1985; Shavelson & Marsh, 1986) of the original Shavelson *et al.* (1976) model postulating that self-concepts in particular subject areas form two separate second order academic factors - verbal/academic and math/academic self-concepts - rather than a single order factor. These advances in theory and measurement have addressed key within-construct issues and provided a robust foundation for between-construct studies, the development of stronger self-concept enhancement and other educational interventions, and research methods that can more appropriately test intervention effects on the self-concept factors most logically related to the goals of the intervention (see Craven, Marsh, & Burnett, 2003).

### **Meta-Analyses of Self-Concept Intervention Effects**

It is becoming increasingly evident that major scientific issues cannot be resolved by a single study and that advances in knowledge come from the integration of many primary studies. The Schmidt (1992) critique demonstrated this rationale persuasively, concluding that traditional narrative approaches to research synthesis are often ineffective at resolving major research issues and outlined the benefits of meta-analysis. This advance in research methodology has been utilized to effectively identify characteristics of international best practice in self-concept enhancement research.

**Hattie's (1992) meta-analysis.** Hattie (1992) conducted a meta-analysis to explore whether cognitively oriented programs had more of an effect on self-concept change than affectively oriented programs. Hattie concluded that 10% of those who experienced an intervention increased their self-concept compared with the control group; effect sizes were higher for adults (.52) than children (.31); lower socioeconomic groups than middle socioeconomic groups; groups with previously diagnosed problems (.55) relative to groups without problems (.26); and other settings (.50) compared to educational settings (.36) (see Hattie, 1992, pp.228-230). The results also indicated that of the total sample, adults with previously diagnosed problems had the highest average effect size (.87) and the effectiveness of teachers as self-concept change agents was considerably lower than average (.26).

Hattie's (1992) meta-analysis is a valuable contribution to the self-concept literature. However, as Hattie (1992, p. 236) pointed out, "there were too many fair and poor studies, too many studies were rejected because they evaluated programs by intuition, too few studies with follow-ups, and too few studies that included control groups". To these concerns Marsh and Craven (1997) added that too few studies "have used well-validated, multidimensional self-concept instruments in which at least some of the scales are closely matched to the intended goals of the intervention" (p. 179).

**Haney and Durlak's (1998) meta-analysis.** Haney and Durlack (1998) conducted a meta-analysis of 116 self-concept/self-esteem pre-1992 studies for children and adolescents. A single effect size was calculated for each intervention and effects for other outcome measures were averaged for studies using more than one outcome measure. The mean effect size for studies focused on enhancing self-concept was significantly ( $p < .01$ ) higher (.57) than the mean effect size from studies focusing on other outcomes (.10). Non-randomised designs resulted in significantly lower effect sizes (.04) than randomised studies (.38). Studies with no treatment control groups had significantly higher effect sizes (.34) than studies with attention-placebo controls (.10). Interventions that were developed based on prior research findings produced the highest effect size of .71, interventions based on a specific self-concept theory resulted in an effect size of .43, interventions that were based on other theory .53, studies based on another rationale produced an effect size of .26 and studies based on no rationale resulted in an effect size of .11. Effects were also stronger for treatment studies (.47) than prevention studies (.09). Studies with the highest mean changes in self-concept had the highest mean effect size across other outcomes (.55) compared to studies with intermediate effects (.31) and small effects (.14). These results suggest that self-concept interventions and research can be enhanced by: employing randomised designs, capitalizing on previous research findings and theory to strengthen interventions, targeting particular categories of students, and importantly studies that successfully enhance self-concept are valuable and may be expected to have a positive impact on other desirable outcomes.

Haney and Durlack's (1998) meta-analysis makes an interesting contribution to self-concept enhancement research; however, there are several important limitations of this study. We argue (also see Craven, Marsh, & Burnett, 2003) that it is important to distinguish between the effects of a self-concept intervention on target areas of self-concept that are directly relevant to the goals of the program (e.g., reading self-concept for a reading intervention), the effects of an intervention on non-target areas (e.g., physical self-concept for a math intervention), and the effects of an intervention on related areas of self-concept where one might predict a transfer effect (e.g., academic self-concept for a math intervention). Logically target effects should be substantially larger than non-target effects whereas related transfer effects should be intermediate. By failing to make this distinction, the Haney and Durlak meta-analysis is likely to have substantially underestimated the effects of interventions on targeted areas of self-concept as they only considered changes in global self-concept, self-esteem, or non-academic components of self-concept.

**The O'Mara, Marsh, Craven, and Debus (2006) meta-analysis.** O'Mara *et al.* (2006) recently extended previous self-concept intervention meta-analyses by specifically accounting for the multidimensionality of the self-concept construct and including studies published up to 2002 thereby considering more studies than previous meta-analyses for children and adolescents 18 and under (145 primary studies, 200 interventions, and 501 effects). In contrast to previous meta-analyses a separate effect size was computed for each self-concept outcome considered in the study. Self-concept facets were also classified as directly related, indirectly related, or unrelated to the goals of the intervention.

Results largely replicated those of the earlier meta-analyses; however, effect sizes were larger for self-concept facets directly related to the intended outcomes of the intervention and smaller for other less relevant classifications such as self-esteem and non-target facets of self-concept. Overall, interventions were significantly effective (mean effect size .47), and benefits did not diminish over time for studies including follow-up tests. In support of the multidimensionality of self-concept and the construct validity approach to the study of intervention effects (see Craven, Marsh, & Burnett, 2003), interventions targeting a specific self-concept domain and subsequently measuring that domain were most effective. The overall (random effects) mean effect size was .51, which is a substantial finding, demonstrating that effective self-concept enhancement interventions need to account for the multidimensionality of the self-concept construct and by targeting specific facets of self-concept, teachers can boost effects.

O'Mara *et al.* also found that higher effect sizes were present for interventions targeting students with pre-existing problems (e.g., low self-esteem, behavioural problems, learning disabilities) compared to preventive interventions. This finding demonstrates that the potential to increase self-concept is much larger for groups who are "at risk" and probably most in need of intervention. This is a particularly important finding for children and adolescents in school settings where the gap between advantaged and disadvantaged students internationally grows continually larger with age (see Marsh & Kleitman, 2002 for further discussion of the social inequality gap reduction model). Hence, it is gratifying to find that self-concept interventions are particularly beneficial for at risk students.

O'Mara *et al.* also found that interventions emphasizing praise and/or feedback yielded the highest mean effect size. Given the cost effective nature and ease of introduction of such interventions this finding has important practical implications for intervention design and for delivery. O'Mara *et al.* also found that the second highest effect size was for interventions that used praise or feedback in conjunction with some other feature, such as skills training. The implications of this finding is congruent with the suggestions of reciprocal effects theorists (see Marsh & Craven, 2005, 2006), who advocate that schools need to simultaneously focus upon enhancing skills and self-concept, using praise and feedback strategies to address the latter (e.g., Craven *et al.*, 1991, Craven *et al.*, 2003). Clearly interventions aiming to enhance self-concept are best served by using praise or feedback strategies since skills training alone is less effective. It is also likely that gains in achievement without associated gains in specific domains of academic self-concept are likely to be short-lived. Overall the results of this meta-analysis suggest that best practice in self-concept intervention includes: (a) a focus on domain-specific dimensions of self-concept most relevant to the goals of the intervention; (b) utilizing praise and feedback strategies particularly those that are contingent upon performance, attributional in nature, and goal-relevant; and (c) simultaneously targeting self-concept and skills training; and (d) targeting children and adolescents with pre-existing problems. These strategies offer a valuable foundation for developing stronger self-concept enhancement interventions and offer potent potential for enhancing the psychological wellbeing and educational outcomes of youth. They also serve as an influential platform for applying advances in self-concept theory and research to inform teacher education.

## Research Evidence

### *Impact of Self-concept on Aboriginal Studies Teacher Education Self-concept*

Recently we have begun applying self-concept theory to elucidate the impact of specific teacher education courses on undergraduate and postgraduate teacher education students' self-concepts. Below we describe one of our studies that has examined the impact of Aboriginal Studies subjects upon multiple domains of teacher education students' teaching self-concepts.

Craven, Halse, Marsh, Mooney, and Wilson-Miller (2005) were commissioned by the Department of Education, Science, and Technology (DEST) to evaluate the impact of preservice Australian primary teacher education Aboriginal Studies courses on practising teachers' abilities to effectively teach Aboriginal Studies in primary schools (see Craven, 2003 for an overview). The sample comprised 388 teachers from 201 primary schools: 198 teachers comprising the experimental group (teachers who had undertaken a core or an elective course) and 190 teachers comprising the control group (teachers who had not undertaken a core or an elective course). A series of one way ANOVAs were conducted to test whether teachers who had undertaken an Aboriginal Studies teacher education course had statistically significant higher target variable scores in comparison to teachers who had not undertaken such courses.

Teachers who had undertaken Aboriginal Studies teacher education courses had statistically significant higher overall self-concepts compared to control teachers in regard to: their perceptions of their knowledge of Aboriginal Studies subject matter, teaching Aboriginal students, and their self-concept of their overall ability to teach Aboriginal Studies and teach Aboriginal students effectively. Examination of the differential impact of teacher education courses on cognitive and affective self-concept components revealed an interesting pattern of results. Cognitive self-concept facets for knowledge of subject matter, teaching Aboriginal Studies, teaching Aboriginal students, and Aboriginal Studies total self-concepts were significantly higher for the experimental group compared to the control group. No significant differences between the groups were present for cognitive elements of community consultation self-concept. Significant differences between the experimental and the control group were also present for the affective component of teaching Aboriginal students whereby scores for the experimental group were significantly higher on this variable compared to the control group. These results suggest that teachers who have undertaken Aboriginal Studies teacher education courses compared to teachers who have not undertaken such courses are more likely to understand Aboriginal Studies content matter, more likely to feel competent in regard to teaching Aboriginal Studies, more likely to feel competent in regard to understanding and being able to teach Aboriginal students well; and more likely to enjoy teaching Aboriginal students compared to teachers who have not undertaken such courses. These results attest to the power of teacher education courses to impact positively on teachers' self-concepts in regard to both teaching Aboriginal Studies and Aboriginal students. The results in relation to affective components of self-concept in relation to knowledge and teaching Aboriginal Studies are of concern. These results suggest teacher education courses may not be fostering teachers' enjoyment of learning about and teaching Aboriginal Studies. Similarly, the non-significant results for both cognitive and affective

components of community consultation self-concept suggest that this is an area of self-concept that teacher education courses are not having a significant impact on.

Craven et al. also undertook path analysis to explore the relation between variables for both the control and experimental groups. Path analyses were conducted separately for the experimental and control groups of teachers. For the experimental group self-concept shared a strong relation with teaching pedagogy (.57\*\*\*), teaching history (.52\*\*\*), teaching current issues (.54\*\*\*), students' knowledge (.86\*\*\*), and the implementation and appreciation of departmental requirements (.76\*\*\*). This pattern of results was similar for the control group. These results suggest that teachers' self-concepts have an important relation to what they perceive they actually teach, student knowledge outcomes produced, and their ability to implement and appreciate departmental policy. These results reaffirm the critical importance of teachers' self-concept in relating to desirable educational outcomes.

To further explore the differential relation of affective and cognitive components of self-concept to desirable outcome a path analysis was conducted based on the experimental group. Cognitive components of self-concept shared a strong positive relation with teaching pedagogy, teaching history, teaching current issues, students' knowledge, and implementing departmental requirements. These results suggest that teachers' self-concept in regard to feeling capable are strongly related to desirable outcomes. Affective components of self-concept are strongly related to students' knowledge and to a lesser extent teachers' ability to implement departmental requirements. These results suggest that affective components of self-concept also may have an important relation to desirable outcomes. Teacher education courses whilst they impact on affective components of teachers' self-concepts to teach Aboriginal students do not have a significant impact on teachers' affective components of self-concept in other domains.

The results of the Craven et al. study are important in that this study is the first Australian national study to begin to elucidate the impact of Aboriginal Studies teacher education courses on teachers' ability to understand and teach Aboriginal Studies. The study found that preservice Aboriginal Studies courses do make a positive difference. Teachers who have undertaken such courses have statistically significant higher self-concepts. Results of path analyses also demonstrated that teachers' self-concepts have an important relation to what teachers actually teach, the knowledge that students acquire, and teachers' ability to implement and appreciate departmental policy. These results attest to the critical importance of teachers' self-concept in relating to desirable educational outcomes for both teacher education and teachers' subsequent attitudes to teaching in the classroom.

### ***The Reciprocal Effects Model: Impact of Self-concept on Performance***

Marsh and Craven (2006) have reviewed a body of sound empirical educational research showing that prior academic self-concept had a positive effect on subsequent academic achievement beyond what could be explained by prior levels of academic achievement. This body of research is based on sound longitudinal causal modelling studies along with the results of recent meta-analyses (Valentine & DuBois, 2005; O'Mara, Marsh, Craven, & Debus, 2006) and demonstrates that self-concept and

achievement share a mutually reinforcing causal reciprocal relation. Capitalising on previous advances in theory and empirical research, Marsh and Craven developed a reciprocal effects model (REM; also see Marsh, Byrne, & Yeung, 1999; Marsh & Craven, 1997) whereby the causal relation between academic self-concept and achievement is conceived as dynamic and reciprocal. In reviewing the available international evidence (see Marsh & Craven, 2006), they found that support for the REM is particularly strong in relation to academic self-concept and school performance whereby increases in specific domains of self-concept lead to increases in associated performance domains and other desirable psycho-social and socio-economic outcomes and improved performance leads to better self-concepts.

Craven and colleagues' research program (for overview see Craven & Marsh, 2008) have also demonstrated the centrality of self-concept for addressing timely socio-economic issues of our time including bullying intervention (Marsh, Parada, Craven, & Finger, 2004; Parada, Craven, & Marsh, 2008); peer support interventions (Ellis, Marsh, & Craven, 2005); reading and mathematics intervention (Craven, Marsh & Debus, 1991); perceived discrimination (e.g., Bodkin-Andrews & Craven, 2006); and addressing disadvantage in Aboriginal communities (Craven et al., 2005). These results clearly demonstrate the pervasive significance of the self-concept construct, offer further support for the theory on which this research is based, and affirm that enhancing self-concept has a causal influence on achievement and multiple desirable psycho-social and socio-economic outcomes with critical implications for interventions aiming to bridge the gap. Clearly, enhancing skills alone is not enough to improve achievement; people need also to hold positive self-concepts of their abilities in specific areas.

### ***Impact of Self-concept Enhancement on Mathematics and Reading***

Early reading failure casts a long shadow over the remainder of a young person's education more often than not resulting in the truncation of years of schooling with highly adverse individual and social consequences (Rimm-Kaufman, Kagan, & Byers, 1999). Entwisle, Alexander, and Olson (2005) have demonstrated that young children are launched into achievement trajectories when they start formal schooling or even before, and the patterns of these early trajectories are highly stable over childhood and adolescence. In addition, in education research there is broad support for Mathews effects – early small differences in academic outcomes predict large subsequent differences (Stanovich, 1986).

Based on the results of longitudinal causal ordering studies (see Marsh & Craven, 2006 and previous discussion on REM), reading interventions that only target reading achievement are unlikely to produce sustainable improvements in literacy, while interventions that target both skills and self-concept are likely to be more effective. A similar scenario is also predicted for the relation of mathematics achievement and self-concept. As such self-concept theory (e.g., Marsh & Craven, 1997; 2005; 2006), provides a theoretical explanation for tangible new solutions to maximise the potency of reading and mathematics interventions. Below we present two example studies that have targeted reading and mathematics self-concept and achievement to provide examples of the potential potency of such interventions that capitalize on advances in self-concept theory and research.

**Craven, Marsh, and Debus (1991) study.** Craven, Marsh, and Debus (1991) implemented a self-concept enhancement intervention in a primary setting. The primary purpose of the study was to enhance reading and mathematics self-concept and secondary effects were predicted to occur in self-attributions and academic achievement. Participants were primary school students who were low on academic self-concept. The intervention was a combination of a researcher-administered treatment and a teacher-administered treatment designed to enhance reading and mathematics self-concept.

The researcher-administered treatment enhanced reading and mathematics self-concepts (target facets), school and general self-concept (transfer facets), and some logically related self-attributions (e.g., attributing success to effort). The researchers also found that non-target facets of self-concept that were unrelated to the goals of the intervention were not affected. The findings provide support for: (a) the importance of applying a construct validity approach to testing the effectiveness of the intervention on target, transfer, and non-target facets of self-concept, (b) the usefulness of the self-concept enhancement intervention; (c) the critical importance of accounting for multiple dimensions of self-concept in intervention studies; and (d) the necessity of utilizing the strongest available multidimensional self-concept measurement instruments with demonstrated reliability and validity.

Despite the effectiveness of the similar researcher-administered treatment, the intervention administered by teachers in the context of the regular classroom did not result in significant changes in self-concept. To address this paradoxical result Craven *et al.* (1991) suggested that future research based on teacher-administered interventions should consider: (a) strategies to maintain the frequency of reinforcement delivered by teachers; (b) introducing the intervention at the beginning of the school year to ensure feedback was perceived as salient by students; and (c) extending the treatment implementation period.

**Craven (1996) study.** Craven (1996) incorporated the design features suggested above to maximize teacher-generated effects on self-concept. The purpose of this large-scale study was to investigate the effectiveness of an intervention to enhance academic self-concept and the related constructs of self-attributions and academic achievement. Participants for the longitudinal analysis were 1,300 middle and working class children from 8 schools in metropolitan Western Sydney from each of the years of 3, 4, and 5. From each of the 50 classes participating in the study, 18 participants with the lowest combined academic self-concept scores were selected from the longitudinal pool to participate in the enhancement component of the study. The self-concept enhancement intervention was a combination of internally focused feedback and attributional feedback (see Craven, 1996) targeted at reading or mathematics or a combination thereof. The intervention was delivered over a period of 14 weeks by primary school teachers in the regular classroom context and by research assistants in educational settings as an analogue to withdrawn assistance groups. Six students from each of the 42 experimental classes were assigned to the within-class control group. One additional class from each of the 8 participating schools was randomly assigned to be an experimental diffusion control group (see Craven, Marsh, Debus, & Jayasinge, 2001 for an overview of diffusion effects and the need to incorporate diffusion control groups) and did not receive either the teacher-mediated or researcher-mediated intervention. This control group was

incorporated in the research design to test for possible diffusion effects of the teacher-mediated intervention to non-target participants in the within-class control group.

The results demonstrated that the researcher-mediated intervention was successful in enhancing several targeted facets of self-concept and some logically related self-attributions and areas of academic achievement. For example, the researcher-mediated intervention in mathematics enhanced mathematics self-concept, some mathematics attributions and mathematics achievement. The single-domain teacher-mediated interventions were successful in affecting some aspects of self-concept, self-attributions, and academic achievement relevant to the goals of the intervention, though the teacher-administered intervention was less potent than the researcher-administered intervention. Students experiencing the combined teacher-mediated intervention showed gains in some aspects of reading achievement but the intervention did not enhance self-concept or self-attributions.

Comparison of academic self-concept and self-attribution scores of the within-class control group with the external diffusion control group demonstrated that the within-class control group had higher academic self-concepts and self-attribution scores at posttest than the external diffusion control group. Comparison of self-concept scores of the within-class control group with the external diffusion control group at time 2 revealed that main effects for group were present for school, general, and combined academic self-concept. Participants in within-class control groups had higher self-concepts in school, general, and combined academic self-concept at time 2. Main effects for group were not present for reading and mathematics self-concept at time 2; however significant aptitude treatment interaction effects were present for mathematics and reading self-concept with prior levels of self-concept at time 2. These significant aptitude treatment interaction effects suggest that diffusion effects in mathematics and reading self-concept for students in the within-class control group are greater for some categories of students at time 2. The presence of this diffusion effect suggests that teachers can enhance self-concept over a relatively short period and that enhancing self-concept can diffuse readily across all students in the classroom. The findings provide support for: (a) the effectiveness of the intervention as a means to enhance self-concept particularly for treatments mediated by researchers, and mediated by teachers in single academic domains, (b) the importance of including multiple dimensions of self-concept in intervention studies, and (c) the need to test for diffusion effects when utilizing within-class full experimental designs.

### **Implications for Theory, Research, and Practice**

In this paper we have attempted to emphasise the pervasive significance of the self-concept construct for making good things happen in teacher education outcomes and our graduates' actual teaching in the classroom. We have also attempted to present a rationale for why self-concept is important for teacher education by way of an overview of key advances in self-concept theory and some example research areas in particular. In teacher education we have demonstrated that a positive self-concept in specific domains serves as an influential platform for and underpins subsequent teaching. We provided an example derived from our Aboriginal Studies teacher education research. However, grounded on recent advances in self-concept theory and research we hypothesise that self-concept will display an important role for a diverse range of teacher education Key Learning Areas (e.g., science, maths, music, art) and content. We also predict based on the REM that

enhancing teacher education students' self-concepts in specific course areas will also share a causal relation with a diverse range of desirable teacher education outcomes (e.g., academic achievement, commitment to teach the content in the classroom in this area). Put simply because self-concept and achievement share a mutually reinforcing relation no teacher educator is wasting her or his time in enhancing teacher education students' self-concepts in specific domains. We emphasise that enhancing teacher education students' teaching self-concepts is critical for maximising a wealth of desirable teacher education outcomes in specific content areas and as such offers a research-based tangible new strategy for enhancing teacher education. As such we advocate that effective teacher education courses need to include the enhancement of university students' self-concepts alongside the content, skills, and strategies delivered in teacher education.

We have also provided some examples of how self-concept is a critical driver of key educational outcomes. We demonstrated that enhancing mathematics and reading self-concepts positively impacts on a range of desirable educational outcomes. We also highlighted REM research that demonstrates the critical relation self-concept shares with performance outcomes such as academic achievement. It is also important to note that self-concept also shares an important relation with non-academic performance indicators as well (e.g., sports' performance, physical and mental health, relations with peers) and as such also offers an important key for intervention in non-academic facets of schooling. Overall, these results suggest that no teacher is wasting his or her time in enhancing their students' self-concepts in specific areas; this is likely to have a positive impact on students' adaptive learning strategies, and gains in achievement are likely to be long lasting and optimised when self-concept and skills in specific areas are enhanced simultaneously. In essence, we propose the inclusion of self-concept as a crucial component of school intervention as well as an important measure in the effective evaluation of quality teaching and learning. In addition, we advocate that teacher education students should be taught the rationale for enhancing school students' self-concepts and specific strategies for effectively enhancing students' self-concepts in multiple academic and non-academic domains. We hope that this paper will assist teacher educators to consider the vital role of self-concept in teacher education, enhance their students' self-concepts in a diverse range of teacher education areas; and teach their students how to enhance their pupils' self-concepts and the rationale for doing so.

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