The relationship between teacher efficacy and higher order instructional emphasis

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Introduction

In educational research there is a consensus that the teaching of higher order thinking is important (Raudenbush, Rowan, and Cheong, 1993: 524). Research suggests, though, that there is a concentration on lower level thinking in classrooms rather than higher level thinking (Edwards, 1995). Examination of what motivates teachers towards certain behaviours can be explained by the construct of teacher efficacy which has been linked to critical instructional decisions (Tschannen-Moran et al., 1998).

The purpose of this research was to investigate the relationship between teacher efficacy and the emphasis that teachers placed on higher order thinking in their teaching programs. In the study, this emphasis on higher order thinking was labelled “higher order instructional emphasis”.

The research examined teaching in New South Wales government schools in the subject areas of history and science in Year 7 to Year 10. These years constitute the first four years of high school.

To reach a conclusion on the importance of the contribution of teacher efficacy to any variance in higher order instructional emphasis it was appropriate to examine the contribution of other independent variables. These variables included the year level of the class and the nature of the class, with the latter referring to whether the class was graded.

Related literature

Teacher efficacy

The construct of teacher efficacy was derived from Bandura's theory of self-efficacy (1977). Applied to the context of education teacher efficacy has been defined as “the extent to which teachers believe they can affect student learning” (Dembo & Gibson, 1985:173). Teacher efficacy is seen as a multidimensional construct with Ashton and Webb (1982), for example, identifying two dimensions as “teaching efficacy” and “personal efficacy”. The first factor represents a teacher’s sense of teaching efficacy or belief that teachers can overcome factors external to the teacher such as the background of students. The second dimension, personal efficacy, is the belief of an individual teacher in their own personal capacity to deliver the necessary teaching behaviours to influence student learning.
Studies have shown that these two dimensions are independent (Woolfolk and Hoy, 1990: 82). Ross (1992) found little correlation between teaching efficacy and personal efficacy. This means that individual teachers could believe, for example, that teaching can significantly determine what students learn but that they are not capable of having much of an effect on the learning of their own students.

Researchers have also questioned whether there are three rather than two dimensions to the construct of teacher efficacy. For example Guskey (1988) suggested the possibility of a third dimension following his study of elementary and high school teachers' sense of responsibility for positive and negative student outcomes. In their study of prospective teachers using a revised version of the sixteen-item Gibson and Dembo Teacher Efficacy Scale (1984), Woolfolk and Hoy (1990) concluded from the factor loadings that the construct of teacher efficacy consisted of three dimensions: teaching efficacy; and, two dimensions of personal efficacy. These two related dimensions were teachers’ sense of personal responsibility for positive student outcomes and their personal responsibility for negative outcomes.

General organisational literature has linked self-efficacy to work-related performance including productivity, the ability to manage difficult tasks, adaptability to new technology and the ability to make better use of their skills in a changing context than those with lower self-efficacy (Gist and Mitchell, 1992). High self-efficacy improves achievement of outcomes as individuals persist on tasks and focus on problem solving strategies (Stipek, 1993).

Research suggests that teacher efficacy may underlie critical instructional decisions including the use of time, classroom management strategies and questioning techniques (Gibson & Dembo 1984; Saklofske, Michayluk and Randhawa, 1988; Woolfolk, Rosoff, and Hoy, 1990). Teacher efficacy has also been shown to be a strong predictor of commitment to teaching (Coladarci, 1992), adoption of innovations (Midgley, Feldlaufer, and Eccles, 1989) and higher levels of planning and organization (Allinder, 1994). Teachers with a higher sense of efficacy are less critical of students when they make mistakes (Ashton and Webb, 1986) and exhibit more enthusiasm about teaching (Allinder, 1994).

Gibson and Dembo (1984) in a classroom study of eight elementary teachers concluded that high and low efficacy teachers demonstrated differential patterns of behaviour in the classroom. While there was not a significant difference in teacher use of time between high efficacy and low efficacy teachers in the general categories of total academic and total non academic time there were differences detected in subcategories of behaviour. Compared with the low efficacy teachers, the high efficacy teachers spent less time in small group discussion and more time monitoring and checking seatwork, in preparation or paperwork and in whole class instruction. High efficacy teachers also showed significantly more persistence than low efficacy teachers in leading students to correct responses.
Podell and Soodak (1993) found that low efficacy teachers were more likely than high efficacy teachers to refer students who were difficult to teach to special services. This was particularly the case with students from low socio economic backgrounds.

In looking at the two factors of teaching efficacy and personal efficacy that could underpin teacher efficacy, research has produced mixed results regarding the significance of teaching efficacy in teacher decision-making. While research involving prospective teachers (Woolfolk and Hoy; 1990) found that teaching efficacy was significantly correlated with bureaucratic orientation and pupil control ideology other studies have found that teaching efficacy does not relate to teaching behaviours and outcomes but that personal efficacy does (Saklofske et al.; 1988; Soodak and Podell; 1993).

Soodak and Podell (1996) suggested that there may be a developmental sequence in relation to teaching efficacy in that prospective teachers' beliefs about their future field of operation are important until they have actually had the experience to develop their self-efficacy from their personal experiences.

Studies have found positive correlations between teacher efficacy and student achievement (Fuller at al., 1982). Berman and McLaughlin's evaluation (1977; cited Dembo and Gibson, 1985:173) of 100 Title III ESEA projects found a positive relationship between teacher efficacy and the achievement of project goals, degree of teacher change, continued use of project methods and materials and increased student performance. Armor et al. (1976 cited Dembo and Gibson, 1985:173-4) found a positive correlation between teacher efficacy and progress in reading achievement while Ashton and Webb (1982) found a significant relationship between teacher efficacy and the performance of students from high school basic skills classes on the Metropolitan Achievement Test in mathematics and language.

As an indication of the substantial impact of efficacy on student achievement, Ashton and Webb (1986) reported that teaching efficacy explained 24 per cent of variance in mathematic achievement of high school students, while personal efficacy explained 46 per cent of variance in language performance. Schunk (1991) found that changes in efficacy improved teacher use of cognitive strategies and consequent increased performance in mathematics, reading and writing.

Studies have supported the notion that teachers in more effective schools have higher levels of efficacy and a greater sense of responsibility for their students’ learning (Brookover and Lezotte 1979 - cited in Guskey and Passaro; Trentham, Silvern and Brogdon, 1985; Guskey, 1988).

It was expected that teachers who had high self-efficacy were more likely to emphasise higher order instructional objectives and outcomes than teachers with low self-efficacy. This was because high efficacy teachers have a greater belief in their ability to succeed. Furthermore high efficacy teachers were more likely to have had success with higher order objectives and outcomes with students in the past because such teachers would make
greater efforts to achieve them, would persist in the face of difficulties and were better able to cope emotionally with problems that arose. This also meant that the degree of emphasis that high efficacy teachers placed on high order instructional objectives outcomes was more likely to be successfully implemented in the classroom.

Higher order instructional emphasis

The dependent variable in this study was higher order instructional emphasis. This was defined as the emphasis that teachers placed on higher order thinking in their teaching programs and was operationalised through the emphasis placed on higher order instructional objectives and outcomes in the Stage 3 and Stage 4 (Year 7 to Year 10) science and history syllabuses in New South Wales.

Definitions of higher order thinking in the literature indicate its complexity and many facets. Resnick, for example (1987:3), described higher order thinking skills as: elaboration of material presented; drawing inferences; analysis; and, the construction of relationships. The study used Newmann's definition (1990:44) of higher order thinking as that which "challenges the student to interpret, analyse, or manipulate information, because a question to be answered or a problem to be solved cannot be resolved through the routine application of previously learned knowledge." This definition captured both the challenge of problem solving and the type of thinking in the higher taxonomical levels.

This study recognised the importance of higher order thinking in the context of a subject domain. Higher order thinking then was operationalised in the terms of the specific curriculum. This was appropriate given the findings from cognitive research that specific content knowledge plays a fundamental role in thinking (Resnick, 1987:18).

Teaching for higher order thinking is seen as important for the learning of all students, whether high or low achieving, and in all subject areas (Raudenbush, Rowan, and Cheong, 1993: 524). Moreover, Peterson (1988) asserted that a focus on teaching higher level skills may be particularly important for low achieving students because they need more support to learn those skills. Research indicates that lower-achieving students can gain from the teaching of cognitive processes and knowledge structures (Doyle, 1983).

Studies have shown that average ability students can match the performance of high ability students if taught problem solving procedures (Clements, 1991). High ability students also benefit from such instruction (Linn, Sloane and Clancy; 1987). Furthermore, failure to develop higher order thinking skills may lead to significant learning difficulties even in the primary years (Resnick, 1987:8).

Specific teacher behaviours that place a focus on problem solving have been associated with improvements in higher order thinking. For instance, student
verbalisation has been linked to improvements in problem solving ability (Underbakke, Borg and Peterson, 1993: 144).

This study looked at the junior years of high school. Hargreaves and Earl's (1990) review of research which encompassed this stage of schooling indicated the importance of higher order thinking during these years. They noted that one of the developmental tasks of young adolescents is to think in ways that become progressively more abstract and reflective. Hargreaves, Earl and Ryan (1996) confirmed the importance of critical and problem solving skills in students aged ten to fifteen years.

There is evidence that teaching in high schools generally concentrates on basic skills with teaching of higher order objectives as significantly related to students in classes classified as high track. For example Raudenbush, Rowan and Cheong (1993) in a study of high school teachers in sixteen schools in the United States found that higher order objectives were pursued primarily for high track students, especially in mathematics and science. Page (1990) also noted that classes with high-achieving students were more likely to emphasise higher order instructional goals than classes with low-achieving students.

Research has examined explanations for variations in teaching for high order thinking. Raudenbush, Rowan, and Cheong (1993) researched teachers of mathematics, science, social studies and English in high schools in California and Michigan to test three explanations for the variation in emphasis on higher order instructional goals. These were: hierarchical conceptions of teaching and learning that are part of the curriculum; subject matter and pedagogical expertise; and, the organizational environment of the school.

The differentiated nature of the curriculum was taken to suggest that the higher the academic track of the class then the greater would be the emphasis on higher order instructional objectives. Similarly, the higher the year level of the class, the greater the emphasis on higher order instructional objectives that was expected.

**Justification for the study**

The study was justified firstly because there was a gap in the literature on the relationship between teacher efficacy and higher order instructional emphasis. While research into self-efficacy in the context of school education has identified its relationship with a range of teacher behaviours such as the use of time, classroom management strategies, questioning techniques and academic focus (Gibson & Dembo, 1984; Saklofske, Michayluk and Randhawa, 1988; Woolfolk, Rosoff, and Hoy, 1990) there is a lack of research on the link with the type of instructional objectives and outcomes emphasised by teachers. Studies which looked at academic focus, such as the Gibson and Dembo study (1984), examined academic focus in terms of allocated time and classroom organization for formal curriculum learning rather than the type of thinking involved.
Furthermore in relation to higher order instructional objectives and outcomes in school education, the literature discusses the reasons for emphasis in higher order thinking in terms of organisational characteristics and conceptions of learning (Raudenbush, Rowan, and Cheong, 1993; Newmann, 1990b) but not in terms of motivational theory.

The research was also justified by the gap in the literature on the measurement of changes through the junior high school years in higher order instructional emphasis, particularly in a context such as New South Wales where there is a mandated standard syllabus for the teaching of science and history to all students in Years 7 to 10. There was a lack of studies that measured variance in higher order instructional emphasis in a context with such a constraint.

**Research design**

To investigate the relationship between teacher efficacy and higher order instructional emphasis, the following research questions were identified:

- What emphasis do teachers of history and science place on higher order instructional objectives and outcomes for students in Year 7 to Year 10?
- Does the emphasis that teachers of history and science place on higher order instructional objectives and outcomes change through Year 7 to Year 10?
- Does the emphasis that teachers of history and science place on higher order instructional objectives and outcomes change with the nature of the class?
- To what extent is any variance in the emphasis placed on higher order instructional objectives and outcomes explained by teacher efficacy?

The research design consisted of two stages. The first stage of the study consisted of a pilot of the questionnaire to collect data on higher order instructional emphasis in science and history and on teacher efficacy. The questionnaire was piloted with 21 respondents.

The main part of the study involved the distribution of a questionnaire to a random sample of 35 government high and central schools as well as semi-structured interviews with seven teachers from four different schools.

The questionnaire consisted of background information on the respondents and the junior classes reported on, a scale for the instructional emphasis of junior classes and a scale for the measurement of teacher efficacy. Teachers were requested to complete the instructional emphasis scale for two junior classes. Background information requested of respondents consisted of sex, years of teaching and years at the current school. Respondents were also
requested to indicate the year level of the class whether the class was graded high, average or low achievement or was of mixed ability.

This study used the sixteen-item Gibson and Dembo (1984) Teacher Efficacy Scale. This instrument has been widely used (e.g. Reames and Spencer, 1998; Yisrael, 1996; Hipp, 1996), is reliable and is “recognised as a standard measure of professional efficacy” (Ghaith and Yaghi, 1997:453). The scale has response options scored on a six-point Likert scale ranging from 1= “strongly disagree” to 6 = “strongly agree”.

Use of the Gibson and Dembo (1984) Teacher Efficacy Scale allowed the three factors of teacher efficacy: teaching efficacy; personal efficacy; and, outcome efficacy to be examined. These three factors were considered in terms of the extent to which they explained the higher order instructional emphasis of teachers. Use of a three-factor or two-factor solution depended on factor analyses of the teacher efficacy scale and the extent to which the solution contributed to the central focus of the research on the relationship between teacher efficacy and higher order instructional emphasis. The two factors of teaching efficacy and personal efficacy were to be used if it was found, as noted above with Woolfolk and Hoy (1990: 88), that analysis using the three aspects of efficacy added nothing to analyses based on the two independent factors of teaching efficacy and personal efficacy.

Separate measures of instructional emphasis for history and science were developed. Measurement of instructional emphasis consisted of items that measured higher order instructional emphasis and items that measured lower order instructional emphasis as suggested by Raudenbush et al (1993:536). The scale for each of history and science consisted of twenty items. Ten items were designed to tap higher order instructional emphasis for each subject, consistent with the advice by Raudenbush et al (1993:546). Ten items were constructed to measure lower order instructional emphasis. A six-point Likert scale was used ranging from 1 = “no emphasis” to 6 = “very strong emphasis”.

The construction of items to measure higher order instructional emphasis in science and history involved mapping objectives and outcomes from the New South Wales Board of Studies syllabuses for these subject areas to the elements of higher order thinking in the literature so as to construct items that were to be categorised as higher order. A similar process was used with the lower order items.

**Characteristics of the sample**

Of the 85 teachers in the sample, 52 (61.2 per cent) were science teachers and 33 (38.8 per cent) were history teachers. This was consistent with the distribution of questionnaires with 60 per cent of the surveys for science teachers and 40 per cent for history teachers.

Of the 85 teachers 47 (55.3 per cent) were male and 38 (44.7 per cent) were female.
Teachers in the sample were highly experienced with mean years of experience = 17.99 (SD = 8.06) and 54.1 per cent having nineteen or more years of experience and 5.9 per cent having four years or fewer.

The teachers tended to have been at their current school for a substantial period of time with mean years at current school = 7.98 (SD=5.82). 12.9 per cent were in their first year at their current school.

The 85 teachers in the sample provided information on 161 classes.

Table 1: Characteristics of science and history classes

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Science</th>
<th></th>
<th>History</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per Cent of science classes</td>
<td>Number</td>
<td>Per Cent of history classes</td>
</tr>
<tr>
<td>Year 7</td>
<td>30</td>
<td>30.3</td>
<td>11</td>
<td>17.7</td>
</tr>
<tr>
<td>Year 8</td>
<td>20</td>
<td>20.2</td>
<td>10</td>
<td>16.1</td>
</tr>
<tr>
<td>Year 9</td>
<td>18</td>
<td>18.2</td>
<td>19</td>
<td>30.7</td>
</tr>
<tr>
<td>Year 10</td>
<td>26</td>
<td>26.3</td>
<td>20</td>
<td>32.3</td>
</tr>
<tr>
<td>Vertically integrated</td>
<td>5</td>
<td>5.1</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>mixed ability</td>
<td>40</td>
<td>40.4</td>
<td>35</td>
<td>56.5</td>
</tr>
<tr>
<td>low achievement</td>
<td>16</td>
<td>16.2</td>
<td>4</td>
<td>6.5</td>
</tr>
<tr>
<td>average achievement</td>
<td>13</td>
<td>13.2</td>
<td>7</td>
<td>9.7</td>
</tr>
<tr>
<td>high achievement</td>
<td>30</td>
<td>30.3</td>
<td>16</td>
<td>25.8</td>
</tr>
<tr>
<td>Total number of classes</td>
<td>99</td>
<td>100</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

Results

Instructional Scales

Principal components factor analysis was performed on both the science and history instruments. These analyses revealed two separate factors which corresponded with higher order emphasis and lower order emphasis in each of science and history. The separate higher order scales for science and history were reliable with an alpha coefficient of .8914 for science and of .8479 for history while the lower order scales were less reliable than the respective higher order scales but still quite reliable with an alpha coefficient of .7853 for science and .8479 for history.

The correlations between the higher order and lower order scales in science and history were respectively .384 and -.177. On the science scale those items measuring lower order emphasis did not load negatively on the higher
order scale. This would suggest that higher order instructional emphasis does not necessarily mean that a teacher would not also emphasise lower order instructional objectives and outcomes. This would confirm Raudenbush, Rowan and Cheong’s suggestion (1993: 535). On the history scale, eight of the ten lower order items loaded negatively on the higher order scale but the weak correlation would not support a contention that teachers either emphasised lower order instructional objectives and outcomes or higher order instructional objectives and outcomes.

**Descriptive statistics for higher order instructional emphasis**

The mean for higher order instructional emphasis of 3.7 (SD 0.7) fell between “some emphasis” (3) and “moderate emphasis” (4).

Changes in higher order instructional emphasis amongst each of the year levels was then examined. The mean increased at each of Years 7 to 10 from 3.2 in Year 7 to 4.1 in Year 10.

Figure 1 compares higher order instructional emphasis in science and history through Years 7 to 10. Generally, a similar pattern was noted.

![Higher order instructional emphasis for science and history - year levels](image)

**Figure 1 Comparison of higher order emphasis in science and history by year level**

The overall increase between Year 7 and Year 10 was substantial for both science and history but the pattern of increase varied between the two subjects. In science the largest change was between Year 8 and Year 9 while in history there was virtually no change between Year 8 and Year 9 with the largest change between Year 7 and Year 8. Table 2 displays the results.
Table 2: Changes in standard deviation units in higher order emphasis by year level

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Science</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 7 to Year 8</td>
<td>.39 sd</td>
<td>.16 sd</td>
<td>.66 sd</td>
</tr>
<tr>
<td>Year 8 to Year 9</td>
<td>.24 sd</td>
<td>.42 sd</td>
<td>.05 sd</td>
</tr>
<tr>
<td>Year 9 to Year 10</td>
<td>.55 sd</td>
<td>.28 sd</td>
<td>.49 sd</td>
</tr>
<tr>
<td>Total change</td>
<td>1.18 sd</td>
<td>.86 sd</td>
<td>1.20 sd</td>
</tr>
</tbody>
</table>

In relation to class types the means ranged from 3.05 for classes graded as low achievement to 4.12 for classes graded as high achievement. This corresponded to some emphasis (3) and to moderate emphasis (4).

Figure 2  Higher order instructional emphasis by class type

Teacher efficacy scale analysis

Both oblique and orthogonal rotations were used to compare a two factor and three factor solution in concurrence with the theoretical models for teacher efficacy as discussed above. A three-factor solution of teaching efficacy, personal efficacy and outcome efficacy was not supported with only two of the four items posited to be part of the factor of outcome efficacy loading on this factor. The analysis was more supportive of a two-factor solution of teaching efficacy and personal efficacy. A two-factor solution in this study explained 39.207 per cent of the total variance, more than the 28.2 per cent of total
variance explained by the Gibson and Dembo two-factor solution and the 30.7 per cent of the Soodak and Podell three-factor solution. The factors were only weakly correlated (.173).

Analysis of internal consistency reliabilities yielded an alpha coefficient of .6636.

The mean item scores for teaching efficacy were lower at 3.26 compared with personal efficacy 4.38 on the six-point scale.

Results confirmed the independent nature of the factors underlying teacher efficacy. It is possible that teachers could have one view of the ability of teachers to overcome factors such as home environment and a separate view of their own ability to produce the behaviours necessary to do so.

This sample of teachers demonstrated a stronger sense of personal efficacy than of teaching efficacy. The item mean was higher for personal efficacy than for teaching efficacy with the eight items with the highest mean all from the personal efficacy dimension. This sense of personal efficacy covered both the learning area and the behavioural area. For instance over 70 per cent of respondents moderately or strongly agreed that they could accurately assess whether an assignment was at the correct level of difficulty and over 43 per cent moderately or strongly agreed that if a student masters a new concept then it might be because they, the teacher, knew how to teach that concept. The item with the highest mean and with over 83 per cent of respondents moderately or strongly agreeing was being able to deal quickly with disruptive and noisy students.

The items where respondents indicated the least strength in teacher efficacy related to the capacity of teachers to overcome the background of students. The two items with the lowest mean related to limitations over discipline.

**Relationship between teacher efficacy and higher order instructional emphasis**

In order to study the relationship between teacher efficacy and higher order instructional emphasis multiple linear regression analysis was used. The correlation matrix indicated that there were four variables significantly correlated at the 0.01 level (2-tailed) with the dependent variable, higher order instructional emphasis. These were teacher efficacy, the personal efficacy factor of teacher efficacy, the year level of the class and the nature of the class.

The concern in using both teacher efficacy and its factor of personal efficacy was their high correlation ($r = .635$). This raised the problem of collinearity with multiple linear regression. Given the importance of personal efficacy and to avoid problems of collinearity it was decided to use the two factors of teaching efficacy and personal efficacy rather than teacher efficacy.
Tables 3 and 4 summarise the model and change statistics for the addition of each variable. The dependent variable was higher order instructional emphasis. Table 5 presents the coefficients.

**Table 3: Model summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>.056(^a)</td>
<td>.003</td>
<td>-.003</td>
<td>9.45</td>
</tr>
<tr>
<td>2</td>
<td>.366(^b)</td>
<td>.134</td>
<td>.123</td>
<td>8.84</td>
</tr>
<tr>
<td>3</td>
<td>.501(^c)</td>
<td>.251</td>
<td>.237</td>
<td>8.24</td>
</tr>
<tr>
<td>4</td>
<td>.511(^d)</td>
<td>.262</td>
<td>.243</td>
<td>8.21</td>
</tr>
<tr>
<td>5</td>
<td>.515(^e)</td>
<td>.265</td>
<td>.241</td>
<td>8.22</td>
</tr>
<tr>
<td>6</td>
<td>.517(^f)</td>
<td>.267</td>
<td>.239</td>
<td>8.23</td>
</tr>
<tr>
<td>7</td>
<td>.611(^g)</td>
<td>.374</td>
<td>.345</td>
<td>7.64</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), gender  
b. Predictors: (Constant), gender, class nature  
c. Predictors: (Constant), gender, class nature, class level  
d. Predictors: (Constant), gender, class nature, class level, years experience  
e. Predictors: (Constant), gender, class nature, class level, years experience, years at the school  
f. Predictors: (Constant), gender, class nature, class level, years experience, years at the school, teaching efficacy  
g. Predictors: (Constant), gender, class nature, class level, years experience, years at the school, teaching efficacy, personal efficacy

**Table 4: Change statistics**

<table>
<thead>
<tr>
<th>Model</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig.F Change</th>
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<td>.003</td>
<td>.499</td>
<td>1</td>
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<td>.481</td>
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<tr>
<td>3</td>
<td>.117</td>
<td>24.598</td>
<td>1</td>
<td>157</td>
<td>.000</td>
</tr>
<tr>
<td>4</td>
<td>.010</td>
<td>2.169</td>
<td>1</td>
<td>156</td>
<td>.143</td>
</tr>
<tr>
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<td>.004</td>
<td>.769</td>
<td>1</td>
<td>155</td>
<td>.382</td>
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<tr>
<td>6</td>
<td>.002</td>
<td>.466</td>
<td>1</td>
<td>154</td>
<td>.496</td>
</tr>
<tr>
<td>7</td>
<td>.106</td>
<td>26.005</td>
<td>1</td>
<td>153</td>
<td>.000</td>
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Table 5: Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
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<tbody>
<tr>
<td>(Constant)</td>
<td>-.16.301</td>
<td>7.264</td>
<td>-2.244</td>
<td>.026</td>
<td></td>
<td></td>
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<td>gender</td>
<td>-1.291</td>
<td>1.332</td>
<td>-.068</td>
<td>-.969</td>
<td>.334</td>
<td></td>
<td></td>
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<tr>
<td>Class nature</td>
<td>3.565</td>
<td>.599</td>
<td>.391</td>
<td>5.952</td>
<td>.000</td>
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<td>Class level</td>
<td>2.419</td>
<td>.495</td>
<td>.321</td>
<td>4.888</td>
<td>.000</td>
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<td></td>
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<tr>
<td>Years experience</td>
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<td>.087</td>
<td>-.094</td>
<td>-1.273</td>
<td>.205</td>
<td></td>
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<tr>
<td>Years at school</td>
<td>-1.742E-02</td>
<td>.118</td>
<td>-.011</td>
<td>-.148</td>
<td>.883</td>
<td></td>
<td></td>
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<tr>
<td>Teaching efficacy</td>
<td>6.645E-02</td>
<td>.107</td>
<td>.042</td>
<td>.622</td>
<td>.535</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal efficacy</td>
<td>.641</td>
<td>.126</td>
<td>.335</td>
<td>5.100</td>
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The proportion of the variation in higher order instructional emphasis explained by the inclusion of all the variables is 34.5 per cent. The proportion of variation of higher order instructional emphasis contributed by class nature and class level is significant. The proportion of variation contributed by teaching efficacy is not significant. However, the proportion of variation contributed by personal efficacy is significant. The variables of gender, years of experience and years at the school which were not significant in the correlation matrix did not significantly contribute to the proportion of variation.

The multiple regression analysis suggests that class nature (beta = .391) is the best predictor of higher order instructional emphasis. Class level also appears to be important (beta = .321). When these two variables are included in the equation along with gender, years of experience, years at school and teaching efficacy, then personal efficacy is still important (beta = .335) with the probability associated with the t value at less than 0.005. Teaching efficacy is not important even before personal efficacy is added (beta = .050).

 Interviews

The interview subjects' understanding of higher order thinking reflected the study's definition and the subjects confirmed that the items on the higher order instructional emphasis scales measured higher order instructional objectives and outcomes.

From the comments of the subjects it was interpreted that they placed at least some emphasis on higher order instructional objectives and outcomes but that there was some difference amongst them in the extent of that emphasis. There was general consensus that there was more higher order instructional
emphasis in Year 9 and 10 than in Year 7 and 8. Variation in emphasis was explained by the subjects as arising also from the ability of the students in the class. The ability of students to cope with an emphasis on higher order thinking was linked to such factors as the literacy levels and the language and cultural background of the students.

The interviews explored the subjects’ sense of teacher efficacy, looking at both teaching efficacy and personal efficacy. Comments by the interview subjects indicated a range in strength in both teaching efficacy and personal efficacy. Interpretation of the subjects’ comments supported the notion of the independent nature of the two factors of teaching efficacy and personal efficacy, a strong relationship between teacher efficacy, in particular personal efficacy, and emphasis on higher order instructional objectives and outcomes.

Discussion

This study considered a number of independent factors to explain the variation in higher order instructional emphasis. This enabled a more considered judgement to be made on the importance of the contribution of teacher efficacy to variance in higher order instructional emphasis.

Using multiple linear regression analysis, this study found that while the proportion of variation contributed by teaching efficacy was not significant, the proportion contributed by personal efficacy was significant. Class nature and class level also were statistically significant. The important finding for this study is that even when class nature and class level were included in the equation along with gender, years of experience, years at school and teaching efficacy, then personal efficacy was still important.

The interview stage also supported the relationship between teacher efficacy and higher order instructional emphasis with that relationship stronger for personal efficacy than for teaching efficacy. The three interview subjects who were regarded as having the strongest higher order instructional emphasis were the three subjects who were categorised as having strong personal efficacy.

This study identified the powerful link between personal efficacy and higher order instructional emphasis. Teachers with a greater sense of personal efficacy placed a greater emphasis on higher order instructional objectives and outcomes than teachers with a lower sense of personal efficacy in similar contexts of the year level of the class and the nature of the class. This finding supports other studies (Saklofske et al., 1988; Soodak and Podell, 1993; Smylie, 1988; Allinder, 1994) that have found that personal efficacy consistently relates to important teacher behaviours.

The results of this study could also help to explain the substantial between-teacher variance in emphasis on higher order instructional goals for science and social studies that was found in the study by Raudenbush et al. (1993).
Application of Bandura’s theory (1977) to this study suggested that teachers who believed in the power of teaching to overcome the effects of such factors as the background of students and were confident in their own teaching abilities were more likely to have a greater academic focus in the classroom and give more emphasis to higher order instructional objectives and outcomes. This study found that it was teacher confidence in their own teaching abilities that mattered and not a general belief in the power of teaching. This supports other studies that have found that teaching efficacy does not relate to teaching behaviours and outcomes but that personal efficacy does (Saklofske et al.; 1988; Soodak and Podell; 1993).

Taking into account that it was the personal efficacy factor of teacher efficacy that was found to be important, the findings were consistent with the expectation that teachers who had higher teacher efficacy were more likely to emphasise higher order instructional objectives and outcomes than teachers with lower teacher efficacy. This was considered to be the case because higher efficacy teachers have a greater belief in their ability to succeed. Furthermore they were more likely to have had success with higher order objectives and outcomes with students in the past because such teachers would make greater efforts to achieve them, would persist in the face of difficulties and were better able to cope emotionally with problems that arose.

The comments of interview subjects with high personal efficacy were consistent with this reasoning. These subjects spoke of an emphasis on higher order thinking as “it (has) always been my goal”, that “the (student) background doesn’t stop me emphasising higher order thinking”, that it is “just a matter of finding the right avenue” and that “if we stay within their comfort zone there will be no progress towards a higher level of thought”. Difficulties with students were seen as something to overcome rather than a reason not to emphasise higher order instructional objectives and outcomes. They also spoke of past achievement, in particular nominating performances of their students in the Higher School Certificate.

This study investigated the relationship between higher order instructional emphasis and teacher efficacy at the individual teacher level. In the high school context it would be instructive for research to expand to the subject department level or school level. Research has examined the construct of collective teacher efficacy (Goddard et al., 2000). This construct has been defined as “the groups’ shared belief in its conjoint capabilities to organize and execute courses of action required to produce given levels of attainments” (Bandura, 1997:477) and there is some initial evidence that collective teacher efficacy is positively associated with differences between schools in student achievement (Goddard et al., 2000).
Concluding comment

In conclusion it would be appropriate to quote the words from one of the interview subjects who was categorised as having a strong sense of personal efficacy.

Every student was in fact given I guess you would say complete entitlement to the full range of outcomes and really to be fair I think that that is really the only way that we can go.

BIBLIOGRAPHY


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