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The inquiry nature of primary schools and students' self-directed learning knowledge

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Self-directed learning (SDL) is viewed as a desirable outcome of schooling, yet scant information is available to educational leaders and teachers on how to implement an inquiry-based curriculum or to support effectively students' development as self-directed learners.

To understand better the relationship between the inquiry nature of primary schools and students' SDL knowledge, The Primary School Characteristics Inventory was used to categorise six South Australian primary schools as providing a low, moderate, or high, level of support for inquiry. From within these schools, 150 students were explicitly taught about SDL. Students' SDL knowledge was assessed before engaging in four lessons on SDL, at the completion of the lessons, after three months and again after six months.

Also, students' class work was assessed and examination made of the relationship between levels of thinking and the schools' emphasis on inquiry-based learning. This study identifies significant relationships between school context, SDL knowledge and classroom performance.

Self-directed learning, inquiry-based curriculum, explicit teaching

INTRODUCTION

South Australia's education system is increasingly emphasising the need for all students to become self-directed lifelong learners, yet there is scant information available to educational leaders and teachers on how to implement an inquiry-based curriculum or to support effectively students' development as self-directed learners. To date, most information on self-directed learning (SDL) draws on adult learning literature with little research to guide practice at the school level. Recently there has been a call for research with K-12 students to describe self-directed learning as it relates to students in schools (Hmelo-Silver, 2004).

This paper reports a study of the relationship between the inquiry nature of primary schools and students' knowledge of SDL, and the relationship between the inquiry nature of these schools and the thinking skills of primary students in classroom work. It describes a model of self-directed learning in primary students that was used to guide the development of two instruments: one to assess the inquiry nature of primary schools, the other to assess students' knowledge of SDL. Key concepts in the model were incorporated into class lessons designed to teach explicitly students about self-directed learning.

Current descriptions of SDL (Hmelo-Silver, 2004) in adults emphasise the processes of planning learning, developing and applying strategies to learn and use appropriately learning resources. The

skills that are needed to engage in SDL involve students being aware of what they do and do not understand, being able to set learning goals, identify what they need to learn more about, plan and select strategies, and being able to monitor whether or not goals have been met (Hmelo-Silver, 2004).

SELF-DIRECTED LEARNING IN PRIMARY STUDENTS

Generally, SDL focuses on students' ability to self-assess their own learning needs in order to carry out activities to inquire and find out about the things they want to know (Blumberg, 2000). Self-management has been emphasised and it has been suggested that there may be characteristics of learners that relate to their movement toward self-management (Treffinger, 1975). More recently self-directed learning in elementary (primary) students has been defined as "self-directed work on problems for which the individual or small group has ownership" (Treffinger, 1993, p.431). SDL has been emphasised for gifted students, although it has been suggested that all students could engage in it (Treffinger, 1993). If this is to happen, it is important to clarify what SDL means for all primary students.

The model of self-directed learning in primary students presented in Figure 1, depicts SDL as composed of internal and external influences. Internal influences comprise personal characteristics of the learner such as attitudes and dispositions, which influence the way students approach tasks, as well as their initiative, effort, and persistence. Other internal influences are personal learning strategies of self-regulation and metacognitive strategies of planning, checking and reflecting. The external influences involve the context that directs and structures an overall inquiry activity in order to reach goals, the curriculum, the teacher, the classroom, as well as the availability of resources such as books and ICT equipment.

A positive motivation for SDL is important as it enables a student to initiate effort to carry out SDL strategies, to find resources and to persist when running into difficulties (Wigfield, Eccles, and Rodriguez, 1998). Also pertinent to motivation are the processes of self-efficacy related to being able to carry out an inquiry task, and causal attributions that explain who or what is held responsible for the students' success or failure on the task. Although motivation is recognised as a characteristic of a student, it is increasingly being recognised as being dependent on external social influences such as the way classrooms are organised (Pintrich and De Groot, 1990). Within schools and classrooms students interact with their peers and teachers, and these interactions have a major influence on students' motivation (Wigfield, Eccles, Rodriguez, 1998). The model presented indicates this view of motivation as exerting both an internal and external influence.

The arrows in the model depict a direct interaction of the student variables of attitudes, dispositions and motivation with self-regulated learning strategies and motivation and external self-directed learning strategies. The arrows also indicate that there is an interaction of context variables with self-regulated learning strategies.

Inquiry and Higher Order thinking skills (HOTS)

The model also depicts an inquiry task as having an important effect on SDL as well as being recognised as providing the incentive to be self-directed. Inquiry requires creative and critical thinking and these are important aspects of higher order thinking. Creative thinking involves analysis and creating, while critical thinking also involves evaluation. These higher order thinking skills are described in Bloom's taxonomy of cognitive objectives (Anderson and Krathwohl, 2001). Higher order thinking involves reflective thought and is often done under conditions of uncertainty that require self-regulation and knowledge construction (Hmelo and Ferrari, 1997). Inquiry tasks aim to develop students' higher order thinking as inquiry involves the need to

analyse the possibilities involved, bring together ideas and judge the relevance of each idea to the problem as well as reflecting on and judging the adequacy of a final solution.

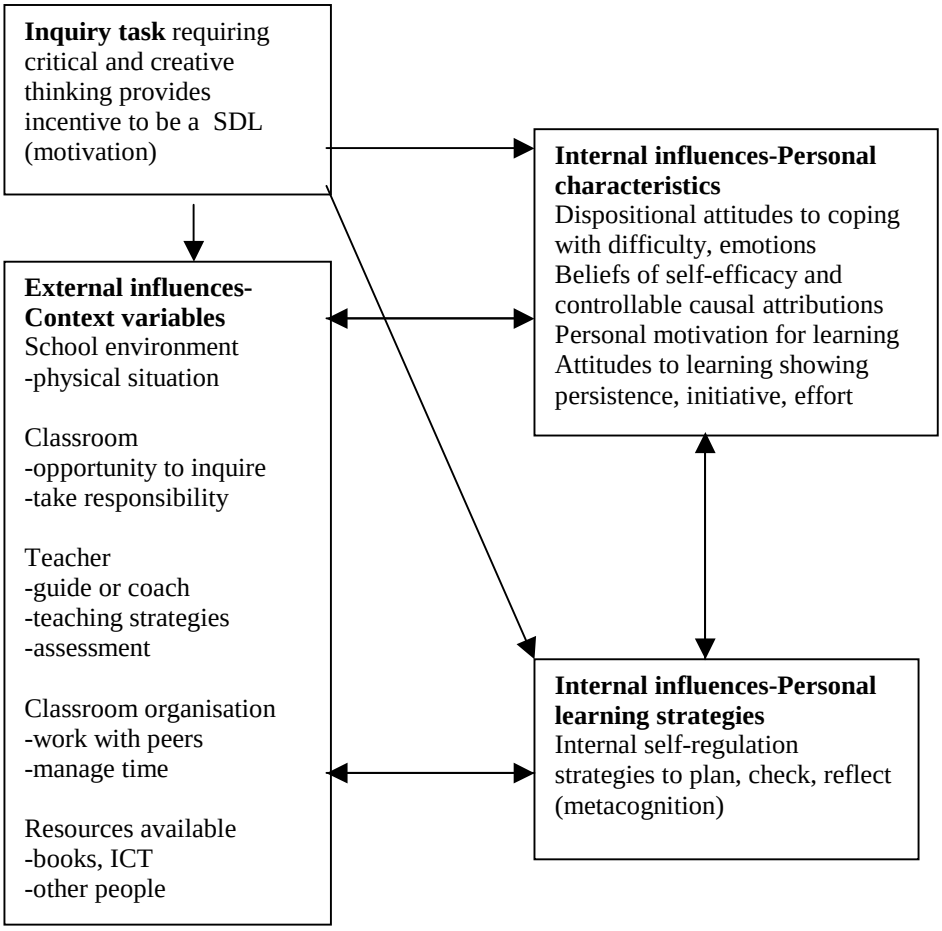

Figure 1. Model of self-directed learning in primary students

School influences on self-directed learning

Increasingly, there has been a focus on the influence of school level factors on students' learning and this is particularly important in considerations of SDL.

Perry and Weinstein (1998) indicated a need for empirical studies that explored classroom-school relations and school-level factors at the elementary school level. Most studies have focused on the effects of the amount of schooling, rather than the effects attributable to the quality of the schooling received by children (Rutter and Maughan, 2002). Rutter and Maughan described the qualities as contextual factors such as school organisation and management, group management in the classroom, and the pedagogic qualities of the teacher. Further, they argued that variations in school qualities have effects on pupil behaviour. These qualities have provided a useful basis for explaining the extent to which school characteristics could support student self-directed learning.

The influence of school level factors on student learning were also the focus of Sternberg's (2000) School Characteristics Inventory (SCI), which was constructed to develop a profile of a school that would reveal patterns about its structure and functioning that might impede or progress the school moving towards desired goals. Sternberg's inventory was designed to be used by any educational staff to assess the modifiability of a school context prior to carrying out interventions to improve student or teacher performance. Teacher level effects on student learning were studied by Rhine (1998) who found that when classrooms were designed by teachers so that student

understanding was the primary goal they emphasised the nature of classroom tasks, the teacher's role, and the social culture of the classroom.

The dimensions described by Rhine (1998), the features of schools described by Rutter and Maughan (2002) and the School Characteristics Inventory (SCI) designed by Sternberg (2000) guided the development of the 'Primary School Characteristics Inventory' (PSCI) for this study to assess the inquiry nature of primary schools.

Explicit teaching of self-directed learning in primary schools

From studies designed to promote learning and understanding with Chinese learners, Chan (2001) concluded that students' approaches to learning developed in response to learning environments, and implied that it would be important to change an existing learning environment in order to help students develop different ways of thinking and approaching learning. Chan highlighted the importance of bridging learning with direct instruction.

Westwood (1997) argued that teaching students explicitly about SDL reduced the likelihood that learning vital self-directed learning skills was left to chance. As suggested by Westwood, explicitly teaching students about SDL involved analysing tasks into easy steps, teaching task approach strategies, using clear teacher modelling, frequently revising previously taught skills and maximising time on task (Westwood, 1997).

This study is part of a larger investigation of primary school students' knowledge of self-directed learning. The aims of this study are (a) to clarify whether there is a relationship between primary students' knowledge of SDL and the inquiry nature of the school environment and (b) to assess the relationship between the inquiry nature of schools and students' thinking.

METHOD

This section outlines the procedures for selecting schools, the instruments used to assess the inquiry nature of the schools, the SDL knowledge of students and their reasoning levels (Ravens' Standard Progressive Matrices) and describes the intervention program of four lessons designed to teach students about SDL explicitly.

Participants

Cluster sampling was used to select 20 South Australian primary schools of more than 250 students to which the PSCI was sent. Thirteen schools returned one or more completed inventories; thus the sample was also a convenience sample as the return of the inventories meant that the schools were willing to participate in the study. Six schools were chosen on the basis of the PSCI classification of the inquiry nature of each school. One High, three Moderate, and two Low inquiry schools were selected from the inventories returned by the 13 primary schools. In total, 150 students from six intact Year 5 classes were taught about self-directed learning in four lessons carried out over one week. Whole classes participated in the class lessons (mean of 25 students per class).

Instruments

The Primary School Characteristics Inventory (PSCI)

The Primary School Characteristics Inventory (PSCI) was developed to assess the inquiry nature of the school. The inventory was pre-tested with 12 teachers in one school before being piloted by being sent to 100 schools across South Australia. Statements were written to elicit ratings of the beliefs of the school staff about the characteristics of the school that supported inquiry. The statements represented five broad characteristics of the school regarded as indicative of the

school's inquiry orientation. These characteristics included the general ethos of the school, the nature of classroom tasks, the role of the teacher, the role of students, and the organisation of the school. An example of the PSCI is the statement "A climate of mutual respect exists between staff and students" to which each school staff member was asked to respond by considering each statement and rating it on a Likert-type scale of 1 Never, 2 Rarely, 3 Sometimes, 4 Often, and 5 Always, whether they experienced this in their school. For example, if the statement "The school is involved in community activities" was rated at 1, it would indicate that the respondent believed that he or she had never experienced this characteristic at the school, while a rating of 5 would mean that he or she always experienced this at the school.

Responses from 59 schools were factor analysed using principal components analysis. From the analysis, three meaningful factors were achieved which were derived from characteristics indicating the school's inquiry orientation. The reliabilities for the each of the three components of the PSCI were then calculated. The three components were named 'Motivation for student inquiry' (Cronbach alpha = 0.94), 'Organisational structures to support inquiry' (Cronbach alpha = 0.90), and 'Structures to support inquiry strategies in school (Cronbach alpha = 0.85). The scores for the items were also Rasch scaled with the RUMM program (Sheridan, Andrich and Luo, 1997), which confirmed their fit to the three scales.

A PSCI total score was calculated for each of the 59 schools and they were ranked in descending order as to the percentage of agreement for the inquiry nature of each one. Schools were assigned to categories of high (89%+), moderate (71-88%) and low inquiry (70% agreement or less). These categories were used to identify the six schools discussed in this study.

Learning At School Questionnaire (LASQ)

The *Learning At School Questionnaire* (LASQ) was developed from the model of self-directed learning. It has three sub-scales:

(1) The Motivation sub-scale, which includes statements about attitudes to self-directed learning that contribute to dispositional orientation, as well as statements about self-efficacy and causal attributions.

(2) The Strategies sub-scale, which includes statements about self-regulated and self-directed learning strategies that can be employed in self-directed learning.

(3) The inquiry nature of the School Context or environment sub-scale, which includes statements about the support available in the school environment for self-directed learning to be employed in inquiry tasks.

Students were asked to respond to each statement in the questionnaire by circling the words 'Agree', 'Disagree', or 'Unsure'. An example of this is the statement in the Motivation sub-scale: "*I know how to learn about topics that I am interested in"*, to which a student could respond by circling Agree (scored 2), Disagree (scored 0), or Unsure (scored 1).

Two versions were pre-tested and piloted with 55 students in one primary school. The reliabilities were calculated for each of the three scales: motivation (Cronbach alpha = 0.77), learning strategies (Cronbach alpha = 0.77) and inquiry nature of the school context (Cronbach alpha = 0.73). The final version of the LASQ used in this study has 46 items in the scales of Motivation, Learning Strategies, and Inquiry context of the school.

Raven's Standard Progressive Matrices

Raven's Standard Progressive Matrices (Raven, 1956) is a test of non-verbal general reasoning ability. It was used to determine the reasoning level of the students in each school. The Raven's SPM had 60 items which required students to select a piece in order to complete each pattern

accurately. Correct responses were tallied and the raw scores were interpreted with the re-standardised Australian norms (Australian Manual, 1986).

Class lessons on self-directed learning

Four lessons on self-directed learning were developed from the constructs of the model of self-directed learning in primary students and were taught by the researcher to intact classes in each of the six participating schools.

The class lessons undertaken in each school had a problem-based approach. Scenarios about a dolphin sanctuary were developed and presented at the beginning of each lesson and discussed as the basis for classroom activities. The scenarios were real-life issues developed from the information brochure *Adelaide Dolphin Sanctuary* (Government of South Australia, 2003). An active approach was taken where the students were encouraged to discuss issues and role-play in pairs and groups.

The lessons covered motivation and strategies for self-directed learning. Motivation included strategies for promoting a positive attitude to self-directed learning, coping with difficulties in self-directed learning, strategies to be used to persist with difficulty, ways to approach an inquiry task, and strategies for attributing lack of success to external forces such as the resources chosen. The work on self-regulated and self-directed strategies included discussion of learning strategies that could be used to work on inquiry tasks, develop questions to guide information finding, evaluate the usefulness of resources, search for information, evaluate information, and check completed work. Discussions of planning strategies included those useful to work with others to plan activities, strategies to be used to work on a topic, as well as strategies to plan and use time effectively. Negotiation strategies that could be used to work with peers to plan activities were discussed as well as those to negotiate with teachers to work on particular topics.

Lesson Worksheets

Work sheet activities were designed to accompany the lessons about motivation and strategies for self-directed learning. These activities were classified in Bloom's taxonomy of cognitive objectives (Anderson and Krathwohl, 2001). The levels of Bloom's taxonomy are 'remember', 'understand', 'apply', 'analyse', 'evaluate' and 'create'. At the completion of each activity students wrote responses to describe what they could do at school to work in a self-directed way. The responses for each student were transcribed by the researcher and the frequency of responses for each activity was tabulated. The responses were regarded as an index of student engagement which has been described as an important academic outcome (Furrer and Skinner, 2003). The frequency of responses were calculated as engagement in each level of thinking according to Bloom's taxonomy.

PROCEDURES

The thinking skills of the students were assessed by inspecting the written responses to the activities undertaken in the lessons designed to teach explicitly about SDL. The mean frequencies were calculated in each level of thinking for the activities classified in the cognitive domain of Bloom's taxonomy of educational objectives.

Using LASQ, an assessment was made of the SDL knowledge of the students in the sub-scales of Motivation, Strategy, and School Context. Following the lessons, a second assessment was made with LASQ. Three months and six months later assessments were made again of students' SDL knowledge.

The research described in this study was carried out in three phases in order to assess the effect of the inquiry nature of the school on primary students' knowledge of SDL and thinking skills. First, the inquiry nature of schools was assessed using the PSCI, and an initial assessment using the LASQ was made of students' existing knowledge about self-directed learning, and the reasoning level of all students was assessed using the Raven's Standard Progressive Matrices (Raven, 1956). Next, students were explicitly taught about SDL and then assessed on their SDL knowledge. Then students' knowledge of SDL was assessed later after three and six month intervals.

RESULTS

Each sub-scale of the LASQ was Rasch scaled (Sheridan, Andrich and Luo, 1997) in order to convert the raw scores to an interval scale. Rasch interval scale logits were then able to be used to study changes in the students' knowledge of SDL. The means and standard deviations were calculated for the Rasch logit scores on these sub-scales and are shown in Table 2. Effect sizes were calculated (Coe, 2000) to indicate the size of the effect in each sub-scale between each assessment within the schools grouped by inquiry. Cohen (1992) described effect sizes between 0.20 and 0.50 as 'small', between 0.50 and 0.80 as 'medium', and above 0.80 as 'large'.

The relationship between primary students' knowledge of SDL and the inquiry nature of the school environment

The results of the analysis are presented in the three separate components of self-directed learning identified in the study, namely Motivation, Strategy and School Context support for inquiry, and are shown in Table 2.

Table 2. Rasch logit score means and standard deviations (SD) on LASQ 1, 2, 3, 4 for Motivation, Strategy, School Context shown with effect sizes (ES) for Low, Moderate and High inquiry schools

LASQ sub-scales	Low inquiry schools	Moderate inquiry schools	High inquiry school
Motivation	**Mean (SD) ES**	**Mean (SD) ES**	**Mean (SD) ES**
LASQ 1	1.57 (0.99)	1.72 (1.20)	1.60 (0.93)
LASQ 2	1.36 (1.27) -0.18	2.08 (1.36) 0.28	1.86 (0.99) 0.39
LASQ 3	1.42 (1.42) 0.04	1.76 (1.26) -0.24	1.60 (0.84) -0.28
LASQ 4	1.42 (1.29) 0.00	1.74 (1.05) -0.02	1.66 (1.34) 0.05
Strategy			
LASQ 1	1.13 (0.97)	1.34 (1.16)	1.48 (0.93)
LASQ 2	1.41 (1.51) 0.08	1.75 (1.39) 0.32	1.86 (0.99) 0.39
LASQ 3	1.20 (1.41) -0.22	1.60 (1.25) -0.11	1.60 (0.84) -0.28
LASQ 4	1.28 (1.24) 0.06	1.52 (1.23) -0.06	1.66 (1.34) 0.05
Context			
LASQ 1	1.07 (0.97)	1.22 (1.10)	1.20 (0.79)
LASQ 2	0.85 (1.54) -0.17	1.26 (1.21) 0.03	1.61 (1.20) 0.40
LASQ 3	0.74 (1.25) -0.08	1.14 (1.11) -0.10	1.42 (0.74) -0.19
LASQ 4	0.68 (1.41) -0.04	1.12 (1.25) -0.02	1.20 (1.15) -0.22

Motivation in SDL

Figure 2 shows the mean scores for motivation in Low, Moderate and High inquiry schools at the four LASQ assessment times

In the Moderate and High inquiry schools, the effect size was small and significant ($p = <0.05$) indicating that scores increased for knowledge of Motivation immediately following explicit teaching about self-directed learning. In Figure 2 the scores show a decrease at the three and six month testing. In the Low inquiry schools the effect size was not significant and the scores decreased for Motivation following teaching. The scores also show a small increase at the three and six month testing This decrease in scores for motivation knowledge in the Low inquiry school

could indicate that students held a positive view of their abilities prior to explicit SDL instruction and might have modified their assessment to be less positive following instruction.

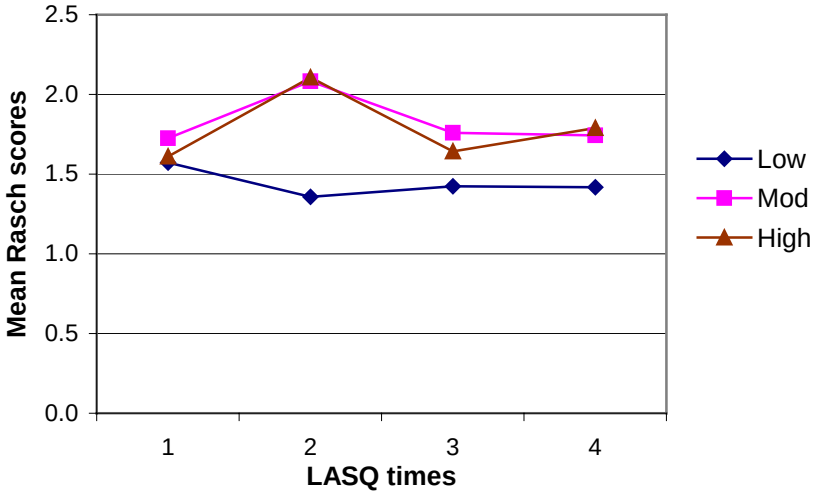

Figure 2. Mean Rasch scaled scores for Motivation in Low, Moderate and High inquiry schools on 4 LASQ assessment times

Strategies in SDL

With regard to learning strategies in the LASQ, the profile of mean score responses for students within each school grouped by inquiry nature is depicted in Figure 3.

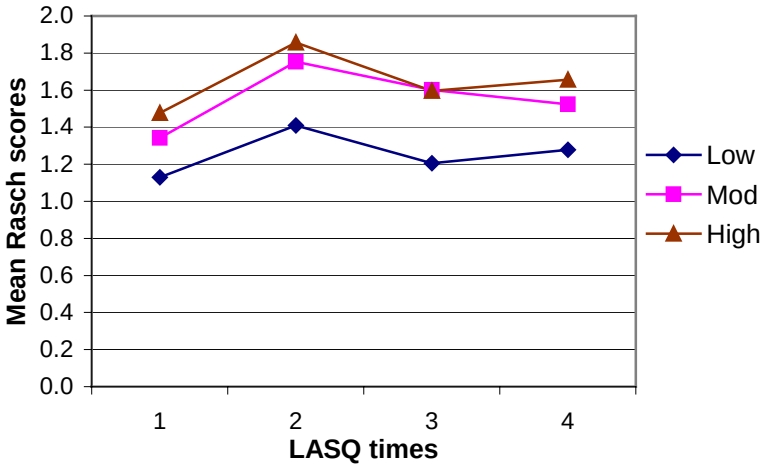

Figure 3. Mean Rasch scaled scores for Strategy in Low, Moderate and High inquiry schools

In all inquiry groupings of schools, the scores for the Strategy sub-scale increased directly following explicit teaching. The gain was significant ($p =< 0.05$) in Moderate and High inquiry schools with a small effect size and not significant in Low inquiry schools. The mean scores for Strategy decreased from time two to time three in all inquiry schools.

Unlike the scores for Motivation, the Strategy scores in the low inquiry schools increased after instruction. Students in all schools irrespective of inquiry nature, responded positively to the strategy aspects of the lessons on self-directed learning. This suggests that for students in low inquiry schools, knowledge of strategies is more likely to be influenced in a positive way by instruction than knowledge about motivational influences.

School context in SDL

The students responded to the statements about school context by circling 'Agree', 'Disagree' or 'Uncertain'. Explicit teaching about school context was not a strong feature of the lessons. However, students were involved in discussion about availability and access to school resources. Although the students were not taught explicitly about the school context in class lessons, this variable was of interest because it was expected that the level of school support that students perceived as available to them could influence their motivation towards SDL. The graphed mean scores for school context are shown in Figure 4.

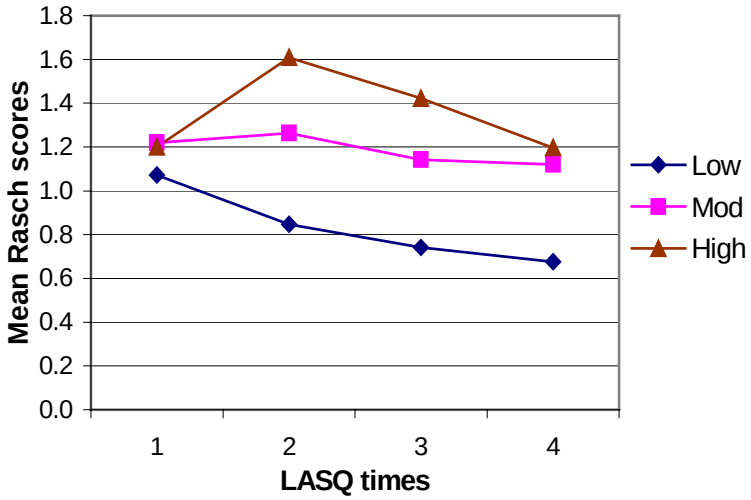

Figure 4. Mean Rasch scaled scores for School Context in Low, Moderate, and High Inquiry schools

The profile of responses, presented in Figure 4, shows a different pattern for the scores related to the inquiry nature of the school context. The scores in the low inquiry school decreased from Time 1 to Time 2 with a small negative effect size. In the Moderate inquiry schools the scores increased on each assessment but the effect size was not significant. In the High inquiry school the mean scores increased at Time 2 with a small effect size and decreased at Times 3 and 4.

Although the inquiry nature of the school context was not a strong focus of instruction, the scores in the Moderate and High inquiry schools indicated that students increased their views of the inquiry nature of the school context following the class lessons. In contrast, there was a decrease over time in the scores for Low inquiry schools.

In summary, The pattern of results on the LASQ indicated that the inquiry nature of a school had an influence on students' knowledge and development of self-directed learning following explicit teaching. The effect sizes indicated that there was a significant gain in scores in High inquiry schools over four occasions ($p = <0.05$) for Motivation and Strategy. Following the intervention, there was a gain in Moderate inquiry schools for scores on Motivation and Strategy. In the Low inquiry schools, there was a small (not significant) gain in scores for Strategy, and a decrease in scores for Motivation.

The relationship between students' levels of thinking and the inquiry emphasis of schools

Students' raw scores on the Ravens' Standard Progressive Matrices (mean for students in Low inquiry schools 105.3, Moderate 107.9, and High inquiry schools 107.4) indicated that across all schools irrespective of inquiry, the students were of similar reasoning ability.

Table 3 summarises the reasoning levels of the students classified by the inquiry nature of the schools, and the mean frequency of responses by the students to the class lesson work-sheets for the activities classified according to Bloom's taxonomy. The frequency of responses to the activities on the lesson work sheets were regarded as an indication of the engagement of the students at each level of thinking in Bloom's taxonomy.

Table 3. Engagement of students in schools categorised by support for inquiry (N=150 primary students)

Level of school inquiry	**Low Inquiry Schools N=2**	**Moderate Inquiry Schools N=3**	**High Inquiry School N=1**
Bloom's levels	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
1-Remember	7.94 (2.98)	10.74 (4.44)	13.46 (4.38)
2-Understand	11.38 (3.63)	12.36 (2.95)	11.82 (2.65)
3-Apply	8.94 (3.02)	10.91 (3.02)	12.79 (3.00)
4-Analyse	**10.33 (3.22)**	**11.16 (3.12)**	**11.96 (3.52)**
5-Evaluate	**12.17 (2.93)**	**12.83 (3.31)**	**14.11 (1.23)**
6-Create	**5.73 (2.49)**	**6.26 (2.07)**	**6.54 (1.91)**

Low inquiry =PSCI<70%, Moderate inquiry = PSCI 71-89%, High inquiry = PSCI >90%

The findings in Table 3 indicate that students were more engaged in the High inquiry school than in the low and Moderate inquiry schools in five of the six levels of thinking. The students in the Low inquiry schools were least engaged across all of the six Bloom's levels.

An examination was made of the three most complex levels of thinking in Bloom's taxonomy, classified as Higher Order Thinking Skills (HOTS). These are shown in bold type in Table 3. The HOTS are the processes needed to analyse, evaluate, and create. The classification of HOTS showed that students in the High inquiry school had a higher mean frequency of responses in activities classified as higher order thinking, while students in the Low inquiry schools had the lowest means for each of the three HOTS. This finding suggests that there was some emphasis on higher order thinking in the high inquiry school and that there was less emphasis on these skills in schools with less emphasis on inquiry-based learning.

The frequency of lesson worksheet responses indicates that students were most engaged in the High inquiry school and least engaged in the Low inquiry schools. Thus, the difference in mean frequency of responses of the students indicates that the inquiry level of the school was associated with the engagement of students when participating in classroom activities.

DISCUSSION

Self-directed learning in primary schools has been recommended for gifted students (Treffinger, 1993) although Treffinger also suggested that all students could be self-directed learners. This study indicates that for primary students in general there is value in assessing and teaching about self-directed learning.

The findings of the study show that in High and Moderate inquiry schools students improved their knowledge of motivation and strategies for self-directed learning after being explicitly taught about SDL in class lessons. The students in the Low inquiry schools had decreased scores on motivation following the teaching intervention and increased scores on strategies. The increase in knowledge of strategies following instruction for all students in each category of inquiry-based school showed that students responded positively to instruction about strategies for learning and increased their knowledge on this sub-scale.

Due to the small sample, it is only possible to identify trends in the results for further investigation. Motivation for self-directed learning and the influence on students of a low emphasis on inquiry-based learning at the school level could be investigated further.

This result suggests that students in schools where there is a higher level of support for inquiry-based learning, benefited more from instruction about motivation than students of comparable ability who were in schools that gave less support to inquiry-based learning. This finding is reinforced by the lesson work-sheet responses that indicated that students were more highly engaged in the High inquiry school and least engaged in the Low inquiry schools. Moreover, this finding supports the view advanced by Wigfield et al. (1998) that school level factors did have a major influence on students' motivation. This indicates that further research could investigate the development of self-directed learning and levels of thinking in large numbers of primary students as well as the relationship of both to the inquiry nature of schools.

Sternberg's (2000) inventory classified schools in terms of modifiability in order to consider whether schools need to be made more modifiable before interventions were undertaken to improve teaching or learning. The results of this study suggest that schools accommodate and support inquiry and self-directed learning more readily than some other schools. In the school context, schools with a strong focus on inquiry-based learning seem to help students develop self-directed learning knowledge. It is important to know this in the context of advocating that schools should develop student knowledge of SDL.

CONCLUSIONS

This paper makes an important contribution to understanding the influence of the school context on knowledge of self-directed learning in primary school children. The study identified significant relationships between school context, SDL knowledge and classroom performance. It showed that primary school students knew about SDL and that there was a link between the inquiry nature of the school and students' knowledge of, as well as their response to, explicit instruction about SDL.

The model of self-directed learning in primary students was the basis for developing class lessons to teach SDL and provided a valuable framework to guide explicit teaching of SDL in primary schools.

It is clear from this study that some schools placed a stronger emphasis on inquiry than others. In light of the relationship that existed between this emphasis on inquiry and students' SDL, effective implementation of SDL in primary schools would be more likely to occur where the school context supported inquiry. As an innovation in primary schools, SDL is less likely to be effective if the level of support for inquiry in the school context is not considered.

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