Developing Engaged Learners among Grade 7 Students through RI^{3}CH TASKS

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Abstract

The Teach Less, Learn More (TLLM) movement (Ministry of Education, 2005) focuses on the quality of interaction between the learners and the teacher. It means teaching better so that students are better engaged during the learning process. This study is one school's response to this call. The school developed RI^{3}CH TASKS, which were transdisciplinary and they engaged students in pragmatic social action through working on authentic problems. These authentic problems also required students to use the higher order skills of analysis and applications. Three classes of Grade 7 students were exposed to RI^{3}CH TASKS for five months. In this project, students were assessed on sub-tasks and these assessments contributed to the assessment of their culminating product. The students were given feedback on their performance in sub-tasks in a timely and specific manner to allow for self-adjustments on the students' part (Wiggins, 1998). This study seeks to find out the relationship between engaged learning and the instructional practices, specifically in using assessment to improve learning. The PETALS^{TM} Engagement Indicator (PEI) questionnaire was used to measure students' engagement before and after intervention via the RI^{3}CH TASKS. The different scales of the PEI questionnaire for engaged learning were also measured before and after the students participated in this study. There was a moderate effect size in the Pedagogy (P) scale and small effect size on the Experience of Learning (E), Assessment (A) and Learning Content (L) scales. A correlational analysis performed between the P, E, T, A, L scales and Engagement scale showed A and L having high correlation coefficients with the Overall Engagement (GG). The implications of these relationships will be discussed in this paper.

Introduction

The Rich Tasks Framework was first derived from the New Basics[1] project undertaken in the late 1990s and early 2000 by the Education Queensland, Australia. New Basics presumes the existence of mindful schools, where intellectual engagement and connectedness to the real world are persistent foci. It is "transdisciplinary"[2], making it different from the traditional interdisciplinary approach which makes links between disciplines. Rich Tasks are designed and built from the New Basics clusters of essential practices, where each task is directly connected to the world of work. Some of the practices are connected to traditional ways of doing things while others may require students and teachers to construct and explore new problems, new learning strategies and new solutions.

Yio Chu Kang Secondary School's vision is to strive towards the building of a community of engaged learners, leaders in pedagogy and innovative practitioners. The school drew inspiration from the Australian's Rich Tasks Framework to design its curriculum innovation, entitled *RI³CH TASKS* which sought to achieve the following: (a) **I**nvolve learners actively, (b) **I**ntegrate subject disciplines and (c) build an **I**nnovative curriculum. The *RI³CH TASKS* project was phased in as a level-wide curriculum innovation aimed at enhancing students' holistic development and engaging them in active learning. In addition to preparing students to satisfy examination requirements, the *RI³CH TASKS* project provided students with the opportunities to learn for understanding through intellectually stimulating and motivating activities. In the *RI³CH TASKS* project delivery, teachers carried out practices on assessment to support student's learning. By playing an active role in their learning, the students drew connections across subjects and gained a deeper understanding of the concepts learned. The aim of the *RI³CH TASKS* project was to increase students': (a) intellectual engagement; (b) higher order thinking capacity; and (c) generic problem solving ability.

Literature Review

Rich Tasks and Theoretical Underpinnings

The Australia's Rich Tasks Framework was based on the ideas of John Dewey, Lev Vygotsky, Paulo Freire and Ted Sizer. It is believed that optimal learning, development and growth take place when learners are confronted with substantive and real problems to solve (Dewey, 1916). Community-based activities which are integrated into the design and planning of the curriculum and the pedagogy have the potential to engage learners in various forms of pragmatic social action.

Cognitive development could be mediated through social and cultural interaction (Vygotsky, 1962). One of the ways for enhanced cognitive development is through the scaffolding provided by knowledgeable others. When applied to the teaching at-risk

[1] New Basics are clusters of essential practices that are essential for the lifelong learning, social cohesion and economic wellbeing.

[2] Transdisciplinary refers to the drawing on practices and skills across disciplines. This approach actively attempts to retain the integrity of each disciplinary methodology, epistemology and canon.

learners using technologies of print and oral language, teacher should provide the necessary structure to enhance their achievement. Another application could be seen in the design of Rich Tasks which require teachers to sequence instruction around repertoires of practices and various key learning areas.

A feature of Rich Tasks is the authenticity of the tasks, which encourage students to apply intellectual, linguistic, social and cultural practices. It is also problem-based in that it connects to the world beyond the classroom. Freire's (1970) work premised on the assumption that the most authentic and powerful form of pedagogy focuses on the identification, analysis and resolution of immediate problems in learners' worlds. This suggests that teachers' role is to facilitate an analysis of the world and specific community problems. This is in contrast to the "banking system" described by Freire (1970), where information is received passively without internalisation. To facilitate these important life-skills including intellectual abilities, Sizer (1992) advocated that students should study fewer things in greater depth in order to achieve greater levels of understanding and more appropriate learning outcomes. Based on these perspectives, the school developed *RI^{3}CH TASKS* as platforms in which teams of students and teachers could work together on intellectually rich activities over a sustained period of time.

Engaged Learning

Assessment tasks, designed as learning tasks, tend to promote the desired learning outcomes and dispositions (Keppell & Careless, 2006). *RI^{3}CH TASKS* as learning tasks could enable the students to connect knowledge and skills from various subject disciplines. The characteristics design of *RI^{3}CH TASKS* required that the knowledge and skills were embedded meaningfully in them. When concepts were connected across traditional disciplines, they would promote meaningful learning as students understand issues in real world contexts. In a study when teachers were observed to make a conscious effort in the planning of learning tasks with real world application, the efforts resulted in students finding value in their learning (Wehlage, Rutter, Smith, Lesko & Fernandez, 1989). In another study where the learning of mathematics was integrated with science, Grade 9 students showed an improvement in their engagement towards Mathematics and their problem-solving skills (Austin, Hirstein & Walen, 1997). The findings indicate the usefulness of providing real world contexts for students to apply abstract mathematics concepts in solving scientific problems.

Engaged learning takes place when teachers: (a) adopt assessment practices that are aligned with learning and teaching; (b) provide regular, timely and constructive feedback to improve students' learning; (c) make clear the assessment criteria; and (d) provide students with a choice in selecting the assessment tasks (Assessment Reform Group, 2002). Such instructional practices which provide opportunities for both learner and teacher to obtain and use information about progress to move towards the learning goals are termed as "Assessment for Learning". According to Wiggins, (1998), feedback when given timely and specifically and which is made understandable to the students, allow them to make self-adjustments and contribute towards learning. When planning

the *RI³CH TASKS*, due consideration was given to include opportunities for feedback to be given to students to scaffold them towards the design of the culminating product.

Guided by the literature review, this study seeks to investigate the impact of using of *RI³CH TASKS* on engaged learning in the Singapore context. It is hypothesised that the use of *RI³CH TASKS* would increase students' engagement. The research questions are:

1. Does the use of *RI³CH TASKS* increase students' perception scores on the PETALS™ Engagement Indicator questionnaire scales?

2. What is the relationship between engagement levels of students who used *RI³CH TASKS* and their scores on the PETALS™ Engagement Indicator questionnaire scales?

Method

Participants

The study adopted a single group pre-test and post-test design, involving students from three Grade 7 classes (N=102). As Grade 7 is the first year of secondary school life in Singapore, the use of *RI³CH TASKS* introduced students to various authentic learning experiences in which they could apply their foundational learning.

Procedure

A team of 36 teachers jointly designed six *RI³CH TASKS* by integrating various combinations of three subject disciplines to make learning more authentic for students in a transdisciplinary approach. Teaching packages were developed which included accompanying workflow charts, schemes of work, lesson plans and assessment rubrics. Between March and October 2008, the *RI³CH TASKS* project was implemented in all the Grade 7 classes in the school. However, data for this study was gathered from only three of the classes.

For each *RI³CH TASK*, the students attended ten units of lessons which lasted for 15 weeks. The first lesson began with a workflow chart which mapped out the various stages which the students had to go through in completing the *RI³CH TASK*. The students were informed of the learning goals, processes and outcomes of the tasks. The rubrics used to assess their work and examples of good pieces of work were also shared with the students. Teachers carried out a series of lesson units to (a) equip the students with the necessary knowledge and skills; (b) develop their understanding of the concepts; and (c) relate the content learnt to the real world. Students were constantly encouraged to engage, explore, elaborate and evaluate their learning. These processes were guided by formal and informal feedback, reflections and group discussions with their peers and teachers. The students designed a culminating product to demonstrate

how they have integrated knowledge and skills learnt from different subjects and disciplines. Rubrics were used by teachers to assess their learning.

Measures

Students' engagement was measured using the PETALS^{TM} Engagement Indicator (PEI) questionnaire which was designed to investigate the underlying dimensions in engagement. The 60-item PEI was constructed based on the principles of teaching and learning for engaged learning (Ministry of Education, 2007). It comprised six scales: Pedagogy, Experience of Learning, Tone of Environment, Assessment, Learning Content and Engagement. The Pedagogy (P) scale measured the extent of consideration given to (a) students' prior knowledge; (b) learning styles; and (c) readiness. The Experience of Learning (E) scale measured the extent of support given to connect and apply concepts learned. The Tone of Environment (T) scale measured the extent of consideration in making students feel safe and respected in a stimulating and productive learning environment. The Assessment (A) scale measured the level of timeliness, specificity and relevance of evidence provided by assessment as feedback to support and to inform learning. The Learning Content (L) scale measured the level of relevance and meaningfulness of the content to be learned by the student. Each of the P, E, T, A and L scale contained six items. The engagement scale (GG), comprised three sub-scales namely: Affective Engagement (GA), Behavioural Engagement (GB) and Cognitive Engagement (GC). Each of the engagement subscale contains ten items.

The PEI questionnaire was administered to the three Grade 7 classes. Students were required to rate the extent to which they agreed with the statements based on an 11-point Likert-type scale. There were also open-ended questions where students wrote a blog to their friends, describing their classroom learning experience.

Results and Discussion

Table 1: A comparison of the Pre- and Post-scores of the PETALS^{TM} scales

Scale	Mean		Std. Deviation		Effect Size
	Pre	Post	Pre	Post	
Pedagogy (P)	58.9	68.1	16.6	17.2	0.55
Experience of Learning (E)	57.5	64.6	18.9	19.2	0.38
Tone of Environment (T)	66.1	67.8	17.3	18.3	0.10
Assessment (A)	65.4	69.0	17.1	18.2	0.21
Learning Content (L)	62.6	68.5	17.0	18.3	0.35

Table 1 show the means and standard deviations for the scores obtained in the five PETALS^{TM} scales. Of these measures, Assessment and Learning Content featured

more prominently, having reached the level of 69.0 and 68.5 respectively. The findings revealed a moderate effect size for Pedagogy, small effect size for Experience of Learning, Assessment, Learning Content, and a trivial effect size for Tone of Environment. It suggested that *RI³CH TASKS* had a positive impact on students' engaged learning, especially in these scales: Pedagogy, Experience of Learning and Learning Content. The encouraging change in Experience of Learning was attributed to the fact that the transdisciplinary *RI³CH TASKS* drew on a range of knowledge and skills and connected learning to the world beyond the classroom, enabling the students to make connection among different subjects. As compared to the routine problems found in textbooks, *RI³CH TASKS* had intellectual, cognitive and developmental depth. These problem-based tasks encouraged students to be creative and innovative in coming up with solutions to the problems.

As the *RI³CH TASKS* were designed to make learning content relevant to the students, thus it was not surprising that there was an observable change in Learning Content scale. The teachers were observed to (a) provide regular feedback to students through teacher-group conferencing; (b) use constructive feedback to help students improve their written tasks; and (c) communicate learning intentions to help them understand the standards to aim for. In spite of having the above assessment practices put in place, the change in the Assessment scale was unexpectedly small. If the implementation period were to be extended, the change could have been more evident.

Table 2: Interscale Correlations[3]

	P	**E**	**A**	**L**	**GA**	**GB**	**GC**	**GG**
P	1	0.68	0.75	0.71	0.61	0.62	0.67	0.81
E		1	0.80	0.73	0.74	0.62	0.65	0.85
A			1	0.87	0.81**	0.77**	0.78**	0.94**
L				1	0.76**	0.66**	0.77**	0.90**

** Correlation is significant at the 0.01 level (2-tailed)

Key:

P	- Pedagogy	**GA**	- Affective Engagement
E	- Experience of Learning	**GB**	- Behavioural Engagement
A	- Assessment	**GC**	- Cognitive Engagement
L	- Learning Content	**GG**	- Overall Engagement

The Pearson Correlation was used to test for strength of relationship among the PEI six scales. From Table 2, Assessment had the largest significant positive correlation with Affective Engagement (0.81 at the 0.01 level) while Pedagogy had the lowest significant

[3] The change in the Pre- and Post-scores in the Tone of Environment scale was small and was excluded in the analysis.

positive correlation with Affective Engagement (0.61 at the 0.01 level). Assessment had the second largest significant positive correlation with Learning Content (0.87 at the 0.01 level) after Overall Engagement (0.94 at the 0.01 level). The results were consistent with the teachers' observations in the lessons which used *RI^{3}CH TASKS*.

Assessment. The findings suggest that assessment practices which inform and support learning was the best predictor of Overall Engagement. Within the Overall Engagement, Affective Engagement registered the highest correlation followed by Cognitive Engagement. This could follow from the assessment practices which informed the students of their strengths and areas for improvement, thereby making the students more intrinsically motivated and deeply immersed in their learning. Almost all the students welcomed this more active way of learning as compared to the conventional practices, as noted from their smiling faces and their laughter in the class when they watched video clips and read texts. The students' positive affect towards the use of transdisciplinary and authentic learning tasks in lessons were evident in the comments when they blogged about their experience of working on *RI^{3}CH TASKS.* For example, they wrote: "I have learnt to plan my personal health plan and diet. As there are three subjects being combined together, it has made learning easy for us…" Only one response sounded negative: '… sometimes we can't do…' The students' responses were almost unanimously positive; as terms like "fun", "interesting", "engaging", "awesome" and "enjoyable" were used in their blogs. The students even requested their teachers to continue with this instructional approach in other classes after the completion of the project.

Learning Content. Similarly, there was a strong correlation between Overall Engagement and Learning Content scales suggesting that students would be engaged when they worked on meaningful and relevant learning content. Among the different components of engagement, Learning Content scale has the highest association with cognitive engagement. The findings suggest that students would show commitment when provided with opportunities for authentic problem solving situated in meaningful context. At the same time, the teachers concurred that *RI^{3}CH TASKS* had engaged their students intellectually. Students were seen to demonstrate willingness to master complex concepts and demonstrated a preference for challenge in their desire to master the knowledge and skills of the task. This could be due to the specific feedback, challenging them to think of ways to improve their work.

Conclusion

The findings from this study suggest that the use of *RI^{3}CH TASKS*, over a period of five months, did contribute towards engaged learning. The transdisciplinary approach adopted in the implementation of the *RI^{3}CH TASKS* project had engaged the Grade 7 students affectively and cognitively. Students were given the opportunities to work with real problems and they appreciated the interconnectedness of concepts and content learning from various subjects. The teachers' facilitative pedagogical practices and the assessment practices seemed to have also played a significant role in engaging the students.

Through this study, the school saw the potential in using *RI^{3}CH TASKS* to engender engaged learning among the students. As the study involved a single group research design, the study's findings could have been conclusive if a comparison group had been used. The findings affirmed the school's belief in the education of the whole child and igniting the passion and curiosity within each child for the purpose of lifelong learning. Moving forward, in 2009, the school planned to continue the use of *RI^{3}CH TASKS* among the Grade 7 students as well as extending it to the Grade 8 students.

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