

Title: The experiences of Secondary one at-risk students' with technology in a CPA classroom

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Abstract

Singapore has a multi-track secondary education system which has the high achievers placed in the gifted education programme, the Express stream for moderate achievers and the Normal Academic and Normal Technical (NT) Stream which is lowest. The first cohort in the NT system was introduced in Singapore schools in 1994 to cater to the needs of students who are less academically and more technically and vocationally inclined. It provides these students with an opportunity to complete 10 years of basic education and prepares them for post-secondary education in technical education institutes. The formal curriculum for this group includes subjects such as Computer Applications (CPA), Elements of Office Administration (EOA), Design & Technology and Technical Studies that are not part of the curriculum for the other streams. The Normal Technical Stream of students are generally perceived to be lacking motivation to study, have less inclination towards academics, show more problems in school with respect to behaviour and have very little task orientation. This paper is a narrative describing how a group of at-risk NT students respond to computer technology lessons. Descriptively, we try to understand the pedagogical practices in place in this classroom, the teacher-student interactions taking place, the skills that the students learn and the level of the student engagement in these lessons. An in-depth understanding of how this group of at-risk students is involved in these lessons enables our attempts to analyse the objectives and goals of the proposed CPA curriculum and the pedagogy that surrounds it.

Introduction

Over the past decade, a number of international research studies have suggested that technology used in classrooms can be especially advantageous to low-achieving pupils. (e.g. Means, Blando, Olson, Middleton, Morocco, Remz, and Zorfass 1993). These researchers have shown that technology can engage pupils in challenging, authentic learning. In addition, according to them, technology increases the complexity of the tasks that pupils can perform successfully, raises student motivation, and leads to changes in classroom roles and organization (Baker, Gearhart, & Herman, 1994; Means & Olson, 1995). Technology has evolved from its support function to play a role in initiating learning processes. It can provide a flexible learning environment where pupils can really explore and be engaged (Bermudez & Palumbo, 1994). Teachers' perceptions are that technology has improved the climate for learning. (Sivin-Kachala, 1996). The above studies have described that technology works in some sense to “engage” at-risk pupils. However, what this paper will be addressing how this technology may be aiming to engage Singapore’s “at-risk” pupils. There is lack of quality intellectual engagement for these pupils which would lead to something meaningful and productive in their lives.

Literature Review

Striking technology uses require employing research and best practices to match technology software to the curriculum and the developmental needs of learners; to customize content area learning; to enrich learning experiences with communications and links to others beyond the school walls; to offer new learning opportunities; and to help learners see the value of learning by applying knowledge and skills to real-world tasks. Wehlage, Rutter, Smith, Lesko & Fernandez (1990) in their research, defined engagement as the result of interaction between pupils, teachers and the curriculum. They argued that engagement may be viewed behaviourally, as to whether a pupil participates regularly in classroom activities. Fred Newman (1990) defines engagement as involving participation, connection and integration in particular classroom settings and tasks. In the 1990s, at the University of Wisconsin Center on Organization and Restructuring of Schools (CORS) project, Fred Newman and his colleagues aimed to identify which aspects of pedagogy had constituent effects on the learning of “at risk” learners in urban and lower socioeconomic US schools. The results of that work was termed “authentic pedagogy”. Newmann’s findings were that high levels of ‘authentic pedagogy’ – specifically cognitive engagement and connectedness

enhance pupil achievement. These effects, he argues, impact on the achievement of both mainstream and equity groups – in the case of CORS, inner city African-American pupils. It furthermore has significant implications for those who advocate basic skills as necessary and sufficient for sustained educational achievement among lower socioeconomic and “at risk” pupils. Engagement in learning is one where successful, engaged pupils are responsible for their own learning. They are able to define their own learning goals and evaluate their own achievement. (Jones, Valdez, Nowakowski, and Rasmussen’s (1994). DeVillar & Faltis (1991) argue that schools have not focused on technology as a means to support engaged learning. He adds that when technology is used to serve “at-risk” pupils, they usually are used for drill-and-practice programs on basic skills. Lee & Anderson (1993) distinguished 7 levels of engagement based on three standards. The lowest standard, behavioural engagement, showed that pupils are basically attentive in classroom activities. Disruptive and inattentive behaviours which are common among “at-risk” pupils, means lack of even behavioural engagement. Behavioural engagement at school would be reflected by low occurrences of disciplinary problems (Ekstrom, Goertz, Pollack & Rock, 1996) and high rates of task completion (Conchas, 2001; Hudley, 1995). Pintrich and colleagues (Pintrich & De Groot, 1990; Pintrich & Schrauben, 1992) associated engagement levels with pupils’ use of cognitive, meta-cognitive and self-regulatory strategies to track and guide their learning processes. There should be opportunities in the classroom that allow pupils to face difficult tasks and solve real-world problems. The term “engagement” has been used to refer to pupils’ cognitive investment, active participation, and emotional engagement with specific tasks. In short, engagement as a continuum ranges from involvement in school to classroom to task to curriculum. It’s not just about behaviour control and time-on-task but about how effectively learners, in this case the “at-risk” pupils, think, understand, design and apply their knowledge. The higher the level of cognitive engagement, the better the learning becomes for the pupils. Documenting the experiences of the NT pupils with technology will be based on these different views of engagement in perspective, which would emerge from the pedagogical practices and classroom activities.

Methodology, Setting and Data Sources

Methodology

To be able to document the classroom experiences, I sought a qualitative research design with a purpose to provide a detailed description of the interactions established in the classroom, a “thick description” (Lincoln & Guba, 1985) and report the actual goings-on in the classroom. I chose to adopt the naturalistic observer stance and follow the naturalistic inquiry process as laid out by Lincoln & Guba (1985). The two prevailing forms of data collection associated with qualitative inquiry are interviews and observation. I took on the role of a participant observer and observed the CPA lessons for one whole year. I followed the students mainly in the CPA lessons for 3 hours a week regularly. I also spent about six hours in the English and Science classes. As an observer, I remained quite passive behind the classroom typing my field notes on the spot in a laptop. During the observations, I took note of a number of events in the classroom that include the physical arrangement of students, lesson objectives, the sequence of activities in the lesson, the kind of tools used in the classroom and also the ways in which the students worked with the tools. In addition to field notes, personal interviews of CPA teachers and students were conducted in an on-going process to clarify observations and confirm findings. The notes were developed richer as time progressed. It also aided to provide more detailed structures for points that were missed out early in the observation sessions. Triangulation of data was done as and when field data was collected. My colleagues part of the research team observed the students in other classes including Mathematics, English and Science and these data were referred to whenever required.

The Setting

The study involves a class of 35 Normal Technical Secondary One students in a school in the west of Singapore. The school was a Government school and it draws its students’ background is mainly working class. The school functions from 0740 hours to 1400 hours and has a student population of 930 and teaching staff strength of 56, excluding the principal and the vice-principal. The site is well-equipped with 2 formal computer-teaching laboratories with Internet set-ups, projector and fully air-conditioned.

The Participants

The students, with an average age of 13-14 had been tracked into this lower school stream based on their primary school leaving scores (PSLE). There were 2 female teachers who taught CPA for this class and both of them were trained teachers with about 4 years of experience apiece. Usually one teacher did the teaching and the other helped the students with their task and also handled classroom discipline-related issues. She went around the computer lab monitoring the students while at work.

Results

To exemplify and paint a picture of a typical CPA lesson, let me describe one: The CPA lessons were usually conducted in the computer laboratory and where one usually does the teaching and the other walked around to monitor the students' engagement on task and also to manage behaviour-related issues. The students had designated seats and computers in the lab and the lab had a seating capacity of approximately 40. In terms of the physical arrangement of the lab, there were 4 rows of computers on either side of the teacher's table. Each row had about 5 computers which were connected to printers. The teachers had appointed a row leader for each row and these kids are responsible for passing worksheets, diskettes and books to other students in the row. This was an indication of the teacher's belief in putting systems and routines in place for these NT students and giving responsibilities to some of them.

Typically, Teacher 1 started with a whole class demonstration of a software application by the teacher. This was a monologue/direct instruction cum demonstration phase where the classroom talk was dominated by the teacher. It was focused on how to use the software application, when to use them, what were the different modifications that the students can do and so on. During the demonstration phase, the teacher "locked" the students' computers so that they can only look at her demonstration and not play with the computers. The class went into a hands-on session following this lecture. In the hands-on sessions, the students followed step-by-step instructions on how to work with the tool which was shown on the projector screen and the class follows her quite intently. The students were seldom allowed to make contributions or suggestions of how they can use the tool or even allowed to explore more on their own. I would put the student behavioural engagement during these phases close to 90%. Here is an example of the teacher talk:

Teacher 1: Okay, go to programs and start Microsoft Publisher.

Student: Then go blank.

Teacher 1: Okay, What did we...What else did we learn?

Students: Learn publish.

Teacher 1: Okay, we learnt how to go to a blank publication. So can you go to blank publication?

Student: Go ready!

Teacher 1: Click on blank publication. Those of you who do not know where is blank, okay this is where you click. Click in front here, you click on this one, blank publication.

Teacher 1: [helping some students] Click on this. Alright! Then what else do you learn?

Students: Emm, Go to the edit word art cher! Word Art.

Teacher 1: Okay now, we used Word Art in the last lesson. Alright! Now, can you all show me on your computer Word Art? Click on the computer where is Word Art?

Teacher 1: Okay good, good! Okay. Word Art! I do not see Word Art okay! Where is word art? Word Art is this one. Mohammed Hairul (teacher calling a student) , this one!

Teacher 1: Okay now next thing is this .Please choose any pattern that you like. Alright! Choose any pattern that you like and click on it and then you type in your text. Okay now, what is the text that you are going to type?

Teacher 1: Just type in your name.

Teacher 1: Okay! Type in your name and you can change the font type. Remember. Click on ok. Which design have you chose? Just wait for a while.

Student: Write your name uh?

Teacher 1: Write your name, not my name!

Student: After that?

The lesson continues in the same way as they learn one application after another. Once they finish their class work, the students are asked to save their work in a diskette and to be able to do that, they are instructed in detail like this:

Teacher 1: What you do is this. Later on you go to D drive. Okay then here you will see CPA folder. You double click on CPA folder and then you will see another folder called graphics. Okay.

Teacher 1: Now, my computer is not saved in D drive alright! So later on, you just look for this folder called graphics [teacher 1 spells out the name: GRAPHICS] and then you will see many, many pictures here. You can double click on it and open and then you see which picture that you like. Okay may be you like a picture of horse you click on it and you press insert. Okay the picture of the horse will appear like that. Okay then you put it in the centre here. If you want to make horse smaller, you resize it from the corner. Okay. Can? Do you want me to show you the steps again?

Students: Noooo.

Teacher 1: okay. Try on your own.

The students learnt software applications like MS Word, MS Powerpoint, MS Publisher and Corel Draw. The pedagogical focus was to have the students observe, listen and follow instructions. They were given a lot of guidance on the classroom tasks and there was very little opportunity to use their creativity and present their work.. A high number of the

students are behaviourally engaged during the CPA lessons in contrast to other academic subjects observed where the engagement was usually around 40-50%. In another survey conducted by Chang et al in Singapore (1995), 51% of the teachers who taught the Normal Technical students agreed that they were better with their hands but paid less attention to theory lessons and 63% of the teachers seemed to have agreed that computer assisted learning motivated the students. They usually followed the teachers' instructions on how to work with the software tools and repeated what she demonstrated. The teacher also concurred with my observation although she attributed certain other classroom environmental reasons too for that. This is shown in another vignette below:

Transcript : Excerpts from Teacher's interview with Researcher

T: yeah, because I think, you know, the CPA is like, you can use computer hands-on, then you know that they are sitting in Air-con rooms. So they, I think they are quite smart in the sense that they know that if they misbehave, then they will be sent out or they are going to be punished and then they will lose their right using the computers. So, in that way, they are bit more cooperative.

R : Ok.

T : As compared to the others.

R : OK, but then, generally you feel they are OK., I mean

T : Ok, but there are like certain occasions lah where they are very.. you know, maybe they have their moods also and then you know, most, I think I can say that about 70 percent of the time that you know, they are quite okay.

R: Okay, so, do you think that they are engaged on task?

T : Yeah. Majority of them are engaged lah

The observations showed that a high number of the students are behaviourally engaged and on-task in the CPA lessons and most of the classroom time is spent on CPA curriculum-related procedural talk. The classroom focus was more on observing, listening, following instructional procedures and completing work.. There were fewer instances of behaviour management issues. (Teacher's occasional two behaviour management techniques included detaining outside "aircon" lab or during recess) . There were regular routines followed in the CPA lessons which helped to maintain discipline in the computer lab. The students were given a lot of guidance to do the task. They used very little creativity or modification in the presentation of their work.. The students seemed to enjoy the CPA lessons. In another

interview to a researcher colleague, about a third of the students have responded that they like the CPA lessons and that they think it is important for them to learn this to prepare themselves for their future workplace.

Discussion

The high engagement on task of the students could possibly be due to the regulated procedural talk which keep the students task-focused and reduces behaviour-related problems which is a common feature observed among these students in lecture-focussed lessons. The pedagogy is highly disciplined and structured which gives them little room to go off-task. One researcher colleague who observed the students in their English lessons shared this with me based on her observation and data, “The sooner the teachers can deal with the classroom management issues, the sooner students can learn here”. Engagement in learning has been related to classroom management issues traditionally (Tan, 2004). “For example, maintaining the momentum and pace of a lesson and sequencing of instruction are factors that keep task engagement high (Kounin, 1970). But although everyone is on-task, the lessons went nowhere in terms of knowledge depth and cognitive engagement. To quote Fred Newman’s point, “where there is social support and help with skills intellectual engagement may be necessary and sufficient to bootstrap up the achievement of most at-risk students”. When I asked the teacher on the reasons they think why the students are behaviourally engaged, they shared that the students liked computers, it is fun-loving to them and students think CPA is relevant and useful for them in their future lives. On asked actually why they need to structure their lesson this way and why not try giving them opportunities to explore, they did share that about 10 - 15% of the students are capable of independent work but not the rest who still require bite-sized tasks since they lack attention and are unable to recall what is to be done when it comes to examinations.

To be able to make a real difference in terms of generating an engaging CPA lesson, changes need to be made in terms of not only the classroom pedagogy which results in the experiences for the students, but also the CPA curriculum and the assessment that drives it in the end. Lets look at the Curriculum first. This CPA curriculum was specially designed for the Normal technical students who are thought to be technically oriented. It is designed to allow students the opportunity to plan and design their outputs after they have acquired basic skills and also to be able to apply the skills learned to other tasks independently. In

addition to this, it encourages teachers to infuse thinking and creative skills so that the users, in this case the students, are able to determine how he/she wants to use the computers in their workplaces, home or in the larger community. Whereas the curriculum talks about applying the learnt skills and creativity, the practical assessment paper is designed to test the students' ability to follow instructions to carry out the designated tasks. This then adds more meaning to the focus of the pedagogy and eventually preparing the students. We began this discussion by describing the experiences of the Normal Technical students in the CPA lessons, looking at the opportunity of technology to be able to engage at risk students. Here is a technology curriculum in place based on the premise that these Normal Technical students take well to practice-oriented lessons. But we have now seen that technology engages these students in terms of behaviour, whereas the pedagogy and curriculum remains shallow and meaningless in terms of preparing them for their lives if it does not give access in terms of knowledge depth. Its about 12 years since this CPA curriculum is in place for these NT students and it is time we understand what kind of curriculum goals and skills we want for them and then to model the pedagogies to achieve intellectually valuable outcomes. Some of the concrete ways at the classroom level itself would be to think of meaningful ways to use the existing applications, namely MS Word or MS Powerpoint such that it engages the students at a higher level. There are also lots of ways how the Internet and gaming can be brought to meaningful use in the classroom which is worth exploring. If not, there might soon be a stage that this technology curriculum may lose its ability to even behaviourally engage these students which has what it has achieved now.

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