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CREATING A CONSTRUCTIVIST-LEARNING ENVIRONMENT USING ICT TO TEACH CONCEPTS AND SKILLS IN CLASSROOM MANAGEMENT : AN EXPLORATION AT NIE, SINGAPORE

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Abstract

Development of ICT has provided new opportunities for delivering instruction in institutes of Higher Education. At NIE we have made an attempt to develop a learning environment that delivers course materials to students in a variety of formats. An indigenous CD-ROM was developed as a comprehensive resource to facilitate learning the concepts and skills associated with classroom management. The CD-ROM was set up in a web-based format so that it could interface with video-clips and websites that are relevant to classroom management issues. Communication with the students was maintained through Blackboard communication tools. The students also had opportunities to interaction on a face-to-face basis with their peers and the tutors during tutorials. This paper reports on this endeavor in using the new technologies in delivering a teacher education module on classroom management and the perception of students who participated in the experiment.

Introduction

Development of ICT has provided new opportunities for delivering instruction in institutes of Higher Education in innovative ways. At the same time the constructivism movement in instructional design emphasizes the importance of providing meaningful, authentic activities that can help the learner to construct understandings and develop skills relevant to solving problems and not by feeding them with more and more information. The constructive perspective of learning states that "knowledge is built by the learner, not supplied by the teacher" (Papert, 1990, p.3). Here, Papert distinguishes between 'instructionism' and constructivism where instruction connotes more control and directiveness while constructivism connotes a flexible setting that fosters and supports learning. Creating such learning environments seems intrinsically problematic. Therefore, it is important that careful planning and design to the extent possible is employed, and that the environment also includes proper support and guidance and rich resources and tools.

Biggs (1999) contrasted between two teaching strategies, one on what teacher does and the other, on what the student does and came to the conclusion that the latter to be more effective. Hence, new learning and teaching strategies may have to be introduced to prepare students to become independent learners. ICT may provide the solution. Through the use of technology teachers can provide opportunities for the students to learn, think critically and discuss among their peers supported by ICT (Olsen, 2000). Giffioen, Seales, & Lumpp, (1999) are of the view that appropriate use of technologies can make learning for students more interesting and enriching. Therefore, it is important that educators made serious considerations of matching the appropriate use of the technology with the content to maximize the student's potential in learning. Frand (2000) envisages that the educator's role of teaching the students

may change with the introduction of technology. The phrase "sage on stage" may change to "guide on the side" as educators take a step back from the normal role of being information giver to one that guide the learning process of the student.

Soloman (1999) is of the opinion that there are many ways technology can be used, but the best way and the most instructionally sound are those that provide students with the real and authentic experiences. This is especially so in the learning of process skills such as teaching and classroom management in teacher education. Authentic episode in the classrooms can help would-be teachers to examine the events and reflect on the solutions. It could also lead to peer discussion of real life encounters in the classroom.

Another aspect in learning that is considered important is collaboration. The focus of much learning has been on individual learning coming from the behaviorist perspective of learning. However, recent studies began to study learning as a collaborative process. Collaboration between students can take place by using software designed for collaboration. Computer supported collaboration is the latest addition to paradigms within the fields of learning by ICT (Koschmann, 1996). Newman, Grifiin & Cole (1989) feel that through the use of computer educators can help the students to communicate and collaborate on joint activities, by acting as support and providing assistance through which group can collaborate with one another. Also a growing body of research provides evidence that organising learners into small communities has beneficial effects on student's achievements and psychological well-being (Oxley, 2001). Community imparts a common sense of purpose. Within community, members grow by meaningful relationships. Learning communities are therefore defined as being characterized by associate group of learners, sharing common values and a common understanding of purpose, acting with in a context of curricular and co-curricular structures and functions that link traditional disciplines and co-curricular. This concept was integrated in the design of the delivery of our module. The Blackboard communication tool was used for this purpose.

Setting

In the Post-graduate Diploma in Education programme at the National Institute of Education, Singapore one of the core modules is "Teaching and Classroom Management". The rational and objectives of the Module are as follows:

Rationale: *an effective teacher should be adept at facilitating learning and maintaining orderliness in the classroom. To be able to do so, the teacher needs to acquire fundamental pedagogical knowledge and instructional skills. This module emphasizes teaching competencies in managing classroom teaching, especially in management of student behavior.*

Objectives: *it is prescribed that by the end of this module student teachers should be able to acquire an awareness of the dynamics of classroom teaching; realize the significance of interpersonal behavior on student's behavior and learning; develop and apply a repertoire of teaching strategies and skills for managing student learning and behavior.*

It was decided that this module be delivered using ICT. The normal mass lecture sessions which use "direct instruction" were cancelled and the content of the lectures were made available on a specially designed interactive multimedia CD-ROM. This CD-ROM allows students engage in active learning process in which students work to construct their own meaning and understandings. The CD-ROM integrates observations, discussions and practical examples to help trainee teachers effectively apply the theories and principles of classroom management and understand the philosophies governing good classroom management. A resource section has also been provided to facilitate more reading and research into areas of interest.

Some video episodes depict enactment of classroom management scenes. These include handling of disciplinary problems inside and outside of the classroom. Some classroom teaching videos show how a teacher introduces a lesson, present information and lesson closure. Other video episodes cover managing group instruction, monitoring group progress and ending group activities systematically. As teaching can be a mediated transaction between a student, the teacher and the learning objective and the environment various strategies and concepts are described in the video clip.

Figures 1-2 show the layout of the content in the CD-ROM. Clicking on any one of the word or phase will lower a dialogue box containing a knowledge bit and references to further reading related to that particular issue. An example is shown in Figure 3 (Time-on-task)

The objectives of this study are to find out i) the extent to which the student teachers used the specially designed CD-ROM for the module and the opportunity provided to interaction through the Discussion Board during Practicum and ii) the perceptions of student teachers about the CD-ROM and the discussion Board interaction.

Method

Data collection

The year 2000/2001 academic session saw the enrolment of 670 Post graduate Diploma in Education students for the core module "Teaching and Classroom Management" in January 2001 semester. They are mostly typical post-graduate student teachers with an age range of 23-25 years and a few older students seeking a second career. At the end of the semester the students were invited for a feedback session. For this session 564 students turned up (84% attendance). They were requested to fill up a questionnaire to provide feedback on the module. 545 (96.6%) usable returns were obtained. The analysis is based on this data set.

Questionnaire

The researchers designed the questionnaire and feedback was obtained from some of the academic staff involved in the teaching of the module to validate the items in the questionnaire. The questionnaire consists of items dealing with the use and evaluation of CD-ROM, Tutorial activities, Discussion Board and General Issues. In all there were 32 items and the respondents were required to express their view on a 4-point scale, 1=strongly disagree, 2=disagree, 3=agree and 4=strongly agree to each of the items.

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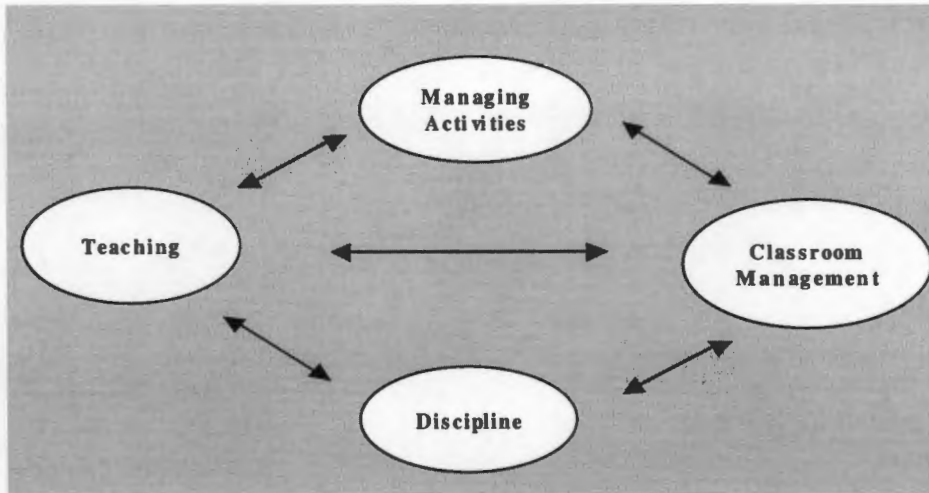
Figure 1: Conceptual Framework of Module
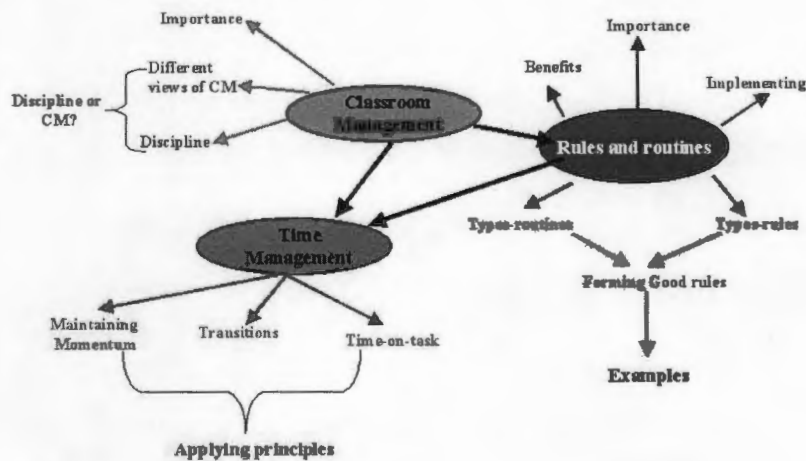
Figure 2: Concept map of Classroom Management content.

Time-on-task

Research has shown that when teachers and students spend more time actively engaged in academic tasks, students learn more. Hence, Suzy needs to keep herself and her pupils on task and be accountable for time spent in the classroom.

Q: Does that mean that students must always be constantly be working on their exercises or working on their worksheets?

Q: How would you maintain time-on-task in a group work?

Get the answers from your textbook : Pages 99 & 101 (Pri) or 98 & 100 (Sec).

Figure 3: Sample dialogue box

Data analysis

Only the data related to the use of ICT is analysed and reported in this paper. The maximum data available is used in the analysis of each item. The sum of cases may not always add up to 545 as there are missing data in some items. The data was analysed using SPSS: PC software. Descriptive statistics is used to describe the pattern of usage and the perception of students on the use of ICT in delivering the content of this module. When comparison is made between subgroups t-test and one-way analysis of variance are used as and when appropriate. The level of significance was set at 0.05.

Results and discussion

Use of CD-Rom

Of the 545 students whose responses were analysed 361 (66%)students viewed the content of the CD-Rom at least once (Table 1). The range of viewing the content of CD-Rom varied from 1 to 10, and the mode is 1. From this it is clear that about 40% of the students who have used the CD have viewed it no more than once. T-test analysis revealed that male students have viewed the content of the CD-Rom more than female students (t= 3.67, p< .001). Informal discussions with students revealed that the students were not used to this mode of learning where they are left on the own to read the content of the module. Besides the pressure of time and heavy academic workload prevented them from viewing the CD-Rom as intended.

Table 1
Frequency of viewing content of CD-Rom

Frequency	Number (%)		Male	Female
0	185	(33.8)	95	70
1	214	(39.4)	73	124
2	89	(16.3)	42	43
3	26	(4.8)	13	11
4	11	(2.0)	7	1
5	12	(2.2)	6	3
6	1	(0.2)	1	
7	1	(0.2)	1	
9	1	(0.2)	1	
10	5	(0.9)	3	1

Students' Perception of the content of CD-Rom

The first ten items in the questionnaire obtained views of the students on the usefulness, relevance and helpfulness of the content of the CD-Rom to give them a better understanding of teaching and classroom management. The responses of the students are list in Table 2.

On a four-point scale the mid-point is 2.5. The mean scores of all 10 items are above 2.5. This suggests that students on the average perceive all aspect of the content of CD-Rom to be of help for better understanding of the issues related to teaching and

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classroom management. Student seems to appreciate most the examples and video clips used to illustrate aspects of teaching and classroom management. The content of the CD-Rom has also helped them to think critically of issues related to teaching and classroom management. But there are between 20 to 33% of students who are not convinced of the benefits of the content of the CD-Rom in helping them have a better understanding of the issues related to instruction and classroom management. Many of the students were also not comfortable with this self-directed learning situation about 70% students felt that some lectures in addition to the CD-Rom would be desirable. But at the same time some 65% of the students appreciated the time made available for independent study by the reduction of lecture sessions.

Table 2.
Students' Perception of CD-Rom content.

No.	Statement	Frequency (percentage)				Mean
		SD	D	A	SA	(SD)
1	It provided support for reading my textbook	22	84	230	13	2.68
		6.1%	23.4%	66.9%	3.6%	(0.68)
2	What I learnt from material in the CD-Rom	16	78	251	14	2.73
	is related to my professional practice.	4.5%	21.7%	69.9%	3.9%	(0.60)
3	It helped to improve my professional	22	96	228	10	2.63
	practice.	6.2%	27.0%	64.0%	2.8%	(0.64)
4	What I learned connected well with what I	19	97	231	9	2.65
	did in my professional practice.	5.3%	27.2%	64.9%	2.5%	(0.62)
5	The examples and content provided a	13	60	270	15	2.80
	framework for my understanding of CM.	3.6%	16.8%	75.4%	4.2%	(0.56)
6	The content guided me to think about how to	18	71	252	15	2.74
	organize my teaching and CM.	5.1%	19.9%	70.8%	4.2%	(0.61)
7	The content help me to think critically about	18	90	236	13	2.68
	my own ideas concerning teaching and CM.	5.1%	25.2%	66.1%	3.6%	(0.63)
8	The content (e.g. newspaper clippings)	20	94	230	12	2.66
	helped me to rethink my bias against new ideas.	5.6%	26.4%	64.6%	3.4%	(0.64)
9	Ideas in the readings helped me to think	18	84	247	7	2.68
	critically of teaching and CM.	5.1%	23.6%	69.4%	2.0%	(0.60)
10	Video clips provided cases for me to reflect	15	68	255	19	2.78
	on what are good/bad CM practices.	4.2%	19.0%	71.4%	5.3%	(0.60)

SD= strongly disagree, D= disagree, A=agree, SA= strongly agree

To find out whether this perception is related to the number of times the CD-Rom was viewed, the perception of students who viewed it more than once was compared with students who viewed it only once. The t-test analysis showed there was significant difference between the two groups at the .001 level {Group 1 = 26.1 (SD = 5.6); Group 2 = 28.0 (SD = 4.2); t = 3.75} The students who viewed it more than once had more positive view of the content of the CD-Rom than those who viewed it only once. The Cronbach alpha reliability of the "Student perception" scale is .948.

Gender is also found to be related to students' perception of the CD-Rom. The male students are more positive than the female students {Male = 27.6 (SD = 5.3); Female = 26.4 (SD = 4.5); t= 2.12, p<. 05}. May be the male students are able to better cope with the demands of the course and find time to view the content of the CD-Rom and hence have a better appreciation of the information, examples and illustration therein.

Discussion Board

Communication with the students was maintained through Blackboard communication tools while they were out on Practicum. The students were provide with the opportunity to communicate and discuss with their tutors or peers problems which they encountered while they were teaching. This was a voluntary communication channel and they were not forced in any way to participate in the discussion. Only 11.4% (n = 62) of the students made use of this opportunity to communicate with their tutors or peers, the rest 89.6% (n = 483) did not avail this opportunity. Table 3 lists the frequency of use of discussion board by those who used it.

Table 3
Use of discussion board (n = 62)

Number of time	Frequency	Valid Percent
1	16	25.8
2	13	21.0
3	9	14.5
4	5	8.1
5	4	6.5
6	2	3.2
7	1	1.6
8	1	1.6
10	6	9.7
12	1	1.6
20	3	4.8
30	1	1.6
Total	62	100.0

Only a low percentage of students have used this mode of communication during the teaching practice. Of the 62 students who have used the system about 60% of them have not used it no more than three times. Here again informal discussion with the students revealed that they were kept rather busy preparing lesson plans and teaching material for their lessons besides attention to the completion of the assignment tasks and they did not have time to engage in discussion with tutors or their peers. Some students have also reported that no one responded to their comment or query so they stopped after their first attempt.

Students' perception of Discussion Board

The perceptions of those who used this collaborative communication device were obtained by means of 5 items in the questionnaire. The responses of the students are recorded in Table 4.

All the items have a mean score greater than the mid-point (2.5) on a 4-point scale. This indicates that the students who have used the Discussion Board in general appreciate the opportunity they had to communicate with their peer and tutors. The others may not have engaged in the electronic group discussion because of their heavy workload and not because that this avenue of communication was not meaningful. Few students also expressed the view that they feel more comfortable sharing their teaching difficulties with their peers face-to-face rather than through the electronic

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media. This suggests that some students require person-to-person approach in the learning process.

Table 4
Students' perceptions of Discussion Board

No.	Statement	Frequency (percentage)				Mean
		SD	D	A	SA	(SD)
1	It provided me an avenue to discuss my problems and ideas	2 3.2%	10 16.1%	48 77.4%	2 3.2%	2.81 (0.54)
2	Responses from other students helped clear my problems and ideas	2 3.2%	20 32.3%	38 61.3%	2 3.2%	2.65 (0.60)
3	Tutors' response helped me	3 4.9%	16 26.2%	40 65.6%	2 3.2%	2.67 (0.63)
4	It encouraged me to express my opinions.	2 3.2%	9 14.5%	44 71.0%	7 11.3%	2.90 (0.62)
5	The idea of using Discussion Board to support us during the Practicum is appropriate	4 6.6%	11 18.0%	46 75.4%	-	2.69 (0.59)

SD= strongly disagree, D= disagree, A=agree, SA= strongly agree

The above five items were computed to obtain a "Students' Perception of Discussion Board" scale. The Cronbach alpha reliability of the scale is .897. To determine the influence of gender on students' perception of discussion board the means scores of males and females were compares using t-test. The test revealed that that is no difference between the two groups, t = 1.024, p> .05. This suggests the both groups value the discussion board as a communication tools in their learning process.

Conclusion

An attempt was made to deliver a module in the teacher education programme partly using the electronic media. For this purpose an indigenous CD-ROM was developed as a comprehensive resource to facilitate learning the concepts and skills associated with classroom management. The CD-ROM was set up in a web-based format so that it could interface with video-clips and websites that are relevant to classroom management issues. By this means the knowledge was provide to the students. However, the onus was on the students to access the information provided in the CD-ROM and prepare themselves for the tutorial sessions. Opportunities for face-to-face interaction with their peers and their tutors were available during tutorials. Communication with the students during the teaching practice period was kept open through Blackboard communication tools.

Though the students were not monitored in the use of the information provided in the CD-ROM about 66% of those who responded to the questionnaire have viewed the content at least once. This was one of our first attempts at self-directed learning by our students. We are quite pleased with this result, as this module does not have a formal sit-in examination. We feel that by providing a little more structure and making a better link between the tutorial activities and the knowledge base in the electronic media we may be able to persuade the students to make more access to it. The tutors also would have to constantly refer to events and episodes in the CD-Rom to make the students realise that they are missing the rich source of information and

illustrations available to them. We also feel that ultimately the module assessment has to be linked to this activity to get students to be serious about it especially for a module that has no formal final sit-in examination.

The results of this study indicate male students to be more self-directed than the female students. This may be due to the fact that the male students are more at ease with computers than their female counterparts. Most students complain that the heavy workload of the programme does not allow them to read widely. Time management seems to be a factor that needs attention to help students cope with the one-year PGDE programme.

The attempt to create learning communities during the Practicum was not very successful, only about 11% of the students made an attempt to communicate through the Blackboard communication tool. Though the students appreciate the opportunity given to them to communicate with each other and with their tutors, once again the main reason cited for lack of use was the heavy workload during the Practicum. If sharing of ideas and experiences are considered important during the practicum there has to be some trade-off with other aspects of the course. Students have suggested that there should be no assignments due during the teaching practice period.

This exploratory attempt to blend electronic media learning with face-to face learning suggests that this mode of course delivery can be successfully used in teacher education by creating an interesting mix of learning activities and providing the right incentives to the student teachers.

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