

Chapter 4

The student experience

4.1 Introduction

During the course of collecting data for this research, two main opportunities arose for obtaining and analysing student responses to studio teaching. The first was at CityU, where a selection of students in the 2nd year of the BEMTE programme were interviewed and asked their opinions of their experiences. The second was at Rensselaer Polytechnic Institute (RPI), where a questionnaire was given to all students taking the Electronics and Instrumentation course as part of the Mechanical Engineering and Aeronautical Engineering programmes.

There were other avenues available for obtaining student feedback. At CityU students are allowed to comment at the end of the Teaching Feedback Questionnaire, which is given as part of student rating of teachers and counts towards annual appraisal. Similarly, one of the fraternities at RPI also asked students to comment on their learning experience, and this data was also available. CityU also uses a Teaching Evaluation and Improvement Package (TEIP), which is a questionnaire given to students in the middle of a semester so that teaching staff can obtain feedback early in the course. This is voluntary and not linked to annual appraisal. There is space for comments at the end of the form.

It was also fortunate that a colleague at CityU, from the Department of English and Communications, was researching for his PhD on how students learn in a second language. He was able to attend a number of classes of the BEME course - the non-ITS control group in this thesis - and his comments are included here also. Finally, colleagues from the Physics Department at CityU, who were partners in establishing the Integrated Teaching Studio, as well as staff in the Electrical, Computing and systems Engineering Department at RPI, have also conducted surveys of students taking studio-based courses. These are quoted for comparison at the end of the chapter.

4.2 City University

4.2.1 Interviews with students

All the BEMTE students who had taken the studio course in 2000-2001 were asked to volunteer for a series of interviews in late 2000, when they had started their second year. The nine students interviewed were self-chosen and therefore do not represent a statistical cross-section of the class, probably only those who had strong opinions to communicate! The interviewees were questioned in Cantonese by student helpers from the Department of Applied Social Sciences, as part of their internship programme. The answers were translated by the student interns, and then transcribed. They were asked a series of questions based upon the 18 question questionnaire given to the students taking the course in Electronics and Instrumentation at Rensselaer Polytechnic Institute in 1999-2000, as detailed in the latter part of this chapter. The aim of this series of interviews was to

ascertain attitudes to studio teaching, in addition to those comments made on the TEIP and TFQ questionnaires mentioned above. The students who were interviewed, as well as those giving comments on the TFQ and TEIP forms were not identified, so it was not possible to carry out any further follow-up at a later date.

The first question asked whether they owned a computer. This allowed some comparison to the first question asked in the Pre-test given in Semester A of the first year course. All students interviewed owned their own computer. The next question asked what proportion of the time they used their computer for schoolwork? The majority used their computers for about 50% of the time for schoolwork. The next question concerned what other uses they made of their time on the computer. Web surfing, chatrooms, email and games were the main responses.

The fourth question asked, on average, how many hours a week they spent outside the scheduled studio classes on work related to this course? The average was 3 hours/week, with a low of 1.5 hours and a high of 10 hours.

The last nine questions were more qualitative, and were aimed at getting the students responses to particular aspects of studio teaching. The quotations are directly as transcribed by the interviewers. As most of the students have some difficulty with grammatical English, the original grammar is retained for authenticity. Some students did not answer all the questions - or gave simplistic answers that provided no content. These have been omitted.

First, they were asked if they thought they learned more efficiently from the studio teaching approach.

Student CA: "No, I cannot learn more efficiently from the studio teaching approach and explains that it is a general phenomenon in the class. Since the students attend classes in computer room, students are easily distracted by computer and do not listen to the lecture. It is because the students can play computer game, check emails and see other websites conveniently. More, they do not worry the lecturer discover because it is very easy to cut the screen".

Student CB: "No. The interactive style of teaching mode is good but the facilities are poor to match the needs of teaching."

Student CC: "No. I prefer reading information from paper to reading information from computer because it is better to him to achieve more knowledge. Information printed on paper is more clear and easy to read as well as memory, and is convenient to bring along everywhere".

Student CD: "No. As many other students, he distracts to play computer game, surf other websites and read emails with classmates. He thinks it is not necessary to use computer in the classes because there is no animations shown in the classes, and the students can print the lecture notes and bring back classes".

Student CE: “No. I cannot find the difference because the style of studio teaching is similar to the lecture and tutorial held in lecture theatre and classroom”.

Student CF: “The answer is yes only when software is used during the studio. Only going through the notes but not using a PC to help us learning, it is not efficient too much”.

Student CG: “No, I have to browse the Web Page during the studio classes, it make me confusing since I am required to click here and then click there. I have to jump from one page to another page. It makes me confusing and wastes a lot of time. On the other hand, there is too much information on the Web site. Sometimes, I do not know which part is important. So I cannot learn more efficiently from the studio teaching approach. I would rather choose the traditional teaching method and sit in the lecture room with lecture notes”.

Student CH: “Sometimes, I can learn more efficiently from the studio teaching approach as there is enough information in the studio classes so that I can study at home throughout. On the other hand, the material delivered is good, especially when the EDEC software is used. You can deliver a good class with the use of EDEC software. But sometimes, I cannot learn more efficiently from the studio”.

Student CI: “No, I cannot learn efficiently from the studio teaching classes as there is too much information in the Web sites. So I don’t know which part is important. On the other hand, it is not a good way to follow up the classes by browsing the Web sites. It is not convenient to study by using PC. I prefer to use notes that enable me to study wherever I am”.

Next, the students were asked if they agreed with the statement “In the studio, I have a chance to know how other students handle the same problems, and can sometimes learn different ways of thinking, which cannot be achieved through traditional system of assignment submitting and marking”.

Student CA: “I disagree with this statement for two reasons.

a) Every student is provided a computer and they do not need to share opinions and discuss with others in doing tutorial exercises. Every student does his or her own exercises without concerning others.

b) In doing experiment, I find it is difficult to change partner to observe other students’ ways of solving problem and thinking. It is because I need to share work with the same partner such as writing data, in order to do the experiment. Also, generally, an experiment cannot finish in one lesson and the partners need to continue their experiment next lesson”.

Student CB: "No. It is because students are divided into small group and the groups sat separately so he cannot know how other classmates do and think. Yet, the studio mode allows him to go to see other classmates' work, share opinions with other classmates and ask the lecturer questions in break".

Student CC: "No. I think it is quite equally to achieve in both studio and traditional system. I find many classmates only look at his or her screen and did not observe others working. In the lessons, many students surf websites, send email and play computer game without listening to the teaching. Actually, I used to concentrate on his own work without discussing and seeing others because he does not want to be absent-minded."

Student CD: "No. It is because there is not compulsory discussion and the students are not active to share opinions and observe others' working. More, the setting of the experiment cannot produce chances to allow interactive activities among the students".

Student CE: "Yes. I can achieve through sharing with the partner and discussing with other classmates in break. Most of the classmates could do the same, too".

Student CF: "Yes, as the student can learn the different ways of thinking through discussing the materials."

Student CG: "No, I cannot learn different ways of thinking as I don't have time to discuss during the studio class. If I have problem, I would like to rise up my hand at once".

Student CH: "No, I cannot learn different ways of thinking in the studio. After I finish the tutorial assignment in the studio, you only check the answer with me but don't give me enough time to discuss with other students".

Student CI: "No, I don't have chance to learn different ways of thinking from other students. I don't have chance to discuss with other students during the studio classes".

Question 7 asked if the students agreed with the following statement "If a lot of students have questions when solving a problem or they get things wrong in the same problem, studio teaching gives opportunities to the lecturer to repeat the corresponding facts, concepts or techniques right away".

Student CA: "I agree with this statement, but I think that lecturer can also have the same chances to repeat the corresponding facts, concepts or techniques right away in the setting of lecture theatre and traditional teaching approach if the students ask their problems in class at once".

Student CB: "Yes. Since the lecturer and the students can search for relevant

information from computer directly and conveniently, the lecturer can answer the questions with the corresponding facts, concepts or techniques immediately. I think it can make learning smoothly”.

Student CC: “Yes. It is because the studio setting that has computer can help to provide relevant information quickly when the lecturer and the students need it. Also, the students can ask the lecturer questions at once when they meet problem. Usually, the students can get feedback about their problems from the lecture before the lesson end”.

Student CD: “The lecturer has the same opportunities to repeat the corresponding facts, concepts or techniques right away in the lecture theatre and studio if the problem is about theory and concepts because the lecturer uses only write board and pen to explain. However, it is necessary to ask in the studio if the questions are relevant to the software”.

Student CE: “Yes. It is because the class size of the studio teaching is only 40 students which allows the students to ask questions directly and conveniently compared with the class held in lecture theatre which is over hundred students. At the same time, the students are handling the same problem so they can share the questions or similar questions with one another and ask the lecturer. Also, the lecturer can explain immediately”.

Student CF: “Yes, but the best use of the studio teaching is not done because you only go through the notes and spend little time to use software or PC. So most of the studio class is quite boring. It is better to let the student to involve the class by giving them work to do in the class”.

Student CG: “No, actually the studio teaching cannot give you opportunities to repeat the corresponding facts, concepts or techniques”.

Student CH: “No, the studio teaching does not give the chance to repeat the concept as the teacher actually don’t know whether we understand the concept or not. Most of the time, we don’t understand the concept in the studio classes so that I have to spend a lot of time to study at home”.

Next they were asked to comment on the statement: “It is easier for me to follow the materials delivered in a studio teaching approach”.

Student CA: “It is easier for me to follow the materials delivered in a studio teaching approach. There are several reasons.

- a) I can download and print the notes and needed materials to read and study before the class.*
- b) I can find and get the notes and materials easily, quickly and immediately*

even if I forget to take the materials to class.

c) I can follow the teaching efficiently in class because I can find and follow the talking materials from web immediately.

d) I can search for other useful information and materials from Internet at once in class”.

Student CB: “No. Since all other courses’ notes are put on the web and I also print them out to read, there is no difference to follow the materials delivered between the studio teaching approach and traditional teaching approach. However, I like the interactive software such as the one provided by CSC because it helps him easier to understand the materials and have deeper impression on the materials through entering and calculating the data”.

Student CC: “No. It is difficult for me to follow because I can read information printed on paper more quickly and efficiently compared with reading information on monitor”.

Student CD: “Yes. It is because I can find the materials from the web in the lesson easily. Yet, it is inconvenient to read the notes if one cannot bring along a computer everywhere”.

Student CE: “Not completely agree. I can read the notes on the web easily and conveniently. However, I am short-sighted (over 700 degree) so it is easy to have headache when I see the monitor. Hence, I cannot be last longer to see the monitor and I dislike using the computer frequently. Though I can print out the notes, it wastes much of time”.

Student CF: “Yes, as student involve in the class more during studio teaching method”.

Student CG: “No, as it is not convenient for me to click here and then there. It makes me confusing. As I am required me to click too much, a simple concept will become more complicated due to too much linkage”.

Student CH: “No, there is no difference between the traditional teaching method and the studio approach. Now I have to spend a lot of time to study at home as I don’t understand the concept in the studio classes”.

To provide some linkage with questions asked by colleagues using the studio for a Physics course (detailed later in the chapter), the students were asked if the present studio teaching classes have successfully focused on ‘student-centred learning’ rather than on ‘teacher-centred teaching’.

Student CA: “I disagree with this statement. I think that the present studio teaching classes focus on “teacher-centred teaching” rather than on “student-centred

learning” because there are too many lectures. The lecturer usually teaches all of the materials instead of letting students read the materials themselves and ask questions when they find problems in understanding the notes”.

Student CB: “No. It is because the most of the time are lectures and there is less chance the students’ thinking are stimulated. I think that more time should be given to do experience and manual had to be clear in instruction”.

Student CC: “No. There is no emphasis on student-centred learning. In my opinion, student-centred learning should be that the teacher teaches the students according to the students’ quality and desires in learning in order to control and speed the students’ improvement. In addition, more group discussions are needed to share opinions. Yet, I think there is no need to discuss because the course is not difficult and all solutions and conclusions could be found in books. More, I think group discussion is good for the studies of social sciences, but is not suitable to the teaching of engineering”.

Student CD: “No. The classes are focused on teacher-centred teaching because the classes emphasise on lectures and the lecturer does not concern whether the students understand the materials taught when the course cannot catch up the schedule”.

Student CE: “No. Some topics have focused on student-centred learning but some have not. Yet, I think the abstract concepts such as transistor should be explained by the lecturer and the basic concepts learnt in Form 7 can use student-centred learning”.

Student CF: “The answer depends on the whether software and PC is used. The student will learn more when you go through the notes and let students to use PC at the same time”.

Student CG: “The present studio-teaching mode cannot focus on ‘student-centred learning’ as too little care is paid to student learning progress. The teacher still goes through the materials when I don’t understand the concept. The teacher should observe the student’s learning progress so that they can repeat the material once the students are not clear about the concept”.

Student CH: “No, the present studio teaching approach is on teacher-centred learning as the teacher doesn’t pay attention to the student’s learning progress”.

Student CI: “Some of the information given by the teacher is unrelated to the Exam. And they give too much information, I am very confusing. Most of the students are actually interested in the calculation rather than the concept. On the other hand, the teacher cannot explain the concept clearly and the concept is different to understand”.

The tenth question asked that if the same materials are taught by the same lecturer, does the student think they will learn more during studio teaching classes than in traditional teaching classes.

Student CA: "Though studio teaching classes allow me to get the materials conveniently and easily due to the causes of more teaching media such as Internet and video to get the information, I think that there is no difference in the amount of gaining the knowledge between the two types of teaching classes. It is because both teach in the form of lecture."

More, I likes to do experiment by hand in laboratory because it is more interesting. In addition, I am more alert and think clearly in carrying out the steps of experiment in laboratory owing to the consideration of the realistic danger. On the contrary, the attitude is more light-hearted in doing the stimulate experiment of computer in studio teaching classes because there is no realistic danger. Also, I find I could not do anything when I do not understand how to use the relevant computer programme of the experiment".

Student CB: "Yes. It is because I can be immediately find out the relevant materials and linking to get more information through Internet in the studio".

Student CC: "No. I think traditional teaching classes lets me learn more because I dislike doing experiment with software. The ideal conditions set by software have no error and I only follow the guided procedure so I has no chance to practice with realistic tools and carry out analysis when error occurs as doing experiment in laboratory".

Student CD: "No. It is because other students whom do not listen to the lecture, but do other computer activities distract me. In the lecture theatre, the students have no computer so they can be more concentrated on listening to the teaching".

Student CE: "Yes. It is because I can have more chances to share different opinions and discuss with other classmates. Also, I can ask the lecturer questions and get solutions conveniently".

Student CF: "Yes, but the lecturer does not use the appropriate teaching method – only going through the notes but rarely apply the theory into the practical case. For example, they could use Discman, MD, TV, such electronic device to apply the theory so that it makes classes more interesting and practical".

Student CG: "No, as I can learn more in the traditional teaching classes. The traditional one allows me to follow the notes easily, compared with the studio teaching classes".

Student CH: "Yes, I can learn more efficient in the studio teaching as the use of PC can help me to learn. The Web sites contain enough information and is well organised so I can easily get what information I want".

Student CI: "I would learn more from the traditional teaching method that consists of the lecture and tutorial classes. The tutorial classes allow me to ask questions and discuss with the lecturer".

Next, they were asked that if the same materials are taught by the same lecturer both in studio teaching mode and traditional teaching mode, would they prefer attending classes in the studio teaching mode.

Student CA: "No. There is no difference between the two modes because the studio teaching mode also emphasis on lecture and it is boring to listen in lecture. Moreover, I like doing experiment with realistic tools in laboratory rather than doing stimulate experiment with computer programme in studio".

Student CB: "Yes. I like the learning climate of the studio teaching mode which is free for students to share opinions and discuss with one another in break. More, it is more benefit to learning because I can find much useful information on web in the lesson at once".

Student CC: "No. As stated before, I like doing experiment in laboratory that can allow me learn more".

Student CD: "No. As stated before, discipline is an important factor to him because I cannot concentrate to listen to the lecture in the studio. I thinks that there are fewer disturbances to me in lecture theatre because the students whom do not want to listen to the class would not attend. However, they are willing to attend studio classes because they can play computer.

Moreover, I likes doing experiment with realistic tools and practice by hand in traditional teaching classes. I think some skills such as soldering, should start to practice early".

In my opinion, lectures should carry out in lecture theatre and the topic such as transistor and relevant to software operation can carry out in studio".

Student CE: "Yes. I can ask the lecturer questions in lesson so I will not waste the time of the lecturer and himself after school".

Student CF: "I prefer studio teaching mode as I can use the PC".

Student CG: "No, as there is too much information in the studio and waste a lot of time to browse the Web page".

Question twelve asked if their attendance in the studio teaching classes is higher than in other classes.

Student CA: "My attendance in studio teaching classes is higher. Yet, the studio

teaching classes were not special attractive and were boring as other classes. I continue to attend the classes because the studio had computer which allowed me to surf other websites when other classes had not the facilities”.

Student CB: “No. I attends all classes. However, the learning climate of the studio teaching mode which is free for students to share opinions and discuss with one another, can attract me to attend the classes”.

Student CC: “No. In fact, my attendances is 100% in all classes because I fear missing any information and find it is important to listen to the explanation of the lecturer and then I can understand the knowledge easily to read the relevant books after the lesson”.

Student CD: “Yes. It is because attendance is compulsory to be 75% and other courses have no this rule. However, I like electronics so I must attend the studio teaching classes if the problem of discipline is solved”.

Student CE: “No. I attended all classes because listening to lesson helps me to understand and remember main points of the course that make me able to answer half of the questions in test even I do not review the notes.

However, I has more interest in attending the studio teaching classes because I can ask the lecturer questions directly, individually and immediately in the lesson. Since the problems could be solved in the lesson immediately, I can gain the knowledge and catch up the course schedule that make me find the course more interesting, too”.

Finally, they were asked whether they felt that they had been enthusiastic in the activities in the studio teaching classes.

Student CA: “No, I wasn't. I dislike doing stimulate experiment because it is not realistic”.

Student CB: “I was not fully enthusiastic in the activities because I suspect whether the studio teaching mode is effective in teaching and helping students to get the knowledge the lecturer gives to students. For example, I cannot catch up and find out the webs the lecturer had clicked to show useful information. In addition, I find there are not enough interactive activities, but too many lectures”.

Student CC: “No. The activities are all computer related, but I do not like always face computer screen and I like reading information printed on books”.

Student CD: “No. I dislike that there are less chances to analysis in the process of experience because I can only follow the guide of manual in doing tests. Also,

there is not much sharing between the partner. Most of the classmates are passive and seldom ask questions and discuss together. Some classmates would find the answers in books while some only copy the data from other classmates. It should be better if there are compulsory interactive activities in the studio classes. In addition, more animations can be used in teaching software which are more interesting and attractive to students and the outcome would be more effective”.

Student CE: “No. Firstly, I do not like using computer frequently due to my problem of short-sighted. Secondly, I am annoyed that I cannot take up the procedure and the principle at once because the students do the stimulate experiments without teaching before. I finds it is very difficult and too abstract to comprehend the procedure and the principle without touching the realistic tools. More, the graphics seem to be two-dimensional and unclear, so I easily miss some steps of experiment and fails to read data finally.

On the other hand, I think that doing computer stimulate experiment is more efficient in time used and resource utilization. Also, computer stimulate experiment is the tendency of practice in the process of designing electronic product so I think I should adapt this type of experiment”.

Student CF: “No, because a) little interaction between the lecturer and student and b) too much theory in the class”.

From the preceding comments it can be seen that those students who offered to talk about their impressions of the studio classes had mixed feelings. Some, like the visually impaired student had particular problems with the screen based material; others had problems accommodating the relative free-form approach to the classes compared to more traditional methods. One thing that was fairly universal was the fact that studio classes involved doing more work, and that the responsibility was placed on the student to make the most of the environment. It is also clear that, although not really liking the studio classes, their performance in the assessments was better than the control group - see Chapter 3, something of which they seemed unaware. Also, many of the comments were contradictory, possibly showing the ambivalent nature of the response to studio teaching.

4.2.2 Other feedback

As explained at the beginning of the chapter, two other methods of assessing student feelings about the studio teaching approach were possible by analysing the written responses in two questionnaires used each year by the faculty. One is the Teaching and Evaluation and Improvement Package (TEIP). This is given, voluntarily, in the middle of each semester so that staff can get an idea of how their teaching is evaluated by the students. The second is the Teaching Feedback Questionnaire (TFQ) given at the end of each semester. It is graded and the results are entered in the staff record. At least one such TFQ must be carried out each academic year.

Many of the comments written were not relevant to this survey - being specifically focussed on specific lectures or tutorials. However, below are some of the comments on the TEIP relating to the

studio classes which were relevant to the study presented in this thesis.

Semester A, 1996. The tutorial questions are too hard for us to solve.....the lecturer should teach us how to memorise the equations and the materials in an interesting way.

Semester A, 1996. The lecture time is mixed up with the tutorial time and I think it is hard to understand the lecture at the same time immediately. So, I think it should separate into two parts in different times. The method is much more suitable for us to understand and ask lecturer question in the class.

Semester A, 1997. The teaching is quite interesting, because she uses the power point and also the lesson in the studio.....It is better for the lecturer to explain the difficulty theory deeply, because she always teach us about the same effort in both the easy and difficult topics. Overall she is quite good in teaching.

Semester A, 1997. About lecture, we can catch lecturer's meaning and we have fairly good absorption of the material. About tutorial, I think it used too much time for doing the tutorial sheet. It's because it assumes the student had attempted the sheet before. The pace in the tutorial is so slow and it has certain degree to waste the time.

Owing to the anonymity of all the comments made by students it is not possible to relate these comments to the preceding ones. They may have been the same students. It is interesting to note that in these examples most comment was made about the tutorials being an integral part of the programme and not separate. Most students seem to like the tutorial/examples classes to be some time after the lecture so that they can absorb the theory, although in practice it is often the case that they are as equally unprepared even in that case!

The TFQ gives scores for a number of different aspects of teaching performance. There is also one overall figure which is the one used in personnel decisions. Recent work by Bradbeer, Shah, Lo and Wong (2004) has shown that there is a close relationship between the overall score given by students at the end of the questionnaire and the individual scores given for different aspects of the teaching, so that the overall score is an accurate reflection of these. However, Bradbeer et al (ibid) also show that there is considerable bias in the overall score, with the most bias being shown for classes which were given to other departments, and in subjects which were not considered part of the main programme but still compulsory core subjects, and for first year classes compared to later years - all the factors present in the courses under consideration in this thesis! The overall score as recorded did not reflect these biases, and as the raw score is the only one available, it has to be assumed that any bias was the same in each of the years studied if any comparison is to be made. Table 4.1 below shows the overall scores for the classes being considered, where a lower number represents a better score. The standard deviations are also given, where the data is available.

Year	1996-7	1996-7	1997-8	1998-9	2000-01	2001-02
Semester	A	B	A	A	A	B
ITS	3.93 (1.27)	3.59 (0.87)	3.33	2.92	3.77 (1.43)	-
Non-ITS	3.33 (1.21)	-	2.97	2.85	3.95 (1.02)	2.89 (0.94)

Table 4.1 TFQ scores: raw score with SD in brackets where available (7 point scale)

As can be seen, the ITS classes consistently gave higher scores, i.e. worse marks, than the non-ITS classes. The contradiction between the students' seeming dislike of studio teaching and their better performance will be considered in the next chapter.

4.2.3 Miller's study

At this point it is instructive to consider an alternative point of view. In 1999 Lindsay Miller from the Department of English and Communications at CityU asked students to keep a diary of how they reacted to a number of different teaching situations. This was part of his PhD thesis (Miller, 2003). One of the classes that he studied was the first year BEME Electronic Engineering class i.e. non-ITS class which was part of this study.

Although the class was not held in the studio, as pointed out previously, the same material was used for the lectures in both ITS and non-ITS courses. Relevant abstracts from Miller's comments follow. To preserve anonymity, I am referred to as Dr. R, male. Like the previous section, Miller also keeps the original grammar.

Miller first comments on my attitude to teaching the students from MEEM. He comments that the amount of effort expended by me on writing my lectures does not seem to match my claim that I lack enthusiasm for lecturing (this class).

“One might think that a lecturer with such negative perceptions of his students, seemingly borne out by poor attendance of his lectures, might not prepare or present well. Instead, the opposite was true for Dr R since he provided handouts and numerous examples, and prepared special computer graphic presentations of his material, all of which must have taken hours to prepare. It may be the case that Dr R is used to presenting his material in such a manner to any audience of students, but his claiming a lack of enthusiasm for lecturing at CityU was not matched by his performance.

As in the case of Dr P, Dr R's general lecture conduct may be considered exemplary, and if his students were aware of the effort expended on his lectures, they might take greater interest in them. Achieving this, though, may require the help of the MEEM Department, i.e. the students' parent department, highlighting the importance of Dr R's course and his value as a lecturer”.

Miller states that lecture handouts were extremely important in my lectures. During his observations of my lectures he noticed that I made constant reference to them. He postulates that, perhaps as a result of providing such extensive support via handouts, I felt that I was able to proceed with the

lectures at a reasonable pace, i.e. I did not need to wait for students to copy any of the equations or diagrams as they were reproduced on the hand-outs. However, as one student, Wilson told him, this was not always the case - (D) indicates a diary entry:

Wilson (D): The lecture was about digital system. I understand the lecture's speaking but I couldn't follow the topic. As he didn't has any notes for us and all text shown on the screen was too small. I totally couldn't understand all the things. And I can't write quick enough to make the notes.

“Dr R complained about his students’ lack of proficiency in English. He believed that this caused them many problems in his course even though he provided supporting hand-outs and extensive references for each lecture. He felt that the students did not have enough language ability to comprehend much of the lectures. However, in another part of the interview Dr R complained about the students’ lack of background knowledge, especially in mathematics, which he said made it difficult to teach them. There may be some confusion here between the students’ general English proficiency and any specific background knowledge expected of them. For example, in one of the lectures I observed mathematics work played a significant role and anyone not familiar with the level of mathematics assumed there would have had difficulties following the lecture, regardless of whether they were first or second language users.

Similar to Dr P, Dr R also did not see incorporating language strategies into his lectures as something he was prepared or qualified to do. Still, Dr R’s views of the students’ proficiency levels assisted him in the first weeks of his course. He was highly aware of the type of students he was teaching and so at the beginning of the semester he gave them an outline of the course and a study plan, suggesting what they should aim to do during the semester. He also informed the students what he expected from them, namely two to three hours of reading in addition to class work. In addition to this assistance at the beginning of the course, Dr R also helped students during his lectures by using micro and macro-signals for forward and backward referencing, relating the content of the current lecture to lectures he had already given and those that he was planning to give in the future, using phrases such as “We have covered some of this before...” and “I’ll talk about this more later on, don’t worry about it right now.”

Miller writes that students’ responses to my lectures indicate that they were more aware of content problems rather than specific language problems. Many students wrote in their diaries about not understanding the concepts or principles that were presented even though they understood the words the lecturer used.

Ken (D) I can hear the lecture, but a large part did not understand. Just hear the words. The lecturer teached clear, but I didn't know why I didn't understand.

Although, I can guess the vocabulary and the meaning and know the method to calculate the equation, I didn't know what he said.

“A much more detailed analysis of this Dr R's language and the problems the students have in comprehending the content through it is required, more than can be attempted here. However, there does appear to be a great deal of confusion between the concepts of language proficiency and content knowledge, concepts that in engineering courses are difficult to separate for both lecturer and students. For instance, Dr R's perception that the students' language proficiency hinders their ability to follow his lectures does not match what a former TI student had to say:

Ernie (D): In this lecture, a new topic was started. It was about logic system. This subject I had learnt before. As a result, I understood it very well. It recalled some memory which is about this subject.”

Another issue related to the language proficiency of students was that I was one of the lecturers who was considered by some of them to speak fast, causing some difficulties, especially as my speech was also delivered in a non-local accent.

Johnson (D): I am not follow the speaking of the lecturer. I think English is a big problem. Is the lecturer change to local lecturer it may be better. [Is it the lecturer or his English you do not like?]. Second entry: His English.

“The hidden issue here is to what degree is the students' inability to comprehend a lecture a function of their low general language proficiency (including their relative inability to understand a foreign accent), and to what extent is it a result of not having the specific subject matter knowledge required of them?

Nevertheless, SPs did not offer any criticism of Dr R's inability to use Cantonese with them. Since Dr R was a foreign teacher they expected all his lectures and interactions with them to be conducted in English. However, as first-year students this was probably the first time many had a non-Chinese teacher, possibly accounting for the apparent lack of communication between students and lecturer, which in itself may have been perceived as lack of English language skills by the lecturer”.

Terry (D): The style of the lecture, I think the local lecturers are more suitable because foreign lecturers' speaking speed is too fast. It is difficult to catch to the point. Besides, for some difficult idea, it is not easy to understand, so if the lecturer is local, he can use Cantonese to explain the difficult idea.

On the subject of the heavy use of technology in the teaching of the course, Miller writes that it was clear I had gone to great lengths to prepare computer-generated examples of models and diagrams to illustrate my lecture. He observes that this high-tech approach to lecturing appears to be in

keeping with the mood of academic management these days at CityU, which is to make use of sophisticated technology in teaching. My use of a computer program was a way of introducing the models and diagrams but had the benefit of familiarising them with computer programs in preparation for their own use of them in the teaching studio after the lecture.

However, he states that the students reacted badly to my computer presentations for two reasons: Firstly, as I moved the mouse to point to different parts of a diagram or example, the students became frustrated by not being in control of the program themselves. All the students were computer literate and used to working with computers every day, and therefore having to watch someone else use a computer seemed to annoy them. Secondly, to make it easier to see the images projected onto a large screen, I dimmed the lights. This was often done at the beginning of a class and the students would sit in semi-darkness for extended periods of time. In such an environment the students succumbed to their tiredness and easily lost their concentration. In addition to this, while extemporising about the diagrams I used stress to highlight features, for example by contrasting two words: “If I put a current *here*, I’ll get a field like *this*.” This meant that the students had to focus on the diagram instead of getting textual support from the speaker. During my presentation of computer graphics I often looked at the screen myself – unsurprisingly as I was pointing out features as they talked – but this meant that I was unable to monitor the students’ comprehension, or lack thereof.

Jack (D): Dr R use a computer program called EDEC to present his lecture. To keep the image clear, he turned most of the lights off. This cause the hall dark and made me feel sleepy. In addition, it’s hard to read the words on the screen as the projector’s image aren’t so clear. There’s lot of “here, that, this” Although there is visual aids it is hard to follow. There are animations in the software which should help us to understand the lecture. However, it don’t help much actually.

Miller writes that the use of computer technology as a teaching device was criticised in respect of other lecturers as well, and so it was not specifically my use of the technology that was being criticised. It is possible that students were not sufficiently well prepared to shift into learning via this new mode, that is, they had not yet learned how to apply their undoubted computer literacy in a lecture context. As a result the demands placed on the students by trying to integrate this new literacy with conventional literacies was too great for most.

The two case studies presented in Miller’s thesis serve to illustrate that although lecturers and students may take part in the same lectures, they may still hold differing views about what is actually happening in those lecturing events.

“These mismatches in perceptions of the behaviours of lecturers and students respectively can cause problems for students attempting to comprehend lectures in their second language. In order for lectures in an L2 to be successful, both lecturers and students must share similar views and perceptions of the lecture event, and of those features which aid in the students’ comprehension of the information pre-

sented.”

4.2.4 The Studio Physics study

Another study, carried out in 1998 by one of the other CityU staff using the ITS also gives some interesting insights. This was based on a questionnaire similar to the one used for the study in this thesis. Yu and Stokes (1999) report the following:

“Student-teaching-student approach

(1) 77% of the students agree that it is easier for them to ask questions or express their ideas during discussions with their group members in the “students teaching students” approach compared to the traditional “teacher teaching students” approach. Only 7% disagree.

(2) 63% of the students agree that they have more opportunity to reinforce or correct their concepts quickly after discussions with their group members, while only 8% disagree.

(3) 54% of the students agree that they have more confidence to approach the instructor, or to express their ideas to the instructor, after discussing first with their group members. Only 8% disagree.

(4) As a whole, 50% of the students agree that they learn more efficiently from the “students teaching students” approach, while about 12% disagree.

Problem-based learning and interactive learning approaches:

(1) 69% of the students agree that they have chances to refresh, apply and test their knowledge as they go through the lecture, and not after the lecture, and this helps them learn more during the lecture. Only 9 % disagree.

(2) 62% of the students agree that the system provides opportunity to see how other students handle the same problems, and sometimes different ways of thinking, which cannot be achieved in through the traditional system of assignment submission and subsequent assessment. 12% disagree.

(3) 63% of the students agree that they have chances to know how the lecturer marks the answers, so that they can know immediately the concepts they are unclear about, the facts they have overlooked and the techniques they are unfamiliar with. Only 8% disagree.

(4) 75% of the students agree that, if a lot of students have problems when solving the problem or get wrong in the same problem, the “interactive learning” has given

opportunities to the lecturer to repeat the corresponding facts, concepts or techniques right away. 10% disagree.

(5) As a whole, 55% of the students agree that they learn more efficiently from the “problem-based learning” and “interactive learning” approaches, while only 7% disagree.

Overall:

(1) 57% of the students agree that they learn more efficiently from classes in the MMIT studio using the above teaching approaches. Only 8% disagree.

(2) 56% of the students agree that the present studio teaching classes have successfully focused on “student-centred learning” rather than on “teacher-centred teaching”. 13% disagree.

3) 60% of the students express that if the same materials are taught by the same lecturer, they will learn more during these classes in the MMIT studio than in traditional teaching classes

4.2.5 Discussion

From the studies considered above it is clear that there was considerable dissatisfaction with some aspects of studio teaching, but also some satisfaction, quite often both feelings being expressed by the same student. First, many students did not like long lectures, but did like the informal atmosphere of project-based learning where they could discuss things with their classmates. Secondly, the actual environment was appreciated, especially some aspects of the multimedia material, such as the interactive tutorials. There was also some dissatisfaction with the seeming disconnect between the material being presented and the lack of focus as far as what was expected of them.

The result of all this feedback from students was a major reworking of the studio concept, and the way in which the courses were structured. This took place after the end of the period considered in this thesis. The implications are discussed in the next chapter.

4.3 Rensselaer Polytechnic Institute

4.3.1 Introduction

As reported in Chapter 1, Rensselaer Polytechnic Institute in Troy, New York, was the first university to really apply studio teaching in a major way. By 2000, all first year courses across the curriculum were taught using the methodology, with many other courses up to 4th year undergraduate also taught the same way. As part of the research for this thesis, at the end of 1999 I spent 8 months in the Electrical, Computer and Systems Engineering Department, where I taught one of the courses.

This was a course in Electronics and Instrumentation taken by 3rd and 4th year Mechanical Engineering and Aeronautical Engineering majors.

The total course intake was around 120, with the class split into three sections of 40 students each, each section taken by a different professor as instructor. They were organised in groups of 4, each sharing a computer workstation connected to instrumentation for carrying out experiments. Unlike the courses taught at CityU, there were no lectures given as part of the course, and no formal tutorials. Everything was project based with a short description of the project given to the students by the instructor before each one started. The instructor was assisted by two Teaching Assistants. Each section had 2 two-hour sessions in the teaching studio, with another 2 sessions available as a first-come, first-served open shop period.

The students in the courses had little or no electronics experience during their preceding courses, other than some physics. Most of the class had experienced 3 or more studio courses before this one. There were extensive notes available on the course web site, provided by the professor in charge of the course. The course was based around a series of projects with little lecturing and no tutorials, although quizzes were held regularly. The web pages were updated regularly reflecting some of the questions raised in class, and also to provide more material for the projects if it was not available elsewhere. He also provided hints as to how to complete the project.

The groups had to provide a pre-project report based upon their initial work in the studio, which was then supplemented by a final project report. The pre-report and final report were both assessed. During the course there were two quizzes with a final in-class test. Students were expected to use the textbook (actually a physics text that I felt was not really suitable for this class!), as well as the web to access information. This was expected to be done either in class or as out of class work.

The emphasis on self-learning and larger group size provided an interesting contrast to the CityU approach, which had far more instruction and less project work, as at the time of this study. The students were given two questionnaires; one before their final assessment by me, and another after their assessment by one of the fraternities. The first was given to all students in the course, and had a 35% response rate; the latter, only to the class I taught, and had a similar response rate.

4.3.2 The first questionnaire

The questions and responses to the first questionnaire are given in Appendix 7. Question 1 ascertained that a small percentage of students did not own a computer. This is surprising as RPI has a scheme for students to buy lap-tops at a steep discount, as well as the whole campus being wired for internet access. However, it seems that even in 1999 some students did not feel it necessary to buy a computer.

The second question asked what proportion of time they spent using the computer for schoolwork.

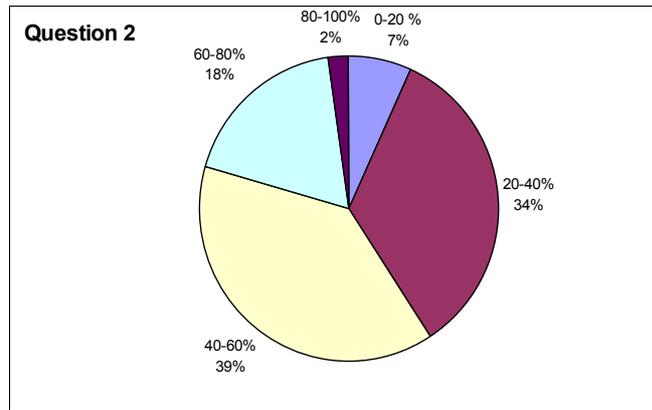


Figure 4.1 What proportion of your time do you use your computer for schoolwork?

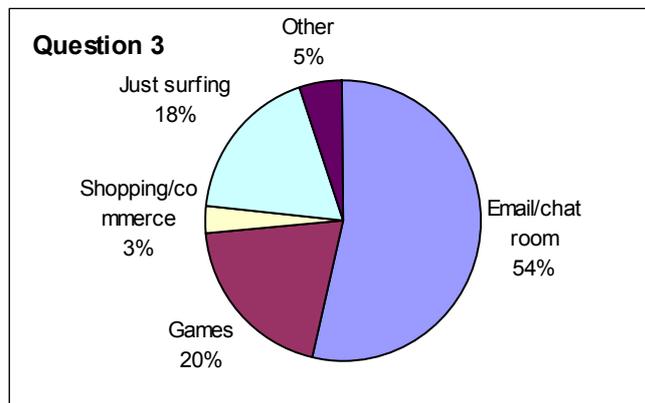


Figure 4.2: Other than schoolwork, what computer application takes up most of your time?

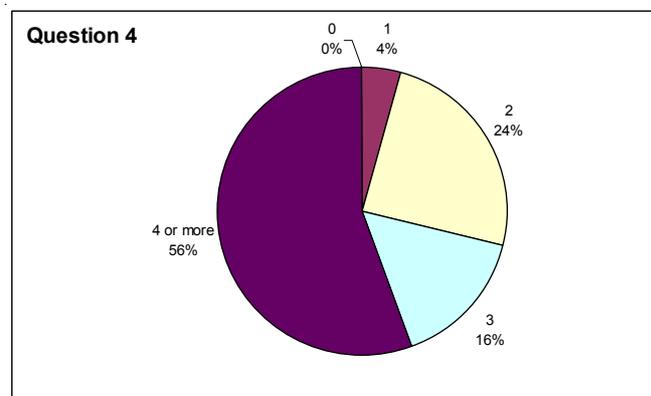


Figure 4.3: How many studio-type courses have you taken before this one?

The large majority spent under 60% of their computer time on school activities - Figure 4.1; however, Question 3 asked what the rest of the time was spent on, and this is shown in Figure 4.2 below. It is clear that email/chat rooms dominated, as may be expected.

The next question asked about the number of courses taken in studio mode before this one - Figure 4.3. Surprisingly the majority had taken 3 or more. Only 2 respondents had only taken one such a course. There were no students who were new to the methodology.

Question 5 shows the main difference between this course and the ones taught at CityU - Figure

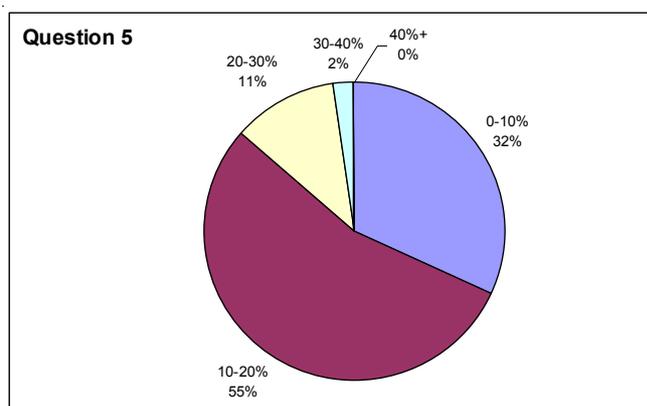


Figure 4.4: On this course, when in the studio, what is the ratio of time is spent on presentations by the instructor to other coursework?

4.4. The large majority of the respondents claimed that less than 20% of the class time was taken with presentations by the instructor. This compares to around 50% at CityU. The next question - Question 6 - asked about the amount of time spent out-of-class on the course work. Over half the class spent between 4 and 6 hours on such work, again different to CityU, where empirical evidence shows that 2 to 4 hours is normal for most students.

The final group of questions were looking for a range of responses from strongly agree to strongly disagree on a 5 point scale. It should be noted that the questionnaire was framed such that these general questions on studio teaching were from their experience of all studio courses, not the one taken here. These final questions were based on a questionnaire used by RPI to determine student feedback. They are also similar to those used by Yu and Stokes (1999). As far as I know there has been no analysis carried out as to the bias or construct validity of these. They are used here for comparison with the results of the feedback from the RPI and CityU Physics students taking similar courses only.

Question 7 concerned the ability to carry out group discussion. As can be seen from Appendix 7, around 67% strongly agreed, or agreed.

Question 8 asked about reinforcing or correcting concepts. In this case 58% strongly agreed or agreed.

Question 9 concerned confidence in asking questions of the instructor. 64% strongly agreed or agreed that they would have more confidence after initially discussing the ideas with their group.

Question 10 showed that only 54% either strongly agreed or agreed that studio classes allowed them to learn more efficiently. A surprisingly high number of 36% of students disagreed, or strongly disagreed, with this statement.

Question 11 continued this line of thinking by asking whether the studio environment changed their ways of thinking about a problem. A small majority - 52% agreed, whilst 12% disagreed or strongly disagreed.

A similar small majority - 55% agreed or strongly agreed that there are more opportunities in studio teaching for interaction with the lecturer, whereas 56% agreed or strongly agreed that it was easier for them to follow the material in the studio - Question 13.

One of the claims made for the studio teaching approach at RPI is that it allows for more student-centred learning. However, only 45% agreed or strongly agreed with this statement, with 19% disagreeing or strongly disagreeing.

The next two questions asked students to give their opinions as to whether their instructors would have performed better in studio teaching or in traditional teaching. In some ways this was not a fair question as few, if any, of the students had come across their instructors previously, so any comparison was rather imaginary. However, it is interesting to note that 53% agreed or strongly agreed that they would learn more from that instructor in the studio and 48% agreed or strongly agreed that they would learn more with the same materials.

The results from the questions are shown in pie-chart form in appendix 7. For ease of comparison, the results are restated in slightly different form in Table 4.2 below. This gives the responses in terms of a scale from 1 to 5 - where 5 corresponds to strongly agree, and 1 to strongly disagree. The mean and standard deviation are given for each question.

	Mean	SD
Question 7: It is easier for me to ask questions or express my ideas during discussions with my group in the studio teaching classes than to do the same in front of the lecturer and the whole class in traditional lectures.	3.8	1.2
Question 8: After discussions with my group members, I have better chances to reinforce or correct my concepts quickly.	3.5	1.2
Question 9: I have more confidence to ask the lecturer questions or to express my ideas to the lecturer after discussing with my group members.	3.7	1.2
Question 10: I can learn more efficiently from the studio teaching approach.	3.1	1.4
Question 11: In the studio, I have a chance to know how other students handle the same problems, and can sometimes learn different ways of thinking, which cannot be achieved through the traditional system of assignment submitting and marking.	3.4	1.2
Question 12: If a lot of students have questions when solving a problem or they get things wrong in the same problem, studio teaching gives opportunities to the lecturer to repeat the corresponding facts, concepts or techniques right away.	3.5	1.2
Question 13: It is easier for me to follow the materials delivered in a studio teaching approach.	3.0	1.4
Question 14: The present studio teaching classes have successfully focused on student-centred learning rather than teacher-centred teaching.	3.3	1.3
Question 15: If the same materials are taught by the same lecturer, I think I will learn more during studio teaching classes than in traditional teaching classes.	3.5	1.2
Question 16: If the same materials are taught by the same lecturer both in studio teaching mode and traditional teaching mode, I prefer attending classes in the studio teaching mode.	3.7	1.2

Respondents: 45

Response Scale: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree

Table 4.1 Table 4.2 Responses to questions concerning attitudes to studio courses at RPI

Other than for Question 13, the means indicate that the average response is between neutral and agree.

The next question asked about their attendance in studio teaching classes. Virtually all respondents attended for between 80-100% of the timetabled time. This corresponded to attendance rates at the CityU studio courses, which averaged 95% attendance over the six cohorts studied (compared to 95% at the start of the semester dropping to 50% at the end for the non-ITS courses!).

Finally, the respondents attitude to studio teaching was ascertained. This was measured in their enthusiasm for the classes. As can be seen from Figure 4.5, the vast majority had favourable responses.

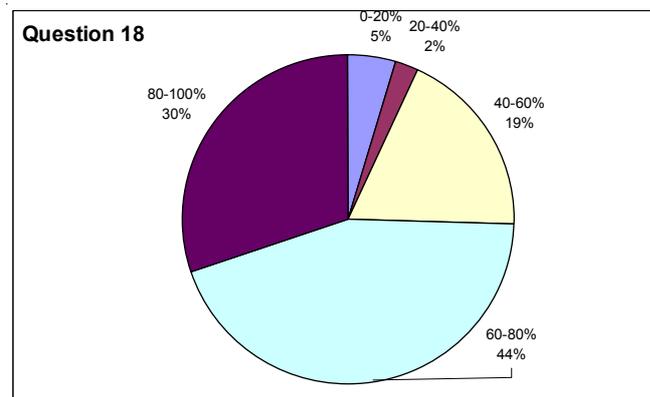


Figure 4.5: I feel that I have been ?% enthusiastic in the activities in the studio teaching classes.

At the end of the questionnaire a space was left for comments from students. Many of these were related to questions from the survey.

Student RQ1: “When lecturing teach – don’t just go over the topics we should know. Overall the course was fun – I enjoyed it”.

Student RQ2: “There is too much paperwork involved in this class. There was always a rush to finish assignments. Spend the first few lectures reviewing basic concepts since most of us have not seen this material since (early) physics courses. Make all announcements in class – the web page is great but it cannot circumvent personal communications.”.

Student RQ3: “Not enough time spent on teaching the material. Maybe 30 if mins per day was spent on lecture the concepts would be better understood”.

Student RQ4: “The professors waste too much time talking when we need the time to do labs”.

Student RQ5: “Overall I really enjoyed this course. But too much was expected to be previously known. We have never had this coursework before. The design in

most projects was over our heads”.

Student RQ6: “I definitely learned a lot from this course. This can be attributed to the fact that I never was introduced to the field of electronics and circuits. I still learned a lot. I just thought that many times it seemed as if we were expected to know much more than we actually did know”.

Student RQ7: “The class as a whole was a good learning experience”.

Student RQ8: “Class at times had too much going on and took up most people’s time, while it was not their only class”.

Student RQ9: “Groups of 4 are too large, especially for this classroom. The work can easily be divided among 3 people, but adding a 4th makes it too crowded for all 4 to work together and it becomes much more difficult to find work for that person to do”.

4.3.3 The Fraternity questionnaire

The other questionnaire given to students was aimed at getting feedback from students for return to individual instructors after assessment was completed, and was administered by one of the university fraternities, Tau Beta Pi. It simply asked for comments or suggestions which would be given to the instructor concerned. As may be expected, there was some duplication of responses, but it was impossible to ascertain which students had returned both questionnaires, as they were both confidential. The comments relevant to this thesis are given below:

Student RF1: “Class was a lot of work – too much at times”.

Student RF2: “Too much work. This class isn’t even my major and I spend the most time on it. The material is gone over so fast that I will never remember what I was quizzed on or any useful information. Emphasis wasn’t on learning – it was on finishing the experiment on time because there was so much work to do. I was excited about this class originally, but it’s structure and style of lecturing has caused me to not be as active or even care about what I am learning’.

Student RF3: “Studio is much more conducive to the hands on learning style I have. I wish a studio classes were as well instructed as this one is”.

Student RF4: “I got very little from this class. The teaching format, or lack thereof, was insufficient. Questions weren’t addressed the best way possible. As a result the out of class work load was too severe for this course”.

Student RF5: “Studio (classes) should have supplementary instruction”.

Student RF6: “Although the studio class approach is very helpful for ‘hands on’ circuit building, I feel more time needs to be spent lecturing to provide a more

solid theory base before breaking loose and building circuits. Also, the preproject reports seem to be a huge waste of time because you basically have to have the project completed to do well”.

Student RF7: “I think that the idea of studio classes is good, but they rarely seem to work out as well as planned. This class seemed to just throw projects at us without enough background information. Most of us are not electrical engineers, and therefore need a little more explanation of how the components work before we can properly apply them to projects. This class could be improved upon greatly by including more instruction at the beginning of class”.

Student RF8: “More time needs to be spent on a lecture in the studio. Perhaps 1 day out of 3 could be a lecture about the materials needed for the week’s experiment. I enjoyed working in groups of 4”.

Student RF9: “The class format is good in theory – however, resources (lab equipment) and instructors are insufficient. 4 people is too large for a group. A little more focus on learning, then doing. Just throwing us into an activity teaches nothing”.

Student RF10: “My major complaint about this class is that I don’t feel the lecturer taught us anything. We would be told to perform an experiment and to generate a plot from it. We would then be told to explain it. The problem was that we never had it taught to us, so we had no knowledge to use to evaluate it. Overall I did not enjoy this class. I did like some of the projects, but I feel as though I didn’t learn very much. It was hard to get help during the class because of all the groups, and so few TAs”.

Student RF11: “Lecture more! It doesn’t have to be for 2 hours a day, but we need something to supplement the text. Sometimes more teaching was needed to clarify different concepts in the course. It made labs more difficult to understand since many of us had little or no knowledge about the experiments. Studio courses are definitely more effective than boring students by lecturing for 2 hours”.

Student RF12: “.the class was great: very well organised, interesting projects etc...well chosen TAs”.

Student RF13: “Again, as I saw in all my Physics classes, I like the IDEA behind the studio teaching, the implementation here at RPI needs work. I don’t think studio teaching is an excuse not to lecture. We were hardly ever taught anything in this course. All was left to be figured out, or was left to the TAs. Therefore, because our group was more apt to figure stuff out ourselves, our overall grade suffered compared to groups that had the TA stand over them the whole time and answer every question for them. Basically, I want to see more STRUCTURED TEACHING. At least ½ an hour of lecturing at the beginning of each class, perhaps”.

Student RF14: “I prefer lectures. Too much time in lab is spent doing, rather than learning and understanding for a studio class to be effective”.

Student RF15: “Many mechanical engineers have to take this class. Without a lecture I don’t know how it can be expected that we learn much. In addition, you can still do well without having an understanding”.

Once again it seems that some students really like studio classes and some do not! However, the amount of time needed to complete the work in studio project-based classes is clearly a problem. Many students complain about the amount of work they have to do. This reflects some of the views of CityU students. At the same time students would like to see more actual teaching, i.e. material presented more formally in the form of lectures. The balance between the formal and the informal must, therefore, be at the heart of effective studio teaching. This will be addressed at the end of the chapter.

4.3.4 Other survey results from RPI reported in the literature

Similar student feedback studies were carried out at RPI during the first few years of studio implementation. The most comprehensive was by Carlson, Jennings and Schoch (1998) in 1997. They also compared two cohorts - one in the studio and one in lectures.

The student demographics given in Table 4.3 indicate that the two groups were well matched academically.

	Studio course	Lecture course
Number of students	27	27
Non-majors	1	2
Females	5	5
Caucasian	13	14
Black	2	2
Asian and others	12	11
Average QPA	3.179 ± 0.530	3.164 ± 0.532

Table 4.3 Student demographics (from Carlson et al, 1998; Table 1)

Nonetheless, as shown in Table 4.4, students in the studio course on average performed better on the three exams than the students in the lecture cohort.

	Studio course	Lecture course
Average	77.01	75.81
Standard deviation	10.59	10.8
Median	79.68	74.29

Table 4.4 Total percentage exam scores (from Carlson et al, 1998; Table 2)

As Carlson et al. write:

“Note, in particular, that the median score of the studio students was more than five percent higher — roughly equivalent to half a letter grade. Since the two groups were apparently comparable, and since the preparation was the same for both, the studio format itself led to the improved performance. At the very least, the studio format appears to be as effective in the cognitive domain as the more conventional format”

They then analyse responses from two surveys. One was given to all School of Engineering students all engineering courses in 1997, and the other from a survey of just those students taking the studio course mentioned above.

Significant differences emerged in the affective domain, judging from surveys of student attitudes and perceptions. Table 4.5 lists selected average responses from the survey administered to all engineering courses. There were 16 questions in the survey, with only the questions that prompted noticeable differences quoted in the study.

Carlson et al, comment:

“The “bottom line” here is the overall course rating (statement 16), which was 3.6 on a 4.0 scale for the studio course, as compared with 3.0 for the lecture course. Increased student satisfaction with the studio format is also reflected in the responses to statements 11, 13, and 14. Furthermore, the studio course received higher positive responses than the lecture course on all aspects of the survey. Of particular interest is the comparison of responses to statements 4 5,6, and 10. Since the assignments, exams, etc., were identical for both courses, the studio format again seemed to be more satisfactory from the student viewpoint. Finally, a special survey was administered to students in the studio course alone for evaluation purposes”

Statement	Studio	Lecture
4. The written assignments aided the learning process	3.7 ± 0.5	3.4 ± 0.7
5. The level of difficulty is reasonable	3.3 ± 0.7	3.1 ± 0.6
6. The amount of work required is reasonable	3.3 ± 0.6	2.9 ± 0.8
10. The tests, quizzes, etc., are learning experiences	3.4 ± 1.0	2.9 ± 0.8
11. The course format is appropriate to the subject	3.6 ± 0.7	3.1 ± 0.8
13. The course encourages students to think for themselves	3.6 ± 0.6	3.2 ± 0.8
14. The course increased knowledge/skills in the subject	3.8 ± 0.4	3.4 ± 0.7
16. Rate the overall quality of the course	3.6 ± 0.7	3.0 ± 0.7
<i>Respondents</i> : 25 in the studio course, 34 in the lecture course <i>Response scale</i> : 4 = strongly agree, 3 = agree, 2 = disagree, 1= strongly disagree <i>Course rating scale</i> : 4 = one of the best, 3 = above average, 2 = average, 1= below average, 0 = one of the worst		

Table 4.5 School of Engineering Course Survey (from Carlson et al, 1998; Table 3)

According to Carlson et al, the selected results given in Table 4.6 reveal the following points:

- “The studio format promoted class attendance. (Indeed, attendance remained above 90% throughout the term, whereas it dropped appreciably in the lecture course.)

- Students appreciated the individualised attention in class and felt less need for extra help outside of the classroom.
- Students did the outside work necessary for the studio class and felt that they benefited from the experience.
- Students felt that they learned more from the studio format and preferred it to a conventional format.

The higher student rating for the studio course evidently reflects these points”.

Statement	Mean ± SD
1. I attended most of the studio class sessions	3.0 ± 0.3
3. I appreciated having a staff member nearby in the studio to help me when I needed it.	3.8 ± 0.4
5. I sought out-of-class help for this course more than I usually do	2.4 ± 0.8
6. I liked having the experiments and computer projects integrated with other studio activities	3.5 ± 0.6
8. I did most of the out-of-class work with another student	3.1 ± 0.6
10. I did most of the preparation work on time	3.1 ± 0.5
18. The studio format helped me learn how to learn	3.4 ± 0.6
19. I thin I learned more from the studio course than I would have from a conventional format	3.6 ± 0.6
21. The studio format felt more "friendly" than a conventional format	3.8 ± 0.6
21. I enjoyed the studio course format more than a conventioal course	3.8 ± 0.5
<i>Respondents :26</i> <i>Response scale: 4 = strongly agree, 3 = agree, 2.5 = neutral, 2 = disagree, 1 = strongly disagree</i>	

Table 4.6 Studio course survey (from Carlson et al, 1998; Table 4)

4.4 Discussion

Considering the diversity of views quoted above, it is difficult to come to any firm conclusions about the students’ attitudes to studio teaching. If conclusions can be drawn, then the main one would seem to be that the experience of students with exposure to studio classes before the one surveyed is different to those who have not. For example, the majority of RPI students had been in studio classes before, and could therefore grasp the reasons behind the methodology, even if this resulted in just a hardening of their responses. One response - not quoted as the language was rather crude - hated the studio classes with a passion; however, some of his classmates had exactly the opposite feelings, and, indeed thrived in the environment.

One aspect common to both the CityU and RPI surveys was the compulsory nature of the two courses at CityU and the course at RPI studied in detail. Both were given by the Electronics or Electrical Engineering Departments to non-EE students. And the courses were all ‘core’ courses which were not elective. As Bradbeer et al (2004) showed, this type of course - usually referred to as a ‘service course’ - has a lower student rating than core courses in the students’ major and certainly lower ratings than for elective courses. The possible implications of this on any qualitative survey are looked at in Chapter 6. Some other comparisons have been made between studio and non-studio classes in the main disciplines of the students, and these are considered in the next

chapter.

As for the CityU students - they were in the majority first year students, except for repeats. In fact, during the period of the study, for two cohorts, the studio class was their first ever class at the university. Not only did they have to cope with a completely new learning environment - starting university after school or college is always a stressful time - they were also exposed to a teaching and learning methodology that was totally outside their previous experiences.

Trying to understand the reason for the apparent dichotomy between the feelings towards the studio based classes and the better assessment results is the main focus of the next chapter. One possibility is to consider learning styles, and to determine whether this provides an explanation for some liking and some loathing the studio classes.¹

¹ During the course of writing this thesis I attended two workshops. The first on learning styles and the other on metacognition. Whilst not including much in the thesis on the latter, I was struck by the concepts behind the former; they seemed to fit into my own experiences, and I considered them empirically correct. This may be a controversial statement in the light of some recent publications e.g. Coffield, F., Moseley, D., Hall, E, Ecclestone, K. (2004).