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Virtual Learning in the Undergraduate Architecture Studio

Dr Ola Uduku

School of Architecture, Edinburgh College of Art

Email: o.uduku@eca.ac.uk

Abstract

For the past two academic years; 2003/4 and 2004/5, at the University of Strathclyde, the second year studio has been involved in a project that has involved the use of Virtual Learning as part of the design process. This report discusses the effect and use of Virtual Learning Environments (VLE) in the studio, by both students and staff over a two-year period. It compares the year two studios in 2003-4 and 2004-5, which both had VLE-based studio projects, that each ran slightly differently. This is an ongoing project which will continue to be developed further in Strathclyde Architecture School's studio culture.

Keywords: Landscape, Architecture, Experiential Learning, Collaborative Learning

Introduction

VLE in the Studio

Strathclyde Architecture School is one of the biggest in Scotland, with a large undergraduate population. On average the Year Two Architecture studio has a student total of about 60 - 65 students, divided into three tutorial groups with 20 +/- students in each. The attraction of using virtual learning in the studio was clear, fundamentally as a teaching tool to help teach ever-growing student numbers efficiently. It also gave a chance to introduce a new form of technology to the studio and monitor its acceptance, penetration and adaptation to use in Year Two studio culture.

At Strathclyde University, there has been a concerted push to introduce and support Virtual Learning Environment (VLE) teaching, the Department of Architecture being one of the first to become involved. In what was initially a joint initiative between the Studio/Year 2 Convenor and the Building Technology lecturer, an attempt was made to use WebCT™, University of Strathclyde's chosen VLE provider, as an integral part of the studio for both communication and teaching purposes. The initiative, called "Pavilion in the Park", involving the full scale design and building of a small pavilion installation was a qualified success but not without its problems. This is described in more detail in a separate report at Appendix 1.

In the 2004/5 session, the project changed in theme slightly – it no longer called for a pavilion designed in a landscaped park setting, but for the design and construction of a full scale interior design installation, that was to be located in the Year Two design studio. In terms of the use of WebCT ™ however, there was little difference in its suggested and actual use. Further details are given at Appendix 2. The student and staff profile for each year was also not markedly changed so the issues dealt with were familiar. The rest of this case study discusses this in more detail within the context of the different Studio Project demands and student – staff relationships to the brief and WebCT ™ VLE programme.

Studio Work in the Year Two Architecture Course at Strathclyde

As a traditional school of Architecture, the Architecture Studio design project remains the core part of Architectural education, especially in the early years. The design studio proportionately has the most credit weighting in the syllabus up until the fourth year. In second year, the design studio is both exploratory and pedagogic in aim and ambition.

In the Pavilion project for both of the years, 2003/4 and 2004/5, the main learning objective of the studio was the encouragement of students to work, in teams on a "live" scale 1:1 project, from development through to the production stage. Through the vehicle of a small-scale design project this demanded that students conceive, design and produce part of a pavilion as a joint design project over a short, prescribed two to three week time period. On both occasions that the project was run, this period also extended through a two-week vacation period, which had significant consequences for WebCT™ use (see Appendix 1 & 2 design project briefs).

WebCT™ was introduced to students at the commencement of each project. In the 2003/4 projects, this was through a formal introductory session delivered by the Departmental Computing Officer to both tutorial staff and students. All staff and students involved in the project were given individual WebCT™ login identities and passwords. The 2004/5 project had a more informal introduction to WebCT™. It had been assumed, correctly that the incoming studio had already used WebCT™ in their First Year and therefore needed no formal introduction to the software. Also the tutorial staff were not introduced to the programme formally, as staff remained largely the same as the previous year (90% unchanged). What follows is a description of WebCT™ use during each programme, taking an analytical viewpoint, considering both student and staff experiences.

VLE use in Pavilion in the Park Project - 2003/4

As a first trial, the Pavilion in the Park design studio use of VLE worked particularly well. After the formal introduction, each of the three Year Two Studio Units began to work on their pavilion design project incorporating WebCT™ use in their working and communication methods. Key to its use in the 2003/4 session was its effectiveness as a file sharing mechanism, which students used to store digital ".dmg" drawings of parts of the site, and also later on for the sharing of their design detailing of parts of the pavilion. The internal mail server on the WebCT™ system was also used as an efficient information system for students to communicate with each other during the vacation. The students had initially been asked to develop their own website to be placed in their WebCT™ file space as a record of their design working process. This however was only worked on by two of the groups, with one group only completing the task.

Staff take-up of WebCT™ was much more limited. Despite the introduction to the course and student tutorials discussing WebCT™, there was limited staff use of the system as either a teaching or communication tool. Only the organisers of the system, the Studio Convenor and the Year 2 Technology Lecturer regularly used the system, mainly as a communicative tool. The Part-Time tutors were content to use the general university email system to communicate with students; none of the six staff used the file sharing facility or WebCT™ internal email system throughout the module.

At the end of the year, a brief feedback session was held where students were asked to comment on the course, with specific comments elicited on the pavilion project. Most student responses acknowledged the value of WebCT™ as a communication and file-sharing tool, but its actual use, as experienced in the pavilion studio, was limited. Thus although students were well aware of the benefits of the VLE and the technicalities of its use, less than half of the year cohort used it to its full capacity. For staff, the take up was even poorer. When questioned, most staff were not fully aware of the uses and benefits of VLEs such as WebCT™ and none of the tutors involved in studio teaching in the Pavilion in the Park Project worked within the WebCT™ environment. The reasons given at the feedback meeting at the end of the year were similar to those of the students.

Both students and staff felt in reviewing the project that although the benefits of WebCT™ were clearly comprehended the effort needed to use it made it not worth pursuing. For those [students in this case] who did use the programme, it was because it was worth the effort and an efficient means of both sharing information and communication to all members of the group.

2004/5 Analysis

The Second Project, Architecture Studio 2c called; Pavilion Exhibition Space, was significantly different from the first in that though still a 'live' scale 1:1 project, the design proposed was more interior in its function. The key learning objective was the development of group working, production and presentation skills by students. Each unit worked to produce a 1:1 constructed 'in-studio installation' of all, or part, of their displayed material from an earlier studio project; Architecture Studio 2b, the design of a small pavilion – with an exhibition space. There was however some similarity in the project's organisation; as before students had to work in unit groups and had a fixed time, straddling a vacation period, to develop their schemes and present it as part of their interim review.

In the studio, the WebCT™ component was introduced at the beginning of the Pavilion design project, which started with individual design proposals for a Pavilion, prior to the group development of the exhibition Display Space (see Appendix 2). This time, because students had already come into contact with WebCT™ in their First Year in connection with another course, there was no formal introduction to the software. Students and staff were thus simply informed that there had been a WebCT™ virtual space set up for the project that they could use for file sharing, communication and other purposes during this part of the Studio.

The use of the programme for the Exhibition Space project proved again to be limited. One unit used the communication component, WebCT™ mail, extensively as a co-ordination tool for their members, very successfully, especially over the Xmas vacation period. The other two units used WebCT™ only occasionally – for internal communication through the mail server. Staff use however was virtually nil; aside from the Year Convenor, who used the facility as both a message service to the year and individual groups, the file sharing facility as a dissemination space for ".dmg" files of the initial individual design site, and the student quiz facility, no other staff used WebCT™.

The review and WebCT™ use for this project took a different form from that of the previous year. A WebCT™ questionnaire was set up within the software's quiz facility. (transcripts of both student and staff interviews are included in Appendix 3). This was publicised to the entire studio, and students were encouraged to use it. About a third of the year responded to the questionnaire. Design tutors were informed about the questionnaire, but none chose to use it. Since there was no staff questionnaire response, a paper version questionnaire was printed out and given to staff to respond to and to fill in, this elicited an 80% response (see Appendix 3). These anonymous questionnaires for staff and students were supplemented by informal end of semester feedback sessions conducted by the Studio convenor.

The feedback gained from the different questioning modes was quite uniform. Students generally were aware of the benefits and possibilities that using the WebCT™ facility had to offer, but generally only used the programme selectively, despite the increased 'content' available to them. Only the students who had used it as an organisational tool over the Xmas vacation felt the facility was "worthwhile". Most of the third who responded did not feel it contributed much to their learning experience.

With staff there was, as in the year before, a reluctance to use the programme – this was prefaced this year by the fact that staff pointed out that they had not had a formal introduction to the programme, so the three new staff (out of six part time staff and two full-time staff) felt totally unaware of the programme's existence.

Analysis

The results discussed here derive from lessons learnt from the use of WebCT™ in the studio for two consecutive years for two similar projects. Essentially, in the case of the Year Two Architecture Studio at Strathclyde, the concept of virtual learning, via the WebCT™ tool has been introduced relatively smoothly into the studio culture at various levels. Its main functions within the studio environment have been conventional, as a communication and information resource tool. It is slowly being incorporated into studio life and teaching, but is yet to be used by the majority of students and has had poor take up thus far amongst staff. Possibly it is too soon judge how this might develop over the next few years, as the VLE studio is still in its early stages.

What is clear is that Virtual Learning is as time intensive to organise and run as that of traditional teaching methods. Furthermore the introduction of new technology has a slow take-up rate. Unlike architectural drafting programmes such as Autocad™ , which have a direct effect on drawing and design production, the value of using VLE in the studio are more long term and not immediately apparent.

From a student perspective, although Second Years seemed to be aware of WebCT™, the effort required to use it effectively was cited as the major barrier to its use. Students have to log in separately to WebCT™ from the University network system; the effort to do this makes it somewhat difficult for non-committed students to use. Thus despite having most of the course information and schedule on WebCT™, only a few students bothered to use the facility on a regular basis. The WebCT™ system itself also had the continuing problem of being unstable especially in its initial studio trial in 2003/4. Although it ran with less 'down time' in 2004/5 this was mentioned by students as a further deterrent to its use. Those who did use it though, found it particularly useful as a tool for collaborative learning, both at communication level, when students were far away from the University environment, (ie at their homes over the Xmas break), which produced positive results for the groups who used the system in both case study studios.

For staff, there were more 'real' barriers to its uptake; firstly the 'part-time status' of staff at the University of Strathclyde limits their access to computing and other resources. Despite the full introduction given to all staff in the 2003/4 session, it took considerable time to

administratively set up part-time studio staff with log in accounts and passwords. This was further exacerbated in the 2004/5 session by the non-dedicated launch of the project, which left the three new tutorial staff with no knowledge that the workings and use of WebCT™ within the studio environment was accessible to them. The problem with organising staff access and passwords continued through to 2004/5 and is likely to only be fully resolved when the University improves access to computer network facilities provided to part-time staff.

In discussion with staff it was clear that there was general indifference to WebCT™ use, as it did not make communication or teaching in studio easier. Staff primarily communicated with students using their office or home email to connect to student university email addresses. As a teaching tool, WebCT™ also had little to offer, staff generally were able to bring in material they intended to work with and felt that the VLE environment might act as a barrier or hindrance to 'one-to-one' communication and the physical presence that is valued in the tutorial system. It was clear therefore, that there was a critical need to introduce the concept of the VLE, its associated software, and most importantly its ultimate benefits in the studio to tutorial staff, working on design programmes in which it will be used.

Staff are unlikely to have had prior knowledge or use of these systems and can only properly engage with the WebCT™ environment with proper pre-training, support and discussion. This was unfortunately taken for-granted in the 2004/5 session and not well supported in the previous year. Thus Year Two Tutorial staff at Strathclyde were not totally resistant to WebCT™ use. They had limited awareness and access to the facility and subsequently reported an indifference to a system that had been poorly integrated (and in a few cases not at all integrated) into their studio teaching.

University teaching and online support for the use of VLE in the classroom, (or studio in this case) did exist, but only of a specific and generalist nature. The key issue that made studio tutors' work with WebCT™ difficult, was the difficulty of obtaining access to University electronic network services and the setting up of passwords. Also the scheduling of pre-studio training and access to support should have been better organised, although this depended on initial access to network electronic services by studio staff.

Although there was a small proportion of students who did make extensive use of WebCT™, on a collaborative basis, this did not feed into a whole year summative assessment process, due to only partial use of the WebCT™ learning environment by the Year Two Design Studio. This is an area that is hoped will be developed in future studios.

Conclusions

The use of VLEs in the studio at Strathclyde is in a transitional phase. There are a number of other courses within the Architecture school adopting the use of WebCT™ within their teaching structure, that also link with students' experience of its use in studio. There are still a number of teething problems that have to be sorted out; the stability of the system, and well-run staff introduction programmes to name a few. The University-chosen VLE, WebCT™, has multiple functions and interfaces, which make it a potentially powerful

teaching tool in a number of different ways, in the two years of its use in the studio we have only got to grips and explored its uses in the area of communications, file storage, and latterly student feedback. It is likely that as staff and students become more conversant with the programme it will be better integrated into studio and lend itself to more innovative uses.

From this case study, the key issues, which are highlighted as influencing the adoption and use of an effective VLE in the studio, are summarised in the bullet points that follow:

Pointers for successful VLE use in the undergraduate architecture studio

General

- VLE programmes are multi-faceted in their application and use in a design environment. This gives them definite relevance within a studio environment in various areas, including communications, data storage, and as an information interface.
- All current VLE programmes require an amount of mastery, pre-planning, and adaptation before they can be introduced and used successfully in the studio environment.
- Programmes are not perfect, neither are they always stable – there are likely to be 'down' periods, when the system or the hosting network freezes or is simply inaccessible.

Students

- Although most students are, or can become reasonably conversant with the concept and use of VLE programmes over the course of a design studio, they will not necessarily choose to use or work within the VLE environment. This is likely to be because its benefits are less direct than 3-d drawing and presentation programmes which can be immediately seen to enhance final design drawings. The benefits of group communication and accessible storage systems are less immediately apparent.
- The computer interface to the VLE environment should be direct and clear to students - if they are to use it frequently.
- To ensure student commitment to its use, studio projects should set specific tasks that require the use of the VLE environment to complete - if it is introduced as a useful option most students are likely to opt not to use it.
- A benefit of most VLEs, such as WebCT™ is that individual student use can be monitored, thus staff can decide on how to deal with students who decide not to use the system for assignments, feedback etc. Students can similarly use the medium to make direct contact with tutorial staff who are known to use the system over the duration of the studio. Also ultimately it is an

environment that will enable co-ordinated collaboration feed into an open, phased peer group assessment process.

Staff

- For studio projects that will involve a number of staff with varied access rights to university or other computing resources supporting the VLE system, it is imperative that these are resolved before the studio commences.
- All staff involved in VLE studio projects require pre-studio introductory sessions to ensure that they are aware of and understand the uses and potential of VLE in the studio.
- Staff involved with VLE use in the studio will also need access to adequate backup and support.
- It is imperative that there are properly set up and recorded staff feedback sessions to monitor the success or otherwise of VLE use from a teaching perspective. As the key facilitators to the design studio, the accurate understanding and subsequent co-option of staff views on VLE teaching are crucial to its success and integration into the studio environment.

About the author

Since this case study was written, Ola Uduku has let the University of Strathclyde and is now at the School of Architecture, Edinburgh College of Art.

APPENDIX 1 –

University of Strathclyde Year Two Architecture Studio (Feb-May 2004): Pavilion in Park Brief

Introduction

The entire pavilion project will be run on the WebCt communications network; coursework, comments, and discussions will all be accessible on the Webct server, the onus being on students and units to use this as the major mode of day to day communication in relation to the project. The initial two-week design phase of the project will run as an ordinary studio, in parallel with the *relocating resources live!* Project. Thereafter the project will be run mainly on Webct, but also through a bi-weekly meeting format in which groups from each unit will have working "site meetings" to give progress reports on elements of the project.

All design tutors, BTE2a, and M&C tutors will be acting as "consultants" and "advisors" on the pavilion project, and so can be consulted by appointment during the project. In the final phase of the project students will work with the parks and gardens staff of the university to clarify siting issues.

The Brief

Part One (weeks 1 – 3) Design:

Each student in weeks 1 and 2 is asked to develop ideas for and design a pavilion. Your design will be presented as a single poster.

dimensions: 1.8m x 1.8m x 2.4m

The pavilion will be located within the new Rottenrow Gardens. Its main function will be as a temporary publicity outlet for the University of Strathclyde during the summer months. It should also have the possibility of being used as a small café or drink vending outlet in the summer term or when the gardens are being used for open-air functions such as graduation day, plays and concerts.

As the chosen design will be constructed, it is important that the materials specified are:

- inexpensive,
- will do no permanent damage to the Rottenrow Gardens site
- easily transportable, and
- demountable.

Although this structure is temporary, it should provide shelter from the elements, and have a floor surface, raised above the external ground.

Associated Course Assignments:

Building Technology and the Environment 2a:

Produce a short report, (3 pages) describing through design graphics and writing, what systems and materials you have chosen to support your chosen design.

Media and Communications 2

In the Pavilion Project, each of you is asked to design a pavilion. Picking up on some of the work we did in M and C 1, you are to produce an **A2 poster** to present your design.

In addition you will be asked to make a wood model of your individual pavilion design at 1:7 scale..

Each unit will then decide on which pavilion design proposal that the unit wishes to develop and eventually construct in the Rottenrow Gardens.

Part Two: (weeks 3 – 11) Production

For this part of the project you are asked to work in groups, (3 –4 persons per group). You can choose who you want to work with from within your unit. There are a number of tasks that each group will have to choose. We suggest that if you feel experienced in an area you should choose tasks relating to this where possible.

Group One: Marketing

As this is a live project, each group should be able to market their project, both to the rest of the Department and also to the public. We also want this group to make contact with industry and appropriate funders who might help you with the funds needed to build the pavilion. This Group should work directly with the information Group to disseminate marketing material online and in other media.

Group Two: Procurement

This group will work directly with a member of the project advice team to buy and source the materials for your pavilion. The group will also work directly with the working drawings and details group to get accurate measurements and quantities needed for the materials.

Group Three: Working Drawings

This group will produce 1:50 drawings of the pavilion from which the procurement groups will be able to take quantities, and the details group will be able to identify areas which need further detailing.

Group Four: Information / Web Pages

This group will work on the unit's webct page, inserting a progress diary on a daily to weekly basis with illustrations and photographs recording the project. The group will also work with the marketing and feedback group to contribute to the bi-weekly "work-in-progress meetings".

Group Five: Detailing

The detailing group will work closely with the working drawings and procurement group to both provide necessary detailing and also alter the design where necessary to make the actual construction process more straightforward.

Group Six: Organisation / Project Management

This group is responsible for making sure each of the other groups work together to deliver the design required for the final phase of the project. They act as trouble-shooters and should be the front contributors able to give an overall view of the units progress at the bi-weekly progress meeting. This group also has direct responsibility of finding out from the parks and gardens staff, what restrictions and requirements they place on the construction of the pavilions and communicating this to the relevant groups.

Associated Assignments:

BTE2a

Each unit should produce one of these drawings:

Draw principal building sections of the construction system(s), (2 groups should tackle this)

Draw floor and roof framing plans, scale 1:50

Draw horizontal sections that illustrate the detail of load-bearing components at the corners, scale 1: 50

Draw vertical sections through the principal floor-wall and roof-wall intersections that illustrate the detail of load-bearing components, scale 1:50

Draw an axonometric view of the complete construction system for the park pavilion, minimum scale of 1:100. Remove floor and roof decks to reveal the underlying structure.

Design:

Each student should write a two-page essay describing his/her contribution to the group work done during this phase. Illustrations and diagrams should form part of the report.

Part Three Construction: (weeks 11- 12/13)

Each unit will work as a group to construct the pavilion using the drawings and information produced by the different groups. The pavilions and relevant publicity material for each group should be complete in time for the second year credit review.

All pavilions should be weatherproof enough to withstand being on display for the first week of the end of year show.

APPENDIX 2

Millennium Gardens Pavilion and Exhibition Space: University of Strathclyde Architecture Studio 2c (Dec 04-Jan 05)

The Millennium gardens have proved to be a successful central thorough fare for the University. The gardens are therefore a good setting for the siting and construction of a pavilion, where information about the University and current City events can be displayed. The pavilion would also have display space for the exhibiting of small displays of art work and other media pieces related to the University or to travelling exhibitions to the city. Your task is to design this small pavilion in the park, comprising exhibition space, including the necessary facilities for visitors and a staff member who would run the kiosk on a daily basis. Consider carefully its relationship to the existing Collins Gallery in the McCance Building, which we will use as a case study. The pavilion must also conform to the new disability access requirements and, where possible, use materials which have sustain able futures...

You have till the 14th December to complete this design. Each unit will then design an exhibition space for their studio area, this may relate to display spaces that have been created in your individual design projects. This designed exhibition area will provide display space for specific pieces of work produced during the first semester by different members of the unit. We will be using the WebCT environment to manage the joint working required for this and it is hoped you will use this to develop a web site/web log on line diary of this collaborative effort.

Pavilion Specific Programmatic Requirements

Small Counter area and office for one staff member:	$5m^2$
Exhibition area;	$10m^2$
Information area:	$4m^2$

(display and information area might adjoin each other, however information area must be able to work separately of exhibit ion area)

WC area	$4m^2$

(at least one WC must be disability accessible)

Total Area:	**$24m^2$**

You may want to add to this minimum specification a café, small seminar space, or other usable public area. This area should be for a maximum number of 20 adults.

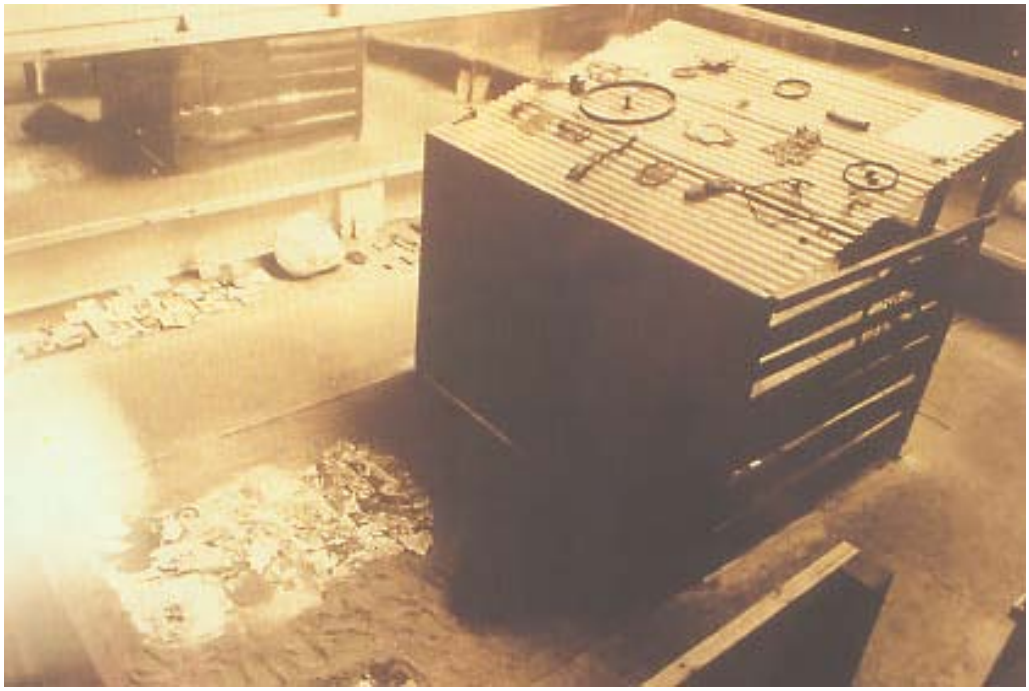

Figure 1 The Smithson's Pavilion project

Figure 2 University of Strathclyde Year 2 Architecture Studio, 2002/3 - Panel from "Pavilion in the Park" Project full scale model

APPENDIX 3

University of Strathclyde Year Two Studio 2c Student Questionnaire, April 2005

Questions: Using WebCt:

1.0 How often do you usually log on

Once a day

Two or three times a week

Occasionally - (once in a week or two)

Rarely - only when I am told to

2.0 What would make you use webct more often?

3.0 what other means do you use to communicate with other members of your unit, or year

text messaging

mobile phone calls

ordinary email

4.0 Does your unit use WebCt to communicate- or has it done so in the past

Yes No

4.a If it hasn't why? Short answer please

4.b If it has how did it work out ? Short answer please

5.0 Should we use more webct and virtual learning environments within the studio?

Yes No maybe

Why?

7.0 Do your tutors use webct in studio?

Which other web based resources do you use:

8.0 Library catalogue : frequently occasionally never

9.0 Digimap frequently occasionally never

10.0 Pegasus frequently occasionally never

Thanks for taking part in the questionnaire

What works/doesn't work about webct? Short answer please

WebCt Tutor Survey

1. Were you aware that webct was being used as an interface in the year?

Yes No

2. Is the idea of having an online virtual learning environment in the studio like WebCt a good one?

Why?

3. What mode of communication do you most use with your Unit, outside of tutorial days:

Mobile phone text messages, telephone email other (mention)

4. If you had more access to / were aware of Webct would you use it for any of the following:

- Sharing files (like maps and drawing files)
- Calendar (showing dates and deadlines for projects)
- Communication (webmail – like email and general messages)
- Other (you name this/these uses)

5. Please write any other comments you have about WebcT or virtual learning environments overleaf.

Thank you for completing the survey.