THE *QUANTI.COM* CHALLENGE TEACHING ONLINE-OFFLINE COURSES IN QUANTITATIVE DATA ANALYSIS TO *QUANTOPHOBIC* STUDENTS AND STAFF

Patsy A. Clarke
University of Natal
South Africa

In fulfilling their brief to build a digital university the Centre for IT in Higher Education (ITEd), presents academic modules in Digital Media to staff and students from technologically under-resourced backgrounds who have had limited opportunities for acquiring practical IT skills. In a core module on Research Data Analysis Theory and Tools, a component on Computer-based Quantitative Data Analysis develops competency in advanced software tools to assist implementation of research projects. A challenge of this course has been to build confidence in learners with limited statistical and quantitative backgrounds, who articulate anxiety and phobia about work of this nature. This paper reports on the design, implementation, assessment and outcomes of a predominantly Internet and web-based course that used the metaphor of a Big Bother/Survivor Challenge process to prepare largely 'quantophobic' post-graduate students and staff to conduct sound quantitative data analysis in research projects while reducing 'quantophobia' and building confidence. Initial results suggest that the use of the metaphor, together with other design features of the course, contributed to reduced 'quantophobia' and increased confidence with quantitative work.

INTRODUCTION

As part of the University of Natal's goal to transform into a digital university and develop academic policy related to online learning, the Centre for IT in Higher Education (ITEd) devised a modularised academic programme in Digital Media and Online Learning for staff and postgraduate students. This program has applied for registration in terms of the Skills Development Act and would support academic development, as well as provide opportunities for skills development and knowledge acquisition in the field of Information Technology including for those who previously had limited exposure to this field. In this respect ITEd was mindful of two recent laws. The Employment Equity Act of 1998, is intended to redress inequities in the work place for designated groups, namely black people, women and people with disabilities; the Skills Development Act of 1998 imposes levies on companies to fund skills development as well as providing rebates to those who fulfil employee skills development.

THE ITED PROGRAMME

Available to participants with a basic degree, the ITEd programme facilitates constructivist learning processes through the following core modules: Digital Media Development; Education and Information Technology; Research Data Analysis, Theory and Tools; and an Internship in Information Technology. In addition, elective modules are available through partnerships formed with other university departments. These courses can be pursued at Certificate, postgraduate Diploma, Honours and Masters level. All modules in the program are presented predominantly online with some face-to-face contact. Use of the proprietary software, *WebCT*, facilitates online classroom access. The 16 credit Research Data Analysis, Theory and Tools module includes the following unit standards which run over an intensive two weeks each: Computer-based quantitative data analysis; Computer-based qualitative data analysis; Reference management; and Digital data collection tools and methods. Reasons for presenting the courses online include the following:

- ITEd courses teach about online technology through use of online technology;
- To facilitate ongoing communication and interaction among course participants;
- To facilitate group work over a distance;
- To deliver online information and resources;
- For online submission of required course projects/activities;

- For the convenience afforded by asynchronous contact to participants in fulltime employment.

THE STUDENTS

During 2001 19 students enrolled for the unit standard *Computer-based Quantitative Data Analysis* in the first semester and seven more enrolled when the course was repeated in the second semester. The 26 students consisted of 20 females, six university staff members with a further four students also in full-time employment. Nine of the students were not registered with ITEd for Digital Media qualifications but enrolled as part of their postgraduate Sociology research methodology requirements. Four students were distance students. All but one student attended the two-day face-to-face contact time during which students received practical training in the software package for data analysis, *SPSS*. Students had variable, often limited, exposure to statistics or quantitative methods prior to enrolment for this course. The following are extracted from students' descriptions of their expectations at the start of the course:

"For me working with numbers has never been easy and I hate them".
"..those dreaded words of stats, maths, numbers, numbers numbers…."
"…my phobia for numbers and tables…"
"Analysing data and working with numbers gives me a headache".
"I have a block about quantitative methods as they are not of much use".
"When I think quantitative, ultimately I think difficult".

THE CLASSROOM METAPHOR

Table 1
Parallel Features of the Quanti.com Survivor Challenge' and the Course

Features of the Quanti.com challenge	Features of the course
Meet the criteria for selection.	Fulfil course pre-requisites e.g. academic prerequisites; access to online computer.
Meet the challenges and develop survival skills.	Make use of prior and current skills and learning; develop new skills and knowledge.
Meet both individual and group challenges.	Complete individual activities/projects and group work.
Adapt to the unfamiliar customs of the challenge environment.	Learn the terminology of the quantitative research paradigm; apply its procedures, methods and rules.
Collaborate with fellow challenge participants. Consult with *Big Sister*.	Use course resources, their own and other learners' good thinking and reflection, as well as guidance from the course facilitator.
Have access to *Big Sister* with camera surveillance.	Have online access to course facilitator. Students observe the facilitator on their desk-tops via the web cam.
Enjoy success; wrestle with challenges; persevere.	Succeed; fail; improve.
Keep a journal of the challenge experience.	Keep a learning journal.
Survive the challenge.	Achieve personal and course goals.
Enjoy and challenge, or not…	Enjoy the course, or not…

As the course presenter had experienced the motivating nature of metaphor as a learner, (Clarke, 1998) and later as an observer in a variety of online courses, a classroom metaphor was used as a device intended to inspire course participants with a new, creative and/or unexpected way to approach their own learning process and overcome *'quantophobia*', an expression adopted by current students from a project implemented by former students. In addition the use of metaphor was intended to stimulate student reflection and creative thinking as well as encourage students to focus more on the *process* of their learning rather than merely its products e.g. results and activity outcomes. The metaphor chosen was that of a mock online Big Brother /Survivor

Challenge based loosely on the TV programs as televised in South Africa during 2001. *Quanti.com* was the name given to the imaginary sponsors of the challenge. Table 1 illustrates a selection of comparative features between the survival challenge and the course.

OTHER FEATURES OF THE ONLINE CLASSROOM

The following resources were provided on the WebCT classroom interface:

- Classroom homepage with course and metaphor introduction, directions, list of challenges/activities and timeframe;
- Link to an online survey to be completed and that provided data for 'cleaning and screening'.
- Classroom discussion forum for introductions, questions, solutions, support, ongoing interaction and communication and peer review of selected work;
- Email for project submissions, one-to-one contact and one-to-group contact;
- Class chat for student use and group work;
- Participant list with photographs;
- Readings and links to online text-books on statistical and research methods, journal articles, conference papers, and other related resources.
- Glossary and a link to a dictionary;
- A growing FAQ in response to questions posed in the discussion forum; and
- A link to '*Big Sister'*, via ongoing capture of web cam images of the course facilitator working at her desk.

LEARNING ACTIVITIES /CHALLENGES

- Challenge 1: Keep an ongoing daily learning journal of the learning experience
- (To assist learners with this task as well as with self-evaluation of their learning process, one of the resources on the online classroom was Duffy's (1995), list of questions on different aspects of learning).
- Challenge 2: Submit a structured online introduction and personal metaphor of learning.
- Challenge 3: Complete a web-based survey. (This task was based on a survey used in the *SPSS Survival Manual* (Pallant, 2001).
- Challenge 4: Online readings, links and examples.
- Challenge 5: Attend a 2-day face-to-face 'Click-start to SPSS' practical training course.
- Challenge 6: Submit a short written paper based on the readings and resources.
- Challenge 7: Online peer review of papers.
- Challenge 8: Group project with online survey data preparation and cleaning.
- Challenge 9: Quantitative data analysis project. (This task used the available online dataset provided with the *SPSS Survival Manual* (Pallant, 2001).
- Challenge 10: Submit a portfolio and evaluation of learning and development.

In addition to the above challenges, extra *mini*-challenges were presented via the discussion forum to stimulate discussion and provoke students to reflect on their learning process.

COURSE ASSESSMENT

Student work was assessed in the following categories: Ongoing assessment of attitudes and behaviour in (online and face-to-face) class interaction; submitted paper and contributions to online peer evaluations of papers; contributions to on-line discussions; group project and process; individual data analysis project; submission of portfolio.

OUTCOMES

Despite the expressed *'quantophobia'* at the start of the course, students tackled the challenges of the quantitative data analysis exercises with energy and a fair amount of success. However, the final test will be how those students who design projects in the quantitative paradigm fare in their research projects this coming year. Both presentations of the course elicited favourable comments in the learning journals concerning the use of a challenge metaphor, the use

of the web cam, the contextualisation of tasks, the use of practical examples and the mix of practical and theoretical tasks. In addition the swing from the former negative attitudes was evident in the following extracts from the learning journals:

> "My life has changed because I can now do things I never thought I would be able to."
> "Despite my trepidation about statistics I have enjoyed this course."
> "I won't have to shy away from quantitative analysis in future."
> "I now understand how to approach this paradigm. It is the most interesting course I have ever done"
> " I found myself for the first time enjoying work with numbers."
> "This has been a wonderful experience. I had hated statistics, now I understand how to achieve results"
> "Now I know the importance of including a statistican in the planning stage".

In addition to this increased positive attitude to quantitative work, there were favourable comments about classroom features that reduced the experience of isolation. These included the group work, ongoing online discussions and interaction, as well as the web cam images of the course facilitator: "It makes me feel as if *Big Sister* is sitting right in front of my desk".

Difficulties referred to in journals included being overwhelmed by the quantity and depth of the online readings and resources; the excessive time demands of almost daily submissions requiring between four and six hours of work a day; and difficulties with expressing personal metaphors (though there was some success at illustrating them with graphics). The course facilitator observed that students had some difficulties with the writing up of statistical test results. (This has led to a growing FAQ with annotated examples of statistical test reporting). In addition the more chronologically mature students coped better with reflective exercises and processes than their younger counterparts.

DISCUSSION

The reduction in *'quantophobia',* as expressed by students in their learning journals, as well as their reference to factors that reduced feelings of possible isolation in online learning, has been taken as a measure of success in terms of the course design and implementation. In response to the difficulties observed and expressed, after the first presentation of the course a number of changes were introduced. These included subdividing the challenge activities into smaller chunks with sub goals to provide more structure and scaffolding. Readings and resources are now accompanied by sub-questions that assist the students in organising and structuring their reading. In addition more explanations of metaphor and metaphor examples are provided with the online resources.

REFERENCES

Clarke, P.A. (1998). *Telematic teaching of adults via the World Wide Web- a university case study*. Unpublished thesis. University of Pretoria. Available at: http://www.und.ac.za/users/clarke/thesis /index.html

Duffy, M. (1995). Sensemaking: A collaborative inquiry approach to "doing" learning. *The Qualitative Report*, *2*. Available at: http://www.nova.edu/ssss/QR/QR2-2/duffy.html

Pallant, J. (2001). *SPSS Survival Manual*. Allen & Unwin: Australia.