

CyberSurviver: Affective considerations of 'surviving' online learning

S. Meyer

University of Pretoria
Pretoria, South Africa
e-mail: Salome.Meyer@up.ac.za

J. C. Cronje

Faculty of Education
University of Pretoria
Pretoria, South Africa
e-mail: jcronje@up.ac.za

I. Eloff

University of Pretoria
Pretoria, South Africa
e-mail: Irma.eloff@up.ac.za

Abstract

This article concentrates on the role that affective learning plays in e-learning. Understandably, personal contact is minimal in online learning so the question arises: *How do students cope with the lack of personal contact?* The purpose of this study was to explore and interpret the participants' affective experiences in an online learning environment. The basis for the study was a master's course presented entirely online for a period of six weeks. The style of the internationally acclaimed reality television game show, *Survivor*[®], was used as a guiding format for developing the course. The game was played in cyberspace; and as the learning experiences of participants were based on surfing the Web, the game was called *CyberSurviver*. The nature of the interaction between the participants and their feelings throughout the game were monitored and recorded by reading their e-mails. Once the course was completed, two focus group interviews were held to discuss the feelings participants experienced during the course. The findings were then compared to Krathwohl's taxonomy of the affective domain. Kort and Reilly's model on the integration of affect served as an instrument to measure the affective responses and development of the participants throughout the course.

INTRODUCTION

The purpose of this study is to explore and interpret the affective experiences of students in an online learning environment and to discover categories of meaning with regard to emotion and its impact on learning (Marshall and Rossman 1999, 33). The study continues a tradition of reporting the findings of an on-going

development research (Reeves 2000) study into the functioning of virtual learning communities in the *SA Journal of Higher Education* (Cronje 1997; Cronje and Clarke; 1999; De Villiers and Cronje 2005; Rauscher and Cronje 2005).

Kort and Reilly (2002a; 2002b) illustrate how emotion sets influence and impact on the learning process of an individual (see Figure 1). Inadequate attention has been given to the affective domain in online learning. Lecturers focus their attention on cognitive processing and psychomotor functioning with little time set aside for exploring and clarifying learner feelings, emotions, and attitudes (Adkins 2004; Bastable 2003, 332; Lee, Zeleke and Meletiou-Mavrotheris 2004; Murray 2002). This may lead to students feeling extremely incompetent and cause a great deal of stress. One should consider cognition and emotion as two closely related, dynamic streams of experience that interact with each other and influence overt behaviour in subtle, complex ways (Cousin and Davidson s.a.) instead of seeing them as two separate entities. Affective learning is part of every type of educational experience, even though the primary focus of learning may be on either the psychomotor or cognitive domain. The study was aimed at discovering what the affective experiences of students in an online environment were. In order to discover what these affective experiences were, research objectives had to be set. The sort of questions we asked were: How did online students cope in the online learning environment? Why did online students ask for help? Why did online students offer help? What were the principal causes of motivation and frustration? And what made the students persevere with the course despite constant stress and the option to leave the course and thus, minimise their stress if they wanted to? These questions gave rise to the main question driving this article, which is: 'What categories of feelings are experienced by learners in a highly stressful online course?'

BACKGROUND

The basis for the study was a course that formed part of a two-year tutored master's degree in computer-assisted education. This course, with its focus on e-learning, was presented entirely online from 18 July to 29 August 2002. It is a course renowned for being one of the most stressful of its kind and is sure to elicit strong emotion from its participants. There are a number of factors that make this course relevant to this particular study. Firstly, it is a highly stressful endeavour and will stir many emotions within the students and therefore it served as a perfect model to observe the impact that affective behaviour has on learning. Secondly, it is presented entirely online and therefore allows one to examine the effect that the faceless nature of e-learning has on a student's ability to cope emotionally with the lack of personal contact an online learning environment offers.

Participants in the study were all adults who were combining part-time study with a full-time job. The course was presented in the style of the internationally acclaimed reality television game show, *Survivor*. The game was played in

cyberspace and the learning experiences of the participants were based on surfing the Web, therefore the game was called *CyberSurviver*. Students were divided into 'tribes' before the course commenced according to their level of computer and Web literacy. All the participants had different levels of proficiency. With the exception of the initial face-to-face introductory meeting and the final debriefing or 'tribal council' session, the entire course was presented over the Internet. The Web was used extensively as a communication tool; a virtual meeting-place, a venue for tests and assessment, a drop-off space for assignments and completed tasks, as well as a resource of information. Participants could also communicate synchronously by means of the Internet-based chat room *Yahoo! Messenger*. Some participants had a desktop computer at home, but others could access the Internet only from their places of work.

METHODOLOGY

Communication between the participants

The Web-based tools for communication: *Yahoo! Groups*; *Yahoo! Messenger*; *NetMeeting*; *WebCT*; and *Interwise* were selected in order to provide learners with a wide range of experiences regarding a variety of applications. During the first week of the course, a communication group in *Yahoo! Groups* called *E-learn* was established. This group served as the sole medium of communication until the second week, when other tools were introduced and integrated on a regular basis. It soon became clear that *Yahoo! Groups* was going to be the more formal medium of communication, particularly when a message was meant for the entire group. On the other hand, *Yahoo! Messenger* proved to be popular for interpersonal contact purposes, even across tribal boundaries. Communication was conducted predominately through the Web and through e-mail but the participants did, at times, augment their contact with the telephone.

Assignments

Instructions from the lecturer were posted on the Web on a weekly basis. These instructions included completion of certain individual and collaborative or tribal assignments. Learners had to collaborate and negotiate online for the tribal assignments using the Web-based mediums available to them. All assignments had to be submitted electronically. As with the television show *Survivor*, immunity and reward challenges were posted regularly. At the end of the week's activities, tribe members had to vote off a team member on the basis of pre-set criteria. Evicted members joined each other in a separate tribe. This separate tribe had to complete all the assignments as stipulated for the primary tribes but could no longer be in the running for the grand prize at the end of the course, the weekend away for one family.

The rationale behind 'voting off' someone from the tribe stems from the

problem many university students and lecturers face when completing and evaluating group work tasks: freeloading students. It is a fairly common dynamic in groups; some people do their share of work and more, and some people rely on others to do their work for them. It was thought that this could be avoided if everyone knows that their contribution is being scrutinised and their value in the team is constantly being re-evaluated with the very real chance that they could be 'voted off' and exposed for not pulling their weight in the team.

RESEARCH APPROACH

The approach to this contextual research was qualitative and interpretive. Participants were observed in the situation in which they expressed themselves and in which they gave meaning to what they had experienced. Qualitative research is, by definition, a research effort that seeks to understand peoples' motives, attitudes, feelings and thus by following this research approach we hoped to gain in-depth insights into the learning experiences of the students as well as their associated feelings towards the learning experience.

Research design

A case study was chosen as a design because it reflects *particularistic*, *descriptive* and *heuristic* characteristics (Creswell 1998, 172; Merriam 1998, 27). The context was bound, as the study investigated the experiences of a specific group of students during a specific online event (the *CyberSurviver* course).

Sampling

The specific group of participants were purposively sampled, as they would be *forced* to make meaning of their learning experiences (Cohen, Kahn and Steeves 2000, 50) and because they would inevitably be exposed to stressful situations, evoking emotion during their learning experiences. They were voluntary participants, as it was an optional course. Eight participants of the first as well as the second focus group interview were female. All participants were employed in an educational setting. For reasons of privacy pseudonyms are used in this article.

Data collection

The course started on 18 July 2002. During the six-week course, the first author observed the interactions between the participants by reading e-mails sent by the participants to each other and the lecturer. She only made contact with the participants after the course was completed. Fifteen out of the 24 participants completed the course that ended on 29 August 2002. Thirteen participants volunteered to participate in the first focus group interview and twelve participants

volunteered to participate in the second focus group discussion. Two optional focus group interviews were arranged for March 2003 with the intention of inviting participants to discuss the feelings that they experienced during their involvement in the online course.

Findings

The data were analysed by the first author and an independently contracted external focus group interviewer who was a skilled qualitative researcher. A second independent analyst verified the interpretation of the focus group transcriptions. The data were analysed by searching for themes in the text, clustering these specific themes and by creating categories to search for the meaning of the words that the participants used to communicate. This process was guided by employing the *hermeneutic cycle* – a metaphor that explains the process of inquiry (Cohen et al. 2000, 72–73).

Coding

To describe the data and to get some insight into it, themes or *meaning units* were identified by means of *in vivo* coding (Burns and Grove 1997, 534; Graneheim and Lundman 2004, 106; Holloway and Wheeler 2002, 239 and 240). The first level of coding included phrasing or paraphrasing the words of the participants so that themes could be identified. The second level of coding refined these themes to incorporate them into clusters. The third level of coding then further refined these themes by putting them into categories (Holloway and Wheeler 2002, 239 and 240). Three main categories were identified when the data were coded. They were: Category 1 – Curative factors; Category 2 – Process of development; and Category 3 – Inhibiting factors.

The first category – Curative factors

Three clusters of themes were put together to form the first category of meaning, namely *Curative Factors*. These clusters were *altruism versus individualism*, *communication*, and *internal drive or value system*. The themes of the three clusters are indicated in Table 1.

Table 1: Clusters and themes of category 1 – Curative Factors

Category 1	Clusters
Curative Factors	1. Altruism versus individualism 2. Communication 3. Internal drive (marks, volition) and value system

Some themes indicated either altruistic or individualistic behaviour; and the

behaviour of the participants was the result of feelings experienced, such as fear, trust, distrust, safety, insecurity, joy, and stress. Feelings of loneliness and isolation were experienced by a number of participants. Loneliness was described by a participant as a cause of increased levels of uncertainty and anxiety. Feelings of loneliness, anxiety and uncertainty were experienced particularly late at night, and these feelings, according to one of the participants, adversely affected the participant's expectation of reaching the outcomes of assignments. Participants were, however, of the opinion that e-mail was a 'lifeless' communication medium, as they sometimes had to wait for a reply. This situation was especially troublesome when they had a problem and requested assistance from their peers.

Participants constantly experienced both positive and negative emotions. These feelings could, however, not be described as ambivalence. By using *emoticons* – punctuation marks identifying emotions, such as :-) to indicate happiness and :(to indicate sadness – to transfer their feelings, participants could compensate for the lack of personal contact. The use of *emoticons* in *Yahoo! Messenger* assisted them in expressing themselves whilst they were communicating without seeing each other. Not all participants, however, believed that e-mail with *emoticons* was a suitable medium for expressing emotion. They felt that e-mail only allowed for the use of *emoticons* and words and thus inhibited spontaneous reactions. E-mailing was thus viewed as indirect and clinical. Despite this objection, many of the participants used *emoticons* to express emotion anyway. It seemed that they not only succeeded in transferring emotion but also found it a fun thing to do. Sharing emotions (positive and negative) bound the participants together as a group. A feeling of closeness developed between tribe members. This bond was so strong at some stage that one of the participants felt it would be wrong to get rid of a person by voting her/him out because they had 'come a long way together'.

Feeling scared of being *exposed* also related to the self-image/image of participants. Some felt they had an image to uphold and should not be caught using English grammar incorrectly, as they were Master's students. One participant admitted to typing her e-mail message in MSWord, spell checking it and then pasting it onto the e-mail composer. Participants were initially concerned about their image as Master's (M.Ed.) students, their ability to express themselves in English, as well as the possibility of losing face, but as time went by and pressure increased with regard to deadlines and assignments, surviving the *CyberSurviver* course became the priority. The manner in which some participants attempted to cope with their situation by employing humour was interesting. Camilla sent the following e-mail to inform the lecturer of her effort with regard to an assignment:

Here is my best effort. Three barriers prevented a higher score.

1. Poor eye-hand coordination. (a little bit to do, also, with growing up in the precyber-era) [sic]
2. Inadequate breeding programme. (I don't have a child who can help me:-)

3. Environmental factors. (None of the children in my school can improve on my score:-)
Camilla

The second category – Process of affective development

Three clusters of themes were put together to form the second category of meaning, which we will call the Process of Affective Development. These clusters were the initial phase, second phase and third phase. The themes of the three clusters are indicated in Table 2. During this initial phase, participants acknowledged their inability and lack of knowledge. They felt insecure, because they did not know the level of their peers' knowledge and skills. This made them feel extremely vulnerable, and they believed that their lack of competence caused aggravation and feelings of being exposed. The following quote from one of the students is evidence of this:

You sit there, totally naked and struggle. You do not know what the others knew [sic], and you know too little, but you do not know if they also know as little or less or more than you know.

The intense requirements of the course led to participants struggling on their own at first. After having feelings of chaos and not trusting their own abilities at the beginning of the course, the participants started to develop feelings of competence. During the second phase, participants started to take charge of their situation. Participants also exhibited their acceptance of their inabilities and abilities, by means of self-talk and personal motivation. They took active responsibility for their situations and they were able to motivate themselves through cognitive self-talk. They exhibited further development with regard to their experiences of the *CyberSurviver* course regardless of extreme tiredness and lack of sleep. During the third phase it appeared that participants made cognitive decisions with regard to their efforts and attempts to complete the course. Participants who eventually completed the course saw themselves as tenacious, even though some considered dropping out of the course in the beginning.

● Assessment according to Krathwohl's Taxonomy

Krathwohl's Taxonomy for Affective Learning was used to evaluate the students' development specifically because their feelings were being investigated. The five levels of the taxonomy, organised according to commitment and described in terms of increasing levels of complexity regarding attitudes and emotional responses, are: receiving, responding, valuing, organising and internalisation (Huitt 2001; Van der Horst and McDonald 2001, 39–40). Quotes from e-mail messages, focus group interviews' transcripts and chat room discussions on *Yahoo! Messenger* provided evidence that participants progressed through the different levels. The participants'

attainment of at least the first three levels of Krathwohl’s Taxonomy was easy to identify by reading through the e-mail messages that were sent during the six weeks that the *CyberSurviver* course was active. The further and higher affective development of participants, namely to levels four and five of the taxonomy, were more evident in the transcripts of the focus group interviews.

Table 2: Clusters and themes in category 2 – Process of Affective Development

Category 1	Clusters
<p style="text-align: center;">Process of Affective Development</p>	<p>1. Initial phase Frustration due to insecurity and fear of the unknown</p> <p>2. Second phase</p> <ol style="list-style-type: none"> 1. Uneasiness and dynamics (neg. & pos.) with working in a team (grouping was done without keeping in mind skills, background, leadership) etc. 2. Uneasiness, guilt feelings, rage concerning the process of voting people off the team 3. Life style changing efforts to cope by involving body, mind and spirit <p>3. Third phase</p> <ol style="list-style-type: none"> 1. Sense of achievement 2. Development and cohesion 3. Staying 4. Giving and receiving support

Comparing the three phases as shown in Table 2 to Krathwohl’s taxonomy indicated how students progressed along the affective domain as the course went along: Initial phase (responding to requirements); the second phase (valuing, commitment and organising); and the third phase (internalisation).

● **Model of a learning cycle, which integrates affect**

The affective development of the participants were further compared to Kort and Reilly’s (2002a, 60) model of a learning cycle that indicates the integration of affect into the learning cycle. They suggest six possible emotion continuums that may be experienced by students in the course of the learning (see Figure 1).

In Figures 2 and 3, Kort and Reilly (2002a; 2002b) show how the emotion continuums (axes) are interwoven with the cognitive dynamics of the learning process. From Figure 2 it is clear that the more pleasurable emotions lie to the right of the vertical axis (the learning axis) and the more unpleasant emotions lie to the left of the vertical axis. The vertical axis indicates the upward construction of knowledge, and the misconceptions are discarded downward.

As can be seen in Figure 2, students would start in Quadrant I, as they may be curious or fascinated about something. They may even be puzzled and become

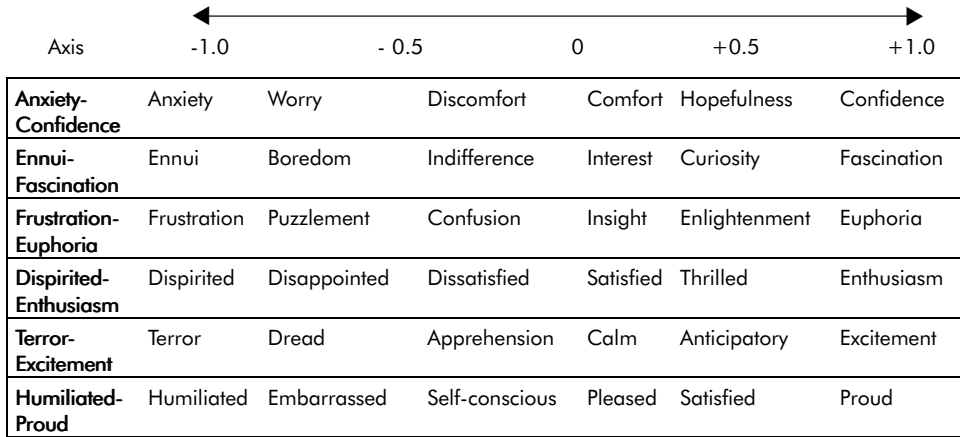


Figure 1: Emotion sets possibly relevant to learning (Kort and Reilly 2002a, 60; 2002b, 8)

motivated to reduce confusion (Quadrant II). In both instances they will be in the top half of the sphere if their focus is on constructing knowledge. As learning takes place movement will take place, for example, when a student discovers how to solve a problem. If a student fails to solve the problem and recognises that some part needs to be reconsidered, the student may move down into the lower half of the diagram (Quadrant III) and at the same time discard misconceptions and unproductive ideas. As the student consolidates the knowledge gained and experiences a sense of making progress, advancement to Quadrant IV takes place. When the student experiences new problems that need to be solved and ideas to solve them develop, the student may find himself back in Quadrant I. Kort and Reilly (2002a, 60) state that ‘a typical learning experience evolves a range of emotions, cycling the student around the four quadrant cognitive-emotive space as they learn’. This leads to the explanation of Figure 3.

A third axis, not visible in the two-dimensional figure, can be imagined as extending out of the plane of the page. This is called the cumulative knowledge axis. This third dimension allows for the creation of a spiral, which will allow the movement between the Quadrants as an orbit. Kort and Reilly (2002a, 61) said: ‘Emotional mood decays over time either from boredom or disappointment’. With this in mind, they explained the spiral movement as follows:

Quadrant I – High anticipation and expectation are experienced as the students build ideas and concepts and try them out.

Quadrant II – Negative emotions develop, and progress decreases as the construction of ideas wanes.

Quadrant III – Students discard unworkable ideas and the negative emotions run their course.

Quadrant IV – Students become hopeful and positive again.

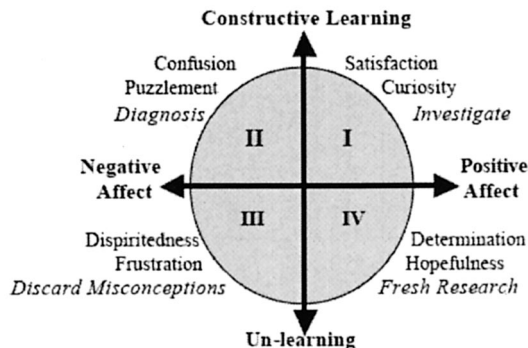


Figure 2: Four-Quadrant model, relating phases of learning to emotions (Kort and Reilly 2002a, 60; 2002b, 8)

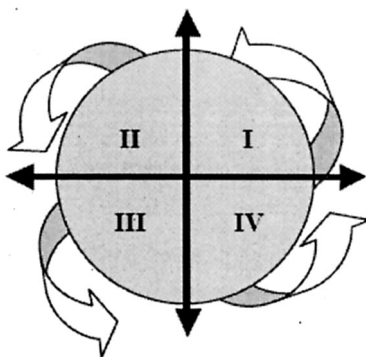


Figure 3: Circular and helical flow of emotion in Four Quadrant model (Kort and Reilly 2002a, 61; 2002b, 10)

The *CyberSurviver* participants experienced ten of the twelve emotions lying on the emotions continuum in Figure 1 between -1.0 and -0.5 during the initial phase of their affective development. The one emotion that was experienced by the participants to a very limited extent was *disappointment*, which was proved by the presence of one quote only indicating the experience of such an emotion. It may be assumed that the participants experienced the *CyberSurviver* course as interesting and stimulating right from the start, as not one quote could be found indicating ennui or boredom. Participants experienced eleven of the twelve emotions (during the second phase) lying on the emotions continuum in Figure 1 between -0.5 and $+0.5$. The one emotion not experienced by participants at all was *indifference*. This indicates that the participants were very much concerned with the content and requirements of the course, as well as their performance in the game. During the third phase, participants experienced all twelve emotions lying on the emotions continuum in Figure 1 between $+0.5$ and $+1.0$. The *CyberSurviver* participants had come full circle and developed to such an extent that they experienced nearly all

the emotions on all six continuums of Kort and Reilly's model. Although the emotions on the continuums of Figure 1 were paired, Kort and Reilly (2002a; 2002b) do not describe the emotions as having distinct points of moving from level to level. As with the comparison with Krathwohl's Taxonomy, the affective development of the participants of this study compared well with Kort and Reilly's model.

The third category

The third category of meaning was called *Inhibiting Factors*, and contained nine clusters. These clusters were *giving up/being voted out; lack of preparation of students; lack of technological support and knowledge, troublesome group selection, language, overload, high financial costs; and problems with the telecommunications service provider*. These factors identified by the participants undoubtedly affected their emotions/feelings/experiences with regard to *Cyber-Surviver*. This category addresses the intensity of the volition of the participants who stayed and completed the course regardless of experiencing many inhibitors. Participants felt that there was a definite gap in their knowledge and skill levels at the onset of the course. This led to frustration and even caused some people to quit the course. It is clear that the participants experienced frustration due to technical problems and a lack of technical know-how. These problems were aggravated by the use of unfamiliar software.

The selection of group members, the chaotic manner in which groups were formed, the lack of participation, the voting system and the predictability of possible winners, were perceived as inhibiting factors. A low proficiency in English was evident in the poorly constructed quotes obtained from the focus group interviews, e-mail messages and messages posted on *Yahoo! Messenger*. This may have been due to the pressure associated with time. The inability to communicate well in English inhibited free participation in electronic discussions and resulted in a lower level of academic discourse.

Time constraints were aggravated by the fact that the participants had to do many activities for the first time, and that they had to figure many technicalities and procedures out on their own. The direct and indirect financial impact on the participants led to many discussions among the participants. It caused strong negative feelings and influenced the relationships the participants had with family members. The added time spent online as a result of poor technical skills and a lack of knowledge increased the financial expenses of the participants. Because they were not sufficiently informed with regard to the additional financial requirements for the course, such as fees for telephone and Internet access, the participants were caught unawares and could not plan sufficiently for these expenses. Problems experienced with regard to the service provider were probably the one aspect of their experiences and exposure that the participants had no control over.

CONCLUSION AND RECOMMENDATIONS

The purpose of this study was thus to explore and interpret the participants' affective experiences in an online learning environment and to discover important categories of meaning about their affective experiences (Marshall and Rossman 1999, 33). The participants achieved success because they had the desire to succeed. Personal characteristics such as determination and perseverance also led to success. All these aspects relate to inner drive, self-image and self-motivation. Participants noted that it was not worth quitting after working so hard and achieving so much. They thus decided to remain on the course due to their positive affective experiences, and despite their negative affective experiences.

By reading through the statements made by the participants, it was realised that if online students were provided with an opportunity to verbalise the learning and personal difficulties they experience during an online course, and they know their opinions are considered, it would make the online experience affectively less frightening and overwhelming. It is therefore important that lecturers should consider the online student as a holistic human being, and plan for online learning events and student-lecturer interaction, to accommodate the holistic nature of the student. As research on affective factors in online learning proved to be limited, it is believed that the structured identification of categories of the experiences of the participants presented in this study may serve as initiators for other studies of this nature. It may even be possible to develop a type of taxonomy for the affective experiences of online learners.

The description of altruistic and individualistic behaviour patterns based on affective experiences, is unique, and may be of value for lecturers who plan collaborative online courses. The description of these aspects, as well as the aspects with regard to communication and internal drive (and value system), promotes the view of how complex and intense the affective experiences and coping mechanisms of online students are. It was evident that online learners will engage in risk-taking behaviour to ensure that they are successful and perceived as being successful. It could be inferred that participation in *CyberSurviver* had both positive and negative consequences and results. On the one hand, participants experienced learning as 'painful', as the competition aspect of the course elicited emotions that could be described as 'sparks'. Positive experiences that were mentioned included interaction, interdependence, communication, support, a feeling of belonging, and teamwork came to the fore.

The complex nature of online learning experiences is also evident in the explanations as to why online students would ask for help, which was one of the questions leading to this study. Online students can experience feelings of desperation at the same time that they experience high volition, which propels them to suppress their feelings of fear and embarrassment at their incompetence, and ask for help. At the same time, other students experience positive feelings because they know how to approach the assignments they have to do. It is

recommended that online lecturers encourage online students to express their feelings, to the group or to the lecturer, by ensuring them that they will be supported and not ridiculed. The students who participated in the *CyberSurviver* game indicated that their personal image, portrayed to family and peers, was important to them. Lecturers should appreciate the concern that adult learners have with maintaining a good image. Lecturers who want to do research on the affective experiences of online students may consider using Kort and Reilly's learning cycle model to assess students' emotions (Kort and Reilly 2002a; 2002b) since it served an insightful purpose in this study. No online learning study was found where a comparison of the affective development of participants was done according to Krathwohl's Taxonomy or where Kort and Reilly's (2002a; 2002b) learning cycle model was applied. It can therefore be assumed that this is a unique feature of this study. Other researchers may want to employ the model as part of their research or take it into consideration when planning and facilitating online learning. It would also be useful to investigate the correlation between the development of the cognitive, technological (psychomotor) and affective domains, and not only the cognitive and technological domains.

REFERENCES

- Adkins, S. S. 2004. Beneath the tip of the iceberg: Technology plumbs the affective learning domain, *T+D Magazine*. Available at: <http://www.learningcircuits.org/2004/feb2004/adkins.htm>. Accessed on 9 July 2004.
- Bastable, S. B. 2003. *Nurse as educator: Principles of teaching and learning for nursing practice*. 2nd Edition. Mississauga, Ontario, Jones and Bartlet.
- Brink, H. I. 1996. *Fundamentals of research methodology for health professionals*. Cape Town, Juta.
- Burns, N. and S. K. Grove. 1997. *The practice of nursing research: Conduct, critique and utilization*. 3rd Edition. Philadelphia, USA, WB Saunders.
- Cohen, M. Z., D. L. Kahn and R. H. Steeves. 2000. *Hermeneutic phenomenological research: A practical guide for nurse researchers*. California, USA, Sage.
- Cousin, G. and Q. Davidson. s.a. *The affective domain and IT teaching*. Available at: <http://www.coventry.ac.uk/ched/research/casestudies/gcadpub1.htm>. Accessed on 16 April 2003.
- Creswell, J. W. 1998. *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, California, USA, Sage.
- Cronje, J. C. 1997. Interactive Internet: Using the Internet to facilitate cooperative distance learning. *South African Journal of Higher Education* 11 (2): 149–156.
- Cronje, J. C. and P. A. Clarke. 1999. Teaching 'Teaching on the Internet' on the Internet. *South African Journal of Higher Education* 13 (1): 213–226.
- De Villiers, M. R. and J. C. Cronje. 2005. Six learning theory perspectives in a Web-based learning environment. *South African Journal of Higher Education* 19 (3): 444–466.
- Graneheim, U. H. and B. Lundman. 2004. Qualitative content analysis in nursing research: Concepts, procedures, and measures to achieve trustworthiness. *Nurse Education Today* 24:105–112.
- Holloway, I. and S. Wheeler. 2002. *Qualitative research in nursing*. 2nd Edition. Oxford, UK, Blackwell.
- Huitt, W. 2001. Krathwohl et al.'s taxonomy of the affective domain. *Educational*

- Psychology Interactive: Taxonomy of the Affective Domain*. Valdosta, GA, Valdosta State University. Available: at <http://chiron.valdosta.edu/whuitt/col/affsys/affdom.html>. Accessed on 22 February 2003.
- Kort, B. and R. Reilly. 2002a. Theories for deep change in affect-sensitive cognitive machines: A constructivist model. *Educational Technology and Society* 5 (4): 56–63.
- . 2002b. *Analytical models of emotions, learning and relationships: Toward an affect-sensitive cognitive machine*. Massachusetts Institute of Technology Media Laboratory. Available at: <http://vismod.media.mit.edu/tech-reports/TR-548.pdf>. Accessed on 5 September 2004.
- Lee, C., A. Zeleke and M. Meletiou-Mavrotheris. 2004. *A study of affective and metacognitive factors for learning statistics and implications for developing an active learning environment*. Available at: <http://www.cst.cmich.edu/users/lee1c/carllee/papers/Study-of-Affective-factors-04.pdf>. Accessed on 9 July 2004.
- Marshall, C. and S. B. Rossman. 1999. *Designing qualitative research*. 3rd Edition. London, Sage.
- Merriam, S. B. 1998. *Qualitative research and case study applications in education*. San Francisco, Jossey-Bass.
- Murray, J. 2002. *The affective domain: A philosophical methodological community*. Available at: http://www.morrismurray.net/affective_domain_essay.htm. Accessed on 26 March 2002.
- Rauscher, W. and J. C. Cronje. 2005. Online with Krathwohl: Affective aspects of learning in an online environment. *South African Journal of Higher Education* 19 (3): 512–526.
- Reeves, T. C. 2000. Socially responsible educational technology research. *Educational Technology* 40 (6): 19–28.
- Smith, R. S. 2002. *Learning in virtual teams: A summary of current literature*. Available at: <http://www.msu.edu/~smithre9/Project12.htm>. Accessed on 27 August 2003.
- Van der Horst, H. and R. McDonald. 2001. *Outcomes-based education: Theory and practice*. 2nd Edition. Pretoria.
- Van Ryneveld, L. 2004. *Games en rules*. E-mail to S. Meyer. Accessed on 3 October 2004.