Chapter 3

RESEARCH METHODS

3.1. INTRODUCTION

Chapter 2 provided a review of literature in five areas related to the present study, including: the evolution of distance education; the impact of technology on distance education; the transnational education model; requirements of computing education at a distance; and, distance education effectiveness. This review of literature provided guidance in the development of this investigation. This chapter goes on to discuss the approach used to develop and validate the multidimensional model for transnational education programs; it describes the research design, the population and sample, instrumentation, data collection, and data analyses that were used in the study. Section 3.2 describes methods used in the development and validation of the multidimensional model. Section 3.3 provides a description of data sources used for validation. Section 3.4 describes the means by which the data was collected. Section 3.5 discusses ethical considerations associated with data collection, and Section 3.6 describes the methods used for the analysis of data.

3.2. RESEARCH PROCEDURES

This research study had multiple goals: first, to identify from literature success attributes of distance education programs; second, based on the identified attributes, to develop a model for successful distance education programs (with emphasis on transnational programs); and third, to validate the model against selected transnational programs. This section describes the methods used in the development and validation of the model.

3.2.1. Development of the multidimensional model

This research study set out to develop a conceptual model for effective transnational education programs: a model that would help to determine why a particular program is effective. To this end, it was important to identify the specific attributes that optimise the effectiveness of distance education programs including transnational programs.

Literature suggested attributes contributing to the quality and effectiveness of distance education programs. However, a great majority of the literature sources related to online distance education programs and students, other types of technology-based programs, and traditional correspondence programs. This study needed to identify attributes applicable to transnational programs: programs that are supported by technology, but include a substantial face-to-face component. Consequently, the review of literature was a two-step process: first, general attributes contributing to the effectiveness of distance education programs were identified; and second, these attributes were assessed in terms of their relevance to transnational programs – only the applicable attributes were selected for consideration in the model. As a result, a final set of attributes was determined. The attributes related to various aspects of the transnational education context including: learners, instructors, program design, technology, evaluation and assessment, and organisational support. Next, in accordance with the bottom-up approach for model development adopted in this study, these attributes were grouped into broader categories – dimensions – describing distinctive aspects of transnational education programs. This collection of dimensions formed a model of effective transnational programs. Details of the model are presented in Chapter 4.

3.2.2. Validation of the model

Following its development, the model was applied to three transnational computing programs for validation; the validation aimed to determine how the

multiple dimensions of the model were apparent in those programs, and if some of the individual characteristics within each dimension were more important to students than others.

This research study employed both qualitative and quantitative methods of evaluation. The qualitative method of evaluation was chosen to complement the quantitative method. Quantitative methods alone often tend to focus on parts of the whole, leading to the investigation of potentially isolated, out-of-context, and unrelated parts (Patton, 1987). On the other hand, qualitative methods focus on providing description and understanding of an entire program or selected aspects of it as a whole (Firestone, 1987). This feature of qualitative evaluation was important to this study as it aimed to identify how success attributes manifest themselves in an entire transnational program. In order to determine the influence of various program attributes, data was collected from participating students through quantitative surveys and qualitative group interviews.

Quantitative surveys were conducted with participants to attain representative answers; these surveys were conducted via questionnaires with closed questions, and the data was then analysed to give statistically significant results. The questionnaires were used to allow participants to note which elements of the learning experience contributed to, or limited, their satisfaction with the program; they were also used to measure the perceived importance of program attributes with respect to program effectiveness. The collected information allowed in-depth examination of the content, structure and process of the evaluated programs (Chute et al., 1999; Wisher & Curnow, 1998).

A self-completion questionnaire was chosen as the most suitable format of the survey instrument for this study because first, it is an effective research tool for small scale studies; second, it enabled the collection of data in a relatively quick and inexpensive manner; and third, *because the knowledge needed is controlled by the questions, therefore it affords a good deal of precision and clarity* (McDonough & McDonough, 1997, p. 171). In addition, data collected through

questionnaires was likely to be more *uniform* and *accurate* than that obtained by other methods as respondents completed the questionnaires under the condition of anonymity and therefore provided more honest replies (Seliger & Shohamy, 2000, p. 172).

In addition to surveys, qualitative group interviews with a smaller number of students were used as a further mechanism to discuss factors perceived as critical to the effectiveness of distance education programs; they were also used to seek elaboration on issues that arose from survey responses. According to Chute et al. (1999), qualitative research enables the exploration of a specific object as deeply as possible. Therefore, the number of participants is smaller and interviews are less formally structured. The interviews typically involve open-ended questions resulting in 'rich' data, which requires more analysis and input by the researchers. Although group interviews are more time-consuming than questionnaires, they provide an opportunity to interact with the students and clarify issues (Chute et al., 1999).

3.3. DATA SOURCES

Three transnational computing programs were selected to validate the multidimensional model for effective transnational computing education. All three programs were delivered offshore in Hong Kong by Australian universities in co-operation with Hong Kong partner institutions. It must be noted that to protect the anonymity and the privacy of Australian universities and their transnational partners, as well as participants of group interviews, no specific information is provided in this thesis regarding the location, or name of individuals or institutions.

The transnational computing programs selected for evaluation included: Program 1, Bachelor of Business (Computer Systems Support) degree – BBCS, offered by Australian university, University A, together with a Hong Kong partner institution, Partner A. The program commenced in 1997, and has produced over a

hundred graduates to date; Program 2, Bachelor of Computer Science degree –
BCO, also offered by University A, but with a different Hong Kong partner,
Partner B. This program has operated since 1992 and has graduated over two
thousand students; and, Program 3, Bachelor of Information Technology degree –
BIT, offered by a different university, University B, in cooperation with the same
Hong Kong partner as Program 2 (Partner B). Program 3 commenced in 1999 and
has graduated nearly four hundred students to date. Table 3.3 depicts the
affiliation of the selected programs with their respective universities and Hong
Kong partners.

Table 3.3. Affiliation of the evaluated programs.

Program ID	Program Type	Australian University	Hong Kong Partner
Program 1	Bachelor of Business (Computer Systems Support)	A	A
Program 2	Bachelor of Computer Science	A	B
Program 3	Bachelor of Information Technology	B	B

The programs operated in part-time mode for students who had previous approved
tertiary qualifications. Students were normally in full-time employment, and
usually studied six subjects per year – two subjects per term. In each of the
programs, lecturers from Australia were responsible for the design of curriculum,
detailed teaching plans, continuous and final assessment, as well as face-to-face
delivery of twenty five percent of the program. Part-time local lecturers taught the
remaining part of the program. All programs relied on the Internet for
communication and provision of study material, e.g. subject Web sites, bulletin
boards, and email. Students met with lecturers and fellow students through face-
to-face sessions, and benefited from Web based support between sessions.

3.4. DATA COLLECTION INSTRUMENTS AND STRATEGIES

Data collection for the study included a survey and group interviews with
students. Since surveys are considered the core methodology for gaining data on

individuals' opinions or preferences, a survey was selected as a suitable data collection instrument for this study; the survey included both quantitative and qualitative components. In addition to the survey, group interviews with students were held to further discuss factors perceived as critical to the effectiveness of distance education programs and clarify questions that arose from survey responses.

3.4.1. Survey

The purpose of the survey evaluation was twofold: to determine which aspects of multiple dimensions of transnational programs were perceived by students as most important to the effectiveness of such programs; and, to assess the extent of students' satisfaction with the various dimensions of their current programs.

3.4.1.1. Survey design

In accordance with its dual purpose, the survey (Appendix A) included two main sections; section B, developed by the researcher, was based on the dimensions and characteristics of the multidimensional model and designed to determine the perceived importance of the various characteristics to program effectiveness; and, section A, adapted from a published survey (Biner, 1993), was used to measure students' satisfaction with their current programs.

Section B of the survey was composed of ten tables representing the dimensions of the developed model; each dimension included a list of characteristics (in no particular order). In each of the dimensions, students were asked to select only three characteristics that, in their opinion, contributed to program effectiveness, and rank the selected characteristics in order of importance. This section also included further descriptive questions aimed at establishing the effectiveness of the transnational program model (that is, one inclusive of a face-to-face component), and determining student preferences regarding possible fully online provision of such programs.

Section A of the survey was designed to measure students' satisfaction with their current programs. An extensive search was conducted to locate a published survey. For research in the academic environment, a majority of the scholars used the Likert scale Teleconference Evaluation Questionnaire (TEQ) developed by Paul Biner (1993). The TEQ, which was specifically developed for measuring student satisfaction in a classroom using interactive teleconference video, was tested by Biner (1993), and found to be very reliable. Consequently, the TEQ was selected and adapted for the purpose of this study.

The modifications to the original TEQ were twofold: first, questions pertaining to the teleconference characteristics of the program were eliminated from the questionnaire; and second, additional questions pertaining to transnational programs were included. It should be noted that modified versions of the TEQ have been used in other studies; for instance, Galante (1997) adapted the TEQ to measure satisfaction levels of students in a traditional program; similarly, Ricketts, Irani, & Jones (2003) modified the TEQ for traditional on-campus students by removing specific questions pertaining to distance education.

3.4.1.2. Pilot test

The initial form of the survey was administered to a group of students (N=12) in Program 2. Students were asked to respond to survey items and also comment regarding the survey's readability and ambiguity, if any. All twelve students completed the survey and responded with comments.

After the pilot test, minor wording changes were made to clarify directions regarding completion of the survey and reduce the ambiguity of one item; item 12 in Section B was changed from "Is this type of course worthwhile? Why?" to "Is this type of course (offered by an offshore university) worthwhile? Why?"

The pilot study served two purposes: (1) to test the layout of the instrument, and (2) to utilise transnational students to obtain feedback on item clarity. The pilot study was important because it confirmed the ease of following the survey instructions, and the clarity of survey items. In addition, the pilot survey provided information regarding the approximate length of time students would need to complete the survey.

3.4.1.3. Survey – data collection

All students invited to participate in the survey were in the final year of their degree programs. The choice of final year participants was based on the need for the participants to have experienced all aspects of a transnational program.

Students were asked during one of their lectures by a non-lecturer to complete the questionnaire, which was handed to them with a plain return envelope; a cover sheet including information about the survey was provided as part of the questionnaire (Appendix B). The students were asked to either complete the questionnaire during the lecture, or take it away and return it later to a drop-in box provided in a convenient location; the survey took approximately twenty minutes to complete; and, participation in completing the survey was voluntary and anonymous.

The survey was administered to approximately three hundred students in the selected programs in July and August 2003. Two-hundred-and-fifty-nine useable completed surveys were returned (86% response rate). The breakdown of useable survey numbers across the programs is presented in Table 3.4.1.3.

Table 3.4.1.3. Useable survey numbers in the evaluated programs.

Program ID	Australian University	Hong Kong Partner	Number of surveys
Program 1	A	A	53
Program 2	A	B	161
Program 3	B	B	45

3.4.2. Group interviews with students

Following a preliminary analysis of survey data, group interviews were held with students from each of the three participating programs. Questions asked were designed to clarify and deepen the researcher's understanding of the program characteristics that students perceived as critical to program effectiveness. The sequence of data collection (analysis of survey results followed by interviews) provided an opportunity for the researcher to determine if issues arose from the surveys that needed to be clarified or further discussed.

The analysis of survey results revealed that there were differences in students' responses based on the particular program in which they were enrolled. Hence, one of the questions asked during the interviews was, "What is it like to be a student in this program?" This question was followed by a related question: "To what extent does this program meet your expectations?" One other issue that called for clarification was the students' perceived opposition to fully online provision of the program; hence, the following question was asked: "Would you prefer the course to be fully online, or face-to-face, why?" The remainder of the questions for the interviews were developed to broaden the researcher's understanding of the programs. A summary of group interview procedures and questions is presented in the Group Interviews Guide included in Appendix C.

Students were invited to take part in the group interviews through email; announcements were also posted on the relevant program Web sites (Appendix

D). Students, who volunteered to participate in the group interviews, were sent a copy of the consent form (Appendix E). Students were subsequently reminded individually of the scheduled dates and times of the interviews through email.

The group interviews with students were conducted over a period of two weeks in December 2003. Each interview session lasted approximately one hour. A total of forty-four students participated in six group interviews with the breakdown of student numbers across the programs presented in Table 3.4.2.

Table 3.4.2. Student participation in group interviews.

Program ID	Australian University	Hong Kong Partner	Number of interview participants
Program 1	A	A	7 (1 session)
Program 2	A	B	29 (4 sessions)
Program 3	B	B	8 (1 session)

In order to minimise researcher bias, each interview had an outside facilitator. The facilitator was provided with an outline of the discussion to be held during the session. This guide included an introduction, a suggested warm-up question, a list of key questions, and a summary (Greenbaum, 1998); each interview session followed the same process. The researcher served as a note-taker along with one other note taker. Following each interview session, the researcher, the facilitator, and the additional note-taker held a meeting to analyse and interpret student responses and compare notes. The notes were analysed for themes that supported results of the survey, themes that differed from the survey results, and new themes that emerged. Data was also analysed for additional characteristics and dimensions that were not included in the multidimensional model, but were identified by the students as factors that impacted on the program.

3.5. ETHICAL CONSIDERATIONS

Permission was obtained from the Human Research Ethics Committee at Victoria University to conduct this study on "Critical Success Characteristics in Offshore Computing Programs". Appendix F provides a copy of the approval letter. The consenting adults participating in this study were at minimal risk. However, participants were informed in writing of the purpose and duration of the research, the benefits of participation, and the extent of confidentiality of records identifying the participants. An explanation of whom to contact for answers to pertinent questions about the research and a statement that participation was voluntary were also included (Appendices D and E).

3.6. DATA ANALYSIS

The process of data collection and analysis was designed to validate the multidimensional model by determining:

(a) the level of students' satisfaction with the attributes of the current program;

(b) which attributes within each dimension were ranked by the students as most important to the success of their program;

(c) if any of the attributes were perceived by the students as most important across all dimensions;

(d) if other attributes, currently not included in the model, were identified by the students as critical to the effectiveness of the program.

The statistical analyses were conducted using the SPSS version 12.0. Descriptive statistics were used to summarise the results of student surveys. Independent samples T-test was used to compare, in terms of student satisfaction, programs offered by the same university, and programs offered in cooperation with the same Hong Kong partner. Where the data did not conform to the assumptions of the normal distribution, non-parametric statistical tests were chosen for the analysis of the data. In particular, Wilcoxon test for paired data was carried out to determine statistical significance of student satisfaction with University and Hong Kong

(local) instructors in each of the evaluated programs. An alpha level of 0.05 was used to determine the level of significance for this study.

To analyse the perceived importance of program attributes within dimensions, reverse weighting of top three attributes was used. This enabled simple, namely based on a single value, ranking of attributes within a dimension. The first, second, and third preferences were weighted as follows: first preference was assigned a weight of 3, second preference – weight of 2, third preference – weight of 1, and lack of preference – weight of 0. The overall importance of an attribute within a dimension was obtained from the sum of the weighted student preferences for that attribute in the dimension.

Content analysis was used to analyse the transcribed data of the group interviews with students. The data was reduced to themes and then interpreted. The four themes that emerged from the analysis included: factors influencing students' decision about enrolling in a transnational program; students' perceptions regarding program effectiveness; their views on potential fully online provision of the program; and, suggestions for program improvement.

Following the analyses of survey results and notes from interviews, the results from both sources were analysed further and related to each of the dimensions of the model. Similarities, differences, relationships, and new themes as well as unexpected developments were examined. The research findings are reported in Chapter 4, according to the nine hypotheses developed for this study in Chapter 1 (Section 1.2). In addition, other pertinent findings gathered throughout the course of this research study were also reported.

3.7. CONCLUSION

This chapter presents the approach used to develop and validate the multidimensional model for transnational education programs; it describes the

research design, the population and sample, instrumentation, data collection, and data analyses that were used in this research study.

The development of the multidimensional model was a two-step process. Firstly, success characteristics of distance education programs, with emphasis on transnational programs, were identified. Secondly, these characteristics were grouped into broader categories – dimensions – describing distinctive aspects of transnational education programs. This collection of dimensions formed a model of effective transnational programs.

To validate the conceptual model and provide responses to the hypotheses of this study, two methods of data collection and multiple data sources were used. The methods included a survey and group interviews, and the sources included three transnational computing programs. The survey focused on the perceived satisfaction with the current program, as well as the perceived importance of program attributes with regard to the effectiveness of transnational education programs. The group interviews served as a complementary source of pertinent information about critical success attributes of transnational programs.

Chapter 4 presents and describes the proposed multidimensional model for transnational education programs, detailing the dimensions of the model together with their attributes; reports the results of model validation through the survey and group interviews with students; and, presents the refined version of the model following validation.