2003

Strategies for effective virtual education delivery in Thailand

Nalinee Thongprasert
Edith Cowan University

2003

Strategies For Effective Virtual Education Delivery in Thailand

Nalinee Thongprasert
Edith Cowan University

Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.

- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author's moral rights contained in Part IX of the Copyright Act 1968 (Cth).

- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.

STRATEGIES FOR EFFECTIVE VIRTUAL EDUCATION DELIVERY IN THAILAND

By
Nalinee Thongprasert
BA (Business)
MA (Monetary Economics)

A Thesis Submitted in Part Fulfilment of the Requirements
For the Award of the Degree of Doctor of Business Administration
in Information Systems at the Faculty of Business,
Edith Cowan University, Western Australia

Date of Submission: August 2003

ABSTRACT

An increasing number of Thai universities are using information and communication technologies to support virtual education delivery (VED). The main purpose of this study was to examine the strategies used by Thai universities to adopt the concept of "virtual education delivery" as an education tool. The study attempted to determine the critical factors that influence success in implementing Thai VEDs, and identified the ways to facilitate such adoption. These factors were synthesised with Thai environmental and cultural factors to develop a strategic framework which can be used to assist universities in Thailand to achieve more effective implementation of VEDs.

The conceptual research framework was derived from knowledge gleaned from a review of previous research studies. The literature suggested some understanding of the "what" and "how" factors influencing VEDs, but contributed generally rather than specifically to the Thai cultural environment. This framework enabled the researcher to contextualise issues and to determine factors influencing Thai VEDs. This was used to develop the domains of the research questions which were examined through case study analysis of four Thai universities.

A multi-method research approach including quantitative and qualitative methods was chosen because of its suitability to this problem. The contexts in determining critical factors influencing the success of Thai VEDs were examined through a survey and case studies. The questionnaire survey was developed from relevant research and based on the theoretical framework. This was administered to 240 students in four Rajabhat Institutes. 167 valid responses were received which was a response rate of 69.5 percent. Multiple regression analysis was used to test the relationships between the dependent variable and the independent variables. The dependent variable was the success of VED interpreted in terms of the effectiveness of quality, productivity and the student perception of their VED courses. The

independent variables were resources, computer literacy, perceived value of computer-based information, culture and information culture. It was discovered that resources, perceived value of computer-based information, culture and information culture were significant influences on the success of Thai VED.

In order to identify recurring themes that could enable the interpretation of another setting, multiple case studies through structured interviews were utilised. This was examined through analysis of four Rajabhat Institutes utilising VEDs. The results from interviewing instructors and administrators who were involved in VED were analysed by using a conceptual cluster matrix and cross case analysis to address the similarities and differences across cases. The results of this stage of analysis concluded that poor computer literacy, negative perceived value of computer-based information and information culture (of both students and instructors) were inhibitors to the success of VED. Further, some characteristics of Thai culture: high power distance, high uncertainty avoidance, and collectivism were founded to be critical barriers to knowledge sharing, essential for collaborative learning in VEDs.

Finally, the results have significant implications for administering and implementing VED. These suggested that there are four coping strategies to enhance VED implementation:

1) improving technologies and providing technical support;

2) increasing IT/IS competency and skills of students and instructors;

3) changing students and instructors' attitude to accept usefulness of VED; and

4) enhancing the members' cooperation and commitment.

In order to apply these findings in a practical setting an Audit instrument has been developed to allow continuous self-evaluation of the effectiveness of VED in Thai institutes

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

    (i)   incorporate without acknowledgement any material previously submitted
             for a degree or diploma in any institution of higher education;

    (ii)   contain any material previously published or written by another person
             except where due reference is made in the text; or

    (iii)   contain any defamatory material.

Signature

Date   22nd January, 2004

ACKNOWLEDGEMENTS

I wish to express my appreciation to my supervisor, Professor Janice Burn for the guidance and support in this undertaking. Her suggestions, insight and constructive criticisms have provided the necessary inspiration to enable me to continue on this thesis.

Secondly, much appreciation and gratitude to those administrators, IT staff and instructors in the four Rajabhat Institutes who were willing to give their patience and time.

Finally, I appreciate all of my friends in PhD Lab for their knowledge sharing and support. Without all of their encouragement this thesis would never have been completed.

TABLE OF CONTENTS

LIST OF TABLES

xi

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

.

1.1 BACKGROUND TO THE RESEARCH

The competitive environment of the 21st century is rapidly becoming more complex and filled with uncertainty. Many organisations have adopted the strategic concept of the 'virtual organisation' as an alternative model to gain competitive advantage (Goldman et al., 1995; Graenier and Metes, 1995; Mowshowitz, 1997; Venkatraman and Henderson, 1998; Marshall et al., 1999; Leimeister et al., 2001). Global competitiveness and advanced information and communication technologies (ICT) not only impact businesses but also educational institutions such as universities. The benefit for ICT enabled universities, lies in economies of scale by sharing intellectual and physical capital to provide virtual courses without time and border limitations (Castells, 1996). As the emergence of increasingly higher performance ICT such as Intranet and Internet becomes more available to students and instructors, they can learn from the experience and knowledge of other group members. This collaboration across various groups can enhance their abilities to solve problems in real situations (McFadzean and McKenzie, 2001). There are many universities in Australia, UK and the US that have begun to realise the benefits associated with virtual learning and thus use it as an alternative tool for delivering material in an age that demands flexibility. One example is, Fathom (http://www.fathom.com), an e-learning portal in USA formed by a group of leading universities and cultural institutions comprising Columbia University, London School of Economics, Cambridge University Press, the British Library, Smithsonian Institution's National Museum of Natural History, and the New York Public Library. This provides e-learning over a variety of subjects to serve the need for life-long learning. A second example is the University for Industry (Ufi) (http://www.ufiltd.co.uk/), a portal promoting lifelong learning and e-learning to enhance individual skills and improve

the business competitiveness of UK industry. The learning services are provided through learn direct over 1000 learning centres. A third example is a flexible on-line learning portal at Macquarie University, Australia (www.international.mq.edu.au). Macquarie University provides students with university courses through on-line distance mode in a variety of locations such as Singapore, Japan, Hong Kong and Mexico. The last example is i-global, an Australian based e-learning venture owned by UTS Sydney, it offers a range of courses from several universities and private companies in a full suite of e-learning content and services to partner organisations.

Davies (1998) suggests that we are moving towards a learning society in which a knowledge worker is recognised as a crucial driver for higher economic performance and improved well being. This has accelerated the demand for mass higher education thus driving universities to investigate alternative modes to their traditional classroom setting (West and Hore, 1989). Most universities realise that the traditional classroom setting, where the instructor and learner meet at the same time and place to exchange information and pursue activities to meet agreed learning objectives, is insufficient to meet the modern demand for education (Peraya, 2001). Long distance education is being used to service this demand such as by sending educational materials through the postal service, television, radio and establishing regional study centres associated with educational institutions throughout the country for providing information to individual students (Sherry, 1996). However, traditional long distance mode has obvious limitations and cannot service the increasing demand for education (Bates, 1993). This has motivated universities to embrace the opportunity to deliver information to the students when and where they want irrespective of distance by using the Internet. The Internet has begun to have a huge influence on education, since access to cyberspace is not restricted by distance and time boundaries (Gaspar and Thompson, 1995).

The rapid development of IT and the reducing costs of IT facilities are similarly leading Thai based companies and universities to use computers and Internet for education and training. In 2001, according to the report of the National Electronics and Computer Technology Centre (NECTEC), the population in Thailand was 62.1

million. Among these there are 4.8 million who have accessed the Internet and the estimated number of Internet users in 2003 will grow up to 6.0 million (NECTEC, 2003). Although most Thai people still have limited access to the Internet, the growing number of Internet users may have an enormous impact on Thai society (NECTEC, 2003). The Internet has become more socially significant, in particular, it is being used as an educational media to transform information transfer via the network (Tao, 2001).

Since the usefulness of Internet web based learning has been recognised by Thai universities, the degree of competition among universities providing on-line education has grown. There are a number of Thai universities such as Chulalongkorn University, Ramkhamhaeng University etc., which have begun to investigate VED systems as a channel for providing education in support of their organisational mission. The VED organisational model is an instructional model that allows the instructors, learners, and contents to be located in different non-centralised locations, using ICT facilities and collaborative networks linking people, assets and ideas. The use of a collaborative team of partners allows VEDs to provide effective and flexible education delivery. However, there are some major issues related to the management of the system as an educational tool and these critically influence success in implementing virtual education delivery in Thai universities.

This research aims to determine the factors that lead to success in the implementation of Thai VEDs in four universities. This is measured against three criteria: improved quality, enhanced productivity of learning and perceived success of VEDs. It also investigates how effective the factors are in facilitating the success of Thai VEDs. From this we develop an appropriate model for the implementation of Thai VEDs which can be used to assess the fit with their existing culture and identify effective strategies for VED.

1.2 RESEARCH PROBLEM

This study focuses on Thai VEDs in Rajabhat Institutes. These Institutes have been forced to reconsider how they can serve the demands of an increasing number of part time students who are in full time employment, and who do not fit the typical student profile. Moreover, tighter budgets from the Thai government have seriously impacted financial support in all Rajabhat Institutes. Consequently, they lack the funds to increase resources such as lecturers and buildings to accommodate the increased number of students. It is therefore hardly surprising that they are looking for alternative means of information transfer to replace traditional lectures. They see VED as the solution of choice, although there seems to be no clear understanding of what comprises VED. Most Rajabhat Institutes appear willing to adopt this approach to provide their educational services despite the lack of guaranteed success. The reasons why some of these attempts have been successful or not, and how to be successful, need to be examined. It appears that most Rajabhat Institutes, who have adopted VED as an alternative tool, have focused on the technology implementation and neglected other factors specific to the Thai environment. In order to determine the significant facilitators and inhibitors of success and thus enable the development of a comprehensive framework for Rajabhat Institutes, three research questions are addressed:

1. What are the factors influencing effective implementation of VEDs in Thailand?

2. How do these factors facilitate successful implementation?

3. How can these be incorporated into strategies for implementation in the context of Thai environment and culture?

1.3 RESEARCH OBJECTIVES

The objectives of this research are to identify the factors that influence the implementation of VEDs in Rajabhat Institutes as follows:

   1) determine the factors which impact on the success of VED systems in which the quality, productivity, and image of educational delivery in Thai VEDs are improved;

4

2) determine the extent to which implementation strategies need to be aligned within the Thai culture specifically in relation to knowledge sharing;

3) design and develop a framework which can be used to identify more effective strategies for implementing VED systems in Thai universities.

1.4 SIGNIFICANCE OF THE STUDY

According to Thai government policy, IT has played a vital role in economic development particularly in the education arena. The government established a national policy called " e-Thailand" and a part of this policy has determined e-learning as an important strategy to improve the effectiveness of educational services (NECTEC, 2003). As a result, Internet web-based learning has emerged in a number of Thai universities. However, to embed Internet web-based learning as an educational tool requires high investment costs in initial hardware and continuing software and humanware. While universities are energetically leveraging the Internet as a learning space with more advanced technologies, their core capabilities are still entrenched in the traditional education and training models. Many universities lack resources and strategies to develop the extensive services required for effective online learning. (Clarke and Hermens, 2001). This can be levelled as an obvious criticism of Rajabhat Institutes in their attempt to implement VED systems as their education tool, however, there is no research directed towards the real reasons for success or failure. The purpose of this research is to determine the significant and dominant facilitators and inhibitors based on Thai culture for VED implementation. The findings from this research will be used to develop strategic guidelines for the improvement of the effectiveness of VED in Rajabhat Institutes.

1.5 DEFINITION OF TERMS

The literature concerning the provision of on-line education has little consistency in the usage of the term "virtual education delivery". *On-line Education* is an instructional model that allows the instructor, learners, and contents to be located in different non-centralised locations so that instruction and learning can occur concurrently yet independent of time and place. This can be a supplement to the

traditional classroom/lecture model, a self-access learning model or completely independent course or program of courses (Fang, 1999). However, most education providers who are making learning materials available via the Internet do so within a rigid hierarchical command and control structure. The instructors issue commands, the students respond by following the specified tasks. The prescriptive norm is a package of information that is transferred from the instructor to the student and represents information dissemination rather than knowledge creation (Foreman, 1998).

A "virtual organisation" has become an accepted business model to stimulate cooperation. This facilitates collaboration around core competencies by using ICT to dynamically link people, assets and ideas (Goldman et al., 1995; Graenier and Metes, 1995; Mowshowitz, 1997; Marshall et al., 1999). Most universities have recognised the prominence of this organisational model to increase their competitiveness (Davies, 1998; Jung and Rha, 2001) and formed partnerships with other universities, Internet providers or business companies to create a VED environment. From these two sets of definitions we can arrive at a clearer definition of VED as below:

Virtual Education Delivery is an instructional model that allows the instructors, learners, and contents to be located in different non-centralised locations so that instruction and learning can occur independently or concurrently regardless of time and place. This is implemented by using the facilities of ICT to promote networked collaboration. It creates additional value for the students and /or institution partners by enabling them to disseminate and gain knowledge and information over the Internet at any location. The virtual education environment can easily support a collaborative learning process in which the students and the instructors are active participants sharing ideas and knowledge to apply concepts and techniques to the solution of problems in the specific area (Hiltz, 1994).

Successful Virtual Education Delivery has the following assumptions:

In collaborative VEDs, participants seek the knowledge they need and solve problems together in a virtual environment. How well the knowledge and information between students and professionals flows depends on how much knowledge sharing and capacity the VED has (Hiltz, 1994). According to Alexander

and McKenzie (1998), the characteristics of successful VED, can be classified into 3 categories: improved quality of learning, enhanced productivity of learning, and improved lecturer and student attitudes towards teaching and learning. The three indicators used to determine the success of VEDs are summarised in Table 1. This combination of successful characteristics of VEDs can enhance the student's experience of VEDs, and ultimately enable Thai universities to realise its particular vision for VEDs.

Table 1 Indicators used to determine the success of VEDs.

Characteristics of successful VEDs	Indicators used to determine the success.
Quality of learning	• A variety of learning styles that meet students' needs (Borthick and Jones, 2000). • Ability to move through learning materials that meets students' needs (Borthick and Jones, 2000). • Adequate information and contents that meet students' needs (Dulworth, 1996). • Accessibility to learning

Productivity of learning	• Creation and sharing of new knowledge (Alexander and McKenzie, 1998).
	  - provide collaborative technologies to share knowledge
	  - encourage lecturers and students to share ideas and insights .

Positive Lecturer and student attitudes to teaching and learning	• Perceptions of lecturers and students in an interactive VED courses (Alexander and McKenzie, 1998).

1.6 METHODOLOGY

The research methodology description in this section is provided only as a summary, with a more detailed description of the methodology provided in chapter 3.

Multi-Method Approach

The purpose of this study is to identify the significant and dominant facilitators and inhibitors for Thai VEDs and identify VED adoption strategies. Following a review

7

of the field of knowledge, an exploratory study is conducted through a combination of surveys, interviews and case studies. The study first used a survey to discover the factors influencing Thai VEDs from the perception of students involved in VED courses. The second part of this study used interviews and case studies to gather in-depth information, new ideas and fresh insights from instructors, managers and administrative staff. This allowed the researcher to gain data from many sources and enabled confirmation of multiple sources via triangulation.

Survey

A questionnaire survey was developed to investigate factors which affect the success of Thai VEDs from the student perspective. The survey was administered to 240 students in four Rajabhat Institutes. There were 167 valid responses received, for a response rate of 69.5 percent and these were the subject of data analysis. Data analysis began with a determination of the research hypotheses in which the dependent variables were the quality, productivity and student perception of their VED courses, the independent variables were resources, computer literacy, perceived value of computer-based information, culture and information culture. Multiple regression analysis was conducted to test whether there were relationships between the dependent variables and independent variables.

Case Study and Interviews

The case study phase of the study involved structured interviews at four Rajabhat Institutes. The interviews were developed from the literature review and the theoretical research framework to determine the relationship and patterns of the factors that surround VED events. Two case studies were located in Bangkok, Thailand and the other two were in Pathumthani and Chachoengsao province 48 and 82 kilometres from Bangkok respectively. The focus of the case studies was on determining how Rajabhat Institutes implemented VED and what factors facilitated or inhibited success from the instructor and administrator perspective. Transcripts of

the interviews were analysed by using a conceptually clustered matrix and cross case analysis to address the similarities and differences across cases. The data from both parts of the study provided input to a new framework for strategic success and a self-assessment audit for effective VED implementation.

1.7 OUTLINE OF THE STUDY

Chapter One of the study provides an overview of the research, including the background to the research, a summary of the key areas of the rest of the study and overview of the integration of the various sections into an overall research framework.

Chapter Two outlines the review literature relevant to VEDs and specific background to this study. The issues in this area are discussed in the context of Thai society and the way it adapts to the use of VEDs. The findings form the basis for the research framework and methodology that are outlined in chapter three.

Chapter Three describes the methodology used in both phases of the study: a quantitative approach through questionnaire survey and a qualitative approach through interviews and case studies. The research placed an equal emphasis on both in order to obtain both a generalised view from students and in-depth details from a distinct group of managers, instructors and administrators.

Chapter Four discusses the data analysis process for the survey instrument. This chapter begins with descriptive statistic to analyse the demographic information of the respondents, then Multiple Regression was used to determine the association of the success of Thai VEDs and several independent variables.

Chapter Five presents the results of interview and case studies. The purpose of this chapter is to examine the research sites as four separate cases. The background information and the relationship and patterns of the factors that surround VED events are summarised in the form of a conceptually clustered matrix. Then cross case analysis is examined in order to address the similarities and differences across cases.

Chapter Six summarises the conclusion to be gained from the study and outlines the limitations of the research. Included in this chapter are emergent research issues. A strategic framework and checklist are developed in order to act as a guideline for implementing successful Thai VEDs.

CHAPTER 2

REVIEW OF THE LITERATURE

2.1 INTRODUCTION

This chapter outlines the review literature relevant to VEDs and then describes how ICT impacts on the learning process from traditional distance learning to VEDs. Further, the chapter outlines a theoretical framework to be used for the remainder of the study.

Section 2.2 provides background information on how VED emerged from distance learning and is divided into two sections: the reasons long distance education has evolved into VED, and the types and benefits of virtual learning. Section 2.3 discusses the research on successful implementations of VED to support educational service in regard to various approaches: technology, social psychology, human relations and cultural context. This leads to a discussion of the research examining how the implementation of VED best practice is developed. The factors influencing the success of VEDs are then further expanded in section 2.4. The main factors are found to be adequate ICT and support resources to service a large market but also several human-related factors such as the value of computer literacy, perceived positive value of computer-based information, cultural context, information culture and task interdependence. The cultural context is distinguished from other factors and we examine Thai culture particularly in the context of knowledge sharing in section 2.5. Section 2.6 discuss this together with a theoretical framework which is discussed and examined in the context of Thai society and the way it adapts to the use of VEDs. This becomes the basis for the research questions that frame the research methodology outlined in chapter 3. A flow chart of the logical development of this chapter is shown in figure 2.1.
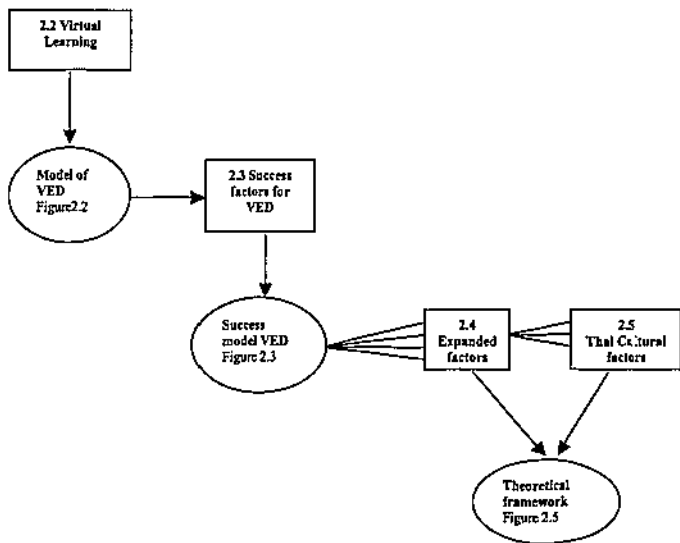
Figure 2.1 A flow chart of literature review

2.2 VIRTUAL LEARNING

2.2.1 From Distance Learning to Virtual Education Delivery

With increased mobility between work positions in recent times, the labour market has changed rapidly, increasing the need for training and retraining. Reasons that education providers are offering long distance education are given below:

- The economic and social contexts have changed

- The number of unemployed workers is increasing with the need for retraining

- Knowledge has become one of the most important economic forces

- Knowledge is rapidly expanding and the lifetime of its use is becoming increasingly shorter

- To survive in the market, companies need to change, to train and retrain their employees

- Investing in human resources seems to be the only way for sustainable development (Peraya, 2001)

Traditional long distance education is based on teaching through mass media communication such as postal service, broadcast television and/or radio, which is mostly characterised by a one-way communication mode. The education system is now focused on learning rather than teaching. Learning is the process of providing knowledge constructed through action, communication and reflection (Davies, 1998). Learners need instant interaction or discussion with instructors and classmates or others. Moreover, they require access not only to a wide range of media, but also to a range of sources of education (Bates, 1993).

The emergence of advanced technology has enabled universities to provide a variety of educational services. Technology has an enormous impact on learning. In his 1999 Comdex keynote address, the Cisco CEO, John Chambers, remarked "The biggest growth in the Internet, and the area that will prove to be one of the biggest agents of change, will be in on-line training, or e-Learning" (Fitzwater, 2000). In addition, economies, which are driven by the use of knowledge and information, have come to play a dominant part in the creation of wealth (http://www.dti.gov.uk). Therefore, a paradigm shift has occurred in the way education is viewed and delivered toward a continual learning process rather than a distinct event (Tongdhamachart, 2002). For these reasons long distance education has evolved into VED. This enables self-paced learning supported by teacher advice and enhances efficiency of teaching-learning by utilising media and knowledge repositories on the Internet. Further, it reduces the gap between urban and rural students by allowing equal opportunity access (Tongdhamachart., 2002).

2.2.2 Types and Benefits of Virtual Learning

- **Types of virtual learning**

The key enabler in virtual learning environments is Internet technology, which can be classified into two broad application categories: (1) computer communication and conferencing (2) information access, retrieval, and use (Agarwal and Day, 1998).

Computer communication and conferencing is a provider-initiated communication. The information provider, who specifies the receiver and controls the information

content, initiates this communication. The information receiver cannot obtain the information if the provider does not start the transmission (Huang, 1997). Examples of provider-initiated communication are e-mail, mailing list, news groups, interactive messaging or chat sessions and video conferencing. Information access, retrieval, and use is a receiver-initiated communication; the information providers place information in the form of text, data, graphs and pictures on File Transfer Protocol (FTP), Telnet, Gopher, and the World Wide Web (WWW) or other information servers and wait for information seekers to retrieve it. The information receiver, who decides when, where and how to receive information, actually initiates the communication (Huang, 1997). Most universities providing educational services today have focussed on receiver-initiated communication. This application can match a variety of learning activities as shown in figure 2.2.
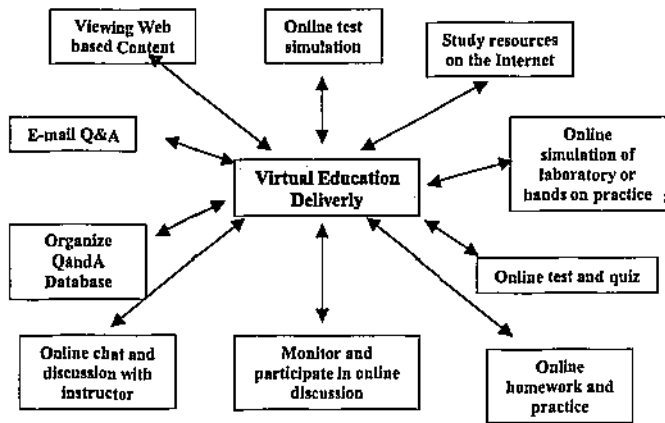
Figure 2.2 Virtual Education Delivery matching the learning activity (Tongdhamachart, 2002).

- **Benefits of Virtual Education Delivery**

  ➢ Cost saving and productivity increase

  The reasons most frequently cited for selecting VED solutions are cost saving and higher productivity. Collaborative technologies enable education providers to deliver instruction (training) or information at lower costs. This cuts travel expense, reduces time, and significantly reduces the need for a classroom, instructor and infrastructure (Dulworth, 1996).

➤ Enhancing business responsiveness

The increasing rate of change in business also impacts on the move to VED. There are a number of factors that cause business cycles to shorten such as the trend towards globalisation, the shift to e-business and shorter product life cycles, etc. (Peraya, 2001). To survive in business and gain a competitive advantage, an organisation needs to re-skill employees to operate effectively in the new environment and VED can serve those needs (allowing staff to study while working). It is clear that the traditional teaching/learning methods can no longer keep pace with this demand (Trondsen, 1998).

➤ Providing a variety of learning styles

Messages are consistent yet customised to learners' needs. VEDs allow learners to access instructions in a more comfortable manner (Dulworth, 1996).

➤ Content is more timely and dependable

Based on a collaborative and continuous process, VEDs can easily be updated, making the information more accurate and useful. Learners can access anytime and anywhere. Flexible education delivery can meet the demands of knowledge workers who cannot join in the traditional classroom-based learning (Trondsen, 1998).

➤ Knowledge creation

The collaborative network in VEDs enables instructors and learners to share information and ideas. Knowledge sharing among people in communities is the fundamental requirement of knowledge creation. Community knowledge enables people to gain better practices and outcomes (Alexander and McKenzie, 1998).

➤ Scalability

VEDs can be provided to an unlimited number of learners as long as they have the infrastructure in place. Programs can increase customers from 10 to 100 or even 1,000 with little increasing cost (Alexander and McKenzie, 1998; Trondsen, 1998).

Virtual education delivery therefore provides greater number of students with more flexible, comprehensive and dynamic communication through the available technologies of videoconferencing, live broadcasting and Internet based virtual learning. This wide range of learning flexibility offered by these virtual environments can serve the individual needs and are regardless of space and time.

2.3 THEORETICAL UNDERPINNING OF VEDs

2.3.1 The Conceptual Background

Universities today compete in offering learning opportunities for mass higher education. Education has become a value good that people seek to invest in for economic performance and well being (Davies, 1998). Therefore, most universities are increasingly providing higher education through distance methods, and using new communication techniques, such as the Internet, satellite broadcasting, video conference and so on. Universities realise that the traditional classroom in which students are required to physically meet in a classroom or laboratory is limited in terms of space and time, and is no longer feasible. The role of instructors has changed as they now direct students' learning by giving directions and reinforcing students' understanding.

There are pros and cons to this method of teaching and learning. One argument suggests that this new method may discourage students' curiosity (McFadzean, 2001). To achieve the aim of education, that is, assisting learners to achieve self-learning, it is essential for students to have positive attitudes towards learning. Therefore, a teaching centre in which instructors are only sources of information and knowledge may not be suited to active learning (McKenna, 1995).

There is also the positive side to the argument. A virtual learning environment for participants who work together via the Internet, can encourage students to learn from the experience and knowledge of the other group members. Further, this collaborative learning environment enhances the ability of students to solve real problems that occur today (McFadzean, 2001). In this way, *"the instructor is no longer there to instruct but to facilitate learning, offer advice and assist the group*

with its learning process. Communication, therefore changes from a one-way instructor to student relationship to an all-round relationship where students communicate with one another and are also helped and supported by the facilitator" (McFadzean, 2001 p. 57).

Given the perceived usefulness and increased affordability of education and training among people who seek higher education, universities are moving towards adopting VED as an alternative tool for providing educational services. However, the "acceptance" or "success" of VED is questionable, and it is hard to ascertain whether it has beneficial effects on learners, and will result in productivity enhancement for universities (Hiltz, 1994). This leads to the question, "What constitutes successful implementation of VED to support educational service, and what factors determine this success?" These issues need to be considered in the context of studying the perception, problems and solutions of VED when implemented as an alternative educational service.

2.3.2 VED in the Thai Context

Global competitiveness and advancement of ICT impact not only western universities, but also Thai universities in their adoption of VED as an alternative mode for providing educational services. The issue of the use of VED was the subject of an interview with a Thai university administrator. He provided the reasons for Thai universities to implement VED as follows:

"In order to bridge the gap between rapidly increasing number of students yet, a constant number of instructors, our university has a policy of implementing VED to support teaching and learning. This can help us to reduce instructor's teaching load and at the same time it helps students with independent study anywhere and anytime"

This view shows that Thai universities are keen to adopt VED as an alternative educational service. Although many Thai universities see VED as a potential solution, they do not seem to have a clear understanding of what comprises VED. Naturally, they consider VED to be a very powerful and essential tool for transmission of knowledge and information to their students. However, the use of ICT with VED originated in the west; other regions of the world have been seen

more as recipients rather than creators of new ideas and information (Thong, 1999). Thus, the key variables to successful implementation of VEDs in developed countries may be different from those in developing countries. This is confirmed by Hallinger and Kenneth (1996), Hallinger and Kantamara (2001), and Morakul and Wu (2001) who claim that culture could impede the implementation of ICT because of differences in the way the systems are interpreted and understood.

This may be the case when Thai universities adopt VED as an alternative way of providing educational services. Facilitators or inhibitors of successful VED in Asian countries may differ from those in western countries. For example, students are more likely to want personal contact rather than self-learning, or they need the regularity of a well structured and timetabled class to keep them motivated (Nunn, 1998).

There is a need for a conceptual framework to help place the overall VED research framework in context. The factors influencing the successful implementation of VED are examined by Hiltz (1994). He summarises the four major approaches involved in the success of VED: technological determinism, the social psychology of users, human relations in organisation and the context of culture.

- **Technological determinism**

This approach emphasises the characteristics of hardware-software that universities use to provide VEDs. The efficiency and effectiveness of the system design and implementation will directly influence efficient and effective user behaviour (Mowshowitz, 1997). The resources including hardware, software and the design and implementation skills of these technologies could be important factors affecting user accessibility and reactions to particular aspects of VEDs.

- **The social-psychological approach**

This approach points to attitudes and capabilities of students and instructors when using new technologies. An attitude is a state of mind involving emotions and expectations or beliefs, such as the pre-use expectation about a VED course that could affect the use of and reactions to VED. It must be noted, however, that students' and instructors' capabilities, such as typing skills or previous use of computers, also affect the success of VEDs. To apply this approach in determining the success of VED, the social-psychological attitude of students and instructors can be classified as: 1) the perceived value of computer-based

17

information, 2) computer literacy. Both factors are accepted as important factors influencing the success of VEDs (Hiltz, 1994; Larson and Bruning, 1996; McCollum, 1997; Winter et al., 1997; Jarvenpaa and Staples, 2000).

- **The human relations approach**

This approach focuses on the collaboration between university members to work within a group setting. The existing relationships and interactions among instructors and students could be a significant facilitator or inhibitor to teaching and learning in VEDs. Implementing successful VEDs requires task interdependence in which agreement and collaboration of members is necessary in each major unit. It is essential that members are comfortable with open discussion of and decision making related to VEDs (Hiltz, 1994; Claver et al., 2001; Haghirian, 2002).

- **The cultural context**

There are a number of ways in which culture influences the use of information technologies. For instance, the cultural background of students influences the way they adopt and use ICT in their learning styles and their interactions with instructors or other students in their groups. Collaborative learning has been accepted as an effective learning style that can enhance students' and instructors' ability to create knowledge and develop understanding (McLoughlin and Oliver, 2001). In the learning process, the cultural context involves the way people think, act and communicate, and it can support or inhibit the success of VEDs. The elements of the cultural context that affect the success of VEDs are information culture and national culture. Information culture refers to the characteristics of education administrators, students and instructors in the use of collaborative ICT for knowledge sharing (Davenport, 1997; Jarvenpaa and Staples, 2000). National culture refers to *"the collective programming of the mind that distinguishes the members of one group or category of people from another"* (Hofstede, 2001, p.9). This collective programming of the mind consists of a patterned way of people thinking, feeling and reacting, acquired and transmitted mainly by symbols which are based on their traditional ideas and values (Hofstede, 2001). The national culture characteristics, which can be viewed as the influencing factors on knowledge sharing in VEDs, are power distance, uncertainty

avoidance, individualism/ collectivism and masculinity/femininity. This will be discussed in detail later in this chapter.

The success of VEDs can be measured from both students' and faculty members' perspective by using educational outcomes as indicators. The outcomes of VEDs can be categorised under three headings: improved quality, enhanced productivity of learning, and overall perception of effectiveness of VEDs. The quality and productivity of learning provided by VEDs can be measured by the degree to which a student accesses, learns, retains, and integrates critical knowledge building information (Hiltz, 1994; Dulworth, 1996; Alexander and McKenzie, 1998; Borthick and Jones, 2000). The perceived usefulness of teaching and learning in VEDs can be measured through the perception of students and instructors in regard to the success of VEDs (Hiltz, 1994; Alexander and McKenzie, 1998). These indicators: quality, productivity and perception of VEDs used to determine the success of VEDs are mentioned earlier in Table 1 of Chapter 1. The four major approaches influencing the success of VEDs are summarised in the model of VED in Figure 2.3
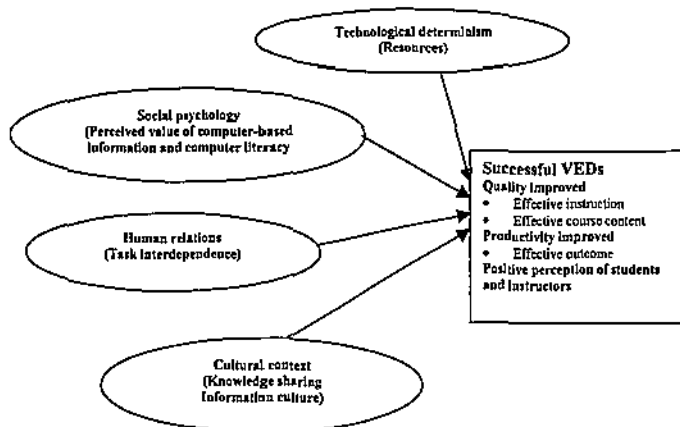
Figure 2.3: Factors influencing VED success

2.4 FACTORS AFFECTING THAI VEDs

The next section expands upon these factors in the Thai context.

2.4.1 Technological Determinism

- **Resources**

Quality and reliability of technology are important determinants of the effectiveness of VEDs (Haghirian, 2002). Technology supporting collaborative learning requires both asynchronous and synchronous communication technologies (Seng and Al-Hawamdeh, 2001).

Synchronous communication refers to "real time" electronic discussion that takes place via the Internet eg. live audio-video conferencing and chat rooms. Asynchronous communication, on the other hand, is time delayed or a time differed computer mediated mode of delivery, eg. electronic mail and discussion forums (Seng and Al-Hawamdeh, 2001). Both synchronous and asynchronous communication technology are used for different purposes. The former is normally designed to provide face-to-face interaction among instructors and students, such as videoconferencing. They can interact in real time and share useful information to enhance effective learning. However, this media requires significant support including high-tech equipment such as a high Internet bandwidth or ISDN connection and experienced IT support teams to operate real time lecture transmission. The latter, asynchronous communication technology requires reliable and accessible communication technology. Instructional resources are mostly accessed via the World Wide Web; therefore, the Internet becomes the technology of choice because of its ready availability, low cost and ease of use.

Although the Internet has been around since the early seventies in the US, it was introduced to Thailand only in 1987 at the Asian Institute of Technology (AIT). AIT had a UUCP connection to the University of Melbourne, University of Tokyo and UUNET. In the early stages of the Internet in Thailand it was made

available only for education and research. By 1995 the usage had expanded from the academic arena to general use (Palasri et al., 1999) Nowadays, many Thai universities, including Rajabhat Institutes, use the Internet to provide their educational services. There are several factors that facilitate the successful use of VED. First, a quality Internet Service Provider (ISP) is required for Internet access. Second, integrated suites of on-line applications are needed. Third, readily configurable on-line environments and facilities to support learning on-line, such as computer laboratories, and network bandwidth, need to be embedded in the system. Lastly, technology standards, which facilitate compatibility and usability of VED products, are essential to the whole process (Urdan and Weggen, 2000). All of these issues may present a significant problem in the Thai context. Budget limitations and costly technological facilities may prove to be severe inhibitors to the success of VED implementation in Thailand.

2.4.2 Social Psychology Approach

- **Computer literacy**

Learning productivity is increasingly dependent on the computer literacy of users. The ability of students to use computers effectively is critical to the effectiveness of virtual learning. Students who have a good understanding of computers should be able to use their computer systems in an effective way to achieve their tasks (Winter et al., 1997).

Computer literacy is defined as the knowledge of computers and how they work in our daily lives. Fenske (1998) suggests that computer literacy courses should be incorporated in the general education curriculum at two levels. The first purpose of a computer literacy course is to provide an introduction to basic computer skills, including an understanding of hardware components and software programs, which means at least being able to operate and use a computer to perform basic tasks. The second purpose is to generate a competency level that refers to the ability to use various software productivity programs and the ability to use telecommunication software, eg. E-mail and discussion boards. The success of conveying knowledge via the Internet is based on how effectively students use computers. Research shows that learners must have both concrete

and abstract knowledge of computers and need to be able to apply their knowledge to new systems and new situations with minimum retraining (Winter et al., 1997).

Computer literacy obviously impacts on the ability of Thai students to learn on-line effectively. According to the National Electronics and Computer Technology Center (NECTEC,) the number of Internet users is estimated at 4.8 million (data at 03/2003). Thailand is falling behind its neighbors when it comes to using technology in business, schools and in society. Comparative statistics of the international population that uses the Internet are shown in Figure 2.4.
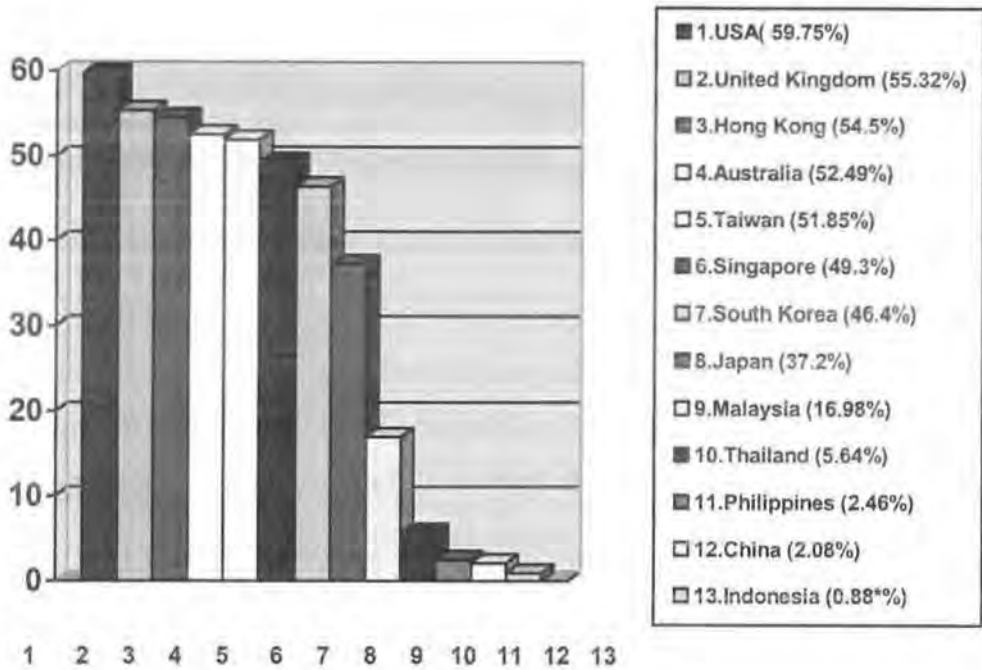
Figure 2.4 Percentage of total population using the Internet (source www.nua.net at 03/2003)

The survey shows that only 5.6% of Thailand's population is reported to use the Internet. The reason for this low percentage most likely has to do with the fact that so few people are computer literate but also, of course, the limited availability of Internet resources. Most universities realise that low computer literacy has an impact on their student learning via VEDs and so provide

22

infrastructure, including a help desk, an information centre, a staff team to assist end-users, or a software library and training to enhance students, in using ICT (Winter et al., 1997). Training is the best-accepted method to develop student knowledge in the use of ICT to facilitate their learning on VEDs. However, there is no guarantee that a student who has passed training courses can use a computer efficiently. Success in students using computers to perform their tasks also requires a well-planned and user-friendly design interface to fit their learning styles (Davis and Bostrom, 1993).

- **Perceived value of computer-based information**

Education providers enthusiastically accept computer-based learning as it offers a potential solution for flexibility in delivery mode and location. Although it can enhance the quality of learning, there are some problems involved, such as learners having low skills in using it and fear of technology or language barriers (Eveland, 2003). This is obviously seen as a potential barrier to learning. Thus, appropriate and useful technologies need to be selected and justified.

The perceived value of computer-based information has long been recognised as an important influence on knowledge creation. The key to success of VEDs is positive perception of participants, including administrators, instructors and students. Administrators have a vital role in making decisions when implementing VED, particularly in Thai universities which tend to have a highly centralized structure. Administrators with more knowledge of technological innovation and the benefits of IS are more willing to adopt a VED (Thong, 1999). Thus the perceived value of computer-based information of administrators is critical in the decision of what and how VEDs are implemented in Thai universities.

Instructors and students should realise that ICT provides them with more accurate, new and up-to date information, convenient data access and the ability to assimilate and use information more effectively (Jarvenpaa and Staples, 2000).

Cox et al. (1999) investigated the factors contributing to the use of ICT by ICT teachers who use it in their teaching. The result of this study showed that the regularity of use of ICT by instructors and their perception of its usefulness

influenced the VED implementation in a positive way. Further, students who had more positive perceptions of computer-based information were more effective in learning on the Web (Larson and Bruning, 1996; McCollum, 1997).

Brown (2002) argues that in a developing country context, perceived ease of use has been the predominant influence in adopting rather than perceived value or usefulness. He concludes that perceived ease of use has significant impact on both usage and perceived usefulness, particularly in cultures with high uncertainty avoidance. This is supported by Arbaugh (2000) who purports that the ability of software packages to facilitate the design and delivery of VEDs also requires much less technical sophistication. Thus, students can perceive usefulness of instruction where they can pay attention to the learning context rather than technological issues.

2.4.3 Size of Market

There is ongoing competition between institutions that provide VED in order to maintain or augment their share of the market in education services (Bodain and Robert, 2001). Providing VED has become increasingly more sophisticated and requires the use of high cost integrated technologies. However, this has an impact on the cost of the projects and drives the provider to look for additional students to gain sustainable profit. A significant student enrollment is needed to provide sufficient financial return to maintain and upgrade the coursework to a level of high quality and relevance. They therefore need to commit resources to continuous improvement for course content and new approaches to learning on-line. Currently, most education providers are under severe competitive pressure from increasing demand, particularly from working professionals rather than from full time students. Providers who do not maintain a viable competitive on-line program are left behind (Green, 2000).

These four factors: resources, computer literacy, size of market and perceived value of computer-based information appear to be important factors affecting Thai VEDs. First, resources are the main vehicles for the transfer of knowledge in a Virtual Learning Environment. Thai universities commonly employ ICT in the form of networked computers, the Internet, e-mail and computer-based presentations. However, there are problems with infrastructure designed to accommodate effective

VEDs when universities have little experience of delivering VEDs. It is of utmost importance that they understand the issues surrounding this mode of educational delivery and plan their strategies to achieve their goals. Second, computer literacy is also a component factor that assists students in learning on-line effectively. In general, Thai students have less knowledge and background of computer usage because they lack adequate training from schools and have insufficient computers for use at home (Eveland, 2003). Universities need to be made aware of the appropriate training needed to ensure that students are given every opportunity to succeed in learning through VED. Third, participants' perceived value of computer-based information is critical to the success of implementing VED. The reality for Thailand is that there still exists a sub-conscious keyboard phobia, and language barriers often present a major problem (Eveland, 2003). These might all be inhibitors preventing Thai students from sharing ideas and knowledge and to search for information on the Internet. Fourth, due to the cost of ICT facilities required for VED implementation, a higher student enrollment is required for Thai universities in order to gain sufficient financial return for ongoing projects. Targets for university positions are not only secondary school students, but also knowledge workers from the public and private domain. This issue has to be considered within the contextual environment of each university as the pressure to increase student enrollment might cause some universities more problems than profits.

There are also some other major elements specifically related to the Thai VED environment. These are discussed within the human relations approach (section 2.4.4) and cultural context (section 2.4.5) as described below.

2.4.4 Human Relations Approach

- **Task interdependence**

In order to increase access for students and to improve the quality of education, advanced technology such as a comprehensive e-mail software program or a software program to transform learning contexts into a dynamic web-based teaching and learning are required. This technology must be designed and developed to fit with the task of on-line education (Jarvenpaa and Staples, 2000). For example, a web-based design is available for two-way communication, where

the lecturer is only a facilitator of knowledge, supporting student collaboration and problem-solving processes (McFadzean and McKenzie, 2001). This requires agreement of members, including academics, in each college and each major unit.

This agreement and cooperation can be achieved through members understanding that VEDs can enhance educational services and lead to competitive advantage for universities. Motivation and reward policies are necessary to obtain the cooperation for using this tool (Claver et al., 2001; Haghirian, 2002). Such policies must be seen to benefit staff rather than to load them with additional burdens.

2.4.5 Cultural Context

- Culture in knowledge sharing

There are three sets of human factors which may be seen to affect the success of VED in relation to the education administrators, students and instructors. In the Thai context, there is a high power distance which is defined as *"the extent to which the members of a society accept that power in institutions and organizations is distributed unequally"* (Hofstede, 1985, p.347). Education administrators play a vital role in providing virtual education delivery. This is generally accepted in hierarchical organizations where administrators have a strong sense of leadership, and subordinates appreciate a hierarchical order (Vance et al., 1992). Consequently, ideas and knowledge are rarely shared between administrators and subordinators. There may be a misunderstanding of how to adopt and implement VED between administers and instructors or the people who take responsibility for the technical infrastructure. For example, those who control the resources may have no awareness of its value added features, or may have inadequate knowledge and competence in providing VEDs (Simons, 1998). They control or make decisions without sharing views and knowledge with instructors or technicians who are the key to success in the implementation stage. Thus, the most significant factor that influences success in running VED is having administrators who have adequate knowledge and are also willing to share their competencies with peers and subordinates.

In addition, there is high power distance between instructors and students. Most Asian students are normally expected to give respect to ancestors, tradition, authority, parents, and elders (Triandis, 1995). If they want to have a harmonious relationship, students are more likely to accept what instructors say. As a result, instructor-centered teaching is more acceptable rather than a learner-centered style (Hofstede, 2001).

The second factor influencing the success of VED is uncertainty avoidance and is related to the student group. VED provides accessible and flexible courses which students can access through the WWW from anywhere at any time. However, it is a double-edged sword: it does facilitate their participation, but it also limits the direct interaction that students have with instructors and other students, which may result in loss of motivation and immediate feedback (Bodain and Robert, 2001). With such delays in two- way communication, some students find it difficult to develop a dynamic and interactive on-line discussion. This isolates students so they fail to receive the information and reject the communicating or sharing of ideas on-line. (Bullen, 1998).

In a successful VED learning environment, students have basic skills and a positive attitude, and are self-disciplined, mature and motivated to share knowledge and learn from each other (Volery and Lord, 2000; Haghirian, 2002). In this learning environment, the instructors need to assist and motivate students to active participation rather than to perform as information broadcasters. Any evaluation of learning success in VEDs should focus on student problem solving skills rather than their content memory (Seng and Al-Hawamdeh, 2001). In this way, the instructors use the computer interface not only to deliver a "lecture" which supplements text-based documents on-line or provides the instructor's interpretations, but also to conduct seminar discussions on key course issues. Students must know what to learn, how to learn and develop their collaborative skills in knowledge sharing by using ICT to enhance their critical thinking and knowledge creation (Seng and Al-Hawamdeh, 2001).

However, most often the VED learning environment is based on the experience of developed country instructors and students. So how well do students from other cultural backgrounds do in such an environment? For example, Asian

27

countries in which the level of uncertainty avoidance is high in a society are more susceptible to being affected by the structure of the teaching process (Hofstede, 2001). Asian students are much more familiar and comfortable with a didactic type of learning style as they expect their instructors to be the experts who have all the answers (Abdon and Rabb, 2001; Hofstede, 2001)

The third factor relates to instructors. Effective learning in VEDs is based on the positive attitude of instructors to technology and skills in using technology to transform their materials into an interactive teaching/learning style and guide students in remote classrooms when they face technical problems (Volery and Lord, 2000; Haghirian, 2002). Some instructors may have problems in using technology. May, (1997) states that instructors in IT and computer science are more experienced and are familiar with IT-mediated technology than others are. However, there is a need to have technology experts and instructional designers to assist all instructors to utilise equipment and identify methods to deliver their education material effectively.

• **Information culture**

Information culture is an integration of two concepts: information systems and organisational culture (Claver et al., 2001). Information systems in education is a process of using ICT to collect, record, store and rearrange data on the operations of the learning process. Information and data are the output and input of these systems and require IT supporting elements. The IT supporting elements include hardware, database, software networks and other resources which are suitable for information processing (Claver et al., 2001).

However, information processing is not the only key to success in knowledge creation; people that control and use ICT are important when processing information. This can be described as the organisational culture. According to Chonin and Davenport (1993) and Nonaka (1994), it is important to look at the information user in a cognitive perspective when the organisational information culture is examined. The organisational culture is a cognitive system explaining how people think, reason and make decisions. It exists at the deepest level and is represented by a set of values, assumptions and beliefs that define the ways in

which organisations conduct their operations (Pettigrew, 1990). The concept that integrates resources (IT) and capability (IS) into organisational culture is identified as "Information culture." This refers to the values and attitudes about information processing, publishing, and communication that instructors and students have in order to enhance the effectiveness of learning.

The influence of information culture on the thinking and behaviour of administrators, instructors and students are shown in many ways. For example, many administrators think they leverage instructors and students by using ICT to deliver information. However, effective information management is how people use information, not machines. IT is just a part of the information culture; values and attitudes towards information and how they use information to perform their competencies are still the key success factors to knowledge creation (Davenport, 1994). Another example can be seen in the hierarchical university; the implementation of IS may create "techno-stress" as they worry that the result will not satisfy their superiors (Claver et al., 2001). There might also be a negative feeling among instructors if they lack commitment, motivation and satisfaction in use of IT/IS. In their views students are more likely to depend on IT/IS, and then the instructors are no longer so important to the students (Claver et al., 2001).

Factors affecting success and failure of Thai VEDs can be summarised in Table 2.1 below.

Table2.1 Identification of Thai VEDs facilitating and inhibiting factors.

Market factors influencing implementation of Thai VEDs	
Facilitating factors	**Inhibiting factors**
• Advanced technologies and skills to create and manage VEDs.	• Low level of technologies and skills to create and manage VEDs.
• Sufficient computer literacy.	• Insufficient computer literacy.
• Positive perception of computer-based information.	• Negative perception of computer-based information.
• Adequate size of market.	• Inadequate size of market.
• Administrators, instructors and students have adequate knowledge and willingness to share their competencies.	• Administrators, instructors and students have inadequate knowledge and reluctance to share their competencies.
• Positive values and attitudes in VED environments.	• Negative values and attitudes in VED environments.
• Cooperation and commitment of university members to provide VEDs.	• Lack of collaboration of university members to provide VEDs.

2.5 THAI CULTURE

Knowledge sharing is accepted as a key to success in the process of knowledge creation (Davenport and Pruzak, 1998). Many still believe that accumulating knowledge is power to gain a competitive advantage for example; the users of Eureka (knowledge transfer between people in organisation) at Xerox were recognised for authoring and validating useful repair tips. This type of opportunity leads to interest in creating an environment that encourages knowledge sharing and VED learning has a critical part to play in this area (Khajanchi and Kanfer, 2000). For universities to be successful in a VED learning environment emphasis should be given to knowledge sharing and knowledge creation, and the environment must be conducive for people to share knowledge.

Knowledge sharing is an interpersonal interaction involving two actions: representation and subordination. Representation is the transmitting function, which refers to the ability of an individual to introduce their ideas (knowledge) to others or students. Subordination is the receiving function, which refers to the ability to accept or absorb another's knowledge (Davenport and Pruzak, 1998; Erich and Williams, 1998). Jarvenpaa and Staples (2000) also contend that knowledge will only grow at the rate at which people in superior positions and those in subordination are willing to share their experiences, insights, and wisdom in their organisation and across organisations. However, the propensity to share will be weak in a strong hierarchical organisation and a closed system. Therefore, the views and propensity to share in VEDs can influence the use of ICT in facilitating knowledge sharing, such as when administrators equate with representation and instructors or students play the subordination role (Shore and Venkatachalam, 1996).

In the Thai context, the degree of hierarchy in public organisations such as universities is high. Thai subordinates believe that people in a higher status have more expertise and knowledge to make the most efficient decisions (McKenna, 1995; Hallinger, 1996). Control by superiors or instructors have been accepted as normal by Thai students. To overcome this issue, the implementation should match this form of knowledge sharing and should address the cultural barriers in Thai universities. Some Thai cultural issues which can act as barriers to knowledge sharing are power distance, uncertainty avoidance and individualism/ collectivism (Hofstede, 2001)

These cultural descriptions originated from Hofstede's work, the most widely known research which compares national cultures in terms of broad value differences. His research used a very large sample of employees from 50 countries within a single organisation (IBM) to examine the role of national culture in work-related activities and knowledge management. Hofstede's framework is constructed on a review of sociological and anthropological theories and is divided into four dimensions: power distance, uncertainty avoidance, individualism/collectivism and masculinity/femininity. Power distance refers to the acceptance by subordinates of unequal power. Uncertainty avoidance means members in organisations who feel threatened by uncertainty situations. Individualism stands for a loosely defined social structure in which people take care of themselves, and collectivism refers to a social structure in which groups take care of the individual in exchange for her or his

lifelong loyalty. Masculinity is associated with "*a society in which social gender roles are clearly distinct: Men are supposed to be assertive, tough, and focused on material success; women are supposed to be more modest, tender, and concerned with the quality of life*" (Hofstede, 2001, p.297). Femininity stands for " *a society in which social gender roles overlap: Both men and women are supposed to be modest, tender and concerned with the quality of life*" (Hofstede, 2001, p.297).

Hofstede's work provides and important framework in which to consider the effects of culture. From this research Thai culture is seen to be one with high power distance, high uncertainty avoidance and collectivism. Thailand has low masculinity which portrays Thai society as respectful of the roles of men and women as equal. Therefore, this culture aspect is not seen as a barrier against knowledge sharing.

The three Hofstede dimensions influencing knowledge sharing in Thai people are defined relative to Thai culture as follow.

2.5.1. High Power Distance " Bhun khun"

High power distance is the first cultural barrier to knowledge sharing for Thai people (Komin, 1990; McKenna, 1995; Rohitratana, 1998). Thais accept a hierarchical authority system with an emphasis on status differentiation and unequal power distribution. They tend to preserve good relationships at every interaction level by working on norms of friendliness and politeness (Rohitratana, 1998) This kind of relationship between those who are in higher positions and their subordinates is called " Bhun khun" well known to all Thai people. The Bhun khun in Thai society can be defined as "*the psychological bond between two persons: one who renders the needy help and favors out of kindness and other's remembering of the goodness done and his ever-readiness to reciprocate the kindness, not bound by time and nor distance*" (Komin, 1990, p.691). Thai subordinates usually give respect and feel obligations to their superiors similar to a father figure in their families (McKenna, 1995). The Bhun khun concept is broadly accepted by the majority of Thai students and instructors. This might obstruct the process of transferring knowledge through university networks, such as e-mail, chat room or bulletin board since students are not encouraged to express their ideas in solving problems, and instructors are afraid to tell administrators what they think. Moreover, instructors or administrators with high status usually make all decisions as they have a role as controller rather than as a colleague (Thanasankit, 1999). Therefore, without direction and guidance, the

ability to create knowledge and use it as a force to develop best practice in academic areas will be limited.

2.5.2 Uncertainty Avoidance " Kreng jai "

Researchers typically characterise Thai people as having a high uncertainty avoidance, which may impede the successful implementation of knowledge sharing (Trompenaars and Hampden-Turner, 1998). This culture can be expressed by the Thai word " Kreng jai ". This concept is defined as the need to avoid uncertainty which is associated with a reluctance to be the cause of discomfort to the feelings of others (Rohitratana, 1993). In Thai culture, subordinates should be polite and accepting. Not surprisingly, they always keep their suspicions to themselves in order to maintain peace. They are afraid to make their superiors lose face in front of others. "Kreng jai" is an aspect of Thai culture that exists in general society. Due to this concept, there is a tendency in Thai culture for differences in opinions between individuals to be "met" rather than confronted. These emotions are regarded as an impediment to knowledge sharing because participants are uncomfortable telling others about what they think or feel.

2.5.3 Collectivism/ Individualism - "Kam lang jai"

The characteristic of collectivist cultures is group identity and interdependence. The in-group members prefer harmonious relationships and hierarchical control. Each person has been taught to show respect for ancestors, tradition, authority, parents and elders (Triandis, 1995). This is obviously true in Thai culture which is characterised by collectivism rather than individualism (Hofstede, 2001). The sense of collectivism in Thai people is strong as a consequence of their living in extended families. In this situation children learn to think of themselves as part of in-groups rather than out-groups. The dependency relationship between the person and the in-group is further developed and reinforced at school (Hofstede, 2001) For example, students in a collectivist society are more likely to form their subgroups based on clan backgrounds rather than joint tasks. This characteristic can be an impediment to knowledge sharing as they lack self-monitoring and are reluctant to participate in out-groups. To encourage them to express ideas or participate in out-groups requires moral support from their social groups. This concept can also be expressed in terms of the Thai words "Kam lang jai" (spirit or moral support) which refers to the participants showing strong loyalty to and gaining strong support from their social

group. They believe that these social groups can provide such support (Hallinger and Kantamara, 2001).

The highly collectivist nature of Thai culture shapes the context for the improvement of Thai VEDs by locating change in the social group rather than within individuals. In knowledge sharing environments, not surprisingly, students are more likely to "move in the direction of change" as a group rather than as individuals (Hallinger and Kantamara, 2001). Thai students are more likely to study in classrooms with their friends rather than study as an individual (Triandis, 1995). They usually hold views and opinions respecting the group and this plays a vital role in their learning styles. This spirit or moral support from their in-group encourages self-confidence in students, and affects Thai VEDs. Hence, without a sense of community spirit or moral support, students are reluctant to ask questions or lack courage to present their new ideas and skills, which is fundamental to knowledge creation

High power distance "Bhun khun", uncertainty avoidance " Kreng jai" and collectivism "Kam lang jai" in Thai culture are the key inhibitors of effective knowledge sharing. Moreover, these cultural factors influence Thai values and attitudes about information processing, publishing and communication.

Three Thai culture barriers to knowledge sharing are summarised in Table 2.2 below.

Table 2.2 Summary of Thai culture barriers in term of Hofstede's dimensions

Hofstede's dimensions of national culture	Thai culture barriers	Inhibitor to Knowledge Sharing
Power distance	Bhun khun	Unwilling to share ideas or knowledge contents
Uncertainty avoidance	Kreng jai	Reluctant to be the cause of discomfort
Collectivism	Kam lang jai	Unwilling to act as individuals

2.6 A MODEL FOR SUCCESS IN THAI VEDs

The conceptual basis to measure the success of Thai VEDs has to be clarified as there are various contexts dealing with VED organisation such as design, development and implementation. This study specifically explores successful

implementation of Thai VEDs from three viewpoints. First, the quality of learning should be improved for example, virtual courses should be provided in various learning styles and accessible information and content should be easy to access and meet students' needs (Dulworth, 1996; Alexander and McKenzie, 1998; Borthick and Jones, 2000). Second, the productivity of learning should be improved in which new knowledge is created and sharing ideas and insights between students and instructors should be encouraged by using collaborative technologies (Alexander and McKenzie, 1998). Third, instructors and students need a positive perception towards interactive VED courses (Alexander and McKenzie, 1998).

A theoretical research model, which incorporates the factors that facilitate the success of establishing and implementing of Thai VEDs, is shown in Figure 2.5. The main focus of this study is to investigate the factors that have a critical impact, and how these factors can facilitate the establishment and implementation of Thai VEDs.

The theoretical framework shown as a research model in figure 2.5 is divided into four parts. The first part shows the independent variables that affect Thai VEDs implementation, including resources, computer literacy, perceived value of computer-based information, characteristics of administrator, student and instructor in knowledge sharing, information culture and their task interdependence. The set of independent variables are influenced by the dependent variable: the success of Thai VEDs incorporated into Thai culture.

The research will examine which factors show significant impact on Thai VEDs in which the quality, productivity of learning, ease of access and also student and instructor perception in VED are improved. The intended outcome of this research will be to establish a strategic framework for effective implementation of Thai VEDs.

Figure 2.5 The Theoretical Framework

Note: $P_1 - P_n$ means participant 1 to participant n

2.7 SUMMARY

This chapter has examined the previous literature and research issues associated with VED. Although most previous studies are based around western VED, there are some significant ideas used as fundamental issues to determine which factors influence VED, particularly in the Thai context. The theoretical framework for incorporating into Thai culture, based on the previous research, is developed in this chapter. This is used in the remainder of the study and becomes the basis for the research questions that frame the research methodology outlined in chapter 3. The next chapter discusses the research methodology that is used in the analysis of the research questions.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In the previous chapter, the literature review identified the factors influencing Thai VEDs and from this we developed a theoretical framework used in the study. This chapter describes the logical basis of the methodology adopted for the research. This chapter is divided into three sections; the first discusses the rationale for using a multi-method approach to the research. The second section outlines the case study approach where interviews are used as a data collection tool, and the final section discusses the quantitative approach using a questionnaire survey. The research methodology and its reliability and validity are discussed and the limitations of the research methodology are also clarified in the last section.

3.2 METHODOLOGY ADOPTED FOR THE RESEARCH

The purpose of this study is to identify the significant and dominant facilitators and inhibitors for Thai VEDs and identify VED adoption strategies. A combination of quantitative and qualitative data collection such as survey, interviews and case study is used to test the research propositions. Both methods can be distinguished by the difference in the nature of data and paradigms. The former, quantitative method attempts to explain data on an interval or ordinal scale, whereas qualitative data are basically obtained from linguistic or pictorial representation, hence it can be difficult to mix these methods because of their different paradigms. Essentially, the quantitative method is a positivist approach, whereas the qualitative method is an interpretive approach (Yin, 1994; Mingers, 2003).

Mingers (2003) surveyed IS articles that had been published in various IS journals both in UK and US. The findings showed that in the main journals only one in five papers make use of multiple research method and this rate has not recently increased.

There are many barriers in term of philosophy, culture, psychology and practice to use mixed methods. However, a combination of quantitative and qualitative method can be used to ascertain the richness and increase validity of the results if the relationships between the research situation and task are specific and well defined.

In this study, questionnaire surveys are typically used when the researcher looks through a specified set of variables (Brannen, 1992). These variables are associated with the theoretical framework and used to develop the research hypotheses. The primary purpose of the questionnaire survey was to collect general data from Thai students who were involved with VED learning in 4 Rajabhat Institutes. Given a very large number of students a survey approach was obviously more practical than interviews. However, another stronger reason relates to the students' personal characteristics, Thai students are not normally comfortable expressing their own opinion through interviews. They tend to be reluctant to be the cause of discomfort to their instructor's feelings (Kreing jai, a Thai cultural aspect addressed in Chapter 2). Therefore, an anonymous questionnaire survey is more suitable to allow them to fully express their views. Moreover, this quantitative approach means the findings can be generalised to be representative of the whole Rajabhat students.

Interviews and case study approaches are used to search for a pattern of inter-relationships between a previously unspecified set of concepts (Brannen, 1992). The literature in the previous chapter suggested some understanding of the factors affecting the success of VEDs but contributed little to the development of the theoretical framework in the Thai VED mode in which Thai culture was incorporated. Using the interview and case study to collect data on distinct groups who were involved with VED management and implementation such as administrators, IT directors and instructors allows the researcher to gather in-depth and new information (Miles and Huberman, 1994; Cavana et al., 2001).

Therefore, to enhance the richness of the research and validity of the results, a combination of quantitative and qualitative approach was used as a methodology for this study. In addition, data from many sources enabled confirmation of each other

via triangulation and also provided new ideas and fresh insights (Miles and Huberman, 1994).

The process of combining quantitative and qualitative approaches can be viewed in three ways: qualitative work as a facilitator of quantitative work; quantitative work as a facilitator of qualitative work; or equal emphasis given to both approaches (Bryman, 1988). This research placed an equal emphasis on quantitative and qualitative approaches. In the quantitative research design, data from questionnaires distributed to the student bodies of the 4 Rajabhat Institutes were analysed by using SPSS to test the variables influencing the success of Thai VEDs. The measurement can be viewed as positivist applied to discover the "real" factors influencing Thai VEDs. The data obtained from students was very important in ascertaining the student perception and identifying the facilitators and inhibitors of Thai VEDs.

The qualitative research design including interviews with instructors, administrators and IT staff was used to identify insights into relationships of the factors influencing Thai VEDs. The quantitative data provided generality of observation whereas the qualitative enhanced the exploration of in-depth details involving administrator and lecturer groups (Bryman, 1988; Cavana. et al., 2001). These groups provided background data, gathering much more information and investigating other factors impacting on VEDs.

The research design, which involves a series of rational decision-making choices, is represented in figure 3.1. The various issues involved in the research design are shown in the frames below.
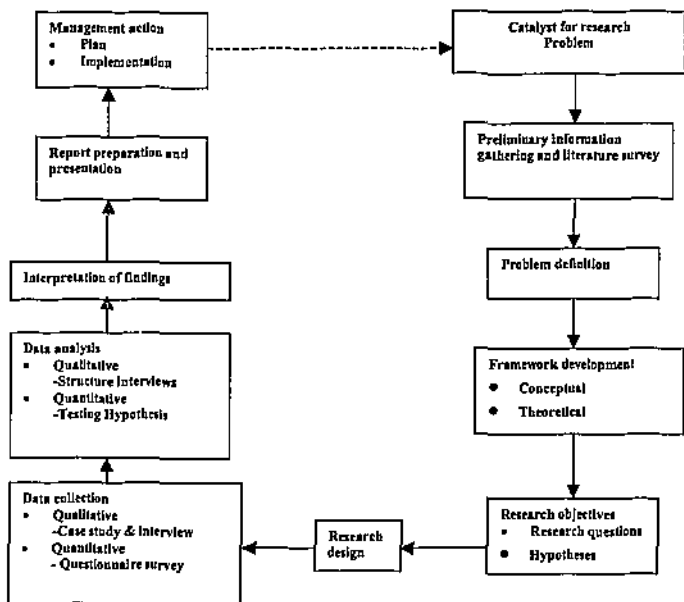
Figure 3.1 A summary of the research cycles (adapted from Cavana, 2001).

3.3 JUSTIFICATION OF THE RESEARCH APPROACH

The researcher was specifically interested in finding more detailed information about the variables and indicators of possible relationships between the variables as identified in the theoretical framework (Chapter 2). Accordingly, a combination of quantitative and qualitative approaches through structured interviews, case study and questionnaires was used. Qualitative and quantitative approaches have their advantages and disadvantages. For example, while questionnaires can achieve generalisation, on the other hand it is not guaranteed to receive a high response rate where the area of research is sensitive. Qualitative research can provide greater details on processes, which links the variables (Brannen, 1992).

In the traditional concept, research strategies used relate to a hierarchical concept. For instance, case study is suitable for an exploratory phase of an investigation, and a survey is appropriate for the descriptive phase. According to Yin (1994) this hierarchical view is misconceptual. The appropriate view is the use of multiple resources of evidence as the way to ensure construct validity. To select which strategy can be used as an advantageous strategy, three conditions should be considered. These are the type of research question; degree of disruption to the normal flow of work; and the degree of focusing on the current event rather than the historical event.

The first condition that has to be considered is the type of question. As the objective of this research was to determine what factors influenced the success of VEDs, the theoretical relationships and generalisations could be made from a questionnaire survey. This also provided internal and external validity. The former was achieved through the theory developed and data collection and analysis to test those theories. The latter was gained from the generalisation (Yin, 1994). The second condition of the degree of researcher interference was minimised using structured interviews and questionnaires. And the third condition of this study was to investigate the contemporary event against the historical event. Using different sources of data and methods would help to prove the validity and the reliability of the outcome (Bryman, 1988).

3.4 QUANTITATIVE APPROACH

In order to investigate what factors influence the success of Thai VEDs, the survey questionnaire was conducted in four Rajabhat Institutes. The questionnaire was designed in accordance with the research objectives and relates to the literature review. The research hypotheses were developed following the theoretical framework. In this framework, the success of Thai VEDs was determined by the dependent variable. This variable was broken down into three main categories following the characteristics of successful VEDs; improved quality, productivity and students' perception of VED courses. To investigate what factors affect the success of Thai VEDs from the student perspective, four hypotheses were formalised. According to the hypotheses, five of the seven factors were determined as the

independent variables. These factors were resources, computer literacy, perceived value of computer-based information, characteristic of student culture and information culture. The selection of five factors was reasonable to determine the success of VEDs from the respondent point of view of students involved with virtual courses. The other two factors: size of market and task interdependence was examined from the perspective of three groups; administrator, IT staff and instructor.

3.4.1 The Research Hypothesis

According to the theoretical framework and the research objective, a number of research hypotheses were developed.

These were:

1. The perception of students in VED courses

P1- H_0: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will not significantly influence the perception of Thai VEDs

P1- H_1: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will significantly influence the perception of Thai VEDs

2. Characteristics of successful VEDs- Quality and productivity of learning

    2.1. Effectiveness of instruction

P2.1- H_0: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will not significantly influence the effectiveness of instruction of Thai VEDs.

P2.1- H_1: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will significantly influence the effectiveness of instruction of Thai VEDs.

2.2 Effectiveness of course content

P2.2- H_0: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will not significantly influence the effectiveness of course content of Thai VEDs.

P2.2- H_1: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will significantly influence the effectiveness of course content of Thai VEDs.

2.3 Effectiveness of outcome

P2.3- H_0: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will not significantly influence the effectiveness of outcome of Thai VEDs.

P2.3- H_0: The five factors: resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture will significantly influence the effectiveness of outcome of Thai VEDs.

3.4.2. Questionnaire Survey

In order to get accurate answers without missing any important details, the questionnaire was first developed in English, then translated into Thai by a Thai lecturer who is expert in questionnaire design and also English. The researcher used personally administered questionnaires as the mode of data collection (Cavana. et al., 2001). A questionnaire was developed in which we stated the purpose of this study, opinions were sought on the research variables, which were presented as factors which influence successful Thai VEDs. Participants were requested to express their opinions on a four-item scale anchored by 1= strongly disagree, 2= disagree, 3= agree and 4= strongly agree. The four-item scale was specifically selected to prevent students from selection of the mid-point. Given their personal characteristics this

would prevent an easy "face saver" solution of mid-point for critical answers. The questionnaire comprised of the following sections: (see Appendix B for full questionnaire)

1. Factors influencing VEDs.
   - Resources
   - Computer literacy
   - Perceived value of computer-based information
   - Culture
     - High power distance
     - Hight uncertainty avoidance
     - Collectivism
   - Information culture
2. Characteristics of successful VEDs
   - Quality and productivity of learning
     - Effectiveness of instruction
     - Effectiveness of course content
     - Effectiveness of outcome.
   - Perception of student of VEDs
3. General comment
4. Background of participants.

The aim of section one, resources, computer literacy, perceived value of computer-based information, characteristics of student culture and information culture were determined as factors influencing the success of Thai VEDs. This section was divided into five parts.

The purpose of the first part is to obtain information about the hardware, software and network that their university provides for collaborative learning as quality and reliability of technologies influence successful VEDs (Haghirian, 2002).

The second part of this section is to let respondents indicate their experiences associated with the use and implementation of ICT. Thus the questions asked about the knowledge of computers and their use critical to the success of VEDs.

Then the perceived value of computer- based information was examined in the third part. These questions were designed to obtain the scale in relation to the respondents

current feeling about using computers such as whether they are considered stimulating, fun, useful and so on.

The purpose of the fourth part was to capture the characteristic of respondents in regard to knowledge sharing with the use of synchronous and asynchronous communication technologies eg. e-mail, bulletin board. These questions were designed based on the culture of high power distance, high uncertainty avoidance and collectivism incorporated into Thai student characteristics.

The fifth part was used to gain an idea as to how the respondents collect, record, rearrange information and formalise their knowledge such as enjoying reading material content on-line rather than listening to instructors in classroom. This related to information culture as a factor that could facilitate and inhibit the success of VEDs.

The first part of section two was sets of items that indicated quality and productivity of learning from the respondent point of view and defined the effectiveness of instructions, course contents and outcomes. The second part of section two was focussed on the respondent perception of VEDs. The questions were designed to let them indicate how much they agreed or disagreed that their virtual courses were a valuable experience. All of the questions in this section used interval scales in order to compute the means and the standard deviations of the responses on the variables. The third section enabled students to provide opinions or comments which were not raised in the above questions. This allowed the researcher to obtain other points of view which the first section overlooked.

The last section of the questionnaire survey was designed to obtain demographic information about the respondents. This included background; age, number of years studying, faculty and mode of studying were all addressed here. These questions used nominal scales in order to assist in frequency counts.

3.4.3 Sample

This study utilised a cross-sectional study, where data was gathered to meet a research objective only once according to the researcher's limited time and costs (Cavana. et al., 2001). There are three groups that influence the successful outcomes of VEDs. These are administrator and IT staff, instructor and student groups. The sampling framework for the survey was based on the student group. The point of views of students who were learning in VEDs could be represented as the measurement of its success. The sample size was 240 students involved in virtual courses. 60 questionnaires (translated into Thai) were sent to each of four Rajabhat Institutes. These are Rajabhat Institute Phranakhon; Rajabhat Institute Suan Dusit; Rajabhat Institute Petchburiwittayalongkorn; Rajabhat Institute Rajanagarindra, representing 240 in total. Respondents were assured that responses would be anonymous and confidential. The questionnaire was conducted by using personally administered questionnaires through disproportionate stratified random sampling. Of the total 240 questionnaires distributed, 167 questionnaires were returned representing a respond rate of 69.5 percent.

3.4.4 Data Analysis

Data analysis of the survey stage of the study is discussed in detail in the next chapter, and the information included here is only an overview of the process. Descriptive statistics were used to assess the demographic characteristics of the respondents. These included frequency counts, which provided the background of the respondents. The next stage of analysis was to determine whether the above research propositions were supported. A hierarchical multiple regression analysis was conducted. Multiple regression analysis is the appropriate method of analysis when the research problem involves a single metric dependent variable presumed to be related to one or more metric independent variable (Bryman and Cramer, 1999). Further, the basic rationale for using hierarchical multiple regression is to allow the researcher to know whether a set of independent variables would significantly add to the variance explained in the dependent variable (Cavana et al., 2001). The dependent variables were the effectiveness of instruction, course content, outcome and the student perception in their virtual courses. Where the independent variables are five factors including resources, computer literacy, perceived value computer-

based information, culture (high power distance, high uncertainty avoidance and collectivism) and information culture.

The result of this stage of analysis indicated what variables had significant explanations for the variation in the success of Thai VEDs categorised as follows: the effectiveness of instruction, course content, outcome and the student perception of learning in VEDs environment.

3.5 QUALITATIVE APPROACH

3.5.1 Case Study and Interviews

The case study investigated which factors influence Thai universities providing VEDs as an educational tool in a real-life context (Yin, 1989). It could be used to answer "how" and "why" these factors facilitated or inhibited Thai VEDs. The aim of the case study was to provide a multi-dimensional picture by interviewing administrative staff and instructors. This can provide the researcher with in-depth information on distinct groups (Cavana. et al., 2001). To strengthen this, the study was designed to use multiple-case studies. According to Yin (1994) the use of multiple-case studies in the range of four to six case studies could produce comparative results and be generally accepted as a theoretical replication. Thus, four case studies were selected based on their VED capability. As a result of gaining data from various sources of evidence, the case study could be used to determine the relationship and patterns of the factors that surround VED events to apply strategies for success in implementing VEDs. If all case studies produced similar results then we would have strong support for the effectiveness of the framework. If there were some contradictory results, the initial framework would be reconsidered and adjusted to accommodate all cases (Yin, 1994).

Based on the existing literature reviews and theoretical framework, 7 factors were identified as key indicators. Thus, the structured interviews were conducted with a list of predetermined, standardised questions based around these 7 factors which were carefully ordered and worded in a detailed interview schedule. There were 2 sets of structured interviews: one was used to interview the administrator, IT director and implementor groups and the other was used to interview the instructor group.

Each target group was asked exactly the same questions, in exactly the same order and the content of the questions was used to manage the direction of the interview.

3.5.2 Interview Structure

Interview for administrators

The interview has four sections. The first section comprised demographic questions and simple questions concerning the university such as interviewee status, responsibility, year of experience, and etc. The second section comprised of questions that relate to four factors, affecting the establishment of Thai VEDs. These questions are designed to obtain information about how the administrators organise resources and increasing number of students, computer literacy and how they perceive value of computer-based information to facilitate VED learning environments. Problems with VED management were also addressed in this section.

The purpose of questions in section three are to examine a series of cultural contexts with regard to knowledge sharing of administrators and their opinion about cooperation and their plan to encourage members to have a commitment in providing VEDs.

The measurement of success in VED is examined from their personal assessment in the last section. In this section participants were requested to express their opinions on a five-item scale anchored by 1= very dissatisfied, 2= somewhat dissatisfied, 3= neither satisfied nor dissatisfied, 4= somewhat satisfied, and 5= very dissatisfied (see section I in Appendix C for full interview questions)

Interview for instructors

The structure of interviews was developed in five sections. The first section has demographic questions and simple questions concerning the university such as gender, age, faculty, and years of experience. The second and the third section are composed of questions that relate to four and three factors respectively, affecting the establishment and implementation of Thai VEDs. Additionally, the assessment of the successful VED by the interviewees is examined in the last section.(see section II in Appendix C for full interview questions)

3.5.3 Procedures

Interviews were conducted with three groups based on their responsibilities from four Rajabhat Institutes. This included the administrators, IT staff and instructors involved with VEDs courses. Letters explaining the purpose and background of the research were sent to the presidents in four Rajabhat Institutes. After getting permission to gather data from the presidents of four Rajabhat Institutes, all interviewees were contacted by telephone to make an appointment for the interviews. The structure of the interview was designed in two sections, In the first section, all interviewees were asked questions by the researcher. A tape recorder was used to record the interview where the interviewees granted their permission. In the second section, they were asked to evaluate the success of their VEDs.

The interviews were conducted by the researcher in Thai. In order to get accurate answers without missing any important details, a second bilingual person who grew up in Thailand and migrated to Australia and obtained her degree and job at Edith Cowan university for many years translated the Thai back into English. Data was translated to text and analysed by using content analysis in an attempt to identify the insights and relationships of the factors influencing the success of Thai VEDs. The results from the structured interviews provided a detailed understanding that came from directly observing administrative staff and instructors and listening to what they said and how they felt about their VEDs.

3.5.4 Sample

There are three groups that influence the success of VEDs, administrator, instructor and student groups. The interview was conducted face-to-face with one president and three vice presidents who were representative of administration in academic affairs. The second group was composed of four IT directors who had responsibilities in managing VEDs and four IT staff who had a vital role in producing VED systems. The last group were twelve instructors from four Rajabhat Institutes who provided educational materials for their courses and interacted with students by using communication technologies in VEDs.

3.5.5 Data Analysis

The four Rajabhat institutes were separately analysed each as a unique site. In each case, a brief discussion of background information, objectives and implementation of VEDs were outlined. The technique used to examine data in the study was content analysis. The questions in the structured interviews were based on the existing literature review. Therefore, terms and categories used in the research were determined by an inductive approach which was based on the "relationship between theoretical and practical perspective" (Berg, 2000). Words and themes based on research categories were counted in a frequency distribution and summarised in the content-analytic summary table then cross-case analysis techniques were used to address similarities and differences of facilitators, inhibitors and coping strategies of VEDs in four Rajabhat Institutes (Miles and Huberman, 1994; Berg, 2000). This pattern analysis was utilised in order to gain a better understanding and more detailed information about the cause and relationship of critical factors influencing VEDs.

It was determined that the data obtained from the interviews would be used to develop a strategic model fitted to the institute's local context (Miles & Huberman, 1994). In addition, the summarised data analysis from four case studies was used to establish the general strategic model that would be suited to other Thai universities.

3.6 ETHICAL CONSIDERATIONS

3.6.1 Questionnaire Survey

The cover letter outlining the aim and scope of the research was given to all respondents with the questionnaire. A copy of its details is shown in Appendix B. In this letter, adequate information was provided and respondents were assured that the information obtained would be kept strictly confidential and would only be used for the research purposes. Respondents were also advised of the right of privacy (anonymity) and that this right would be maintained at all times.

3.6.2 Case Studies

The assurance of respondent's right and anonymity was maintained all the times. Before conducting the interview, a copy of the approval letter from the Edith Cowan

University Committee for the Conduct of Ethical Research and a Form of Disclosure and Informed Consent for Research (both forms are shown in the Appendix C) was provided to the respondents. Respondents were informed of the purpose of the study and that the outcomes and recommendations of this study would be helpful for developing strategic guidelines for the improvement of the effectiveness of VED in Rajabhat Institutes. They had the right to decline to participate at anytime and every answer would be kept confidential and not be made available to any third party.

3.7 SUMMARY

This chapter described the research methodology that was used to conduct the study. The methodology used in this study encompassed both a qualitative and quantitative approach. The use of multiple methods provided convergence and triangulation in which the values of the research were enriched (Bryman, 1988; Creswell, 1994). Moreover, the validity of the research was improved due to the various sources of data collection.

This research placed equal emphasis on qualitative and quantitative approaches. In the quantitative approach, the questionnaire survey was used to gather data from students involved in VED courses in four Rajabhat Institutes. This was used to examine the cause and effect relationships of the factors that influence the success of Thai VEDs. While in the qualitative approach, multiple case study and interviews were used to explore the insights and relationship of the factors influencing on Thai VEDs. This methodology enhanced the exploration of in-depth details involved with administrator and lecturer group (Bryman, 1988; Cavana. et al., 2001).

The next two chapters of this report provide a detailed analysis of data and the presentation of the results from the survey questionnaire and case study respectively.

CHAPTER 4

ANALYSIS OF THE SURVEY

4.1 INTRODUCTION

This chapter examines the data resulting from the first stage of the research based on the questionnaire survey with students involved in VED courses in four Rajabhat institutes. Only results from the analysis of data and prior details of findings are presented in this chapter. The case study and interview stage are discussed in Chapter five. The general conclusion outlined in Chapter 6 examines the results of the research within the context of the literature.

This chapter begins with an examination of the characteristics of the respondents. Descriptive statistics (4.2 and 4.3) are used to analyse the demographic information in the survey. This provided a better understanding of the characteristics of the respondent and a general understanding of the data. The validity, reliability, content and construct validity were tested (4.4). Content validity ensured that the specific points of items in the questionnaire were representative of the concepts. This has been attested through the literature and the judgement of a panel of experts. Construct validity testified to how well the results obtained from the use of the questionnaire fit the theoretical framework. Two specific forms of construct validity were examined: convergent and discriminant validity.

The analysis focused on the factors influencing the success of Thai VEDs: effectiveness of instruction; course content; outcome and student perception of VED courses. This was attained through use of Multiple Regression to examine or predict the success of Thai VEDs from several independent variables derived from the research model in chapter 3.

4.2 CHARACTERISTICS OF SAMPLE

This section examines the demographic characteristics of the respondents in order to provide a better understanding of the contextual issues of the research. The respondents were selected from students who were involved in VED courses. 60 questionnaires (translated into Thai) were personally administrated to each Rajabhat Institute representing 240 in total while an on-line survey was considered it was found to be impossible to administer as the participants had limited accessibility to the Internet even at their institutes or at homes. The participants were asked to answer the questionnaire while they were learning VED courses in the computer laboratories. Due to limited time to allow them to capture the answers, some did not return the questionnaires directly to the administrator (the researcher). Only 167 questionnaires were returned representing a response rate of 69.5 percent. Of these, 16 questionnaires were inadequately completed, thus the response rate for completed questionnaires useable for data analysis was 62.9.

The survey questionnaire captured background data for studying participants. Table 4.1 presents a list of the participants' background.

Table 4.1 Characteristics of student participants

Characteristics	Percent
Gender	
Male	56.3
Female	43.0
Age	
18-24 years	82.8
25-34 years	13.9
35-44 years	1.3
Mode	
Normal	62.9
Weekend	35.8
Faculty	
Education	0.7
Management Sciences	11.3
Technology and Industrial Science	25.2
Humanities and Social Science	4.0
Science and Technology	57.6
Level	
1st year	22.3
2nd year	1.4
3rd year	60.8
4th year	14.2
Other	1.3

As can be seen in Table 4.1, 56.3 percent and 43.0 percent of the respondents were male and female respectively. Most of them (62.9 percent) were full-time and 35.8 percent were weekend-class students. Most of them were between 18 and 24 years old (82.8 percent) and the majority of respondents, about 57.6 percent were studying in Faculty of Science and Technology. Two other major groups were from Faculty of Technology and Industrial Science (25.2 percent) and Management Science (11.3 percent). The others were fairly evenly spread across the remaining faculties. Lastly, 60.8 percent of total students were studying in the third year and only 22.3 percent were in the first year.

4.3 DATA ANALYSIS

In this study, data analysis was developed in three stages. The first stage of data analysis began with getting an overview of the data. This was obtained by checking

the central tendency and the dispersion through the mean, and the standard deviation in the data. This provided a better understanding of how the respondents reacted to the items in the questionnaire and how good the items and measures were (Cavana. et al., 2001). The second section of data analysis tested the goodness of data. In order to strengthen the quality of research design, the validity and reliability were examined. The final stage was hypotheses testing. This stage of analysis focused on factors that would significantly influence the success of Thai VEDs. This was attained through use of multiple regression analysis, which was used to establish the relative importance of factors to the success of VEDs.

4.3.1 Screening of Data

This section provided descriptive statistics of the data for every single item measuring the independent variables and dependent variables. There were two phases of descriptive statistics. The first step is to check the central tendency and the dispersion of the data, the mean, and the standard deviation. These descriptive statistics provided a good idea of how well the questions were framed for tapping the concept (Cavana. et al., 2001). The second phase was to examine whether the dependent variables were approximately normal distributed. Skewness was used as a statistic to measure the distribution and determine whether the distribution differed significantly from a normal symmetric distribution.

- **Descriptive statistics for checking the central tendency and dispersion of data**

The mean and the standard deviation were used to describe the data collected from the questionnaire survey. A questionnaire was designed in which the participants were requested to express their opinions on a four-item scale anchored by 1= strongly disagree, 2 = disagree, 3= agree, and 4= strongly agree.

> ➢ **Independent variable phase**
>
> Descriptive statistics for the independent variable phase are shown in Table 4.2 which presents the mean and standard deviation of resources, computer literacy, perceived value of computer-based information, culture and information culture

Table 4.2 Descriptive statistics of independent variables

Independent variables	Mean	Std.Dev
Resources	**2.78**	
Accessibility to computer facilities on campus	2.67	.822
Getting synchronous communication technologies	2.70	.739
Getting asynchronous communication technologies	2.55	.640
Network speed	2.62	.839
Updated software	2.83	.746
Useful Information	3.10	.710
Up-to-date information on WebPages	3.02	.725
Computer literacy	**3.20**	
Easy to use computer	3.22	.684
Ability to communicate by using e-mail, bulletin board, etc.	3.17	.681
Perceived value of computer-based Information.	**3.13**	
Stimulation	3.25	.663
Fun	3.13	.680
Personal	3.11	.497
Efficient	3.07	.555
Reliable	2.93	.499
Useful	3.25	.553
Desirable	3.19	.657
Culture in knowledge sharing by using ICT		
Power distance	**2.52**	
-Uncomfortable to express ideas which contradict with lecturers.	2.34	664
-Accepting lecturer's instruction rather than questioning them	2.71	.708
High uncertainty avoidance	**2.78**	
-Expecting lecturers to be expert	2.96	.631
-Learning based on lecturers' instruction	3.04	.729
-Being reluctant to express different ideas	2.35	.675
Collectivism	**2.79**	
-Group-based orientation rather than work-based orientation	2.79	742
Information culture	**2.68**	
Being comfortable to read material contents on-line	2.48	.782
Prefer participation by using e-mail or discussion board rather than do your work alone.	2.69	.675
University environments are supportive to learn in VED	2.79	.676

The results using a four point scale show that computer literacy was somewhat enriched (mean = 3.17) as was the perceived value of computer-based information (mean = 3.13). This indicated that most of the respondents were able to communicate by using communication technologies such as e-

mail and perceived that using the computer was stimulating, fun, personal, efficient, reliable, useful and desirable.

.

Power distance and information culture were about average (mean = 2.52 and 2.68). These indicated that there was somewhat high power distance between the respondents and their instructors and that the respondents were likely to read material on-line and participate or discuss with others by using communication technologies.

Resources, high uncertainty avoidance and collectivism were slightly higher than average (mean = 2.78, 2.78 and 2.79 respectively). The mean of 2.78 on the resources indicated the degree of how well the four Rajabhat Institutes provide facilities and information to enhance the respondents' learning through VEDs. The resources were composed of seven items. Among these, four items: Getting asynchronous communication technologies (mean = 2.55), network speed (mean = 2.62), the accessibility to computer on campus (mean = 2.67) and getting synchronous communication technologies (mean = 2.70) were rather lower when compared with others: updated software (mean = 2.83), useful information (mean= 3.10) and up-to-date information on web-pages (mean = 3.02).

The means of 2.78 on high uncertainty avoidance indicated that most of the respondents expected to learn directly from the lecturer's instructions and expected that the lecturers must be the experts and give them all the answers.

Finally, the mean of 2.78 for collectivism could be interpreted to mean that the respondents were more likely to learn by group-based orientation rather than individual work-based orientation.

➤ **Dependent variable phase**

Table 4.3 presents descriptive statistics for the dependent variables. Questions in this phase were grouped into two main tasks. The first task was related to quality and productivity of learning from the respondents' point of view as

follow: the effectiveness of instruction, course content and outcomes. The second task focused on the respondents' perception of VEDs.

Table 4.3 Descriptive statistics of dependent variables

Dependent variables	Mean	Std.Dev	Variance	Skewness
The Success of VEDs	2.86			
Effectiveness of instruction	2.76			
Well organised course	2.74	.629	.396	-.704
Good explanation	2.77	.637	.406	-.543
Useful advice	2.79	.669	.448	-.537
Effectiveness of course content	2.95			
Accessibility	2.95	.661	.437	-.364
Effectiveness of outcome	2.84			
In-depth learning	2.76	.680	.463	-.307
Comprehensive learning	2.93	.650	.442	-.379
Perception	2.89			
Active learning	2.87	.709	.502	-.374
Better learning experience	2.91	.642	.413	-.380

Table 4.3 presents the mean, the standard deviation of the characteristics of successful VEDs. The means on all the success factors: effectiveness of instruction (2.76), course content (2.95), outcome (2.84) and perception of VEDs (2.89) were moderately higher than an average rate of 2.5 on a four-point scale. Additionally, all of the standard deviations and variances are not high indicating that most respondents are very close to the mean on all variables.

These results do not unequivocally support the view that VEDs are successful. Firstly, students weighted the effectiveness and perception of VEDs overall as less than 3 which was accepted as the "satisfy" scale on the four-point scale. Secondly, the questionnaires were conducted while the instructors were controlling their classes. The students might have felt uncomfortable about evaluating the success of VEDs, despite the responses being anonymous. They may have perceived this as a criticism of their instructors.

- **Descriptive statistics for checking the approximately normal distribution**

This phase was to examine whether the dependent variables were approximately normally distributed. The skewness values of the independent variables used to measure the distribution are also shown in Table 4.3. These statistics indicate whether a distribution differs significantly from a normal symmetric distribution. In general, skewness values less than one assumes that the distribution of data is a normal distribution (Cavana et al., 2001). Therefore, it is appropriate to apply Multiple Regression Testing to variables.

4.3.2 Testing the Goodness of Data

To strengthen the quality of the research design, internal reliability was examined in terms of internal consistency of the questionnaire responses. Reliability was evaluated by assessing the internal consistency of items representing each factor using Cronbach alpha (Cavana et al., 2001). The 33-item instrument had a reliability of 0.85, exceeding the minimum standard of 0.70 suggested for basic research. The reliability of dependent and independent factors is shown in Table 4.4.

Table 4.4 Reliability measures

Factors	Alpha
Independent variable	
Resources	0.75
Computer literacy	0.78
Perceived value of computer-based information	0.83
Culture in knowledge sharing by using ICT	0.71
Information Culture	0.78
Dependent variable	
Quality and productivity of VEDs	0.75
Perception	0.72

In order to enhance the quality of research, construct validity and discriminant validity were addressed. The basic qualitative criterion concerning construct validity is content validity. Content validity implies that the instrument considers all aspects of the construct being measured. In applying content validity the factors affecting the success of Thai VEDs in the questionnaire were supported in the literature reviews (Cavana et al., 2001; Creswell, 1994; Yin, 1994). Thus, the instrument could be an accurate representation of a theoretical concept.

Discriminant validity for each item is tested by counting the number of times that the item correlates higher with items of other factors than with items of its own theoretical factor. For discriminant validity, the correlation between independent variables should be less than one-half the potential comparisons (Campbell and Fiske, 1959). The correlation matrix of independent factors is shown Table 4.5.

Table 4.5: The relationship between independent variables

(N = 151)

	Resources	Computer literacy	Perceived value of computer-based information	Culture	Information culture
Pearson correlation Resources	-				
Computer literacy	.462*	-			
Perceived value of computer-based information	.353*	.429*	-		
Culture	.094	.139	.162	-	
Information culture	.063	.007	.149	.260	-

* Correlation is significant at the 0.01 level (2-tailed)

The Pearson correlation matrix obtained for four interval scale variables is shown in Table 4.5. The data shows low multi-collinearity (less than 0.75) with correlations between the independent variables (Cavana et al., 2001 p.320). That means that all questions measuring each concept were loaded more highly on their intended concept than on other concepts; therefore, there is confirmation regarding the validity of the measures (Cavana et al., 2001).

4.3.3 Hypothesis Testing

Five hypotheses were generated for this study, as stated earlier. Following the reliability, construct and discriminant validity tests, the researcher used hierarchical multiple regression analysis for testing the hypotheses.

Multiple regression analysis is the appropriate method of analysis when the research problem involves a single metric dependent variable presumed to be related to one or more metric independent variable (Bryman and Cramer, 1999). Further, the basic rationale for using a hierarchical multiple regression is to allow the researcher to know whether a set of independent variables would significantly add to the variance explained in the dependent variable (Cavana et al., 2001). The independent variables in this research showed five factors: resources, computer literacy, perceived value of computer-based information, culture and information culture whereas the culture factor was defined as high power distance, high uncertainty avoidance and collectivism. It was decided to use the three subcultures instead of the single ultimate of culture as the results of multiple regression could predict what kinds of culture specifically affected the success of VEDs. Therefore, in the multiple regression equation, there were seven independent variables.

The dependent variables were the success of VEDs namely, the effectiveness of instruction; course content; outcome and the perception in VEDs. This statistic was then used to predict the changes in the success of VEDs in response to changes in the independent variables. The objective is most often achieved through the statistical rule of least square (Bryman and Cramer, 1999). The results of the test and their interpretation are discussed below:

1. Student perception of VED

Hypothesis P1-H_0:   *The seven factors: resources, computer literacy, perceived value of computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture will not significantly influence the perception of Thai VEDs*

Hypothesis P1-H_1:   *The seven factors: resources, computer literacy, perceived value of computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture will significantly influence the perception of Thai VEDs.*

Table 4.6 Results of Regression Analysis-Student Perception of VED

Model	B	F	R	R^2	Adjusted R^2	Std. Error	Standardized coefficient of Beta	p-value
(Constant)	3.246	3.290	0.372	0.139	.097	.953		
Resources						.033	.020	.829
Computer literacy						.159	-.038	.673
Perceived value of computer-based information						.036	.180	.042*
Culture								
- high power distance						.096	-.106	.213
- high uncertainty avoidance						.085	-.089	.323
- Collectivism						.131	.053	.517
Information culture						.065	.325	.000**

Dependent Variable: Perception of VEDs

The outputs in Table 4.6 show the seven independent variables that were entered into the regression model, the R (0.372) which was the correlation of the seven independent variables: resources, computer literacy, perceived computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture. The dependent variable in this section was the student perception of VEDs. The interrelation of the seven independent variables was taken into account, and the R square (0.139) was significant at the 0.003 level (F value = 3.290). That means that 13.9 percent of the variance (R square) in student perception of VEDs was significantly explained by the independent variables. Among seven independent variables, information culture is the most important in explaining the variance in the perception of VEDs as the highest number in the beta (β) was 0.325. The second-rated important variable was perceived value of computer-based information in which the beta (β) was 0.180. The positive beta weight indicated that if student perception was to be increased enhancing information culture by supporting useful material content on-line, e-mail discussion and supportive university contexts and perceived value of computer-based information would be necessary.

2. The quality and productivity of learning

2.1 Effectiveness of instruction

Hypothesis P21-H_0: *The seven factors: resources, computer literacy, perceived value of computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture will not significantly influence the effectiveness of instruction*

Hypothesis P21-H_1: *The seven factors: resources, computer literacy, perceived value of computer-based information, High power distance, high uncertainty avoidance, collectivism and information culture will significantly influence the effectiveness of instruction.*

Table 4.7 Results of Regression Analysis-Effectiveness of instruction

Model	B	F	R	R^2	Adjusted R^2	Std. Error	Standardized coefficient of Beta	p-value
(Constant)	2.341	5.787	0.470	0.221	.182	1.176		
Resources						.041	.169	.054
Computer literacy						.196	-.097	.259
Perceived value of computer-based information						.044	.105	.210
Culture								
- high power distance						.118	-.125	.122
- high uncertainty avoidance						.104	-.295	.001**
- Collectivism						.161	.025	.745
Information culture						.080	.211	.008**

Dependent Variable: Effectiveness of instruction

The outputs in Tables 4.7 show the seven independent variables that were entered into the regression model, the R (0.470), which was the correlation of the seven independent variables with the dependent variables: the effectiveness of instruction. The interrelation of the seven independent variables was taken into account, and the R square (0.221) was significant at the 0.000 level (F value = 5.787).

That means that 22.1 percent of the variance (R square) in the effectiveness of instruction can be significantly explained by five independent variables. Thus, hypothesis P21-H_0 was substantiated (the null hypothesis was rejected).

Among seven independent variables only culture: high uncertainty avoidance and information culture was significant at the 0.001 and .008 level respectively. The

results mean that culture: high uncertainty avoidance was the most important in explaining the variance in the effectiveness of instruction ($\beta= 0.295$). The second most important variable was information culture in which the number in the beta (β) was 0.211. The positive beta weight of uncertainty avoidance indicated that students preferred their learning to be controlled by instructors rather than learning by themselves. In addition if the effectiveness of VEDs instruction were to be increased, enhancing information culture by supporting useful material content on-line, e-mail discussion and supportive university contexts would be necessary.

2.2 Effectiveness of course content

Hypothesis P22-H_0:   *The seven factors: resources, computer literacy, perceived value of computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture will not significantly influence the effectiveness of course contents*

Hypothesis P22-H_1:   *The seven factors: resources, computer literacy, perceived value of computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture will significantly influence the effectiveness of course contents.*

Table 4.8 Results of Regression Analysis-Effectiveness of course content

Model	B	F	R	R^2	Adjust ed R^2	Std. Error	Standar dized coefficie nt of Beta	p-value
(Constant)	-.009	8.751	0.548	.300	.266	.474		
Resources						.016	.281	.001**
Computer literacy						.079	.036	.655
Perceived value of computer-based information						.018	.167	.036**
Culture								
- high power distance						.048	-.213	.006**
- high uncertainty avoidance						.042	-.064	.432
- Collectivism						.065	.156	.034**
Information culture						.032	.269	.000**

Dependent Variable: Effectiveness of course content

The outputs in Tables 4.8 show the seven independent variables that were entered into the regression model, the R (0.548) which was the correlation of the seven

independent variables with the dependent variables: the effectiveness of course contents. The interrelation of the seven independent variables was taken into account, and the R square (0.300) was significant at the 0.000 level (F value = 8.751). That means that 30 percent of the variance (R square) in the effectiveness of course contents can be significantly explained by resources, perceived value of computer-based information, culture which composed of high power distance and collectivism and information culture. Regarding independent variables, resources were the most important in explaining the variance in the effectiveness of course content as the highest beta (β) was 0.281. While as the number in the beta (β) of information culture was 0.269 and 0.167 for perceived value of computer-based information. The positive beta weight indicated that if the effectiveness of course contents were to be increased, enhancing resources, information culture and also perceived value of computer-base information would be necessary.

On the other hand, the negative beta weight of high power distance was -0.213 indicating that if the effectiveness of course contents was to be increased, a decrease in the degree of power distance had to be experienced. However, the positive beta weight of collectivism was .156 indicating that students working in a group-based orientation enhanced the effectiveness of course content.

2.3 Effectiveness of outcome

Hypothesis P23-H$_0$: The five factors: resources, computer literacy, perceived value of computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture will not significantly influence the effectiveness of outcome

Hypothesis P23-H$_1$: The five factors: resources, computer literacy, perceived value of computer-based information, high power distance, high uncertainty avoidance, collectivism and information culture will significantly influence the effectiveness of outcome.

Table 4.9 Results of Regression Analysis-Effectiveness of outcome

Model	B	F	R	R^2	Adjusted R^2	Std. Error	Standardized coefficient of Beta	p-value
(Constant)	1.325	8.681	.546	.298	.264	.809		
Resources						.028	.155	.099
Computer literacy						.135	-.193	.094
Perceived value of computer-based information						.030	.270	.002**
Culture								
- high power distance						.081	-.032	.576
- high uncertainty avoidance						.072	-.009	.758
- Collectivism						.111	-.004	.834
Information culture						.055	.413	.000**

Dependent Variable: Effectiveness of outcome

The outputs in Table 4.9 show the seven independent variables that were entered into the regression model, the R (0.546) which showed the correlation of the two independent variables: information culture and perceived value of computer-based information with the dependent variables: the effectiveness of outcome. The interrelation of the two independent variables was taken into account, and the R square (0.298) was significant at the 0.000 level (F value = 8.681). That means that 29.8 percent of the variance (R square) in the effectiveness of outcome can be significantly explained by information culture and perceived value of computer-based information. Among the two independent variables, information culture was the most important in explaining the variance in the effectiveness of construction as the highest beta (β) was 0.413. The second-most important variable was perceived value of computer-based information in which the number in the beta (β) was 0.270. The positive beta weights indicated that if the effectiveness of outcome was to be increased, enhancing information culture and perceived value of computer-based information would be necessary.

4.4 SUMMARY OF FINDINGS

As hypothesised, the following results were obtained: 1. Information culture and perceived value of computer-based information were significant influencers on the perception of Thai VEDs. Students were likely to accept that their VEDs were

useful and provided them with better learning experiences if they believed in the value of collecting, recording, storing, rearranging information to formalise knowledge and enjoyed taking part in discussion with others by using communication technologies such as e-mail and discussion board. Additionally, the more they felt that using ICT was comfortable and desirable, the greater understanding and appreciation they achieved on VED learning. 2. The results showed that the following independent variables: resources; perceived value of computer-based information; culture: high power distance, high uncertainty avoidance, collectivism; and information culture were significant influences on the quality and productivity of learning on VEDs. Among these independent variables, only high power distance showed a negative beta weight. This indicated that if students were likely to accept lecturers' instruction and feel uncomfortable in expressing ideas that contradicted those of lecturers, the quality and productivity of learning on VEDs decreased. For the others: resources; perceived value of computer-based information; culture: high uncertainty avoidance and collectivism; and information culture, they all showed positive beta weights. The results implied that if the quality and productivity of VEDs were to be increased, the need to enhance these five factors would be necessary.

However, the results of the survey reflected views only from the students involved in VED courses in four Rajabhat Institutes. It would be of interest to explore which factors influence the success of VEDs from the administrators' and lecturers' points of views. In the next chapter, case studies and interviews will be used to examine the cause and effect relationships of these factors that affect the perception, quality and productivity of VED learning.

CHAPTER 5

CASE STUDIES AND INTERVIEWS

5.1 INTRODUCTION

The purpose of this chapter is to examine the data, which was based on interviews with administrators and lecturers in 4 Rajabhat Institutes. Results in this chapter are limited to the presentation and analysis of data (and do not attempt to address a conclusion). A detailed discussion of findings in Chapter 4 and 5 are summarised and compared within the context of the literature in Chapter 6.

Each of the research sites is examined as a separate case. The analysis begins with a discussion of background information for each of the Rajabhat Institutes including a brief discussion of the objectives and the implementation of their VEDs. This is followed by a description from the secondary data and interview questions as outlined in Chapter 3.

Structured interviews were conducted based on the existing literature reviews and theoretical framework to determine the relationship and patterns of the factors that surround VED events. The narrative and process models are summarised in the form of a case dynamics matrix. Cross-case analysis techniques were used to address similarities and differences across cases (Miles and Huberman, 1994). The conclusion and a revised strategic model, which could fit the institute's local context, are discussed later in Chapter 6.

This chapter begins with a discussion of the implementation of VED goals for each Rajabhat Institute. The actual names of the respondent organisations are revealed with their permission, but the names of the interviewees are not disclosed and the sources of secondary data have not been referenced.

5.2 CASE STUDIES

5.2.1 Rajabhat Institute Pharnakhon

Background

Rajabhat Institute Pharnakhon (RIPN) is an old institute located in Bangkok, Thailand, which started as a Teacher-Training School in 1924. After 1966, it was transformed into a Teachers' College. On February 14, 1992, King Rama IX, kindly named the 36 teachers' College "Rajabhat Institute". Following the Rajabhat Institute Act 1995 and the rapid changes in society, Rajabhat Institute Pharnakhon became the institution responsible for providing educational services across various disciplines.

RIPN has more than 10,000 students undertaking study in full-time and weekend-classes at both undergraduate and postgraduate levels in Education, Science and Technology, Humanity and Social Science, Management Science, Art and Industrial Science. There are 9 centres providing educational services. Among these only one centre has a network linked with the main centre.

The institute began to use ICT to support the teaching and learning by establishing an Information Technology Development and Service Centre (ITDS centre) in 1996. The responsibilities of the ITDS centre were as follow:

1. Developing digital content for virtual classrooms;

2. Service and maintenance hardware, software, network, Internet service centre and knowledge centre for lecturers and students;

3. Training and motivating instructors and students to use ICT to enhance their knowledge.

Because of inadequate technical staff to assume these responsibilities to obtain a good educational service, the institute decided to outsource to a private company. The company had a five-year contract to implement the VED and training support technologies to lecturers and students. There were two groups of people involved: 1) the institute that comprised of 6 staff and, 2) the outsourced company that comprised

of 5 people. These formed a committee managing the ITDS centre, which was separate from the management of the Institute.

VED Goals

The goal of the ITDS centre in providing VED as an alternative choice is to

1) reduce cost in terms of locations and number of lecturers;

2) increase efficiency of teaching and learning;

3) reduce lecturer's teaching load;

4) provide self-studying anytime and anywhere.

"This will help to reduce lecture's teaching load, at the same time, it helps students with independent study from home, but lecturers will not have time for administration. We will then, have to outsource this function to private companies" (Interviewee Associate president RIPN).

"The reasons we have established the ITDS centre is because we are undergoing transformation into a university under the government control. We need to improve our teaching and learning technologies. We do need to look at the problem and resolve it" (Interviewee Director of ITDS centre RIPN).

VED implementation

The company operated a VED project as a part of the ITDS centre. It provided hardware, software and the network that comprised of a modem with 180-line bandwidth and 2 MB service. The digital content and information are also available on the website

"www.edutoday.com" which is shown below:

Figure 5.1 Virtual learning WebPages – www.edutoday.in.th

Every student was provided with an ID and password to log into this set of
WebPages but they could search only general information on the Internet. Special
digital contents and information in the knowledge bank were available for students
who enrolled in 13 fundamental courses. They obtained another ID and password to
log onto course content or to work on exercises or exams on-line. The company was
responsible for students' assignments and submitted them to instructors by using
digital systems or paper. The system of ITDS centre is shown below:
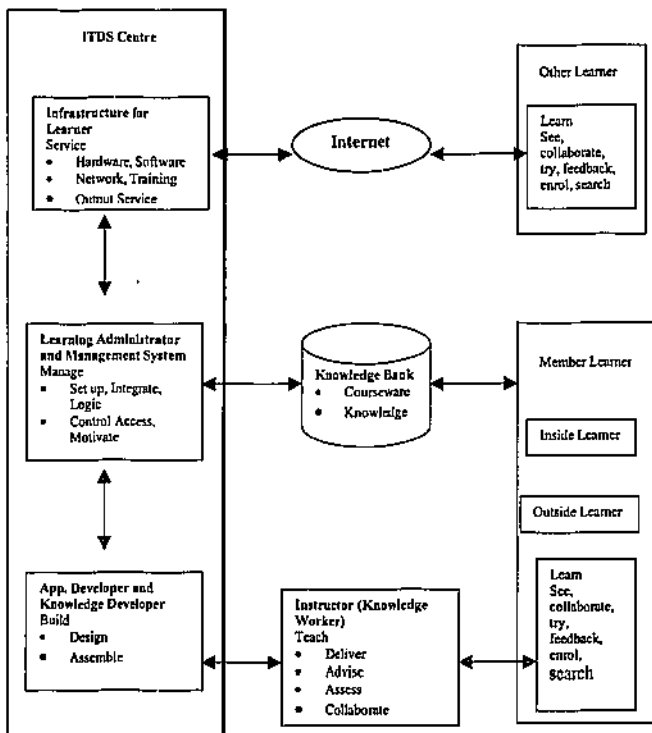
Figure 5.2 Information Technology development and service centre

To determine the complex network of events and processes in a VED implementation of RIPN, a conceptually clustered matrix was used. This matrix provides an initial explanation of what inhibitors and problems were encountered during implementation of VED and what strategies were employed to deal with the inhibitors. There was also an exploration as to what facilitators were used to enhance VED learning environments.

The conceptually clustered matrix in Table 5.1 analyses the interview data of administrators and instructors of RIPN. It relates to four main items: facilitators, inhibitors, coping strategies and evaluating the success of VED. The outcomes in each item were clustered in two ways: *conceptual* which is related to the theoretical model and *empirical* which is based on the interviews that adhere to the conceptual themes.

Table 5.1. The conceptually clustered matrix: Facilitators, Inhibitors, Coping strategies and Evaluating success of VED points of instructor and administrator views at (RIPN)

		Facilitators	Inhibitors	Coping strategies	1-5 point scale evaluating success		
					Quality	Productivity	Perception
Administrator	President or	Resources-ITDS centre support ICT facilities and training(outsourcing to private company) Size of market- a great no of students Task interdependence- good cooperation specifically in 13 VED courses	Computer literacy- lacking com-lit in 1st year students. Information culture- instructors have e-mail address and Internet access but most of them don't use it. (The degree of using ICT to communicate- somewhat low)	-Providing students training and compulsory courses -Motivating instructors to use ICT	3	4	4
	IT Director	Resources- ITDS centre support ICT facilities and training. Task Interdependence- full cooperation specifically in 13 VED courses.	Computer literacy- lacking com-lit in 1st year students. Knowledge sharing -students prefer direct interaction with instructors -Instructors feel their roles as lecturers is threatened. Perceived value of computer-based information -difficult to accept (can't reduce work load) -lack of time to learn new technologies. Information culture- students lack self-efficacy	- Training - Changing instructors' attitude - Offering remuneration	4	4	4
	IT Implementer	Resources- ITDS centre Task Interdependence- full cooperation specifically in 13 VED courses	Computer literacy- lacking com-lit in 1st year students. Knowledge sharing -Instructors and students are not familiar with the systems and learning on VED Perceived value of computer-based information -can not reduce work load)	-Training -www. edutoday.in.th. is designed as a mix of on-line and classroom-based learning (provide manual, books for students and paperwork report to instructors. - Offering remuneration	4 Mean= 3.6	2 Mean=3.3	4 Mean=4
Instructors	Instructor1	Resources-ITDS centre Task interdependence -Full cooperation	Insufficient resources- too many demands in using computers Knowledge sharing Students and instructors-Teacher centre- students are at tertiary level or under so they need advice. -Instructors and administers-accept unequal role (used to receive order & follow without comments Information culture- admin never used e-mail to communicate.	- Motivating instructors by offering a remuneration	3	2	4
	Instructor2	Resources- ITDS centre Task interdependence - Supportive environment -Full cooperation.	Knowledge sharing Students VS instructors- Teacher centre -Instructors VS administrators-good attitude and agree with. Information culture -Administrators never used e-mail to communicate. Perceived value of computer-based information - Instructors have over load teaching and other responsibilities except teaching.	-Training	2.5 Mean=2.7	4 Mean=3	4 Mean=4

(underlining denotes independent variables as identified in Figure 2.5)

Summary of findings

Facilitators

1. Resources are accepted to be an important factor that facilitates VED learning in RIPN. This has been achieved by establishing the ITDS centre and outsourcing to a private company. The view was held that an outsourcing company would enable the institute to provide better educational services.

2. The size of market was not seen as an important condition at RIPN because there was an over demand from students who enrolled in both full-time and weekend-classes.

3. Task interdependence was considered to be an important issue; the interviewees commented that the Institute had a supportive environment with full cooperation for implementing VED across 13 VED courses.

Inhibitors

Four issues had a strong impact on whether or not the VED implementation would be successful. These were

1. Computer literacy

Students lacked basic knowledge of computer systems, specifically in the 1st year. This seemed to be an important inhibitor for VED learning.

2. High power distance in knowledge sharing among students, instructors and administrators were seen to be a barrier to the success of VED.

Instructors VS students

The interviews of two instructors from different faculties showed that the teacher-centre approach was suitable for their students as RIPN students were at the tertiary level or under. This view was supported by the IT director who pointed out that instructors felt their roles were threatened if they let students learn through VED courses. To support this view, instructors also suggested that students preferred direct interaction with instructors rather than learning through VED alone.

Instructors VS administrators

Instructors accepted their unequal role and the control of administrators.

"They look at things from a different angle and if they don't like it, they will just leave it without any comments. Instructors are used to receiving orders and follow the instructions"(Interviewee instructor RIPN).

3. Perceived value of computer-based information.

Although administrators and instructors perceived that the VED was useful, they had an over load of teaching and other responsibilities. They lacked the time to learn new technologies and could not reduce their workload.

4. Information culture.

The interviewee indicated that students lacked self-efficacy and found it hard to study VED courses without the support of a traditional classroom-based teaching. Further, administrators never used e-mail to communicate and under valued electronic use of Information.

Coping strategies

RIPN overcomes the above impediments as follow:

- Providing students regularly with training and compulsory courses
- Changing instructors' and students' attitudes to accept teaching and learning on VED.

  ➢ Changing students' attitudes

Students were required to participate in a computer laboratory and were supported by using textbooks. Students were also provided manuals with step by step on-line courses. Following these, students could gain a better understanding and accepted learning with VED.

  ➢ Changing instructors' attitudes

Teaching and learning on VED was designed as a mix of on-line and classroom-based learning. The ITDS centre provided digital content and on-line exercises or exams, following instructors' requests and submitting them to instructors through paper reports.

- Motivating and encouraging instructors to use ICT and produce VED courses. For example, using VED will give relief from a normal teaching workload, and staff will be given credit and rewards for developing on-line units.

Evaluating the Success of VED

Using a 1-5 point scale for evaluating the success, three administrators: RIPN vice president, the IT director and the manager of VED company weighed the quality of VED higher than instructors (mean = 3.6, 2.7), and productivity nearly the same (mean = 3.3, 3). However, they all perceived VED as useful and accepted that it could be used as a supplement in educational services. This will be discussed is greater detail in the next chapter.

5.2.2 Rajabhat Institute Suan Dusit

Background

Rajbhat Suan Dusit (RISD) is located in the centre of Bangkok, Thailand. As mentioned, it originated from a Teacher-Training School in 1933 and was then transformed into a Teachers' College in 1940. In 1992, King Rama IX named this Teacher's College as " Rajabhat Institute Suan Dusit" (RJSD) which currently offers many courses in five faculties" Education, Science and Technology, Humanity and Social Science, Management Science, and Art and Industrial Science.

RISD has 47,744 students (data at 24/05/02) undertaking study in full-time and weekend-classes at both the graduate and postgraduate levels. The institute provides education through 8 centres in Bangkok and 12 centres across Thailand. The network system links every centre to the main centre using fibre optic and wireless zones in some areas for Internet usage. The location of 20 centres are shown in Figure 5.3.
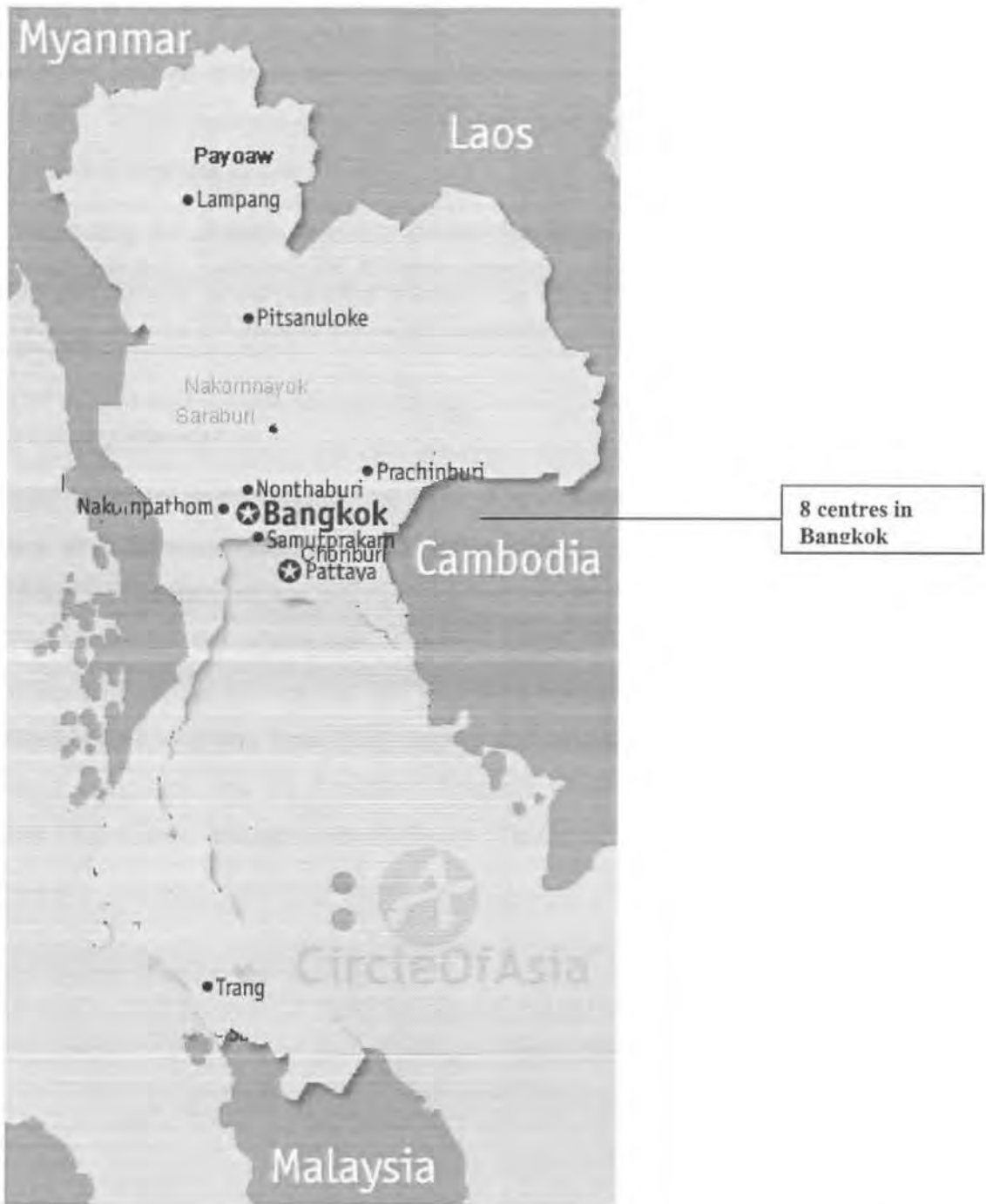
Figure 5.3 Location map of Rajabhat Suan Dusit centres (8 centres in Bangkok and 12 centres across Thailand.

VED goals

Because of the large number of students on the main campus and the other 20 centres, it is necessary for RISD to provide educational services for students in different areas to achieve the equivalent quality of learning. To achieve the goals,

RISD integrated ICT to deliver VED courses to serve the increasing number of enrolled students. Course materials and information were available through a virtual library. RISD students could access their materials on-line and interact with instructors anytime and anywhere.

"Regarding the distance learning system that RISD provide to a great number of students across Thailand, the institute decided to use ICT to deliver VED courses through Internet so our enrolled students can access their lessons and information. There is no need for them to attend in classroom" (Interviewee Vice president RISD).

VED implementation

RISD provides on-line educational services by using synchronous (videoconference) and asynchronous communication technologies (VED courses through Virtual library). The institute has managed educational services through two departments. The first is the Computer Centre, assuming responsibility for offering videoconferencing and training and providing instructors training courses for using Blackboard5 to create their VED courses and offering students various courses in using computers; and the Academic Resource Centre, providing database services and VED courses through a virtual library. This is summarised in Figure 5.4.
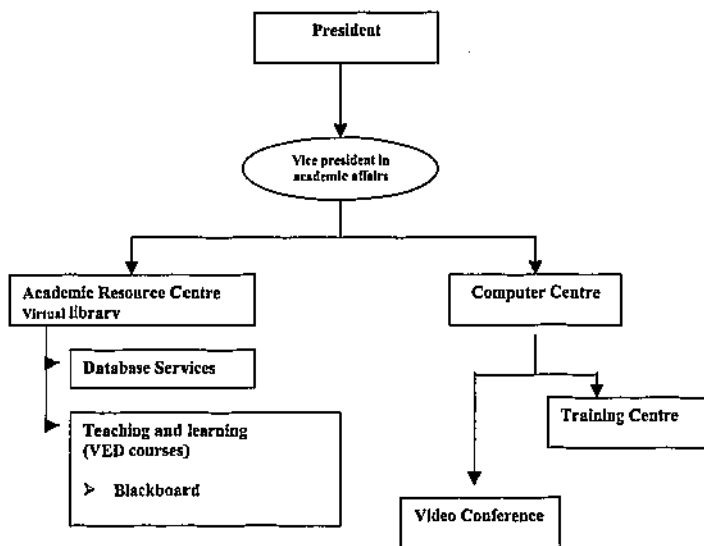
Figure 5.4 Educational service and administrative grant chart

VED courses were run on software named Blackboard5, an e-learning software platform. It was used to deliver a course management system, customizable institution-wide portals, on-line communities, and Web-based integration with administrative systems.

The enrolled students including external and internal campuses could access VED courses by using their usernames and passwords to log onto the institute network through the virtual library WebPages, digital content and 10 on-line information services such as ABI Inform full text, Emerald Insight, etc.

Table 5.2 shows the interview data from administrators and instructors of RISD related to four main items: facilitators, inhibitors, coping strategies and evaluation of the success of VED.

Table 5.2. The conceptually clustered matrix: Facilitators, Inhibitors, Coping strategies and Evaluating success of VED points of instructor and administrator views at RISD

		Facilitators	Inhibitors	Coping strategies	Quality	Productivity	Perception
Administrator	President	Resources- sufficient and advance ICT facilities (hire system) Size of market- a great no of students Task interdependence- good cooperation	Information culture- administrators and instructors in Technology and computer Science using ICT to communicate. The others don't use (The degree of using ICT to communicate- somewhat low)	-Training instructors to use Blackboard -Motivating instructor to use ICT by –offering a remuneration and replacing teaching load -Encouraging instructors to create VED courses	3.5	3.5	4
	IT Director	Resources - sufficient computer laboratory - well designed software (Blackboard) Task Interdependence- good cooperation.	Knowledge sharing -Teacher centre-students prefer direct interaction with instructors -Instructors feel their roles as lecturers is threatened. Information culture- use ICT in unprofitable manner eg. chat.	- Training	3.5	3.5	4
	IT Implementer	Resources- sufficient ICT facilities to serve on demand Task Interdependence- good cooperation	Knowledge sharing Instructors VS students- Teacher centre-student prefer direct interaction with instructors Instructor VS administrators -high power distance- instructors usually accept orders without any comment Perceived value of computer-based information -Students and instructors lack confidence in using search tools (Eng language problem) -unfamiliar with using Blackboard Information culture- never used e-mail to communicate with administrators(no opportunity to do)	-Training -Motivating instructors to accept VED usefulness.	3 Mean=3.3	3 Mean=3.3	4 Mean=4
Instructor	Instructor1	Resources- sufficient and advance ICT facilities Task interdependence - supportive environment - good cooperation.	Knowledge sharing Student VS instructor- educational systems do not support students to self-learning -Instructor VS administrator-dare not to express an idea (The degree of using ICT to communicate- somewhat low)		4	3	5
	Instructor2	Resources - sufficient ICT facilities and supportive IT team Task Interdependence - good cooperation. - supportive environment	Knowledge sharing Students VS instructors-teacher centre (difficult to use student centre) .Information culture -unfamiliar with reading on computer screen -never used e-mail to communicate with administrators (no opportunity to do) (The degree of using ICT to communicate- somewhat low)		2	2	1
	Instructor3	Resources- sufficient ICT facilities to serve on demand Task Interdependence - good cooperation -supportive environment	Knowledge sharing Instructors VS students- (Teacher centre)-student prefer direct interaction with instructors Instructor VS administrators -high power distance- accept and follow if it is a policy Perceived value of computer-based information Instructors do not accept to use VED - lack of time- over load teaching Information culture- never used e-mail to communicate with administrators (prefer face-to-face) (The degree of using ICT to communicate- somewhat low)	- Training -Motivating instructors to accept VED usefulness.	4.5 Mean=3.5	4 Mean=3	5 Mean=3.7

Summary of findings

Facilitators

1. Resources

According to administrators and instructors, the media richness are key technological aspects to be considered by VED facilitators. RISD decided to hire hardware from a private company to minimise problems dealing with a rapidly changing technology and insufficient services. In particular, the network was linked by using fibre optic and wireless zones in some areas to boost Internet usage.

A sophisticated software package name Blackboard5 was used to make course materials accessible anytime anywhere. The implementation was undertaken by the Academic Resource Centre while the training courses were organised by the Computer centre.

2. Size of market

RISD has a great number of students who enrolled in both full-time and weekend classes. It was not seen to be an important condition for RISD to extend the market size.

3. Task interdependence

Task interdependence was accepted as an issue from the views of administrators and instructors. The view was held that RISD had good cooperation throughout the implementation and made the VED a success.

Inhibitors

1. Computer literacy

Computer literacy was seen to be the first issue to impact the effectiveness of learning on VED. To attract the use of VED, the instructors had to have a high level of competency to use Blackboard to create course materials. Although RISD provided their instructors with training courses all the time, there were some that still had problems with using this software.

2. Perceived value of computer-based information.

The view was held that instructors had inadequate time to learn new technologies and were overloaded with teaching. This is confirmed by interviews with the IT Implementer who stated that instructors were unfamiliar with using Blackboard due to having classes in both full-time and weekend sessions. In addition, it was reported that students had problems with the English language.

3. Information culture

The interviews showed that there were negative values and attitudes about information processing, publishing and communication. With respect to RISD information culture, only the administrative staff and IT/ IS instructors were keen to use ICT to communicate but it was not popular for non-IT/IS instructors in other faculties. The interviewee commented that the degree of using ICT to communicate was somewhat limited and none of them used e-mail to contact their administrators. Further, students were " unprofitable" in their use of ICT, eg. Chat Rooms.

4. Culture in knowledge sharing

There was high power distance in knowledge sharing between students and instructors. This was considered as the fourth issue which impacted on the quality of learning on VED. Students appeared more comfortable with learning in the traditional classroom-based approach rather than with individual interaction using ICT.

This culture was found to impede the knowledge sharing between instructors and administrators. Two instructors of RISD stated *"I dare not express my ideas when it is opposite to the administrator's view" and " I think we are still under hierarchical systems which sometimes prevent us from presenting ideas or exchanging information ".*

Coping strategies

RISD overcomes the above inhibitors as follow:

- Providing instructors and students training in using Blackboard and ICT to communicate and exchange information.

- Providing facilities to support teaching and learning on VED such as personal computers for instructors, computer laboratories, Internet wireless Zone, advanced software: Blackboard and data base information systems.

- Motivating instructors of VED courses by offering remuneration and considering it as a part of their teaching load.

Evaluating success of VED

Using a 1-5 point scale for evaluating the success, three administrators: the vice president, the IT/IS training director weighed equally the quality, productivity and perception of VED (3.5, 3.5 and 4). The Virtual Library Implementer weighed the quality and productivity of VED a little bit less than the vice president and IT/IS director (3 and 3). However, he perceived VED as useful at the same score (4).

Instructors diversely weighed the quality, productivity and perception of VED, two instructors were more likely to perceive VED as useful as it could improve the quality and productivity of learning. While one instructor weighed the quality, productivity and perception of VED lower than the others (2,2 and 1). The view was held that she had only been experienced for teaching one year and was uncomfortable with reading from a computer screen. This might present a physical barrier to her to perceive the usefulness of VED. Comparative evaluation of success will be further discussed in Chapter 6.

5.2.3 Rajabhat Institute Rajanagarindra

Background

Rajabhat Institute Rajanagarindra (RIRC) is located in Chachoengsao province, 82 kilometres from Bangkok, Thailand. It was developed from a Teacher-Training School in 1940 and then transformed into a Teachers' College in 1970. In 1992 King Rama IX named this teachers college as Rajabhat Institute Chachoengsao. In 1998 The royal princess change its name to "Rajabhat Institute Rajanagarindra" (RIRC) which has provided educational services across various disciplines including Education, Humanity and Social Science, Management Science, Science and Technology, and Industrial Technology.

RIRC has 13,026 students (data at 2003) undertaking study in full-time and weekend-classes at both graduate and postgraduate levels. Students can learn in the main campus at the city of Chachoengsao and the Bangkla campus, which is 25 kilometres from the city. The Institution network links together with fibre optic and has an effective router provided by Uni-Net (undertaken by The ministry of University Affair). This facilitates the institute by providing educational services through VED and Video Conference between the city and Bangkla campus.

VED goals

With emphasis moving towards a learning society, the demand has accelerated for mass higher education in the east part of Thailand, apart from the Bangkok area. RIRC realised that providing better education service to meet these demands required a change from traditional classroom-based setting to a virtual delivery education. This enabled RIRC to reduce costs in term of numbers of lecturers.

VED implementation

This was obtained through three stages as follow: 1) educating and training instructors in ICT; 2) developing the information technology systems; and 3) producing various courseware on-line.

1) Educating and training

RIRC focussed on human resource development as the first priority. In this stage, 17 instructors were encouraged to further their study in developing VED, and 8 instructors and technicians had IT training at Edith Cowan University (ECU), Western Australia.

2) Developing the ICT systems

The institute realised that to provide a quality distance education required a high speed network so students could access information and on-line course material anytime and anywhere. RIRC had invested in Information technology infrastructures such as telecommunication systems, a distance learning data base

system, the high speed network system with 2 Mbps for transferring data in the country and 256 Kbps for connecting to overseas and VED conference systems between the main and Bangkla campus.

3) Implementing VED

RIRC and Edith Cowan University (ECU) collaborated to provide a Knowledge Server System named Thai On-Line Automated Curriculum System (TOACS) for Thailand. TOACS is a software system provided by ECU free of charge. The system identified opportunities for the Rajabhat Institutes in the provision of curriculum materials on a server network. The system facilitated the development of virtual course materials by the instructors and therefore minimised the use of specialist and technical staff.

Table 5.3 The conceptually clustered matrix: Facilitators, Inhibitors, Coping strategies and Evaluating success of VED points of instructor and administrator views at RIRC

		Facilitators	Inhibitors	Coping strategies	Quality	Productivity	Perception
Administrator	President or Representative	**Resources** -sufficient ICT facilities for instructors (allocating budget) -good software- TOACS (no cost) -human resource development <u>Size of market</u>- a great no of students	<u>Information culture</u>- students lack self-efficacy. <u>Knowledge sharing</u>- students prefer the traditional classroom-based teaching (know what more than know how)	-Training instructors to be able to teach on VED -Development ICT to support teaching and learning on VED	2	2	2
	IT Director	**Resources** -Human resource development	<u>Computer literacy</u> – Instructors lack computer literacy. <u>Perceived values of computer-based information-</u> Instructors don't accept the use of VED (less effective than traditional classroom-based teaching) <u>Knowledge sharing</u> Instructor VS student -Students prefer the traditional classroom-based teaching <u>Information culture</u> -Students lack self-efficacy and do not extensively use ICT. -Instructors prefer face-to-face interaction rather than use ICT to communicate. <u>Task interdependence-</u>Conflict between instructors in Science and Technology and others.	- Training instructors to use TOACS	3	3	4
	IT Implementer	**Resources** - sufficient ICT facilities for instructors in Science and Technology. - good software (TOACS)	<u>Resources</u> – Inadequate computers for students <u>Computer literacy</u> – Instructors lack computer literacy. <u>Perceived values of computer-based information-</u> Instructors don't accept the use of VED (less effective than traditional classroom-based teaching) because lack of time and over load teaching. <u>Information culture</u>- students lack self efficacy and use ICT in unprofitable manner eg.chat	-Clearer project with promoting and offering remuneration - Replace teaching hours.	2.5 Mean=2.5	2 Mean=2.3	2 Mean=2.6
Instructor	Instructor 1	**Resources**- good network to support VED	<u>Resources</u>- inadequate ICT facilities for students <u>Com-lit</u>- Instructors lack computer literacy. <u>Information culture</u> - never used e-mail to communicate with administrators (administrators do not use) <u>Knowledge sharing</u> Student VS instructor- teacher centre(difficult to use with tertiary students or under) (The degree of using ICT to communicate- somewhat low)	Technical staff to support instructors 1.Create WebPages 2.Create digital contents 3.Graphic design	2	2	2
	Instructor 2	**Resources** - sufficient ICT facilities for instructors <u>Task Interdependence</u> - Moderate cooperation.	<u>Com-lit</u>- students have inadequate knowledge to use computer efficiency <u>Knowledge sharing</u> Student VS instructor-teacher centre (difficult to use student centre) Instructor VS administrator-Instructors accept unequal role-dare not express opposite ideas <u>Information culture</u>-Students lack self-efficacy and use ICT in unprofitable manner. - never used e-mail to communicate with administrators (administrators do not use) <u>Perceived value of computer-based information</u>-Instructors do not accept VED cause they have inadequate time to learn and have over load teaching(The degree of using ICT to communicate-somewhat low)	-Training and support a technical team	4	3	4
	Instructor 3	**Resources-** -sufficient ICT facilities for instructors - good software <u>Task Interdependence</u> - Moderate cooperation	<u>Knowledge sharing</u> Instructor VS student- Teacher centre-students prefer direct interaction with instructors Instructor VS administrator-instructors accept unequal role-accept and follow if it is a policy <u>Perceived value of computer-based information</u>-Instructors do not accept the use of VED - lack of time and have over load teaching <u>Information culture</u>- never used e-mail to communicate with administrators (prefer face-to-face) (The degree of using ICT to communicate- somewhat low)	-Training -Motivating instructors to accept VED usefulness. -Supportive VED learning environments cooperation with admin more meeting	4 Mean=3.3	2 Mean=2.1	2 Mean=3.0

Summary of findings

Facilitators

1. Sufficient resources were provided for instructors from the RIRC budget with the software (TOACS) that the institute was granted from collaboration between RIRC and ECU for the purpose of providing improved on-line learning in Thailand. It was believed that the institutes could focus on human resource development, as it was a fundamental resource necessity for delivering a virtual education.

2. The size of market was not seen as a significant factor as RIRC had a great number of students who enrolled both full-time and weekend-classes.

Inhibitors

Table 5.3. The conceptual clustered matrix shows that RIRC had 5 factors that inhibited their success on the implementation of VED:

1. Resources

Although the institute provided sufficient ICT facilities for instructors to use, there were inadequate computer facilities for students to access VED.

2. Computer literacy

RIRC focussed on human resource development; therefore, the institute provided regular training via the Internet using TOACS. Nevertheless, inadequate computer literacy of instructors seemed to be an important issue that inhibited the success of VED implementation.

"The majority of instructors do not have good computer literacy. That makes it difficult to develop. Instructors who received training did not apply this to bring about benefits" (Interviewee IT director, RIRC).

3. High power distance in knowledge sharing among students, instructors and administrators was seen to be another significant inhibitor.

Instructors VS students

The interview of two administrators (the President and the IT Director) showed that students preferred the traditional classroom-based teaching (they want to know what rather than know how).

"Students are not enthusiastic enough to perceive and search information from the Internet. They prefer to be provided knowledge rather than learn or search by themselves" (Interviewee IT director, RIRC).

This culture was confirmed by three instructors who had been teaching on TOACS. They pointed out that the teacher-centre was the appropriate approach in knowledge sharing because students were at the tertiary or lower level.

Instructors VS administrators

There was some high power distance between RIRC instructors and their administrators: the interview of two instructors showed that they accepted their unequal roles but dared not express an idea that was opposed to their administrator's view.

4. Perceived value of computer-based information.

The interview of two administrators and two instructors showed that instructors accepted the use of VED as less effective than traditional classroom-based teaching. They all pointed to three issues for not using VED: students' inability to self-study, lack of time to learn new technologies, instructors had a teaching overload and other responsibilities.

5. Information culture

It was indicated by three administrators and one instructor that students lacked self-efficacy and did not extensively use ICT to enhance their learning on VED. Not surprisingly, the culture to use ICT to communicate between instructors and administrators was really hard to find in RIRC as administrators never used it and instructors preferred face-to-face interaction rather than using ICT to communicate.

Coping Strategies

RIRC overcomes the above barriers as follow:

- Training instructors to be able to teach on VED by using TOACS.

- Motivating staff by promoting the system and offering remuneration.

- Allowing instructors to use their on-line lessons to replace their teaching loads.

- Motivating instructors to accept VED usefulness by supporting a VED learning environment by providing a technical team to help them to create WebPages, digital content, and graphic design.

- Organising more meetings to gain a better understanding of the institute tasks.

Evaluating the Success of VED

Using a 1-5 point scale for evaluating the success, three administrators: the RIRC president, the IT/IS director, and the IT Implementer weighed the quality, productivity and perception of VED quite low (mean 2.5, 2 and 2.6 respectively) as they were not satisfied with the outcome of VED implementation. This was similar to the instructors who weighed the quality and productivity at low levels (mean=3.3 and 2.1). Their perceived the usefulness of VED was not high (mean=3). In summary, the implementation of VED in RIRC has not yet been successful. The details will be discussed in the next chapter.

5.2.4 Rajabhat Institute Valayalongkorn

Background

Rajabhat Institute Valayalongkorn (RIPV) is located in Pathumthani Province, 48 kilometres from Bangkok, Thailand. Named after Prince Valailongkorn, RIPV was established to be a Teacher-Training School in 1932 and then transformed into a Teachers' College in 1970. In 1992 King Rama IX kindly named the 36 Teachers' colleges Rajabhat Institute. Following the Rajabhat Institute Act 1995, the educational services expanded to include Agricultural Technology, Humanity and

Social Science, Management Science, Industrial Technology Science and Science and Technology.

Since its first intake of students in 1992, RIPV now has more than 17,000 students (data at 2003) undertaking study in full-time and weekend-classes at both graduate and postgraduate levels through three campuses. Students can learn in the main campus in Pathumthani province, Bangkok, or in Sakeaw province which is 268 kilometres from the main campus. Regarding the remoteness of these campuses, RIPV has not yet provided a network linking together all three campuses. Only the main campus in Pathumthani has a network linked with fibre optic and has an effective router provided by Uni-Net (undertaken by the ministry of University Affairs). However, students in the other campuses can log onto the Internet and are able to access on-line lessons provided by RIPV instructors.

VED goals

RIPV has a commitment to offering educational services at least cost through advanced and sophisticated ICT on a large scale for delivering a qualitative VED. However, RIPV differs from the previous cases since the process is still developing. Although, the institute is not yet ready to implement VED, two virtual classrooms are presently available. These are www.krunoi.com. and www.ripwlearning.com. Both virtual classrooms were developed by two instructors from faculty of Science and Technology. The goals of two virtual classrooms are to provide approaches and methods of teaching and learning on VED that match the nature and background of RIPV students and instructors.

VED implementation

The first virtual classrooms named www.krunoi.com was designed and managed by an instructor who had a background in Information Technology. Inspired by the usefulness of a virtual classroom but concerned with an inadequate institute budget for buying e-learning software, he decided to create his own virtual classroom. At www.krunoi.com, RIPV instructors could create their own virtual courses by using tools that were available on the WebPages. However, mostly virtual courses were

undertaken by the webmaster and students who enrolled in his courses were specifically allowed access to materials on-line. This is shown below:

Figure 5.5 Virtual learning WebPages – www.krunoi.com

The second VED www.ripwlearning.com. originated from the research project of an instructor from the Faculty of Science and Technology. The purpose of this VED was to provide the model for the institute asynchronous on-line learning. This supported instructors' ability to create course materials and utilities on-line. RIPV students who enrolled in each unit could access these materials and interact with instructors by using e-mail or discussion board via Intranets and Internet at any time and place. Surprisingly, most virtual courses were created by the webmaster. This is shown in Figure 5.6.

Figure 5.6 Virtual learning WebPages – www.ripwlearning.com

The conceptually clustered matrix in Table 5.4 analyses the interview data of administrators and instructors of RIPV. It relates to four main items: facilitators, inhibitors, coping strategies and evaluating the success of VED. The outcomes in each item were based on the interviews that adhere to the conceptual themes. These are shown below.

94

Table 5.4 The conceptually clustered matrix: Facilitators, Inhibitors, Coping strategies and Evaluating success of VED points of instructor and administrator views at RIPV

		Facilitators	Inhibitors	Coping strategies	1-5 point scale evaluating success		
					Quality	Productivity	Perception
Administrator	President or Representati	Resources -sufficient hardware –buying from the institute budget Size of market- a great no of students	Computer literacy – Instructors lack computer literacy. Perceived values of computer-based information- Instructors don't accept the use of VED (less effective than traditional classroom-based teaching) Students don't realise the important of learning on VED The degree of using ICT to communicate – somewhat low	-Training instructors to be able to teach on VED -Motivate instructors to teach on VED	3	2	4
	IT Director	Resources -sufficient hardware –buying from the institute budget	Computer literacy – Instructors lack computer literacy. Perceived values of computer-based information- Instructors don't accept the use of VED (less effective than traditional classroom-based teaching) Task interdependence-lack of supportive environment- the institute is at a remote location. Information culture- students prefer face-to face rather than use ICT to communicate with others. The degree of using ICT to communicate – somewhat low	-Training and motivateing instructors to realise the usefulness and be able to teach on VED	3	3	4
	IT Implementer	Resources - sufficient ICT facilities	Resource Software– No unique software (underdeveloping) Humanware- inadequate IT staff (IT staff have no time to develop tools for VED cause of undertaking other responsibilities. Perceived values of computer-based information Students don't accept to use ICT in searching information because lack of influence in Eng. Information culture- students and instructors prefer face-to face rather than use ICT to communicate with others. The degree of using ICT to communicate – somewhat low	-Clearer project with promoting and offering remuneration - Teaching load replacement.	N/A Mean=3	N/A Mean=2.5	N/A Mean=4
Instructor	Instructor1	Resources- Sufficient ICT to support VED learning	Resources- no unique software as it is costly and administrators don't see as a priority to invest. Information culture-Instructors and students prefer face-to-face interaction rather than use ICT to communicate. -Students do not fully utilise ICT Task interdependence- no clear project and commitment to develop and using available software. Knowledge sharing -Instructor VS administrator- considering the administrator' s personality before expressing opposite ideas. (The degree of using ICT to communicate- somewhat low)	Technical staff to support instructors 1.Create WebPages 2.Create digital contents 3.Graphic design	4	4	4
	Instructor2	Resources - sufficient ICT facilities	Resources- no unique software as it is costly and administrator don't see as a priority to invest. Knowledge sharing Student VS instructor -teacher centre as students still depend on instructors Instructor VS administrator -Instructor obligate to administrator's decision. -the institute has an hierarchy in line management Information culture - never used e-mail to communicate with administrators (administrators do not use) Perceived value of computer-based information -Instructors do not accept that VED be able to replace the traditional classroom-based teaching. (The degree of using ICT to communicate- somewhat low)	1 Establishing the training centre to take responsibilities for providing training with a suitable software. 2.Administrators should perceive value of ICT usage. 3. Create a supportive environment (organise training courses and remuneration).	4 Mean=4	3 Mean=3.5	4 Mean=4

Summary of findings

Facilitators

1. Resources

The interview of three administrators and two instructors showed that there were two facilitators: ICT facilities and size of market that influenced the effectiveness of VED. Regarding the first facilitator, computer laboratories, Internet access, a bandwidth and better delivery platform were sufficiently provided to make VED feasible by using the institute budget.

With respect to the : . I facilitator, RIPV had a constant demand from students who enrolled both in full-time and week-end classes. It appeared to be worthwhile for the institute to use technology since standards were revised to facilitate compatibility and useability of VED products.

Inhibitors

Six issues had a strong impact on whether or not the VED implementation would be successful. These were   -

1. Resources

Although RIPV invested a large amount of ICT facilities, the institute did not implement special software or a high quality VED product and service, as it was costly. It is possible that the institute could authorise IT staff to design the VED software or tools that would be suitable, flexible and easily used. In any case, it was still under development as IT staff did not see this commitment as a priority.

"VED software is being developed to be more suitable and flexible so that it can be easily used. The tool developed will facilitate instructors to design VED courses in addition to the set frameworks. The obstacles are no enough staff, we have to take care of other projects and have a limited time to develop the tool" (Interviewee IT Implementer, RIPV).

"At the present the institute has a VED available at www.krunoi.com developed by an instructor in the department of Computer Science" (Interviewee IT director, RIPV).

2. Computer literacy

Computer literacy was seen to be the second issue to impact on whether the VED implementation would be successful or not. Most instructors of RIPV lacked skill and knowledge in computer usage. The vice president and IT director reported that although the institute provided regular training on how to put course materials on-line, the majority of instructors still lacked skills and motivation to develop their materials, and only a small number of them had applied what they had learned in their training.

3. High power distance in knowledge sharing

Instructor VS Student

The interview of an instructor who used VED as a tool to provide their digital materials showed that teacher centre was suitable to use as students still depended on instructors.

Instructor VS Administrator

Instructors were more likely to accept their role as a subordinate.

"I consider the administrator's personality before I express an opposite idea to them" and " The institute has an hierarchy in a line management, It is really hard to express an idea opposite to them. Thus we are normally obligated to follow administrator's decisions" (Interviewee instructors, RIPV).

4. Perceived value of computer-based information

The interview indicated that instructors and students did not accept the use of VED as they estimated that this was less effective than the traditional classroom-based learning. Also, the students were too low in English fluency.

"The problem in management facilities to provide an effective VED is about the language. Students are not fluent in English "(Interviewee IT Implementer, RIPV).

5. Information Culture

The interview indicated that instructors and students did not fully utilise ICT facilities such as e-mail or discussion board, because they preferred face-to-face

interaction rather than using ICT facilities to communicate with others. In addition, the interview of an instructor showed that the administrators were unlikely to use ICT to communicate with instructors.

6. Task interdependence

The interview held that there was no supportive environment for students to learn through VED as the institute was in a remote area.

"The institute has more than 600 computers in service and there are laboratories sufficient for students. The problem is the campus is quite far away from the city and closed at 6 pm. As a result, students have no opportunities to use it" (Interviewee IT Director, RIPV).

Furthermore, the interview with instructors found that the project to develop and use available software had not yet been cleared.

Coping strategies

RIPV overcomes the above impediments as follows:

- Providing training to instructors to be able to use the utilities on available VEDs particularly www.krunoi.com

- Motivating instructors to realise the usefulness of VED by promoting and offering remuneration.

- Supporting instructors a technical team to create WebPages, digital content and graphic designs.

- Establishing the centre to take responsibilities for providing training on suitable software.

- Creating a commitment in administrative and instructor groups to provide an effective VED.

Evaluating the Success of VED

Using a 1-5 point scale for the evaluation of success, three administrators: the RIPV vice president, the IT director, and the IT Implementer weighed the quality and

productivity of VED lower (mean = 3 and 2.5) when compared to the two instructors who had used VED to facilitate their teaching (mean = 4 and 3.5). Nevertheless, they all perceived VED as useful. This will be discussed further in the next chapter.

5.3 SUMMARY OF CASE STUDIES

The facilitators, inhibitors and the coping strategies of VED implementation were explained in individually conceptually clustered matrix. The Content-Analytic Summary Table was used to examine the similarity and difference of our findings (Miles and Huberman, 1994). The purpose of this analysis is to determine how much of the various cases shared similar characteristics. The tactics used were: making contrast; comparisons; and counting from the original matrix in each case and generating a meta matrix incorporating the reduced data (Miles and Huberman, 1994). The meta matrix of facilitators, inhibitors and coping strategies of the VED implementing environment in four Rajabhat Institutes is shown in Table 5.5.

Table 5.5 The Content-Analytic Summary Table of the four Rajabhat Institutes.

	RIPN	RISD	RIRC	RIPV
Facilitators	Resources-sufficient and advance ICT facilities(outsourcing) (4) Size of market- a great no of students (1) Task interdependence- cooperation (5) and supportive environment (1)	Resources-sufficient and advance ICT facilities(hire system) (6) - well design software (Blackboard) (1) Size of market- a great no of students (1) Task interdependence- cooperation (6) and supportive environment (3)	Resource- sufficient ICT facilities for instructors(5), good software (TOACS) (3) and human resource development (2) Size of market- a great no of students (1) Task interdependence- Moderate cooperation (2)	Resource- sufficient ICT facilities for instructors(5) Size of market- a great no of students (1)
Inhibitors	Com-lit- Students lack computer literacy(3) Info-culture-Students lack self-efficacy. Admin and instructors- somewhat low in using ICT to communicate (3) Perceived com- Instructors do not accept VED (inability to reduce work loads (2) and inadequate time to learn (2) Culture in knowledge sharing Student VS instructor- Teacher centre (student prefer direct interaction (3) and instructors feel their roles as lecturers is threatened (1) Admin VS instructor- instructors accept unequal role (2)	Info-culture-Students use ICT in unprofitable manner(1) Admin and instructors- somewhat low in using ICT to communicate (4) Perceived com- Instructors do not accept VED (Eng barriers to searching information (1) and inadequate time to learn new technologies ex. overload teaching (1) Culture in knowledge sharing Student VS instructor- Teacher centre(5) (student prefer direct interaction (3), instructors feel their roles as lecturers is threatened (1) and the educational system do not support (1) Admin VS instructor- instructors accept unequal role (3)	Com-lit- Instructors and students lack computer literacy(3) Info-culture -Students lack self-efficacy (4) and use ICT in unprofitable manner(2) Admin and instructors- somewhat low in using ICT to communicate (4) ex. prefer face-to-face Perceived com- Instructors do not accept VED(inadequate time to learn and over load teaching (4)) Culture in knowledge sharing Student VS instructor- Teacher centre (student prefer direct interaction (5) and be difficult to use with tertiary students or under(1) Admin VS instructor- instructors accept unequal role (2)	Resources-No unique software and insufficient IT staff (3) Com-lit- Instructors lack computer literacy (2) Info-culture -Students and instructors prefer face-to-face rather than use ICT to communicate (3) Admin and instructors- somewhat low in using ICT to communicate(5) Perceived com- Instructors do not accept VED(less effective than the traditional classroom(3)) Culture in knowledge sharing Student VS instructor- Teacher centre(student prefer direct interaction (1)) Admin VS instructor- instructors accept unequal role (1) and consider administrator's personality (1)
Coping Strategies	-Training (4) -Supporting facilities(1) -Changing instructor's attitude by designing a mixed VED (1) -Motivating instructors – using a reward system (4)	-Training (4) -Motivating instructors (3) –offer a remuneration and replace teaching loads.	-Training (4) -Creating a supportive environment ex. development ICT to support teaching and learning on VED (1) and providing a technical staff (3) -Motivating instructors (1)–offer a remuneration and replace teaching loads -Increasing a cooperation	-Training (3) -Motivating instructors (3) –offer a remuneration and replace teaching loads -Creating a supportive environment ex provide a technical staff (2)
evaluating success Quality Productivity Perception	3.1 3.1 4	3.5 3.2 3.5	2.9 2.2 2.8	3.5 3 4

Note: Each item represents a factor (facilitator, inhibitor or coping strategy) affecting the VED implementation of one interviewee. Factors affecting more than one have numbers appended.

Table 5.5 showed the facilitators, inhibitors and coping strategy in each of the research sites.

Facilitators

This study found that in the majority of Rajabhat Institutes, resources, size of market and task interdependence are the dominant facilitators for the success of VEDs. Most interviewees indicated that sufficient hardware, sophisticated VED software and human development projects enhanced the effectiveness of learning on VED. They also claimed that having a larger number of students would leverage their budgets. In this way the institutes would be able to provide better educational services by using ICT facilities. The study also provides evidence that members had a commitment and a high level of cooperation in implementing VED. However, one Rajabhat Institute had some conflict between instructors who had more experience in ICT fields (teaching in ICT courses) than those who did not. Nevertheless, the level of cooperation in VED implementation was still considerable.

Inhibitors

There were several issues that emerged from the case studies that were seen as inhibitors of the success of VEDs. The first of these was the fact that a lack of computer literacy by students and instructors decreased the effectiveness of learning on VEDs. The second issue was that the majority of students had low levels of self-efficacy. The case studies provided evidence that they did not use the information systems to facilitate their knowledge creation, for example, they did not spend time on Chat and were unable to carry out searches due to their low level of English fluency. Further, administrators and instructors in four Rajabhat Institutes were somewhat low in using ICT to communicate with others, preferring face-to-face interaction rather than using e-mail or even chat rooms. The third issue was the instructors' low perception of the value of computer-based information. It is probably not too surprising that most instructors in all cases believed that the use of VED was less effective than the traditional classroom. This was due to high teaching loads and other responsibilities so they had inadequate time to learn new technologies.

Three aspects of culture in knowledge sharing were found as barriers to the successful implementation of VED. First, the interviewees commented that Thai students had high uncertainty avoidance. They were polite and accepting of what instructors said. Not surprising then that the teacher-centre was the appropriate approach for Thai students, particularly as they were in tertiary or lower level. Instructors felt that their roles as lecturers were threatened if the students had self-learning through VED courses. The second cultural barrier to knowledge sharing was high power distance. It was discovered in three case studies that instructors accepted a hierarchical authority system with an emphasis on status differentiation and unequal power distribution. Hence, they dared not express ideas that opposed the administrator's views. All they did was receive orders and follow the instructions without any comment. One interviewee reported that before expressing any ideas he needed to consider the administrators' personalities as to whether they were willing to listen or not.

Lastly, the results indicated that the level of collectivism in Thai students was high as they preferred to study in classroom-based teaching rather than study individually. They were more likely to participate in-group with their friends and to have direct interaction with their instructors.

Coping strategies

The case studies provided evidence that the strategies used to overcome the problems in VED implementation were training, changing instructors' attitude and motivating instructors by offering remuneration and replacing teaching loads. Additionally, a supportive environment should be created by providing technical staff, increasing cooperation, and developing ICT facilities to support teaching and learning on VED.

Evaluating success

In the last phase, the success of VED in each case is evaluated. Essentially this consists of indicating administrators' and instructors' satisfaction with the results of VED implementation in their Rajabhat Institutes. Decision criteria (at 1-5 point scales) responses for the evaluation ranged from 2.9 to 3.5 in improving quality of

learning, 2.2 to 3.2 in productivity of learning and 2.8 to 4 in the perception of its usefulness. The way in which four Rajabhat Institutes differed in their level of success can provide insight into how they implemented VEDs. The following table provides critical points where the four Rajabhat Institutes varied in their reasons for implementing VEDs.

Table 5.6 Critical issues for VED implementations in four Rajabhat Institutes

	RIPN	RISD	RIRC	RIPV
Outsourcing VED learning service	Technologies and skills	Technologies	VED application	none
ICT readiness	high	high	low	middle
Skills	high	high	middle	middle
Ongoing plans and strategies	high	high	low	low
Member's commitment	high	high	low	low
Supporting environment	high	high	low	low
Stage of implementation	deploy	deploy	initiate	design

The summary in Table 5.6 shows that RIPN was the most success in implementing VED following with RISD as the second ranked. This was supported by the evaluation scores of improved quality, productivity and perception of VED of administrators, IT staff, and instructors of RIPN and RISD at satisfactory levels. RIPV was in the process of creating a plan to design a unique VED application. However, RIPV had two WebPages for providing virtual learning and obtained satisfactory ranking from their member's assessments. The least success was RIRC with regard to its initiation stage. Although, VED application (TOACS) of RIRC was outsourced from ECU, it appeared that they had not yet developed strategies to deploy this application such as ongoing training, a technical team who support instructors creating material contents and/or supportive VED learning environments. This phase will be discussed by comparison with the student's assessment in Chapter 6.

5.4 SUMMARY

This study shows the differences and similarities in implementing VED in four Rajabhat Institutes. The view was held that administrators in four Rajabhat realised that to provide educational service to a great number of students needed emergent VED. Not surprisingly, they all invested a large amount of money in developing resources such as computer laboratories, bandwidth and on-line applications which they expected could help them to facilitate their successful VEDs. It appeared that some of them focused on the technology implementation and neglected other factors specific to culture and instructor's perception. The study also points out the importance of strategies in implementing VED as a key success.

The quality, productivity and perception of VED in RIPN, RISD and RIPV were evaluated overall at satisfactory levels although different strategies had been used. In order to provide better services, RIPN selected to outsource to an e-learning company and motivated instructors to use VED by offering remuneration. RISD established the IT centre and Virtual library assisting with IT/IS and technical support such as help desk, multimedia services and content development team.

The main finding was that RISD administrators act as role models in using ICT to share information and knowledge. This could be justified as a key success in implementing VED as a successful collaboration learning environment. RIPV had not yet implemented the unique VED however, two WebPages with various on-line subjects designed by IT instructors were available for students to have self-paced learning.

RIRC found that administrators, IT staff and instructors accepted that VED implementation in their institute had not been yet successful as the evaluation ranged in the lowest score. The main finding resulting from this study is that RIRC lacks any strategy to implement VED as a success. Although, their on-line application was outsourced, only the software and initial training were obtained from ECU. Further, most of instructors had little experience in using ICT and still believed that VED was not suited for their students. This confirmed the need to develop strategies specific

to the cultural context of the institute in order to achieve successful implementation o
VED. The implications arising from the key findings of the study will be discussed in
the next chapter.

CHAPTER 6

SUMMARY AND CONCLUSIONS

6.1 INTRODUCTION

This chapter discusses the conclusions and implications resulting from the analysis of data presented in chapter four and five. In section 6.2 the finding from each research question is examined using a comparison of the quantitative and qualitative findings. Then the results are discussed within the context of the research in this study and in reference to the previous studies outlined in Chapter 2. The qualitative findings along with the insights of the case studies are explored in section 6.3. In the next section, the researcher focuses on the strategies of the case studies used to analyse the problems posed in the study. Then the implications arising from the key findings of the study are presented, as well as a strategic framework for incorporating Thai culture. Finally, the limitations of the research and the implications of this study for further research are discussed in section 6.5.

6.2 DISCUSSION OF FINDINGS

The research questions examined in this study were:

1. What are the factors influencing effective implementation of VEDs in Thailand?
2. How do these factors facilitate or inhibit successful implementation?
3. How can these be incorporated into strategies for implementation in the context of Thai culture?

Research question 1 and 2 were investigated through the use of a quantitative survey (Chapter 4) and interviews (Chapter 5). These are further discussed in this section. Research question 3 is then discussed after some emerging issues from the study are examined.

The results of the survey obtained from the students who were studying VED courses in four Rajabhat Institutes showed several factors influencing the success of VEDs. These factors are: resources; perceived value of computer-based information; information culture; and culture in knowledge sharing including high power distance, high uncertainty avoidance and collectivism. In addition, the study examined the

impact that perceived value of computer-based information and information culture had on student perception of learning on VEDs.

Further, the study explored whether these factors influenced quality, productivity, and perception of learning on VEDs from the administrators' and instructors' points of view in the same four Rajabhat Institutes. The results from the interview data found that resources and task interdependence are the dominant facilitators however, computer literacy, perceived value of computer based-information, information culture and culture in knowledge sharing seem to be the inhibitors of its success.

The comparisons of what the study found from the questionnaire survey and interviews are summarised in Table 6.1

Table 6.1 The comparison of findings from questionnaire survey and interview data.

Quality and Productivity and Perception of Learning in VED		
Factors	Facilitate/Inhibit	
	Student	Administrator & Instructors
Technological determinism Resources	Facilitate	Facilitate
Social-psychological approach Computer literacy	No influence	Inhibit
Perceived value of computer-based information	Facilitate	Inhibit
Size of market	N/A	No influence
Human relation approach Task interdependence	N/A	Facilitate
Culture context Information culture	Facilitate	Inhibit
Cultural aspects in knowledge sharing • High power distance	Inhibit	Inhibit
• High uncertainty avoidance	Facilitate	Inhibit
• Collectivism	Facilitate	Inhibit

The overview of results from Table 6.1 shows that there were some conflicts between student and the instructor/administrator group over factors that facilitated and inhibited the effectiveness of quality, productivity and the perception of VED. From the survey with students, resources, perceived value of computer-based information, information culture, high uncertainty avoidance and collectivism facilitated the quality and productivity of their learning on VED. This is contrary to the interview results obtained from the administrators, IT and instructors, which show that resources and task interdependence were the only two facilitators.

However, it was found that high power distance was accepted as a significant inhibitor to improve the quality and productivity of learning in VED by both groups. The survey results show that perceived value of computer- based information and information culture facilitated the perception of learning on VED while the interview results indicated these as inhibitors. The following sections discuss these findings from Table 6.1, beginning with a discussion of the findings in regard to technological determinism.

6.2.1 Technological Determinism

The results from both the survey and interviews show that resources, including computer laboratories, network bandwidth, online application and implementation skills of the application, are important determinants of the effectiveness of VEDs. These findings confirm other research that suggests the quality and reliability of technology can support collaborative learning on asynchronous and synchronous communication technologies (Seng and Al-Hawamdeh 2001; Haghirian 2002). The view was held that the efficiency and effectiveness of the system design and implementation are the dominant facilitators. This concerns not only technologies that enhance the successful VED, but also the way that VEDs are implemented and serviced (Mowshowitz 1997).

6.2.2. Social Psychological Approach

This approach is classified under two headings: the computer literacy of students and instructors, and their perceived value of computer-based information.

Computer literacy

The results of the questionnaire survey showed that students' capability of using the computer and ICT neither facilitated nor inhibited the effectiveness of learning on VEDs. This perception differs from the interview results which showed that students in the first year had little experience in using computers to perform basic tasks. However, the students surveyed were mainly in year 2 or 3 and had already completed a computer-training course. It has been suggested by Fenske (1998) that students must have basic computer skills, including an understanding of hardware components and software programs and the ability to use telecommunication software (eg. E-mail and discussion boards) so they can operate and use a computer to facilitate their learning on VEDs. This is also confirmed by Winter et al. (1997), if students have both basic and advanced knowledge of computers, they can then apply their knowledge to enhance their learning.

Further, the view was held that most instructors in two of the Rajabaht Institutes (RIRC and RIPV) also had inadequate computer literacy. Teaching on-line was a new instructional implementation for them and they had little experience to design or run interactive VED courses. This is obviously seen to be an important inhibitor to provide an effective learning in VED in which the instructor must have a good control of the technology and is able to perform basic troubleshooting tasks and present an interactive teaching style (Volery and Lord, 2000).

This result of the study is important for practical reasons since effective learning on VED is the aim of Rajabhat Institutes. In a VED environment, students often feel isolated since they have no direct interaction with the instructor (Volery and Lord, 2000). For this to work, students need to have good time management, self-discipline and computer skills in order to master applications such as e-mail and digital presentation and communication to enhance their learning in VEDs (Volery and Loard, 2000; Haghirain, 2002). In order to increase students' computer skills and competency well-planned and ongoing training including the support of ICT tools

such as computer laboratories, network accessibility, Internet availability are essential for institute administration support to VED. Students who are comfortable with computers will adopt and use it effectively (Jarvenpaa and Staples, 2000).

In order to increase instructors' computer skills and competency effectively a design instructor to assist the development of VED courses and ongoing training must be identified and committed to the institute schedule at an early stage (Volery and Lord, 2000). Further, universities integration of computers with daily work is required to sustain instructors' computer usage (Jarvenpaa and Staples, 2000).

Perceived value of computer-based information

The survey results showed that students' perceived value of computer-based information was a significant influence on the quality and productivity of learning on VEDs. Previous research (Larson and Bruning, 1996; McCollum, 1997; Jarvenpaa and Staples, 2000) concluded that if students realised that ICT provide them with benefits, such as accuracy, and desirable and up to-date information, their abilities to assimilate and use information to enhance knowledge creation would be increased. However, the interview data showed that most instructors did not perceive computer-based information as valuable. They did not accept that VED would provide students with an enhanced learning environment. There were four reasons that instructors did not accept that VED was more effective than a traditional classroom-based learning: 1) inability to reduce teaching hours; 2) language barriers especially for students in understanding information in the English language; 3) time inadequacy to learn new technologies; and 4) having an overload of teaching hours.

6.2.3. Size of Market

In the survey the researcher did not investigate the size of market as an independent variable because it was not a student issue. However, size of market was examined in the interviews with administrators who had responsibilities to increase and maintain a significant number of enrolled students. The results showed that all Rajabhat Institutes had large numbers of students who enrolled in both full-time and weekend-classes and administrators did not deem it important for them to extend the market

size in order to gain more profit. Their concern was how the institutes could extend educational services to all of their students.

6.2.4. Human Relations Approach

In the survey the researcher also did not investigate task interdependence as an independent variable. This was obtained from the interviews with administrators and instructors in the four Rajabhat Institutes. The agreement and cooperation of members in the organisation was seen as a requirement for providing an effective VED (Calver et al., 2001; Haghirian, 2002). The study found that RIPN and RISD had better performance in cooperation in providing VED than RIRC and RIPV. The in-depth interviews with IT/IS managers and instructors showed that leadership played a vital role in motivation and encouragement. Thus, there was a high degree of agreement and cooperation among members in these institutions. However, the study found that there was no unique on-line application for providing VED in RIPV and that there were conflicts between IT/IS and non-IT/IS instructors in RIRC. Therefore, the view was held that there was less cooperation in order to use VED in these institutes. It is also noted that there was a lack of a supportive environment for teaching in VED as there was no incentive for using VED.

6.2.5 Cultural Context

Culture aspects of participants in knowledge sharing

- **High power distance**

The survey results showed that there was high power distance between instructors and students which was a significant inhibitor to knowledge sharing in VED environments. This was confirmed in the interviews, indicating that use of a teacher centred approach was accepted as the favourite learning style among Thai students. Previous research (Komin, 1990; Mckenna, 1995; Rohitratana, 1998; Hofstede, 2001) confirmed that Thai people accepted a hierarchical authority system with emphasis on status differentiation and unequal power distribution. In a high power distance society, students normally treat their instructors with respect since they prefer

to have harmonious relationships (Vance et al., 1992; Triandis, 1995). Therefore, the direction and control of instructors was accepted by students in all case studies.

This study also provided empirical evidences in three case studies that instructors accepted a hierarchical authority system. The view was held that most instructors dared not use ICT to express ideas that opposed the views of administration. All they did was receive orders and follow commands without any comments. The results of this research thus support the inference that high power distance in organisations inhibits knowledge-sharing performance in most organisations (Shore and Venkatachalam, 1996; Davenport and Pruzak, 1998; Erich and Williams, 1998; Jarvenpaa and Staples, 2000). Particularly in Thai hierarchical organisations, such as Rajabhat Institutes in which workers are government officers, there is a tendency to preserve good relationships with those who are in higher positions (Rohitratana, 1998). Thai instructors usually show respect and feel obliged to their administrators, similar to a father figure in their family. They believe that to reciprocate" Bhun khun" (the administrator's help or kindness) is an obligation they have (Komin, 1990; MaKenna, 1995).

• **Uncertainty avoidance**

The survey results showed that high uncertainty avoidance in a VED learning environment was a significant factor that facilitated the success of VED. This indicated that students believed that learning based on precise and detailed instructions could enhance their success in VED learning environment.

However, this is contrary to the theoretical views that to achieve success in VED, students must have the ability to self-learn and know what to learn , how to learn and develop their collaborative skills in knowledge sharing by using ICT to enhance their knowledge creation (Volery and Lord, 2000; Seng and AI-Hawamdeh, 2001; Haghirian, 2002). In this learning environment, the instructors need to assist and motivate students to an active participation level rather than perform as information broadcasters. This is confirmed with the instructors' views which show that for the majority of students in tertiary education, precise and detailed instructions were their favourite structured

learning situation. Students were much more familiar and comfortable with this type of learning style as they expected their instructors to be the experts who had all the answers (Abdon and Rabb, 2001; Hofstede, 2001). The study also confirmed that Thai students were polite and accepting of what instructors said. Not surprisingly then that a learning style directly controlled by an instructor was more acceptable rather than a self paced learning style. In this learning environment, they normally kept their suspicions to themselves and maintained a peaceful situation as they " Kreng jai" (were reluctant to be the cause of discomfort of the feelings of others) (Rohitratana, 1998). Accordingly, in this culture knowledge sharing is inhibited because students are uncomfortable telling instructors what they think or feel (Trompenaars and Hampden-Turner, 1998, Rohitratana, 1998).

- **Individualism/Collectivism**

The survey results showed that collectivism in Thai students influenced a VED learning environment. The interviews of instructors and administrators supported the view that students appeared to be familiar with learning in a traditional classroom-based approach rather than with individual learning with ICT. Thus the findings were confirmed that Thai culture shapes knowledge sharing environments since students prefer to work in groups rather than as individuals (Triandis, 1995; Hallinger and Kantamara, 2001). Therefore, Thai students were more likely to study in classrooms with their friends as they needed "Kam lang jai" (spirit and moral support) from their in-group to encourage their self-confidence in learning. This cultural context was another inhibitor to knowledge sharing in VED learning environments which require students to be willing to act as individuals. In the VED learning style, students lacked confidence to ask questions or to present their ideas, which was a barrier to knowledge creation.

Information culture

The survey findings showed that information culture significantly influenced the quality, productivity and perception of VED. In order to enhance the information culture by supporting useful material content on-line, a supportive VED learning

environment with students motivated to use ICT to share knowledge with instructors and their peers was a necessity. However, some of the findings from the interviews indicated that the majority of students lacked self-efficacy and used ICT (such as chat rooms or ICQ) in an unprofitable manner. Furthermore, use of ICT for communication was somewhat low for administrators, instructors and students. Much of the justification for enhancing knowledge sharing by administrators, instructors and students is based not only on having IT equipment embedded in the system, but also in fostering positive values and attitudes about information processing, publishing and communication (Pettigrew, 1990; Cronin and Davenport ,1993; Davenport, 1994; Nonaka, 1994). The study also found that instructors had negative feelings about the use of IT/IS because they feared that students were more likely to depend on IT/IS and their role as instructors would be threatened, and they would no longer be important to their students (Claver et al. 2001).

6.3 IMPLICATIONS FOR THEORY AND COPING STRATEGIES

6.3.1 Implication for Theoretical Framework

The results of this study suggest several important strategies for developing policy and practice in implementing a successful VED. These are shown in Figure 6.1.

The strategic framework for Thai VEDs
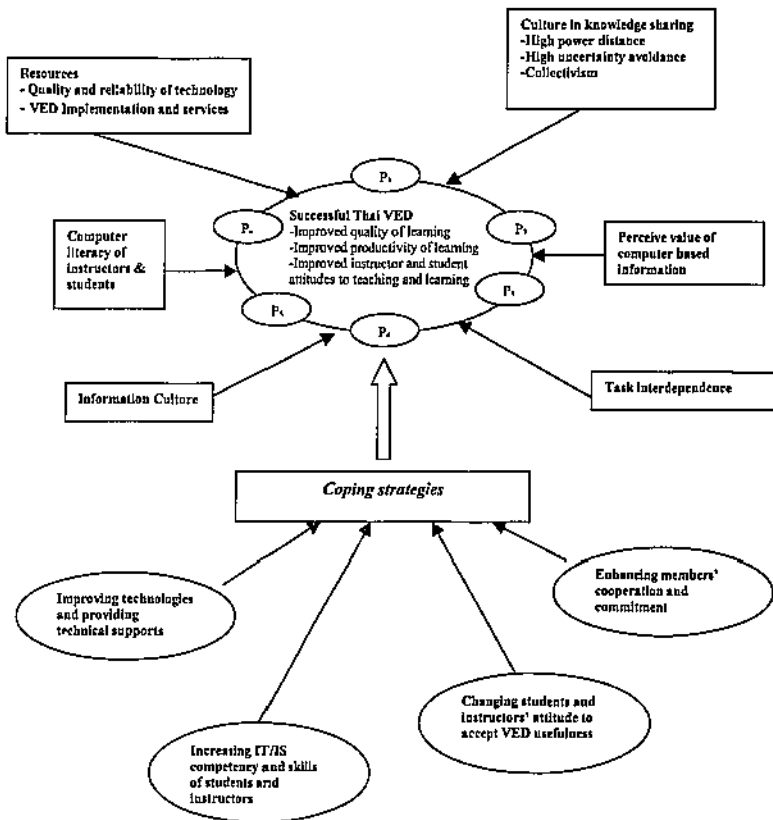
Factors affecting VED implementation

Figure 6.1 The strategic framework for Thai VED

The research outcomes of this study showed several factors influencing the success of VED implementation, particularly in Thai VED. These factors are resources, computer literacy of instructors and students, perceived value of computer-based

information, cultures in knowledge sharing, information culture and task interdependence.

Resources are seen to be the most important factor that can enhance or inhibit the learning outcome. Two issues are involved: the first is the quality and reliability of the IT/IS infrastructure, and the second is the way VED is implemented and serviced. Computer literacy of students and instructors involves an ability to use the computer and its facilities to enhance studying and teaching on VED. The perceived value of computer-based information by the participants is also accepted as being critical to the success and further, administrators, instructors and students must realise that using ICT provides them with value and usefulness. Task interdependence and collaboration of members in an organisation is also essential.

Three aspects of culture of knowledge sharing are found to influence the success of collaborative learning in VED. Firstly, there is high power distance between students and instructors and between instructors and administrators. Secondly, high uncertainty avoidance is found to be characteristic of Thai students, and thirdly, Thai students tend to be collectivist rather than individualist. Information culture is the final influencing factor found from the study. This refers to students and instructors' attitudes to use information processing, publishing and communication to perform knowledge sharing in VED learning environment.

Coping strategies for overcoming numerous barriers to successful VED are established and added to the model. This are improving technologies and providing technical support, increasing IT/IS competency and skills of students and instructors, changing students and instructors' attitude to accept VED usefulness, and enhancing the members' cooperation and commitment.

6.3.2 Coping Strategies

In this section, the discussion focuses on the coping strategies that could be useful and lead to best practice, not only in specific case studies but also generally. In order to achieve learning objectives and to succeed in VED implementation, the research outcomes of this study suggested four main coping strategies that can be used to overcome the problems. These are 1) improving technologies and providing technical support; 2) increasing IT/IS competency and skills of students and instructors; 3)

changing instructors' attitudes and motivating them to adapt VED as an interactive teaching style; 4) enhancing the members' cooperation and commitment.

1) Improving technologies and providing technical support

Sufficient IT infrastructure for delivery of VED courses is of critical importance to the success and student acceptance of VED. The technical IT staff must be qualified and the infrastructure reliable to support collaborative learning which requires both asynchronous and synchronous communication technologies (Seng and Al-Hawamdeh, 2001). These include computer laboratories, network bandwidth, network accessibility, network security, integrated suites of on-line application, Internet availability, audio and video plug-ins, videoconferencing and technology standards which facilitate compatibility, and usability of VED products (Urdan and Weggen, 2000).

Although reliability of the IT infrastructure is a part of the success of VED, the effectiveness of implementation is also important. Two components need to be embedded in a VED project: 1) construction of an effective information technology infrastructure in order to facilitate Web access, e-mail, course management system and other VED services; and 2) technical support, such as library services, help desk, multimedia services are required to support students and instructors. It is believed that if the technical support is lacking, VED learning projects will not achieve their goals. RIPN is a good example to show how technical support can enhance the effectiveness of IT. The results of the case studies showed that the institutes that provided instructors with technical assistance in creating on-line course materials had higher student and instructor perceptions of VED than the case studies that did not provide technical assistance.

2) Increasing IT/IS competency and skills of students and instructors

Proficiency in computer skill of students and instructors is a critical factor in the success of VED. Rajabhat Institutes should ensure that their students have adequate training to be able to use computer technology as it is applied to learning. To achieve these goals, institutions should add multi level and

regular computer literacy courses to the curriculum in both compulsory and supplementary subjects.

The results of the study showed that most instructors lacked competency and skills in using ICT. To correct this problem, institutes tried to solve this problem by providing them with regular training programs, but only a small number of them applied their knowledge to produce VED course materials. To cope with this problem, all training courses should be designed to match with the nature of learners. Basically, the majority of instructors are adult learners who already have much knowledge and experience. Thus, the contents must be designed for practical knowledge rather than theory. Moreover, they need more motivation and collaboration in order to develop their problem-solving skills (Weinstain, 2000). The study indicated that administrators played a vital role in encouraging instructors to apply what they had been trained in. The effective incentives included having a short-term and long-term plan to improve instructor's computer skills, offering computer and ICT facilities and integrating technology with day-to-day work activities.

3) Changing students and instructors' attitudes to accept VED usefulness

Several problems involved with the adoption and use of VED were found in the case studies. First, teacher-centre approach was more acceptable for learning rather than individual study. It was clear that these students preferred precise and detailed instructions and that the traditional classroom with direct interaction with instructors was their favourite structured-learning situation. Second, students lacked self-efficacy and used ICT in an unprofitable manner. Third, Thai students needed strong support from their in-groups to encourage self-confidence to enhance collaborative learning. This is in contrast to the structure of a VED learning environment in which individuals are active and participate in their out-groups. Lastly, most instructors did not really appreciate usefulness of VED and further may have selfish reasons not to pursue the uptake of VED such as perceived diminishing of their own importance and value.

Strategies to increase students' and instructors' positive perception and the eventual adoption of the use of VED in Rajabhat Institutes could be suggested as follows.

a. Providing student orientation programs to introduce them to different teaching and learning styles using VED.

b. Establishing VED learning support systems

- VED courses should be a mixed design between on-line and classroom-based learning.

- Providing students and instructors with manuals with step-by-step instructions on how to use VED courses.

- Promoting synchronous environments to motivate students to use VED.

c. Motivating and encouraging instructors to perceive VED usefulness and use collaborative VED tools, such as e-mail, discussion boards to enhance knowledge sharing and integrating the use of ICT in day-to-day work.

d. Using appropriate on-line applications that provide students with less technically complex and user friendly systems.

e. The success of collaborative learning is dependent on how much participants, including students and instructors share information and competencies through VED tools such as e-mail and discussion boards. Administrators can enhance the use of VED through behavioural change; they must act as the model in using e-mail and discussion boards when communicating and sharing knowledge with others.

4) Enhancing members' cooperation and commitment

To achieve the cooperation and commitment of members, it is necessary that members understand how VED can be utilised and fits with their tasks. In this way, its usage will become part of the institute's value system (Jarvenpaa and Staples, 2000, Claver et al, 2001).

The findings showed that encouragement from leadership by offering instructors remuneration of various types, such as giving relief from normal teaching workloads and giving credit and rewards for instructors who develop VED courses were seen to be successful strategies to enhance the use of VED as an alternative educational service.

6.3.3 New Strategic process

Based on the results of this study, a new strategic review process including audit checklists for administrators and IT staff, instructors and students are developed to evaluate their strategies. This process is shown in Figure 6.2

Each year   Each semester

```
                                              ┌──────────────────────┐
                                              │ Instructor VED       │
                                              │ Audit checklist      │
                                              │ Figure 6.3 Part II   │
                                              └──────────────────────┘
┌──────────────────────┐      ┌──────────┐
│ Major VED            │      │   VED    │
│ Audit Checklist      │─────▶│ strategy │◀────
│ (Administrator and   │      │          │
│ IT staff)            │      └──────────┘    ┌──────────────────────┐
│ Figure 6.3 Part I    │                      │ Student VED          │
└──────────────────────┘                      │ Audit checklist      │
        ▲                          │          │ Figure 6.3 Part III  │
        :                          │          └──────────────────────┘
        :                          ▼
        :                  Each semester
        :                  ┌──────────────────┐
        :..................│ Revised VED      │
                           │ priorities       │
                           └──────────────────┘
```
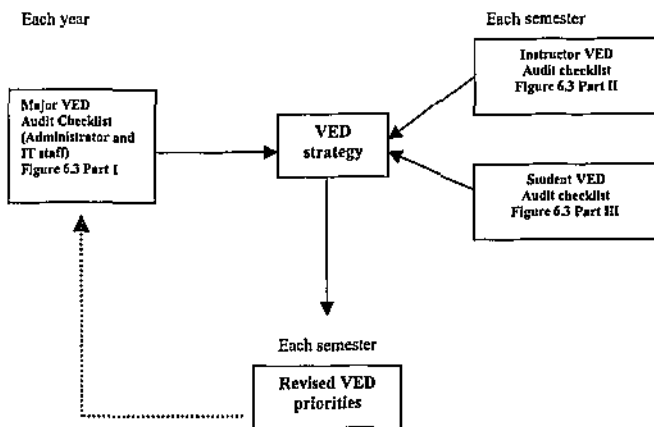
Figure 6.2 VED Strategic Planing Cycle

For implementing VED,it is important that the audit checklist is completed by a sample of all users of the system and not just the IT or administrative staff. In this way the university may discover that stakeholder groups perceive different problems and require different solutions.

This booklet contains questions about good practice in the process of preparing for successful VED implementation, and is to help you make a self-assessment of your project. The purpose of this booklet is to ensure that you include in your plan all the necessary access policies, resources, facilities or modifications needed to create an environment which will improve quality, enhanced productivity of learning and perceived success of VED.

You must complete the relevant checklists and answer all the questions. Rate your own unique circumstances on a 1 to 5 scale with 5 being best. We suggest that you retain this rating and use it to identify the priority actions which are required within your own institute.

Part I: To be completed by administrators, IT staff. This part contains 4 sections:1) resources; 2) ICT skills; 3) attitude towards ICT; and 4) gaining commitment.

Part II: To be completed by instructors involved with VED courses.

Part III: To be completed by students who are learning through VED mode.

For example	1	2	3	4	5
Are there computer laboratories available with the Internet access? *(If laboratories with Internet access are available for 24 hours per7 days (your scale should be 5), 5 days per week(your scale should be 4), between 3- 5 days (your scale should be 3) specifically in VED courses (your scale should be 2) and not at all (your scale should be 1)*				✓	
What is the level of your staff and student's competency and skills in using ICT? *(If their competency and skills in using ICT are low and still need more training, please tick as follow)*		✓			

Total points ___6___

Part I Checklists for administrators and IT staff

Section I Resources

ICT Resources	1	2	3	4	5
What proportions of staff and students have access to PCs? Less than 10%=1 50%=3 more than 90%=5					
What proportions of staff and students have access to the Internet?					
Is there sufficient bandwidth to access information overseas?					
Are students and instructors provided with information technology infrastructure to facilitate Web access, e-mail or discussion boards?					
What level of technical support such as help desk, library services, multimedia services, etc is provided to assist students learning in VED?					
How effective are the IT staff in developing procedures for VED ?					
Is there a budget allocated for the IT component of this project? If there is, please justify its amount such as highest=5, high=4, moderate=3, somewhat low=2 or low=1.					
How effective is the institute in outsourcing (equipment, software etc.)?					
How well is your institution using ICT to provide VED?					
How effective is the institute in evaluating its VED?					

Total points_____

If the total is below 30 (average), your institute needs to consider the ICT issue as a priority for developing possible solutions in outsourcing to e-learning companies for full services, establishing a technical support team, investing in more extensive infrastructure and so on.

Section II ICT skills

IT/IS competency and skills	1	2	3	4	5
How well does the institute prepare (skills, knowledge, and motivation) for the workforce to implement VED?					
What is the level of your institution' expertise in instructional and information design?					
What is the level of students and instructors' ICT skills? How much do they require in terms of VED training?					
How effective are the institute's short t and long-term plans to improve student and instructor's computer skills?					
How often are students and instructors provided with training programs? (regular=5, often=4, sometimes=3, seldom=2, not at all=1)					
How well do the training courses match the background of the learners e.g. expert, novice, intermediate?					
How well are the ICT facilities integrated with day-to-day work activities – is e-mail the most common mode of communication?					
How well does the VED team undertake the responsibility for developing and delivering training courses?					
How well do instructors gain knowledge from training and practical applications?					
How ell defined are the processes and level of skills for evaluating VED?					

Total points_____

If the total score is below 30 (average), your institute needs to have a plan to organise training courses and integrate ICT into work activities.

Section III Attitude towards ICT

Institute as a place to learn	1	2	3	4	5
How effective is the institute in planning to encourage students and instructors involved in VED?					
How effective is the institute in providing introductory courses or orientation sections for students before learning in VED?					
Are there reward systems that support VED learning and teaching? How well do they work?					
How effective are administrators in acting as role models in using ICT?					
Are times set aside for instructors to learn new technologies?					
How suitable are tutors in undertaking an on-line support role?					
What level of on-line tutor support is provided for each student?					
How effective are face-to-face workshops integrated with VED?					
What level of enthusiasm do instructors have in motivating students by teaching in the VED course					
What level do instructors rely on VED tools such as on-line exams, posting e-announcements, and encourage the students to use the VED tools embedded in the course?					

Total points_____

If the total point is below 30 (average), your institute needs to have a plan to organise training courses and integrate ICT in work activities. Strategies to change students and instructors' attitude to accept VED usefulness are also required.

Section IV Gaining Commitment

Commitment to perform the task	1	2	3	4	5
How committed are you, personally, to VED?					
How well do the members understand the benefit of VED?					
At what level do you think members are willing to be involved with implementing VED?					
To what level has the institute developed clear goals and objectives for implementing VED?					
How well are the policies and strategies developed, reviewed and updated on a regular basis?					
Do you have measurable objective or task statements for everyone involved in implementation? How clear it is?					
How well do you keep stakeholders informed by communicating progress and challenges?					
Does the institute have a strategy to encourage instructors in term of communicating and sharing ideas through VED tools? How well does the strategy work?					
Do you have a reward system to enhance members' engagement? How does it work?					
What level of success in term of using follow-up plans to enhance member's commitment?					

Total points_____

If the total point is below 30 (average), a well plan including policies and strategies for implementing VED is needed to develop staff's commitment.

Part II Checklists for instructors

Effectiveness of VED learning?	1	2	3	4	5
How well are resources organised to provide easy access for students?					
Does the institute have clear goals, directions and plans to implement VED successfully? How clear is it?					
Do your students have the opportunity to work collaboratively? To what level – often, sometimes, never?					
How well does the institution provide technical support to assist your teaching on VED?					
How much interaction occurs with students via e-mail or discussion boards?					
Is there a focus on student learning rather than teaching (student-centred environments)? How strong is your role in this approach?					
How well does the VED environment stimulate students' interest?					
What is the level of your administrator's support of VED learning environments?					
What is the level of your satisfaction for VED courses in term of quality and productivity?					
Do you obtain student feedback on the teaching sessions? How frequently do you gather this feedback?					

Total points_____

If the total is below 30 (average), there is room for improving instructions and enhancing collaborative learning environments of VED. Further, increased institutional support are also essential.

Part III Checklists for students

Accessibility, collaborative learning and perception of VED?	1	2	3	4	5
How much access do you have to the Web (anytime, anywhere)?					
What is the level of your VED system in terms of user-friendliness?					
What is the level of your VED system in terms of up-to-date content?					
How useful is VED in providing relevant content?					
How valuable do you find VED in assisting you to learn?					
How effective is VED in enabling you to discuss questions or share ideas with other students?					
What effective is VED in enabling you to discuss questions or share ideas with your instructors?					
Are your instructors enthusiastic in providing a VED learning environment?					
How well do your instructors use VED to provide stimulating and challenging instruction?					
How highly do you rank your VED courses compared to standard teaching mode?					

Total points_____

If the total is below 30 (average), your institute needs to improve VED tools and establish the team to mandate information and course content. There is also a need to motivate instructors to provide a collaborative learning environment through VED.

The maximum score for this Audit will be 300 points. However, a score of 200 and over would represent an extremely satisfactory evaluation of VED services. Scores below 300 need to be examined critically, especially for items where the score consistently is 2 or less. Reviewing these scores on a regular basis will allow you to prioritise the areas for improvement over the coming year and to update these on a regular basis.

Figure 6.3 Audit Checklist for Developing VED implementation in Rajabhat Institutes.

6.4 EMERGING ISSUES FROM THE STUDY

This section explores the implications for further understanding of the research questions that emerged during the course of the study. The discussion included in this section incorporates insights from the case studies and the comparative results of the VED evaluation between two groups: students and also the administrators and instructors.

6.4.1. Case Study Results and Research Issues

There were several issues that emerged from the case studies that had not been found in the literature.

Resources

The first of these issues was that the majority of Rajabhat Institutes recognised that the technological capability enhanced their educational services. Resources such as computer laboratories network bandwidth, on-line applications and others that facilitated VED learning environment were a good investment for their institutions. However, the study found that there were problems with the efficiency and effectiveness of the system design and implementation. The success of VED is not only dependent on technologies, but also on the way that VED is implemented and serviced (Mowshowitz, 1997).

The case studies indicated that RIPN facilitates the quality and reliability of technologies for providing VED by outsourcing to private companies. The view was held that instructors had teaching overloads and other responsibilities. Thus, an outsourcing company would enable the institute to provide better VED services. RISD provided VED services by using synchronous (videoconferencing), asynchronous communication technologies (VED courses through a Virtual library) and e-learning platform (Blackboard 5). The infrastructure, including hardware facilities that served network systems and on-line application (Blackboard 5), were thus hired and bought from private companies. For the management and implementation, RISD employed technical staff assisted by instructors who were expert in IT/IS. RIRC and RIPV allocated the budget to buy the infrastructure and its facilities; thus, IT/IS instructors played a major role in VED implementation and

its services. Not surprisingly, the view in both institutes was held that they had inadequate IT/IS staff to undertake the VED courses and insufficient hardware and services were still serious problems.

This study reinforces the view of the implicit strategies that effective VED outcome is achieved through outsourcing rather than by being administered by institute staff. One Rajabhat Institute (RIPN) decided to outsource to a private company to develop digital contents, service and maintenance of ICT and undertake training and motivating instructors and students to use ICT to enhance their knowledge. There was also found to be an association between outsourcing and the improved quality, productivity and perception of VED. This was evident in evaluating the success of VED by RIPN administrators, IT staff, instructors and particularly students had higher satisfaction levels than the others without outsourced services. From this we could suggest outsourcing as a key strategy for success.

However, the result of this study also brings into the discussion the unclear relation between costs and benefits of outsourcing. There are pros and cons to outsourcing. Many reasons have been identified to encourage outsourcing such as saving money in IS staff costs or technology-related costs, increased flexibility of services, minimising IT problems and passing risk of equipment obsolescence on to the service provider. In contrast, the disadvantages of outsourcing are lower levels of security involved with the services, variable qualifications of the provider, hidden costs that may be incurred in the contract and excessively strong dependence on the provider (Claver et al., 2002). **Further research is required in order to determine whether outsourcing can be an effective strategy for success in Thai universities.**

Computer literacy

It became evident that most Thai students lack basic knowledge of computer systems, specifically in their first year of studies because they had inadequate training and insufficient computers for use at home. However, the four Rajabhat Institutes tried to solve this problem by offering first year students regular training. This may be why the survey results indicated that computer literacy was not a significant factor influencing the success of VEDs; the majority of participants were

third-year students and had had several years of computer training (stated earlier in demographic of participants section, Chapter 4)

Confidence in advanced computer skills, however, seemed to be an inhibitor for instructors to produce VED course materials. Most instructors lacked the skills and experience to develop on-line course materials. Although the institutes provided them with regular training, only a small number of them had applied what they had learned. Many reasons were given as to why the knowledge gained from training courses had not yet been utilised. Firstly, the institutes had not integrated technology with day-to-day work activity and so there was little need to use technology. Secondly, there was no supportive environment, that is, there was a lack of computers for use and insufficient encouragement from leadership. Finally, instructors had techno stress and felt that they had no time to learn new technologies.

It is clear that instructional staff require supportive training facilities to improve their confidence in use of VED.

Perceived value of computer-based information

A positive perception of computer-based information is critical to the success of implementing VED. The mode of this educational delivery is based on the experience of instructors and students in developed countries where even there some might have keyboard phobia or language barriers (Eveland, 2003). This is obviously the case for Thai students and instructors who were unfamiliar with learning and teaching on VEDs. The view was held that students had problems with the English language so they had only a little understanding of the information that was provided on the Internet. Consequently, they did not perceive positively the value of information searching or self-learning. Further, most instructors did not accept VED as an alternative educational approach to teaching since their teaching loads could not be reduced. Administrators, instructors and students need to realise that using ICT can provide them with accurate, up-to-date, and useful information (Jarvenpaa and Staples, 2000). In addition, software packages to facilitate the design and delivery of VEDs also require to be less technically complex and more user friendly (Arbaugh, 2000; Brown, 2000).

Task interdependence

Another key to providing an effective VED is that the members of an organisation need to share the view that VED is useful and fits with their tasks in providing on-line education. Then its acquisition and usage will be part of the organisation's values (Jarvenpaa and Staples, 2000; Calver et al, 2001; Haghirian, 2002). The study found that two Rajabhat Institutes had a commitment to providing an effective VED; this was because the leadership encouraged the use of VED through a reward policy. For example, RIPN and RISD offered remuneration and gave relief from normal teaching workload for instructors who developed VED courses; however, RIRC and RIPV did not have a clear project to offer credit or provide rewards as yet. There was evidence of conflicts between experienced IT and non-experienced IT instructors in RIRC.

Culture in knowledge sharing

Three aspects of the culture in the institutions were considered to be important inhibitors to knowledge sharing, that is, in the process of knowledge creation (Davenport and Pruzak, 1998). The view was held that there was high power distance in two groups: between instructors and students, and also between administrators and instructors. Regarding the former, students were more likely to respect the direction and control of instructors and therefore, it was not surprising that a teacher-centred approach was found to be more acceptable as the preferred learning style among Thai students, in the latter, instructors accepted a hierarchical authority system with emphasis on status differentiation and unequal power distribution (Komin, 1990; Mckenna, 1995; Rohitratana, 1998; Hofstede, 2001). They usually preserve good relationships by working on norms of friendliness and politeness (Rohitratana, 1998). The psychological bond between people in these two groups can be defined as the "Bhun Khun" concept which is broadly accepted by the majority of Thais (Komin, 1990). According to this concept, Thai students or instructors are not encouraged to transfer knowledge through the institutional networks, such as e-mail, chat rooms or bulletin boards. In these environments instructors who performed as controllers or administrators made decisions without any comments from their subordinates; thus, the attempt to share ideas or knowledge through collaborative media in order to solve problems was rare (Shore and

Venkatachalam, 1996; Davenport and Pruzak, 1998; Erich and Williams, 1998; Jarvenpaa and Staples, 2000).

The second aspect seen to be an inhibitor was high uncertainty avoidance. It is considered inappropriate for Thais to share knowledge in the collaborative media (Trompennnars and Hampden-Turner, 1998) as they are reluctant to be the cause of discomfort regarding the feelings of others " Kreng ...." (Rohitratana, 1998). In this culture, Thais are polite, accepting and afraid to c ase their superior to lose face in front of others. The results showed that Thai students preferred a learning style in which precise and detailed instructions w are available as they expected instructors to be experts and to give them all the answers. This was accepted as another cultural barrier to knowledge sharing, as students and instructors were uncomfortable in expressing their ideas or opinions that contrasted with that of the others.

Third, Thai culture exhibits collectivism rather than individualism (Hofstede, 2001). Thais need strong support from their social group " Kam lang jai" in order to express ideas or share knowledge with others (Hallinger and Kantamara, 2001). Students are more likely to study in classrooms with their friends rather than studying alone on VED (Triandis, 1995). This was obviously true when the study found that most students preferred to have direct interaction with their instructors in rather than to study as individuals in VED

In the Thai cultural context where high power distance, high uncertainty avoidance and collectivism were the component issues, students found it was difficult to develop dynamic and interactive on-line discussion. These culture factors are the key inhibitors of effective knowledge sharing (Komin, 1990; Mckenna, 1995; Triandis, 1995; Rohitratana, 1998; Trompenaars and Hampden-Turner, 1998; Thanasankit, 1999; Hofstede, 2001). To overcome these issues, the implementation of VED should be designed to match students' needs and to encourage their knowledge sharing. Instructors play a central role to motivate students to participate through collaborative media in VED. This implies, instructors must be enthusiastic about teaching on-line, friendly towards individual students, frequently using e-mail and discussion board and giving rapid feed back to students or even rewarding students who have active participation (Volery and Lord, 2000).

Information Culture

The factual findings from the case studies indicated that the majority of students in Rajabhat Institutes lacked self-efficacy and used ICT in an unprofitable manner. Further, administrators and instructors gave low assessments of information processing, publishing and communication with respect to knowledge sharing in VED learning environments. They preferred face-to-face interaction rather than communicating through ICT facilities such as e-mail or discussion boards. Moreover, most instructors showed negativity towards IT/IS because their role as instructor was threatened since students were more likely depend on the VED learning environment.

6.4.2 Evaluating Success of VED

This section examines the success of VED implementation in four case studies. In order to determine a VED success, the learning environment must provide evidence that the VED implementation will add value to the institute. Following the theoretical framework, which is shown in chapter 2, the value of VED implementation was measured in terms of educational outcomes. The outcomes of VEDs included improved quality, productivity of learning, and perception of VEDs measured from students, instructors and administrators were seen as the indicators of successful VEDs (Hiltz, 1994; Dulworth, 1996; Alexander and McKenzie, 1998; Borthick and Jones, 2000).

Evaluating quality and productivity of learning provided by VEDs was examined in two groups. First, students' evaluation involved measuring students' reaction or feelings about accessibility, course design and content, desirable information, collaborate learning, learning style that met their needs and knowledge creation. All of this questions in this section used four-item scale anchored by 1= strongly disagree, 2= disagree, 3= agree and 4= strongly agree. The reason that convinced the researcher to use four-item scale to obtain data from students was based on the aspects of culture in Thai students. They were more likely to feel uncomfortable towards their instructors (Kreng jai) if they weighed the instructions low and so preferred to compromise in order to keep in harmonisation with their instructors (Rohitratana, 1998). Thus, omitting "neither disagree nor agree" was the appropriate scale to obtain the fact from Thai students' point of views eg. by forcing a choice.

Second, administrators, IT staff and instructors' evaluation measured the extent to which students' knowledge, skills in critical thinking, and collaboration learning experience changed as a result of VED learning. In this section, the interviewees were asked to evaluate their VEDs with five-item scale. They were confirmed as their names were anonymous and they felt more comfortable to discuss their views personally.

In order to gain the precise results in comparison between two groups: 1) student; 2) administrators, IT staff and instructors. The five-item scale was re-weighed to four-item scale and the results of the success of teaching and learning on VEDs as reported by instructors, administrators and students are summarised in Table 6.2.

Table 6.2 The evaluation of VED in four Rajabhat Institutes

	RIPN		RISD		RIRC		RIPV	
	Student	Admin & Instructor	Student	Admin & Instructor	Student	Admin & Instructor	Student	Admin & Instructor
Improved quality & productivity	2.9	2.7	2.7	2.6	2.9	2.1	2.8	2.6
Perception	3	3.2	2.7	3	2.9	2.2	2.8	3.2

In each Rajabhat Institute, average scales of students' evaluation are shown in the first column and those of all interviewees' evaluation are in the second. The results show that students' evaluation of improved quality and productivity varied from 2.7 to 2.9, moderately higher than the average value of 1-4 point scale (mean =2.5). On the other hand, administrators, IT staff and instructors evaluated improved quality and productivity from 2.1 to 2.7, somewhat lower and a little bit higher than the average score (mean=2.5). The results suggest that administrators and instructors who have vital roles in providing VED learning environments believed that there were still problems in implementing VED and the quality and productivity of learning had not yet improved; however, students agreed that the quality and productivity of learning on VEDs were moderately satisfactory.

Administrators, IT staff and instructors weighted the perception of VEDs from 2.2 to 3.2, while students weighted it 2.7 to 3 This suggests that administrators, IT staff and

instructors had greater variety of perception of the usefulness of teaching and learning on VEDs than their students had.

The results indicated the quality, productivity and perception of VED in all Rajabhat Institutes were moderately satisfactory from students' point of views. However, to obtain in-depth details requires other supportive views especially from administrators, IT staff and instructors with a key role in implementing VED. Further, Thai students were more likely to feel uncomfortable towards their instructors (Kreng jai) if they weighed the instructions low and so preferred to compromise in order to keep in harmony with their instructors (Rohitratana, 1998). This might explain why average scales between students' and administrator, IT staff and instructors' evaluation were quite different. RIRC results showed that administrators, IT staff and instructors accepted that VED implementation in their institute had not yet been successful as the evaluation ranged in the lowest score. The main finding resulting from this study is RIRC was outsourcing on-line application (TOACS) from ECU (ECU provided only the software and initial training), it appeared that they had not yet developed strategies to deploy this application such as ongoing training, a technical team who support instructors to create material contents and/or supportive VED learning environments. Further, most instructors had little experience in using ICT and still believed that VED was not suited to the needs of their students.

In RIPN, RISD and RIPV, average scales of administrators, IT staff and instructors' evaluation were moderately higher than the average value of 1-4 point scale (mean =2.5). This indicated that the administrators, IT staff and instructors in three institutes perceived in VED usefulness and agreed that it can improved their quality and productivity of learning. From these, RIPN seems to be the most successful when the higher average scales from both groups are considered. Students, administrators, IT staff and instructors in RIPN agreed that VED improved the quality and productivity of learning. This would seem to confirm as successful strategies that RIPN selected outsourcing to e-learning company and motivated instructors to use VED by offering remuneration.

The case studies provide evidence that the implementation of VEDs as alternative educational services has not yet been successful since the evaluation from the students, administrators, IT staff and instructors in improved quality and productivity

of VED were not in satisfactory level (average scale = 3 or more). However, successful VEDs can be implemented, but there are numerous obstacles to be overcome. The result of this study also provides the strategies that each institute used to cope with the obstacles.

6.5 LIMITATIONS AND IMPLICATIONS FOR FURTHER RESEARCH

6.5.1 Limitations

This section outlines limitations that became apparent during the process of research. The first of these is that the researcher had limited time and resource constraints, since the focus of this study was on 4 Rajabhat Institutes from 41 institutes across Thailand. The small number of responses from these organisations precludes the generalisability of these results across different types of Rajabhat Institutes. Moreover, the length of time for this study does not allow for any longitudinal data to be gathered. This means that the information given is at only one point of time. However, for the purpose of this study the information gathered can be used to answer the research questions and can also serve as a reference point for future research.

According to Thai culture, students feel an obligation to instructors and feel reluctant to be the cause of discomfort to instructors (Kreng Jai) (Rohitratana, 1998). Therefore, the results of this survey could be biased as they may over-evaluate the quality, productivity and perception of VED in a positive way. However, this problem was particularly overcome by using interviews to explore these concepts further.

Although the interviews provided broad views and in-depth details, the sampling frame focused on instructors who had been involved with VEDs. Previous research Cox et al. (1999) has suggested that the regularity of instructors using ICT and their perception of its usefulness could influence VED implementation in a positive way. This is a limitation to the research in that the evaluation results could be overestimated. It would be interesting to interview other instructors who were not involved with VEDs from different point of views.

6.5.2 Implication for Further Research

This study has examined the factors influencing the success of VED implementation from four Rajabhat Institutes that were more advanced in using ICT. Additional studies using a methodology similar to that in this research but with a larger population are needed to provide generalisations.

This study examined VED in four Rajabhat Institutes that were at the initial stages of implementation. Further research is required to analyse the VED implementation for long term. The more that students and instructors regularly experience and use VED, the greater perception of VED usefulness and outcomes they achieve (Cox et al., 1999).

Finally, the results of this study pointed to cultural factors such as high power distance, high uncertainty avoidance and collectivism which were accepted as critical inhibitors to the success of VED. It is questionable if VED had been implemented for a longer time, whether these cultural factors would have continued to affect its success.

The results of this study did not provide detailed insight into the relationship between the strategies each Rajabhat Institute used to implement VED and its organisational performance. One of the case studies in this study used outsourcing to a private company for implementing VED, while the others employed technical staff or provided assistance for their IT/ IS instructors. Further research is needed in order to provide a better understanding of which strategies work and how these could lead to better practice for Rajabhat Institutes.

REFERENCES

Abdon, B. R., & Raab, R. T. (2001). *Making e-learning Work in the Asia Pacific:Lessons Learned.* Paper presented at the The Information Technology in Regional Areas (ITiRA) Conference, Rockhampton, Queensland, Austrualia.

Agarwal, R., & Day, A. E. (1998). The impact of the Internet on Economic Education. *Journal of Economic Education., 29*(2), 99-110.

Alexander, S., & McKenzie, J. (1998). *An Evaluation of Information Technology Projects in University Learning.,* Australian Government Publishing Services, Canberra.

Arbaugh, J. B. (2000). Virtual classroom versus physical classroom: An exploratory study of class discussion patterns and student learning in an asynchronous Internet-based MBA. *Journal of Management Education., 24*(2), 213-233.

Bates, A. W. (1993). *Educational aspects of the telecommunications revolution in Teleteaching.* Paper presented at the IFIP, North Holland.

Berg, B. L. (2000). *Qualitative research methods for the social sciences*: USA.

Bodain, Y., & Robert, J.-M. (2001). *Investigating distance learning on the Internet.* Retrieved 03/05/2001, 2001, from the World Wide Web: www.isoc.org/inet2000/cdproceedings/6a/6a_4.htm

Borthick, A. F., & Jones, D. R. (2000). The motivation for collaborative discovery learning online and its application in an information systems assurance course. *Issues in Accounting Education, 15*(2), 181-210.

Brannen, J. (1992). *Mixing Methods: qualitative and quantitative research.* England: Avebury, Ashgate Publishing Limited.

Brown, I. T. J. (2002). Individual and Technological Factors Affecting Perceived Ease of Use of Web-based Learning Technologies in a Developing Country. *The Electronic Journal on Information Systems in Developing Countries., 9*(5), 1-15.

Bryman, A. (1988). *Quantity and Quality in Social Research.* London: Unwin Hyman.

Bryman, A., & Cramer, D. (1999). *Quantitative Data Analysis with SPSS release 8 for Windows: A Guide of Social Scientists.* New York: Routledge.

Bullen, M. (1998). *Participation and Critical Thinking in On-line University Distance Education*. Retrieved 2, 13, from the World Wide Web: www.icaap.org/iuicode?151.13.2.1

Campbell, D. R., & Fiske, D. W. (1959). Convergent and discriminant validation by multitrait-multimethod matrix. *Psychological Bulletin, 56*(2), 81-105.

Castells, M. (1996). *The Rise of the Network Society*. Boston, USA: MA:Blackwell.

Cavana., R. Y., Delahaye., B. L., & Sekaran., U. (2001). *Applied business research : Qualitative and Quantitative methods*. Milton: John Wiley&Sons Australia, Ltd.

Chonin, B., & Davenport, E. (1993). Social Intelligence. *Annaul Review of Information Science and Technology, 28*, 3-44.

Clarke, T., & Hermens, A. (2001). Corporate developments and strategic alliance in e-lerning. *Educatoin and Traning, 43*(4), 256-267.

Claver, E., Gonzalez, R., Gasco, J., & Llopis, J. (2002). Information systems outsourcing:reasons, reservations and success factors. *Logistics Information Management, 15*(4), 294-308.

Claver, E., Llopis, J., Gonzalez, M. R., & Gasco, J. L. (2001). The performance of information systems through organizational culture. *Information Technology and People, 14*(3), 247-260.

Cox, M., Preston, C., & Cox, K. (1999). *What Factors Support or Prevent Teachers from Using ICT in their Classrooms?* Retrieved 11/05, 2003, from the World Wide Web: http://www.leeds.ac.uk/educol.

Creswell, J. W. (1994). *Research Design Qualitative & Quantitative Approaches*. Thousand Oaks, California: SAGE Publications, Inc.

Davenport, T. H. (1994). "Saving IT's Soul: Human-Centered Infomation Management. *Harvard Business Review, 72*(2), 119-131.

Davenport, T. H. (1997). *Information Ecology*. Oxford: Oxford university press.

Davenport, T. H., DeLong, D. W., & Beers, M. C. (1998). Successful knowledge management projects. *Sloan Management Review, 39*(2), 43-57.

Davenport, T. H., & Pruzak, L. (1998). *Working Knowledge: how organisations manage what they know*. Boston, Massachusetts: Harvard Business School Press.

Davies, D. (1998). The virtual university : a learning university. *Journal of Workplace Learning, 10*(4), 175-213.

Davis, S. A., & Bostrom, R. P. (1993). Training end users: An experimental investigation of the roles of the computer interface and training methods. *MIS Quarterly., 17*(2), 61-84.

Dulworth, M. R. (1996). Interactive multimedia learning systems. *Journal of Instruction Delivery System, 10*(3), 29-35.

Erich, N. B., & Williams, P. A. (1998). The influence of tacit knowledge and collective mind on strategic planning. *Journal of Managerial Issues, 10*(2), 204-222.

Eveland, J. (2003). *Designing Effective elearning Across National Boundaries.* Retrieved 11/06, 2003, from the World Wide Web: http://www.linezine.com/3.1/features/jedeeanb.htm

Fang, W.-M. (1999). *On-line Education.* Retrieved 25, 2001, from the World Wide Web: www.sjsu.edu/depts/alquist/webct/definition/tsld002.htm

Fenske, R. F. (1998). Computer Literacy and the Library: A New Connection. *Reference Service Review, Summer,* 67-78.

Foreman, J. (1998). Distance Learning and Virtual Organisation. *Newsletter, 2,* 21.

Gaspar, R. F., & Thompson, T. D. (1995). Current trends in distance education. *Journal of Interactive Instruction Development, 8(2),* 21-27.

Goldman, S. L., Nagel, R. N., & Preiss, K. (1995). *Agile Competitors and Virtual Organisations: Strategies for Enriching the Customer.* New York, USA: Van Nostrand Reinhold.

Graenier, R., & Metes, G. (1995). *Going Virtual: Moving Your Organisation into the 21st Century.* New Jersey: Prentice Hall.

Green, J. (2000). *The online Education Bubble.* Retrieved 22, 11, from the World Wide Web: www.prospect.org/print/v11/22/green-j.html

Haghirian, P. (2002). *Designing the Virtual Classroom: Towards an Effectiveness Model in Internatinional Marketing Teaching.* Paper presented at the Proceedings of AMA Summer Marketing Educators' Conference, San Diego, USA.

Hallinger, P. (1996). Culture and educational administration, A case of finding out what you don't know you don't know. *Journal of Educational Administration, 34*(5), 98-116.

Hallinger, P., & Kantamara, P. (2001). Learning to lead global changes in local cultures, Designing a computer-based simulation for Thai school leaders. *Journal of Education Administration, 30*(3), 197-220.

Hiltz, S. R. (1994). *The virtual classroom:Learning without Limits via Computer Networks*. Norwood, NJ.: Ablex.

Hofstede, G. (2001). *Cultures Consequences : Comparing Values, Behaviors, Institutions, and Organisations Across Nations*. Thouson Oaks, London, New Delhi: Sage Publications.

Huang, A. H. (1997). On-line training: A new form of computer-based. training. *Journal of Education for Business, 73*(1), 35-38.

Jarvenpaa, S. L., & Staples, D. S. (2000). The use of collaborative electronic media for information sharing: an exploratory study of determinants. *Journal of Strategic Information System, 9*, 129-154.

Jung, I., & Rha, I. (2001). A virtual university trial project : Its impact on higher education in South Korea. *Innovations in Education and Training International, 38*(1), 1-31.

Khajanchi, V., & Kanfer, A. (2000). *Knowledge management*: National Centre for Supercomputer Applications

Komin, S. (1990). Culture and Work-related Values in Thai Organisations. *International Journal of Psychology, 25*, 681-704.

Larson, M. R., & Bruning, R. (1996). Participant perceptions of a collaborative satellite-based mathematics course. *American Journal of Distance Education, 10*(1), 6-22.

Leimeister, J. M., Weigle, J. r., & Kremar, H. (2001). Efficiency of Virtual Organisations - The Case of AGI. *Electronic Journal of Organizational Virtualness, 3*, 12-42.

Marshall, P., Burn, J., Wild, M., & J, M. (1999, 23-25 June). *Virtual Organisations: Structure and Strategic Positioning. Proceedings of the Seventh European Conference on Information Systems*. Paper presented at the Proceedings of the Seventh European Conference on Information Systems, Copenhagen, Denmark.

May, B. E. (1997). Curriculum Internationalization and Distance Learning: Convergence of Necessity and Technology. *Journal of Teaching in International Business, 9*(1), 35-50.

McCollum, K. (1997). A professor divides his class in two to test value of online instruction. *Chronicle of Higher Education, 43*(24), 23.

MaFadzean, E. (2001). Supporting Virtual learning groups. Part 1. *Team Performance Management: An International Journal, 7*(3), 53-62.

McFadzean, E., & McKenzie, J. (2001). Facilitating virtual learning groups A practical approach. *Journal of Management Development, 20*(6), 470-494.

McKenna, S. (1995). The cultural transferability of business and organisational reengineering examples from South East Asia. *The TQM Magazine, 7*(3), 12-16.

McLoughlin, C., & Oliver, R. (2001). Designing learning environments for cultural inclusivity: A case study of Indigenous online learning at tertiary level. *Australian Journal of Educational Technology, 16*(1), 58-72.

Miles, M. B., & Huberman, A. M. (1994). *An Expanded Sourcebook, Qualitative Data Analysis*. Thusand Oaks, London, New Delhi: SAGE Publications.

Mingers, J. (2003). The paucity of multimethod research:a review of the information systems literature. *Information Systems Journal, 13*(3), 133-249.

Mowshowitz, A. (1997). Virtual organisation. *Communication of the ACM, 40*(9), 30-37.

(NECTEC), National Electronics and Computer Technology. (2003). *Internet users in Thailand*. Retrieved 25/06/2003, 2003, from the World Wide Web: www.nitc.go.th/internetuser/internet1.html

Nonaka, I. (1994). Dynamic Theory of Organizational Knowledge Creation. *Organization science, 5*(1), 14-37.

Nunn, D. (1998). *Delivering general education subjects electronically:part one, The NODE, Technologies for Learning*. Retrieved 18/05, 2003, from the World Wide Web: http://node.on.ca/tfl/fieldnodes/nunn.html

Palasri, S., Huter, S., & Wenzel, Z. (1999). *The History of the Internet in Thailand*. USA: University of Oregon Books.

Peraya, D. (2001). *Distance Education and the WWW*. Retrieved 23/04/01, 2001, from the World Wide Web: http://tecfa.unige.ch/edu-comp/edu-ws94/contrib/peraya.fm.html

Pettigrew, A. M. (1990). Is corporate culture manageable?, in Wilson,D. and Rosenfeld,R (Eds). *Managing Organisations*, 267-272.

Rohitratana, K. (1998). *The role of Thai values in managing information systems case study of implementing on MRP Systems, in Avgerou,C.* Paper presented at the Proceedings of the Fifth International Working Conference of IFIP WG 9.4-Implementation and Evaluation of Information Systems in Developing Countries, Bangkok.

Seng, L. C., & Al-Hawamdeh, S. (2001). New mode of course delivery for Virtual Classroom. *Aslib Proceedings, 53*(6), 238-242.

Sherry, L. (1996). Issues in Distance Learning. International. *Journal of Educational Telecommunications, 1*(4), 337-365.

Shore, B., & Venkatachalam, A. R. (1996). Role of national culture in the tranfer of information technology. *Journal of Strategic Information Systems, 5*, 19-35.

Simons, G. (1998). Culture Matters, A Barrier Analysis of 30 Culture Factors Affecting Distributed Workplaces. *Newsletter, 2*(4), 5-11.

Tao, E. Y. (2001). *Impact of Internet Technology on Educatoin-A comparison between Education Institutes' Internet usage in Developed and Developing Countries.* Retrieved 28, 2001, from the World Wide Web: http://tao.monterey.edu/papers/internet_impact.html

Thanasankit, T. (1999). *Understanding the impact of Thai culture on requirements engineering.* Paper presented at the Corbit, B.J and Falvey, L.(eds) (1999) The Melbourne Thai Forum, Melbourne.

Thong, J. Y. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems; Armonk, 15*(4), 187-314.

Tongdhamachart., N. (2002). *e-Learning: New Age for Thai Education.* Japan: Education Technology and Human Resource Development Section, NECTEC.

Triandis, H. C. (1996). *Individualism and Collectivism.* Boulder, CO: Westview Press.

Trompenaars, F., & Hampden-Turner, C. (1998). Riding the Waves of Culture: Understanding Cultural Diversity in Global Business. New York: McGraw-Hill.

Trondsen, E. (1998). Learning on Demand. *Journal of Knowledge Management, 1*(3), 169-180.

United Nations Educational, S. a. C. O., (UNESCO). (2001). *The new information and communication technologies for the development of education science and culture.* Paris.

Urdan, T. A., & Weggen, C.C. (2000). *Corporate e-learning: Exploring a new frontier:* WR Hambrecht Co.

Vance, C. M., McClaine, S. R., & Boje, D. M. a. S., H.D. (1992). An examination of the transferability of traditional performance appraisal principles across cultural boundaries. *Management International Review, 32*(4), 313-326.

Venkatraman, N., & Henderson, J. C. (1998). Real Strategies for virtual organising. *Sloan Management Review, 4,* 33-48.

Volery, T., & Lord, D. (2000). Critical success factors in online education. *The International Journal of Educational Management, 14*(5), 216-223.

Weinstein, M. B. (2000). Thirty three world-class competencies. *Training and Development, 54*(5), 20-23.

West, L., & Hore, T. (1989). The impact of higher education on adult students in Australia. *Higher Education, 18,* 341-352.

Winter, S. J., Chudoba, K. M., & A.Gutek, B. (1997). Misplaced resources? Factors associated with computer literacy among end-users. *Information & Management, 32,* 29-42.

Yin, R. K. (1994). *Case Study Research: Design and Methods.* Thousand Oaks, California: SAGE Publications, Inc.

APPENDICES

Appendix A. Questionnaire items

Item	Item wording

Resources	**Items used to examine VED have resources to facilitate learning –** source: Dulworth (1996) and Alexander and McKenzie (1998)
	Easy to get access to computer facilities on campus
	   a) In class b) After class
	Your network allows you to use
	   a) Synchronous communication technologies (eg. video and audio conferencing, chat room)
	   b) Asynchronous communication technologies (eg, e-mail, newsgroups, bulletin board)
	Your network is high speed in data transmission and document exchange
	There are an advance and up-to-date software to facilitate your learning
	Your web page is a useful source of information.
	Information on web pages are updated all the time
	You improve your learning by using ICT facilities

Computer literacy	**Items used to examine experiences associated with the use and implementation of ICT** – source: Winter et al. (1997) Easy to use computer Easy for you to communicate with others by using e-mail, bulletin board, etc.
Perceived value of computer-based information	**Items used to examine currents feeling about using computer** – source: Larson and Bruning (1996) and Jarvenpa and Staples (2000) Stimulating Fun Personal Efficient Reliable Usefulness Desirable

Item	Item wording
Culture in knowledge sharing	Items used to examine experiences associated with the use of the synchronous eg. video or audio conferencing and asynchronous communication technologies eg. e-mail, bulletin board, etc. to facilitate knowledge sharing- source: Hofstede (2001) and Seng and Al-Hawamdeh (2001) **Power distance** To express your views or ideas that contradict what instructors say is not comfortable for you to do You are more likely to accept lectures' instruction rather than resist them. **Uncertainty avoidance** Your instructors should be expert and can give you all the answers. You still need some instructions from instructors rather than control your own learning process. If your views are different from others in a group, you are reluctant to express it out. **Collectivism** You are more likely to discuss assignments with others based on relationship rather than group work.
Information culture	Items used to examine experiences associated with information processing, publishing and communication –source: Claver et al. (2001) You enjoy reading material contents on-line rather than listening to instructors in classrooms You like to take part in discussion about your subjects with instructors. or other students by using e-mail or discussion board rather than do your work alone. Your university context such as rules, system or daily environments are supportive to you to learn on-line.
Evaluation success of VED	Quality and productivity - source: Dulworth (1996), Alexander and McKenzie (1998) and Borthick and Jones (2000) • Effectiveness of instruction Instructor organises the course well. Instructor presents material clearly and summarises points. Instructor critiques my work in a constructive and helpful way. • Effectiveness of course contents You can access to any information and materials provided online. • Effectiveness of outcome I gain a good understanding in this field. My skill in critical thinking is increased. **Perception** This helps you to increase your knowledge. I found the course to be a better learning experience than normal face-to-face course.

APPENDIX B

Strategies for Effective Virtual Education Delivery in Thailand

Dear participant,

As a DBA researcher at Edith Cowan University, Australia, I would appreciate your support in this project, which looks at some issues concerning virtual education delivery.

Aim and scope of this research

The aim of this study is to determine the significant and dominant facilitators and inhibitors for virtual education delivery. These factors will be synthesised with Thai culture factors to develop a comprehensive strategic framework for Rajabhat Institutes, which can be used successfully to meet the needs of students

The outcome and recommendation of this study will be helpful for educational administrators to develop strategic guidelines for the improvement of the effectiveness of VED in Rajabhat Institutes

Completing the attached questionnaire should not take longer than 20 minutes. This questions will gain and understanding of how you view your VED environments and how you evaluate the quality, productivity and perception in your virtual education delivery.

A good response will help to gain a comprehensive picture of the issues listed above so I would appreciate your support by completing this questionnaire and returning it to the person who distributes this questionnaire. You are assured that the information obtained will be kept strictly confidential and will be only used for research purposes. Data will not be made available to any third party.

Any questions concerning the project entitled "Virtual Education Delivery in Thailand: Application of Models and Strategies to Rajabhat Institutes" can be directed Assistant Professor Nalinee Thongprasert, Faculty of Management Science, Rajabhat Institute Ubon Ratchathani Tel 045-262423 ext.1300

If you have any concerns about the project or would like to talk to an independent person, you may contact Assit. Prof. Jirawat Suthipat Dean, Faculty of Management science, Rajabhat Institute Ubon Ratchathani Tel 045-262423 ext. 1300

Thanking you in advance,
Nalinee Thongprasert

EDITH COWAN UNIVERSITY

STRATEGIES FOR EFFECTIVE VIRTUAL EDUCATION DELIVERY IN THAILAND

This is an anonymous questionnaire. Please ensure that you do not write your name, or any other comments that will make you identifiable, on the attached. By completing the questionnaire you are consenting to take part in this research. As such you should first read the enclosed. Disclosure Statement carefully as it explains fully the intention of this project.

Aim and scope of this research
The aim of this study is to determine the significant and dominant facilitators and inhibitors for virtual education delivery. These factors will be synthesised with Thai culture factors to develop a comprehensive strategic framework for Rajabhat Institutes, which can be used successfully to meet the needs of students.

To complete this questionnaire
For the purpose of this research, virtual education delivery is defined as an instructional model that using the facilities of information and communication technology (ICT) and network collaboration in teaching and learning. The instructions and learning can occur whenever and wherever the learners need to learn. These questions are related to your virtual classes. Please read carefully and answer all the questions. You are assured that the information obtained will be kept strictly **CONFIDENTIAL** and will be only used for research purposes. Data will not be made available to any third party.

To return this questionnaire
Please complete this questionnaire and return to the person who distributes this questionnaire.

Nalinee Thongprasert, DBA Candidate

Professor Janice Burn – Principal Supervisor

All correspondence to:
Nalinee Thongprasert, School of Management Information Systems, Faculty of Business and Public Management, Edith Cowan University, Pearson Street Churchlands,
Perth WA 6018.

146

Mark your answers by ticking the responses as shown:

Example ①   ②   ③   ④
Please read these statements carefully and tick the circle that corresponds to how much you agree or disagree with the following statements and please answer every question.

Section 1: Factors influencing virtual education delivery.
1. How much do you agree or disagree your online courses are available resources to facilitate your learning

Resources	Strongly disagree	Disagree	Agree	Strongly Agree
Easy to get access to computer facilities on campus	①	②	③	④
Your network allows you to use a) synchronous communication technologies (eg. video and audio conferencing, chat room) b) asynchronous communication technologies (eg, e-mail, newsgroups, bulletin board)	① ①	② ②	③ ③	④ ④
Your network is high speed in data transmission and document exchange	①	②	③	④
There are an advance and up-to-date software to facilitate your learning.	①	②	③	④
Your web page is a useful source of information.	①	②	③	④
Information on web pages are updated all the time	①	②	③	④

2. Please indicate how much you agree or disagree to the following experiences associated with the use and implementation of ICT

Computer literacy	Strongly disagree	Disagree	Agree	Strongly Agree
Easy for you to use computer	①	②	③	④
Easy for you to communicate with others by using e-mail, bulletin board, etc.	①	②	③	④

3. For each of the following pairs of words, please tick the response that represents where you fall on the scale in terms of your currents feeling about using computer

Perceived value of computer-based information	Strongly disagree	Disagree	Agree	Strongly Agree
Stimulating	①	②	③	④
Fun	①	②	③	④
Personal	①	②	③	④
Efficient	①	②	③	④
Reliable	①	②	③	④
Useful	①	②	③	④
Desirable	①	②	③	④

4. Please indicate how much you agree or disagree to the following experiences associated with the use of the synchronous eg. video or audio conferencing and asynchronous communication technologies eg. e-mail, bulletin board, etc. to facilitate your shared ideas and knowledge with others. (**Characteristic of students in knowledge sharing**)

Power distance	Strongly disagree	Disagree	Agree	Strongly Agree
To express your views or ideas that contradict what instructors say is not comfortable for you to do	①	②	③	④
You are more likely to accept lectures' instruction rather than questioning them.	①	②	③	④

Uncertainty avoidance	Strongly disagree	Disagree	Agree	Strongly Agree
Your instructors should be expert and can give you all the answers.	①	②	③	④
You still need some instructions from instructors rather than control your own learning process	①	②	③	④
If your views are different from others in a group, you are reluctant to express it out.	①	②	③	④

Collectivism	Strongly disagree	Disagree	Agree	Strongly Agree
You are more likely to discuss assignments with others based on relationship rather than group work.	①	②	③	④

5. Please indicate how much do you agree or disagree to the following experiences associated with information processing, publishing and communication

Information culture	Strongly disagree	Disagree	Agree	Strongly Agree
You enjoy reading material contents on-line rather than listening to instructors in classrooms.	①	②	③	④
You like to take part in discussion about your subjects with instructors or other students by using e-mail or discussion board rather than do your work alone.	①	②	③	④
Your university context such as rules, system or daily environments are supportive to you to learn on-line.	①	②	③	④

6. There are three sets of items in this section that indicate quality and productivity of learning from a student point of view; we would like you to try to separate them out in your thinking. The first relates to the teaching or presentation style and effectiveness of your instructor; the second, to the course content; and the third to the outcomes of the course for you.

For each of the following, please tick a response that corresponds to the following scale

Course instruction	Strongly disagree	Disagree	Agree	Strongly Agree
Instructor organises the course well	①	②	③	④
Instructor presents material clearly and summarises points	①	②	③	④
Instructor critiques my work in a constructive and helpful way	①	②	③	④

Course content	Strongly disagree	Disagree	Agree	Strongly Agree
You can access to any information and materials provided online	①	②	③	④

Outcomes of the course	Strongly disagree	Disagree	Agree	Strongly Agree
I learn a great deal of factual material	①	②	③	④
My skill in critical thinking is increased	①	②	③	④

7. Please indicate your feeling about your virtual course.

Perception	Strongly disagree	Disagree	Agree	Strongly Agree
I feel more "involved" in taking an active part in the course	①	②	③	④
I found the course to be a better learning experience than normal face-to-face courses.	①	②	③	④

Section 2. General questions
8. This section allows you the opportunity to provide your comments and the issues that were raised. Please also provide details of any issues that you feel were not addressed associated with your virtual courses.

Section 3: Student background

The following questions are designed to provide a background summary of the students taking part in virtual classroom.

9. Gender: ① Male   ② Female

10. Age Group:
    ① Under 18
    ② 18-24
    ③ 25-34
    ④ 35-44
    ⑤ Over 45

11. I am studying in the Faculty of:

    ① Education
    ② Humanity and Social Science
    ③ Management Science
    ④ Science and Technology
    ⑤ Art Science
    ⑥ Technology and Industrial Science

12. Mode: ① Normal Section   ② Weekend Section

13. Your level: (eg, first year undergraduate, second year postgraduate etc.)

    O Undergraduate   O Post graduate
    ①First year
    ②Second year
    ③Third year
    ④Fourth year
    ⑤More than fourth year

APPENDIX C

STRATEGIES FOR EFFECTIVE VIRTUAL EDUCATION DELIVERY IN THAILAND

Aim and scope of this research

The aim of this study is to determine the significant and dominant facilitators and inhibitors for virtual education delivery. These factors will be synthesised with Thai culture factors to develop a comprehensive strategic framework for Rajabhat Institutes, which can be used successfully to meet the needs of students

The outcome and recommendation of this study will be helpful for educational administrators to develop strategic guidelines for the improvement of the effectiveness of VED in Rajabhat Institutes

A series of questions will be asked and will take approximately 30 minutes. . This question will gain and understanding of how you view your VED environments and how you evaluate the quality, productivity and perception in your virtual education delivery.
The interviews will be recorded and tapes will be erased at the end of the research

If you have any questions about the study, please ask the interviewer at any stage. You may decline to participate if you so desire. The interview will be kept confidential, and only aggregate results are sought.

Any questions concerning the project entitled "Virtual Education Delivery in Thailand: Application of Models and Strategies to Rajabhat Institutes" can be directed Asst. Prof. Nalinee Thongprasert, Faculty of Management Science, Rajabhat Institute Ubon Ratchathani Tel 045-262423 ext.1300

If you have any concerns about the project or would like to talk to an independent person, you may contact Asst. Prof. Jirawat Suthipat. Dean, Faculty of Management science, Rajabhat Institute Ubon Ratchathani Tel 045-262423 ext. 1300

I (the participant) have read the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that I may withdraw at any time.

I agree that the research data gathered for this study may be published provided I am not identifiable.

I understand that I will be interviewed and the interview will be audio taped. I also understand that the recording will be erased once the interview is transcribed.

_____   Date
Participant or authorised representative

_____   Date
Investigator

Section I. Interviews for administrative staff

Date_____

Gender_____

Age: O 20-30
      O 31-40
      O 41-50
      O 51-60
      O Over 60

Department: _____ University: _____
Respondent: _____ Position: _____
Responsibilities: _____
Years of experience in administrative work_____
What is your involvement in the University VED?

Section1 Resources (characteristics of software, hardware and humanware)

The following factors may affect to the success of VED. How are these organised to provide an effective VED in your university?

- Resources: hardware, software and humanware to support VED.

- Increasing the number of student's enrolment based on using VED as an education tool.

- Improved Computer literacy of instructors and students.

- Improved perceptions in the value of IT-based information of students and university memberships

- Do you have any problem in management to provide facilities to provide an effective VED?

Section 2. Culture context in knowledge sharing.

- To what level of success do you think that ICT can facilitate information and knowledge sharing environment?

  Very much   Moderate   Somewhat   Not at all

     O   O   O   O

- What in your opinion are the critical problems to impede information or knowledge sharing?

Section 3 Task interdependence

A major task of education is to create knowledge. Do you think that your VED has been designed to utilise and fit that task? Why or why not?

In your opinion. Do members in each academic and each major unit agree and feel comfortable to provide VED?

What in your opinion are the impediments of the members' agreement?

Do you have any support to encourage members conforming to provide an effective VED? Please give me an example of your project or plan.

Section 4. Successful VED

In your opinion, what level do you evaluate the success of university VED in this following terms:

Quality	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
Students' exam performance	O	O	O	O	O
Student s' level of interesting and involvement	O	O	O	O	O

Productivity	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
Students' skills in critical thinking	O	O	O	O	O
Collaborate learning experience Students' exam performance	O	O	O	O	O

Perception	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
Usefulness as an alternative tool to provide educational services	O	O	O	O	O

Section II. Interviews for instructors

Part A: Background

Date_____

Gender_____

Age: O 20-30
         O 31-40
         O 41-50
         O 51-60
         O Over 60

Faculty: _____ University: _____

Respondent: _____ Position: _____

Responsibilities: _____

Years of experience in teaching_____

What is your involvement in the University VED?

Section1 Resources (characteristics of software. Hardware and humanware)

To what extent has your university provide ICT to support your teaching in virtual courses? (eg, your personal computer, up-to-date software, access to Internet or training courses)

In your opinion, what are your feeling about the facilities you use? (eg. helpful, interesting or waste of time)

Are there any problem with the availability of facilities or with the lab assignment's ability to help you provide material on virtual courses?

What advice would you give to university to do with ICT in order to enhance the effectiveness of VED?

Section 2 Computer literacy

How many years have of experience have you had in using computer?

What level do you think your ability to use computer is?

- Fundamental level eg. ability to use keyboard in typing, set control panel, use file manager and copy file etc.
- Moderate level eg. ability to use Microsoft office such as windows, excel and power point etc.
- Advance level eg. ability to create program, create web page, etc.

Do you have any technical difficulties with the use of computer?

Do you still need some more training courses to strengthen your ability to use computer? Could you give me an example what kind of training courses do you think that will be useful for you?

Section 3. Perceived value of computer-based information

How do you feel with this sentence " computer make work more interesting"?

To what extent do you use information available on Internet to improve your teaching? (eg. searching information for your teaching, learning to create websites, etc.)

In your opinion, Do you think that information technologies can provide you higher quality information (eg. more precise, new and up-to-date) and greater accessibility to data (eg. easy to get to, comprehend, and analyse)?

Section 4. Culture context in knowledge sharing.

General question

How often do you communicate with following group of people by using ICT? (eg e-mail, chat, groupwise etc.)

With colleagues

With students

Power distance

How would you describe your teaching styles?

(eg. provide students lessons and exercises on the web and let them follow your way (teacher-centre), provide students theories and let them discuss freely about the case study. You just assist them when they have a problem or need some advice (student-cetre))

Can you give examples of what style works best to help students gain knowledge?

Do you believe that the quality of student's learning is virtually exclusively dependent on the excellence of teachers?

Very much	Moderate	Somewhat	Not at all
O	O	O	O

Do you provide students any channel or media to make a discussion relate to topics in

VED courses? If yes please give a channel do you use and how it works?

Power distance between instructors and administrative staff.

Have you ever sometimes disagreed with your administrative staff? What did you do?

Uncertainty avoidance

Do you feel comfortable to confront by using ICT to express your views or opinions?

How could things be improved so that there is more communication with you and your administrators?

Collectivism

To what extent do you need administrator's support to provide VED courses eg. motivation, rewards, etc.

In your opinion. Do your university goals, rules and regulation support or inhibit your knowledge sharing with others?

Section 5 Information culture

What kinds of information channels or media do you prefer to share information or knowledge? eg. telephone, face-to-face, electronic mail, etc.

In your university. Do you have supportive information culture where information is valued as a resource that should be share openly and freely without regard to the hierarchy or personal class?

What is the impediment in your view that impact on information or knowledge sharing?

Section 6. Task Interdependence

A major task of education is to create knowledge. Do you think that your VED has been designed to utilise and fit that task? Why or why not?

In your opinion. Do members in each academic and each major unit agree and feel comfortable to provide VED?

What advice would you give to university for encouraging members to agree that VED are useful and can use as an alternative tool to provide educational service?

.

Section 7. Successful VED

In your opinion, what level do you evaluate the success of university VED in this following terms:

Quality	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
Students' exam performance	O	O	O	O	O
Student s' level of interesting and involvement	O	O	O	O	O

Productivity	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
Students' skills in critical thinking	O	O	O	O	O
Collaborate learning experience Students' exam performance	O	O	O	O	O

Perception	Very satisfied	Somewhat satisfied	Neither satisfied nor dissatisfied	Somewhat dissatisfied	Very dissatisfied
Usefulness as an alternative tool to provide educational services	O	O	O	O	O