Research and Trends in E-learning from 2000 to 2004 A Content Analysis of Master's Theses in Taiwan

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Abstract: This research targeted at a series of content analyses of master's theses on E-learning in Taiwan from 2000 to 2004. A total of 264 research papers were analyzed in terms of variety, research types, and research topics. The objective of this research was to analyze the content of theses, in order to observe the current trend of development and changes in E -learning field. It is hoped that this research will shed light on the development of E-learning. By analyzing the content of master's theses, this research aimed to investigate their research directions, research topics, and application fields. Besides, it explored the characteristics of E-learning development in Taiwan, and therefore can serve as a reference for the research and development in E-learning or related studies in the future.

Key-words: E-learning, research trend, content analysis, master's theses, graduate students

1 Introduction

Writing master's theses is always one of the most important tasks for graduate students. Through master's theses, the research solutions can, on the one hand, be widely recognized in the academic community, and on the other hand, graduate students can advance their own careers for applying occupancy, promotion, funding or scholar awards (Henson)[2][3][4]. Similarly, researchers often study the publications of research findings in academic or refereed journals as a significant task for their profession. For fresh researchers, understanding master's theses on E-learning helps them recognize the field of E-learning more broadly. Consequently, having a systematic analysis of master's theses may enable researchers to discover the current and future trend in E-learning research.

In recent years, within the field of E-learning, there are few research papers that give a systematic inspection of the master's theses on E-learning. Eybe and Schmidt inspected researched reports in chemistry education particularly based upon the quality criteria of publication from academic journals, reports, and documents [1]. They chose 81 chemical education studies from 1991 to 1997 published in the International Journal of Science Education (IJSE) and the Journal of Research in Science Teaching (JRST). These studies were evaluated according to six quality categories and corresponding criteria: (1) theory-relatedness, (2) quality of the research question, (3) methods, (4) presentation and interpretation of results, (5) implications for practice, and (6) competence in chemistry. These reports have given particular guidance for E-learning researchers on how to conduct research and how to issue qualitative studies. However, a more comprehensive content analysis of master's theses on E-learning may be useful in investigating the recent trend of E-learning research in general.

In the field of E-learning, a growing number of research schemes have been carried out cooperatively. Researchers with a diversity of cultural backgrounds have increasingly begun to supply their ideas to this field (Jenkins)[5]. Additionally, the field of E-learning currently involves substantial and notable diversity, and this may result from the variations of the methodologies used and the research topics chosen for exploration. A careful analysis of the research types and topics may be therefore helpful to present E-learning research. Researchers will also be able to observe current research trends for their future studies. It is consequently suggested that master's theses on E-learning be analyzed in terms of their variation, research types, and research topics.

2 Problem Formulation

This research attempted to analyze master's theses on E-learning in Taiwan from 2000-2004. The

research questions in this study were addressed as follows:

(1) How were the research types of master's theses on E-learning different from each other?
(2) How were the research topics of master's theses on E-learning different from each other?

2.1 Research Articles for Analysis

To inspect the current research trend in E-learning, this study analyzed all of the master's theses on E-learning accomplished from 2000 to 2004 (five years) in Taiwan. A total of 264 articles were analyzed as the study sample.

2.2 Research Type

The research type of each master's thesis was assorted into one of the following five categories: (1) empirical article, such as quantitative and qualitative research, (2) position paper, to seize a particular position in a certain subject of E-learning, (3) theoretical article, to project an innovative theory or theoretical structure in the field of E-learning, (4) review, to outline research literature without proposing a tough position, and (5) others (e.g., a portrayal of E-learning curricula in a specific nation)[7]. These categories were analogous to those used by Smith et al. in the field of educational psychology [6]. Their categories were rated by two researchers (both holding a doctoral degree in science education) with an inter-rater reliability of 0.96. The frequencies of each category were also calculated for analysis.

2.3 Research Topic

In this study, the researcher categorized the research topic of each master's thesis into one of the following ten categories: (1) content development, (2) evaluation, (3) implementation examples and issues, (4) instructional design, (5) policy issues, (6) research, (7) social and cultural issues, (8) standards and interoperability, (9) tools and systems, and (10) others. This categorization was adopted from *E-Learn 2006: World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education*.

3 Problem Solution

3.1 Master's Theses on E-learning by Research Type

Table 1 and Figure 1 illustrate the changing trend of research types from 2000 to 2004. Within these five years, the empirical research was the chief type of master's these on E-learning, ranging from 67.9% to 75.9%. Following the empirical research type, position articles ranked second. Besides, there were only a few theoretical papers, reviews of literature, and other types of papers.

Table 1 Frequencies and Percentages of Master's E-learning Type From 2000 to 2004 (n=264 papers)

Research type	2000	2001	2002	2003	2004	2000-2004
Empirical	9 (69.2)	19 (67.9)	43 (69.4)	56 (75.7)	66 (75.9)	193 (73.1)
Position	1 (7.7)	5 (17.9)	13 (21.0)	13 (17.6)	11 (12.6)	43 (16.3)
Theory	1 (7.7)	2 (7.0)	3 (4.8)	1 (1.3)	1 (1.1)	8 (3.0)
Review	2 (15.4)	1 (3.6)	2 (3.2)	3 (4.1)	7 (8.0)	15 (5.7)
Other	0	1 (3.6)	1 (1.6)	1 (1.3)	2 (2.3)	5 (1.9)

Note. Numbers in the parenthesis show the percentages.

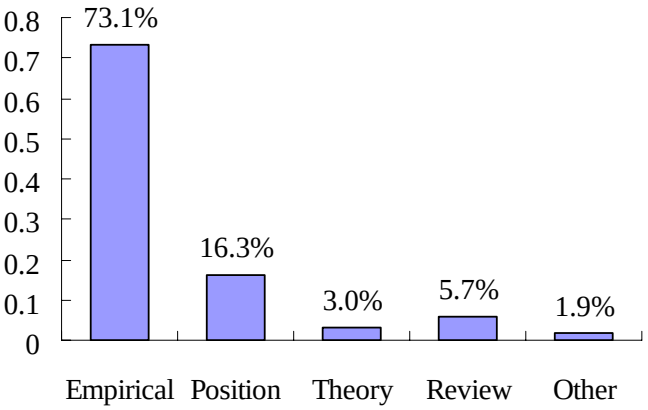

Fig. 1 Percentages of Master's E-learning Type From 2000 to 2004 (n=264 papers)

Table 2, Figure 2, and Figure 3 display an analysis of research type by school. For schools, most issued papers were empirical-study-based, followed by position papers, theoretical papers, reviews of literature, and other types of papers, in a descending order.

Table 2 Frequencies and Percentages of Master's E-learning Type in Schools (n=264 papers)

Research type	Private school	Public school
Empirical	90(76.3%)	103(70.5%)
Position	15(12.7%)	28(19.2%)
Theory	6(5.1%)	2(1.4%)
Review	5(4.2%)	10(6.8%)
Other	2(1.7%)	3(2.1%)

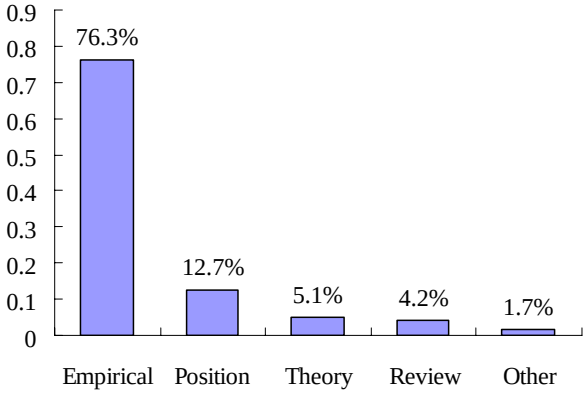

Fig. 2 Percentages of Master's E-learning Type in Private Schools

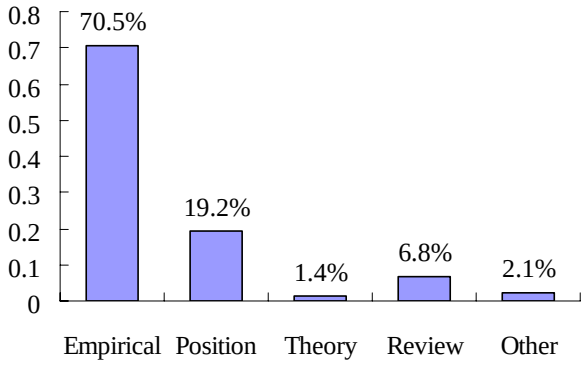

Fig. 3 Percentages of Master's E-learning Type in Public Schools

3.2 Master's Theses on E-learning by Research Topic

Master's theses on E-learning were analyzed by research topics. Table 3 showed the shifts of research topics within the five years, and Table 4 displayed the research foci of private and public schools. The top two topics in each year are highlighted. The category 'evaluation' consistently ranked top two from 2000 to 2004, with an average of 17.4% of the total research papers. This category had a rising trend within these years, increasing from 14.3% in 2001 to 19.3% in 2004 (see Table 3). The category 'implementation examples and issues' also ranked top two from 2000 to 2004, with an average of 20.1% of the total research papers. Furthermore, issues about 'standards and interoperability' have also attracted attention from graduate students. Surprisingly, the papers about the research issues of 'tools and systems,' 'instructional design,' and 'research' did not contribute much to the total number of master's theses on E-learning. For private school, the category 'evaluation 'and 'implementation examples and issues' ranked top two , with averages of 17.3% and 19.9% of the total research papers(see Table4 and Figure 5). For public school, the category 'evaluation 'and 'implementation examples and issues' also ranked top two, with averages of 17.3% and 20.3% of the total research papers respectively(see Table4 and Figure 6).

Table 3 Frequencies and Percentages of Master's E-learning Topic From 2000 to 2004 (n=264 papers)

	2000	2001	2002	2003	2004	2000-2004
content development	0	1 (3.6)	9 (14.8)	7 (9.5)	8 (9.1)	25 (9.5)
evaluation	3 (23.1) *	4 (14.3) *	10 (16.4) *	12 (16.2) *	17 (19.3*	46 (17.4) *
implementation examples and issues	4 (30.8) *	4 (14.3) *	12 (19.7) *	19 (25.7) *	14 (15.9) *	53 (20.1) *
instructional design	3 (23.1) *	1 (3.6)	8 (13.1)	8 (10.8)	10 (11.4)	30 (11.4)
policy issues	0	3 (10.7)	2 (3.3	2 (2.7)	3 (3.4)	10 (3.8)
research	0	3 (10.7)	5 (8.2)	4 (5.4)	4 (4.5)	16 (6.1)
social and cultural issues	0	1 (3.6)	7 (11.5)	1 (1.3)	7 (8.0)	16 (6.1)

standards and interoperability	0	7 (24.9) *	7 (11.5)	10 (13.5)	9 (10.2)	33 (12.5)
tools and systems	2 (15.4)	4 (14.3) *	1 (1.5)	11 (14.9)	8 (9.1)	26 (9.8)
others	1 (7.6)	0	0	0	8 (9.1)	9 (3.3)

Note. Numbers in the parenthesis show the percentages.

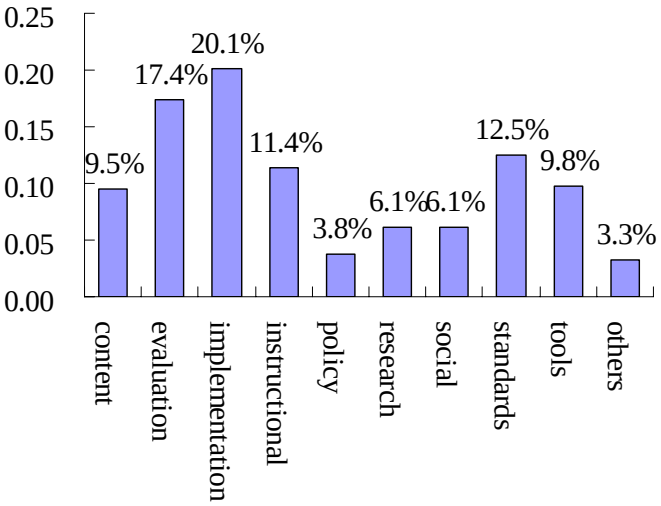

Fig. 4 Percentages of Master's E-learning Topic From 2000 to 2004 (n=264 papers)

Table 4 Frequencies and Percentages of Master's E-learning Topic in School (n=264 papers)

	Private school	Public school
content development	11(9.4%)	14(9.5%)
evaluation	20(17.3%)*	26(17.5%)*
implementation examples and issues	24(19.9%)*	29(20.3%)*
instructional design	13(11.3%)	17(11.4%)
policy issues	4(3.8%)	6(3.8%)
research	7(6.0%)	9(6.1%)
social and cultural issues	7(6.0%)	9(6.1%)
standards and interoperability	15(12.4%)	18(12.6%)
tools and systems	12(9.8%)	14(9.9%)
Others	5(4.1%)	4(2.8%)

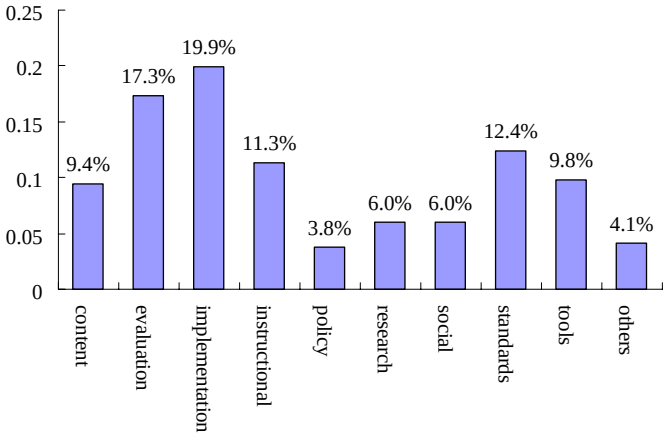

Fig. 5 Percentages of Master's E-learning Topic in Private Schools

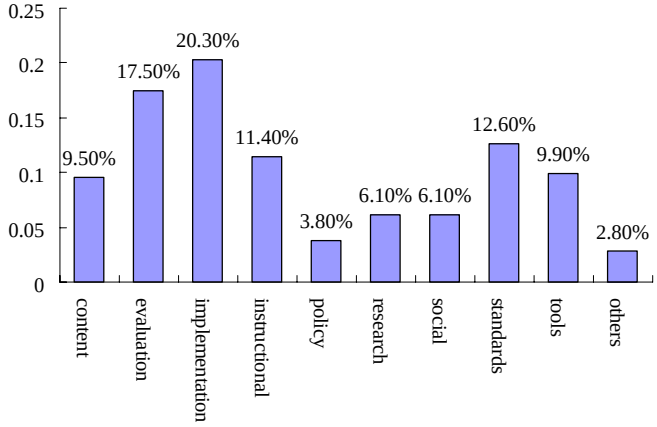

Fig. 6 Percentages of Master's E-learning Topic in Public Schools

4 Conclusion

This research conducted sequences of content analyses of master's theses on E-learning from 2000 to 2004. This research showed that most of the master's papers on E-learning were classified as empirical research, while position, theoretical and review articles were rarely targeted in the master's theses on E-learning. The study issue of evaluation and implementation were the most recurrently studied in these five years, and evaluation topic probably revealed a rising trend when analyzed by years. In recent years, research topics related to 'standards and interoperability' and 'tools and systems' also drew relatively more attention. For school, most issued papers were empirical-study-based, and the category 'evaluation 'and 'implementation examples and issues' ranked top two topics.

It is expected that the analysis will offer some direction for graduate students, in making suitable decisions and expanding their extents when conducting research and writing papers in the future. It is also suggested that a similar research be conducted in every five years, and graduate students can not only check and review the research trend in this field, and possibly discover more contribution to the region and some shifts of the research trend.

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