# A Comparative Study of Doctoral Dissertation Research Category in Educational Technology between Mainland China and America

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**Abstract:** The study employed a content analysis to analyze comparatively doctoral dissertations of America and Mainland China in the field of educational technology from 2002 to 2011. Number of doctoral dissertations in educational technology field in America was much more than that in Mainland China. Educational technology research field was divided into six categories: “design”, “development”, “utilization”, “management”, “evaluation”, and “educational technology subject theory”. Among six research categories in America, “evaluation” category had an overwhelming role. However, no Ph.D. students focused on the “educational technology subject theory” for the past ten years in America. Among six research categories in China, the most studied category was “development”, and the least studied category was “management”. The focuses on “evaluation” were significantly different among the students in America and China, and both Chinese and American doctoral students paid little attention to “management”.

**Key words:** research category, educational technology, comparative study

## Introduction

Ph.D. dissertation in educational technology between Mainland China and America in the field of educational technology was compared in the paper. The findings of the study show that the decisions about which research areas to focus and provide relevant information for Ph.D. students and their advisors in these 2 countries about trends in the 6 research categories. Ph.D. dissertation in educational technology emerged in the US were earlier than those in China. Therefore, researchers and students especially from China, a developing country, could learn from the study trend of educational technology in America. And also the claims of the work inform policies that may see a need for research in a particular research topic area and develop educational policies to move Ph.D. research into areas which are understudied in China or America.

## 1. Statement of purpose

The purpose of this research was to review doctoral dissertations to understand the research category change and the differences and similarities between Mainland China and America in the field of educational technology from 2002 to 2011. The concrete research questions addressed were:
1. What is the status of the doctoral dissertation research categories in Mainland China?

2. What is the status of the doctoral dissertation research categories in America?
3. What are the differences and similarities of research categories of doctoral dissertations in Mainland China and America?

## 2. Research category of educational technology

There are two main definitions of educational technology (instructional technology) from Association for Educational Communications and Technology (AECT). "Instructional technology is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning (Seels and Richey 1994:129)." "Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources (AECT, 2008)." The research category of 1994 definition is "design", "development", "utilization", "management", and "evaluation", and that of 2008 definition is "creating", "using", and "managing". The 1994 definition is more complete, accurate and clear to summarize educational technology research category than the 2008 definition (HE, 2010).

As a research field, educational technology theory system includes not only "design", "development", "utilization", "management", and "evaluation" of processes and resources but also "educational technology subject theory". Therefore, educational technology research field was divided into six categories: "design", "development", "utilization", "management", "evaluation", and "educational technology subject theory". "Design" is about design of different levels in the instruction system, including the design of instruction process, instruction software, instruction environment, and instruction model. "Development" is to integrate theory and technology for developing the instruction system and other systems. "Utilization" is the usage of information technology. "Management" is management of instruction system, instruction resource, instruction equipment, instruction research, and etc. "Evaluation" is to formulate evaluation standard and measure educational technology field, judge and response. "Educational technology subject theory" is the theory about subject significance which is the basic values and philosophical position of the subject, and that is why study the educational technology subject. In this study, the six categories were used to classify the doctoral dissertations of Mainland China and America in educational technology field over the past ten years.

LV (2006) did a similar, but different, content analysis study of literature sources in the field. Her study was limited to American doctoral dissertations from 1995 to 2004. In her study, research category was divided into five categories: "design and development", "utilization", "management", "evaluation", and "educational technology subject theory", and the reason of "design and development" as a category was that "design" and "development" was close. Although the relationship of "design" and "development" was close, there were the dissertations which contents were about "design" without "development". So in this study there were six categories to be used to classify not only American but also China doctoral dissertations from 2002 to 2011.

## 3. Methodology

The methodology used in this research was a content analysis. Content analysis (Krippendorff, 2004) is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use. Content analysis is to analyze the presence, meanings and relationships of certain words and concepts within

texts or sets of texts, and then make inferences about the messages. In this study, we analyzed the presence, meanings and relationships of certain words and concepts within the titles, abstracts, and whole passages of doctoral dissertations to infer research category.

### *3.1 The dissertation resources*

#### *3.1.1 Dissertation resource of America*

The dissertations from America were identified from the ProQuest database of Ph.D. dissertation. The total Ph.D. dissertations in education discipline and the technology sub-discipline from 2002 through 2011 was 818, excluding the dissertations of other countries except America, and the total number of Ph.D. dissertations was 789.

**Table 1. Number of Ph.D. Dissertations of America from 2002 through 2011**

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | 65 | 71 | 51 | 86 | 95 | 104 | 84 | 75 | 81 | 77 | 789 |

#### *3.1.2 Dissertation resource of Mainland China*

The doctoral dissertations of China majoring in educational technology from 2002 to 2011 came from CNKI database, WANFANG database, and National Digital Library of China. The total number was 224, but there were 16 dissertations only with paper title without abstract, which can not be rated. There were 208 doctoral papers included in this study.

**Table 2. Number of Doctoral Dissertations of Mainland China from 2002 through 2011**

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Number | 2 | 15 | 11 | 20 | 31 | 26 | 22 | 31 | 29 | 21 | 208 |

### *3.2 Validity*

The six categories, as the criteria, had content validity to be used to classify the dissertation research category. Two reasons to support this: the one was that those six categories represented the entire range of possible items in educational technology field. Those categories were developed mainly from the 1994 AECT definition which has been accepted widely; the other was that each category can cover a broad range of topics.

### *3.3 Reliability*

There were two research sections to guarantee reliability:
1) Pre-classification. The purpose of this section was to ensure the consistency of three authors' classification opinions. The three independent authors rated 40 dissertations separately. The 40 dissertations included 20 Chinese and 20 English dissertations. Two Chinese dissertations and two English dissertations were randomly selected from 2002 through 2011 each year. The three authors discussed the different judges until all the people reached an agreement to have classification criterion consistency. The two judge standards: one is that the content about management, evaluation and subject theory were classified "management", "evaluation" and "educational technology subject theory" respectively; the other is to judge the content about design, development, and utilization at the same time. A paper about the design and development of processes and resources, and then use those in the education practice, which can be classified "utilization"; content

about the design of processes and resources, and then develop that in the education practice, which can be classified "development". It can be classified according to the title and abstract. If it can not be classified from title and abstract, the whole paper will be seen. 2) Classification. Two authors rated dissertations separately, and then discussed the different judges until the same results. In case of disagreement occurring between the two authors, the third author rated the dissertations, until the three authors agreed the results.

## 4. Findings

### *4.1 Dissertation number comparison*

The total number of Ph.D. dissertations of America from 2002 to 2011 was 789; while the total number of doctoral dissertations of China was 224. The American dissertation total number was more than three times than Chinese. The number of professionals in educational technology field in America was much more than that of number in China.

### *4.2 Educational technology subject theory category comparison*

As shown in Figure 1, no dissertation from America that research category was about "educational technology subject theory" over the past ten years, which indicated that few American Ph.D. students focused on this category. The rate change of the doctoral dissertations on "subject theory" from China in five years was irregular, and the highest rate was 15.38% in 2007. As we can see from the data, Chinese doctoral students conducted the research on "subject theory" more than those of American Ph.D. students.

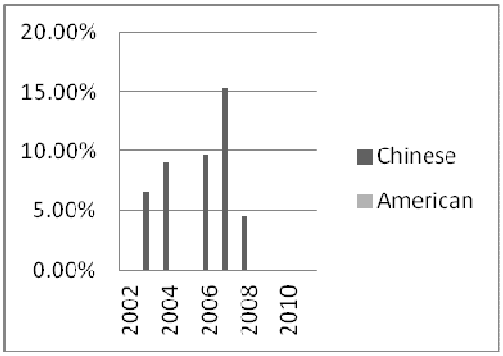


**Figure1. Percentage of Subject Theory Category Comparison**

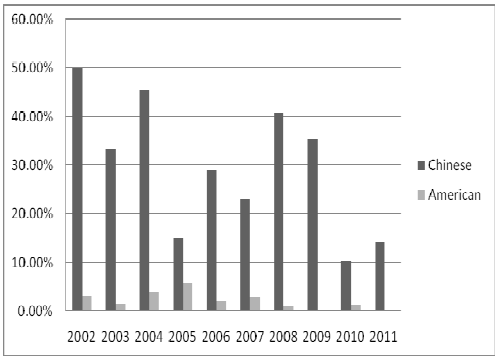


**Figure 2. Percentage of Design Category Comparison**

### *4.3 Design category comparison*

Among the rates of "design" of America over the past ten years shown in Figure 2 below, there were 5.81% in 2005 as the maximum obtainable, 3.92% in 2004 as the next, 0% in 2009 and in 2011 as the lowest, and "design" dissertation had small portion for each year. While among the rates of Chinese "design", there were 50% in 2002 as the maximum, 45.45% in 2004 as the next, and 10.34% in 2010 as the lowest, and the rate reduced as wave from 2002 to 2011. All rates of Chinese "design" in each year from 2002 to 2011 were much higher than those of America. The highest difference of rate was 46.92 percentage points in 2002, and the lowest difference of rate was 9.11 percentage points in 2010, which showed the Chinese dissertation about "design" got larger share in total Chinese dissertations than that of America in total American dissertations.

*4.4 Development category comparison*

As shown in Figure 3, among the rates of "development" of the dissertations from America, the maximum rate was 4.76% in 2008, the next 2.67% in 2009, the lowest 0% in 2002 and 2004, and the development dissertation had small portion for each year. While among the rates of Chinese "development", the maximum was 60% in 2005, the next 50% in 2002, and the lowest 22.73% in 2008. All rates of Chinese "development" in each year from 2002 to 2011 were much higher than those of America. The highest difference of rate was 57.67 percentage points in 2005, and the lowest difference of rate was 17.97 percentage points in 2008. The situation of different rate of "development" was similar to the situation of different rate of "design" between America and China.

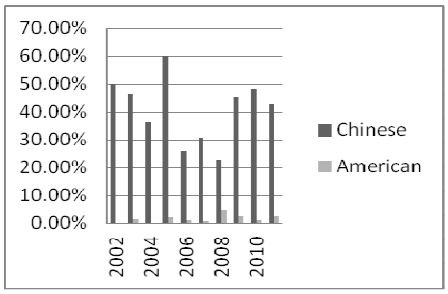


**Figure 3. Percentage of Development Category Comparison**

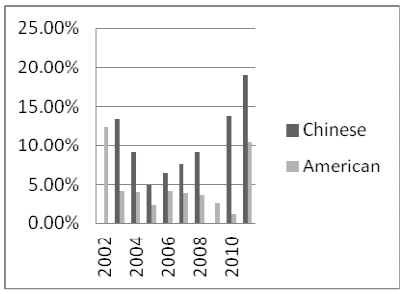


**Figure 4. Percentage of Utilization Category Comparison**

*4.5 Utilization category comparison*

The highest rate of "utilization" of America, as shown in Figure 4, was 12.31% in 2002, next 10.39% in 2011, and the lowest 1.23% in 2010. While the highest rate of "utilization" of China was 19.05% in 2011, next 13.79% in 2010, the lowest 0% in 2002 and in 2009, and the rate rose as wave from 2002 to 2011. The highest difference of rate was 12.56 percentage points in 2010, and the lowest difference of rate was 2.24 percentage points in 2006. The rate difference of "utilization" for each year between America and China did not have any predictable patterns.

*4.6 Management category comparison*

The highest percentage of "management" of America was 5.33% in 2009, and the lowest was 0% in 2004 and in 2010 (see Figure 5). While the rates of "management" of China showed only in two years, and the portions were small, 3.85% in 2007, and 3.23% in 2006. We can see from the data that Chinese doctoral students paid less attention to conduct "management" research in educational technology field than those of America.

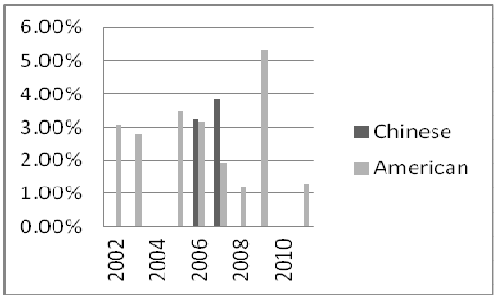


**Figure 5. Percentage of Management Category Comparison**

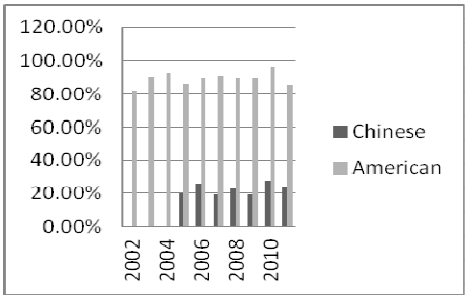


**Figure 6. Percentage of Evaluation Category Comparison**

*4.7 Evaluation category comparison*

All rates of "evaluation" of America, shown in Figure 6, were over 80%, and among them the rates of four years were over 90%, 96.30% in 2010, 92.16% in 2004, 90.38% in 2007, and 90.14% in 2003. And all Chinese rates of "evaluation" in the ten years were below 30%, 0% in three years. All rates of American "evaluation" in each year were much higher than those of China. The data showed that "evaluation" was main research category for American Ph.D. students, and Ph.D. students in America concentrated on "evaluation" more than Chinese doctoral students.

*4.8 The six categories comparison*

As shown in Figure 7, the American six research categories, "educational technology subject theory", "design", "development", "utilization", "management", and "evaluation", the rate was 0%, 2.15%, 1.77%, 4.69%, 2.28 %, and 89.1% respectively from 2002 to 2011. The data indicated that the rate of "evaluation" was overwhelming, and "design", "development", "utilization", "management" made up a small proportion respectively over the ten years, and no Ph.D. dissertation was about "subject theory", and the main research category in educational technology field of America was "evaluation". While the Chinese six categories, the rate was 4.81%, 26.44%, 39.42%, 8.65%, 0.96%, and 19.71% respectively over the ten years. "Development" had the largest rate among all research categories, and "management" had the smallest rate.

Comparing of Chinese and American research category, as shown in Figure 7, the rates of four categories of China, "educational technology subject theory", "design", "development", and "utilization", were higher than those of America. The result demonstrated that doctoral students in China paid more attention to the above 4 research category research than Ph.D. students in America.

On the other hand, the rates of "management" and "evaluation" of America were higher than those of China. Especially the rate of "evaluation" of America was much more than the other research categories of America and all research categories of China. The highest difference of rate was 69.39 percentage points in "evaluation"; the lowest difference of rate was 1.32 percentage points in "management". The most difference on research category was "evaluation" between America and China, and the students of two counties concentrated little on "management".

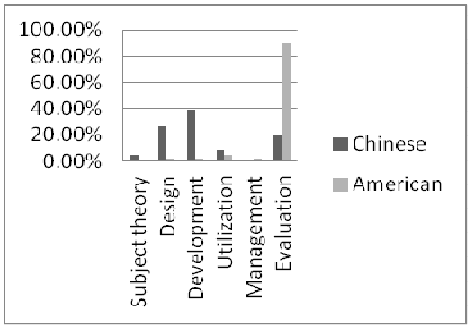


**Figure 7. Percentage of Six Categories Comparison**

## 5. Summary & Discussion

There are the following findings, reasons and suggestions:

1. Number of doctoral dissertations in educational technology field in America was much more than that in Mainland China. The research category of educational technology field is reflected in the research of doctoral students. Cultivating more Ph.D. students in China would be one method to strength educational technology research and promote integrating information technology into education.
2. No Ph.D. students in the US focused on "educational technology subject theory" from 2002 to 2011. The subject theory in the Ph.D. students' research would be reinforced.
3. Among six research categories of America, "evaluation" had an overwhelming role. The focuses on "evaluation" were significantly different among the students in America and China. Among six research categories, the most studied category was "development" in China. Two reasons may support the findings: one is the American students inclined to explain, analyze and judge the existing educational technology phenomena; while the Chinese students were inclined to start the new educational technology field. The other is that development of educational technology in America was more comprehensively than that in China. Technology used in the education field and Ph.D. dissertation in educational technology emerged in the US were earlier than those in China. Educational technology developed from the 1920s in the US and the first Ph.D. dissertation was in 1977; while technology into education developed from the 1970s and the first doctoral dissertation was in 1997 in China. New things in educational technology were needed to build at the emerging stage in China.
4. Both Chinese and American doctoral students paid little attention to "management". The reason is that the study of management domain needs professional management knowledge and experiences which few Ph.D. students had.

There would be the other reasons to explain the findings, such as different thinking and culture between western people and eastern people, different research habit between Chinese and American Ph.D. students, different policy between China and America, etc.

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