

# Review of Edutainment and Flash in the Field of Educational

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**Abstract**—The purpose of the present study is to analyze the development of Flash and Edutainment in the field of Educational Technology. This study critically reviewed and analyzed articles about Flash and Edutainment, from 1999 to 2010 (end to the October), in five journals in the field of it. 103 articles identified from the synthesis and comparisons of articles were grouped into three latitudes representing commonalities: the number of distribution studies, the content of research, and the center of research. Some problems were found though the analysis and some suggestions have been proposed.

**Index Terms**—Content analysis, educational technology, edutainment, flash.

## I. INTRODUCTION

At the beginning of the century, Flash and Edutainment attract people's attention in various fields. As yet, some achievements have been obtained in the field of Educational Technology. We selected 103 articles about Flash and Edutainment, from 1999 to 2010 (end to the October), in five journals as follows: E-Education Research, Distance Education Journal, China Educational Technology, and Distance Education in China. We studied articles in the way of content analysis from the three latitudes: the number of distribution studies, the content of research, and the center of research. Some problems were found though the analysis and some suggestions have been proposed.

## II. RESEARCH METHODS AND RESEARCH TOOLS

### A. Research Methods

This article tried to do a statistics analysis on the papers of Flash and Edutainment, especially in the field of Educational Technology in China, by the means of content analysis. In the field of Educational Technology, content research is a specially research method, which quantizes and describes the research content in it objectively and systematically. [1] Obviously, this is the most effective method of study.

### B. Sample

When The CNKI paper database was searched, and as the results have indicated, papers on Flash and Edutainment

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begun showed up from 1999. Consequently, the study samples are articles, closely related to the Flash and Edutainment, selected in the representative periodicals in the domain of Educational Technology from 1999 until 2010. These journals are: E- Education Research, Modern Educational Technology, Distance Education Journal, China Educational Technology, and Distance Education in China. Based on the CNKI, this article selected “title” as retrieval item, “Flash”, “Action Script” or “Edutainment” (in Chinese) as “title”, “Fuzzy” as matching retrieval method to retrieval the above five journals. And it turns out, 103 articles were obtained as valid samples (rejecting the policy propaganda, news, advertising, leadership talk, notices, and editor’s note, etc.).

TABLE I: THE SAMPLE SITUATION TAB

Year Journal	1999-2010											total	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		2010
E- Education Research				1		1	1	2	2	3	5	5	20
Modern Educational Technology				1	1			1	6	4	14	10	37
Distance Education Journal			1					1	1	5	4	3	15
China Educational Technology	1		1	2	2	1			3	4	6	2	22
Distance Education in China			2	1	2	3						1	9
total	1	0	4	5	5	5	3	2	12	16	29	21	103

### C. Categories and Unit of Analysis

The analysis categories refer to the definition: “Instructional Technology is the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning.”[1] According to the research, we determined the basic theory research, design and development research, teaching application research, management and evaluation research, and other researches on Flash and Edutainment as categories. Each category has been subdivided into different subclasses mesh, as shown in TABLE II.

TABLE II: THE CONTENT ANALYSIS CATEGORIES AND THE RESULTS OF ANALYSIS

category	papers	year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	subtotal (proportion)	total
			Theory research	Foundation knowledge study			1	2	1	1	1		1	2		
Design and development theory research					1						1	2	3	7(6.8%)		
Current and trend research											1	1	2	4(4.9%)		
Design and development research	Design and principle research										1	3	1	5(3.9%)	23(22.3%)	
	Design and development pattern										3	4	1	8(7.8%)		
	Instruction Design research										1	1	1	3(2.9%)		
	System design research											1		1(1.0%)		
Platform and technical research											1	1	2	4(3.8%)		
Teaching application research	Application model research			2		1		1		2	1	3	3	13(12.6%)	33(32.0%)	
	Application strategy research					1				2	1	2	1	7(6.8%)		
	Application effect study			1		1	1			2	3	1	3	12(11.7%)		
	Application attitude analysis												1	1(1.0%)		
management and evaluation	Management and evaluation standard research							1						1(1.0%)	3(2.9%)	
	Management and evaluation method research							1						1(1.0%)		
Other researches	Education and research the fusion game	1			1	2	1	1	1				1	9(8.7%)	22(21.4%)	
	Education function and value research					1				1	2	3		7(6.8%)		
	Education and learning psychology research										1	3	2	6(5.8%)		
subtotal			1	0	4	5	5	5	3	2	12	16	29	21	103	

Each individual article is an analysis unit. If the paper has a complete structure, whatever the length size, will be alculated as an article.

D. Evaluation Record and Reliability Analysis

Reliability analysis of the content refers to the consistency of the judgment made by two or more researchers who participated in the content analysis. If the consistency is higher, the credibility of the content analysis is higher too. [2] This study marked three judges as A, B, and C. The evaluation results are shown in TABLE III.

TABLE III: THE RESULTS REGISTRATION FORM

evaluation \ item	A	B	C
1	✓	✓	✓
2	×	✓	×
3	✓	✓	✓
4	✓	✓	✓
5	✓	✓	✓
6	✓	✓	✓
7	✓	×	✓
8	✓	✓	×
9	✓	✓	×
10	✓	✓	✓
11	✓	✓	✓
12	✓	✓	✓
13	×	×	×
14	✓	×	×
15	✓	✓	✓
16	✓	✓	✓
17	✓	✓	✓

After the reliability analysis, we got reliability 0.92. According to experience, if reliability is greater than 0.9, the evaluation results could be regarded as result of the content analysis.

E. Statistic Tools

The data statistics, analysis and charts of this research were all used the software Microsoft Office Excel 2010.

III. RESEARCH RESULTS AND ANALYSIS

A. Analysis of the Quantity Distribution

In the domain of Educational Technology, papers related to Flash and Edutainment began to appear from 1999. In the next few years, the related articles published are small in number. However, each year from starting 2007, articles published was rising, and the sudden growth trend appeared in 2009. The growth of which is more than ten times of 1999(as shown in Fig. 1).

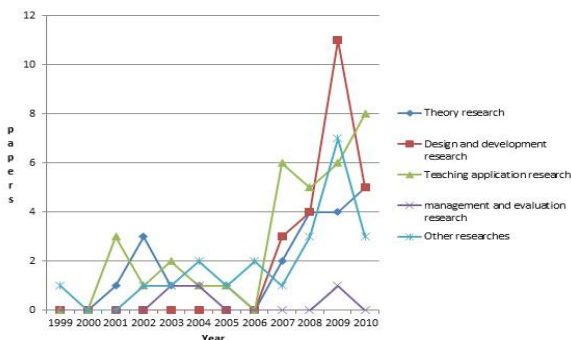


Fig. 1. Flash and education game articles quantity statistics.

The development trend is tallied with it of edutainment in our country. China’s edutainment generally began in early of this century. The Company Shengda has produced Study of Lei Feng, the first educational game, which caused people’s great attention in 2004. Then the China Hero Spectrum, a character simulation game, was developed in September 2005. But these two games were not well accepted. Then more and more company saw the prospect of edutainment, and several education game software were developed, such as Ohover, Wawayaya, Online School and so on. [3] In recent years, edutainment is gradually becoming a hot, and the organic combination of Flash and edutainment were paid the universal attention in the domain of Educational Technology.

B. Analysis of the Research Content

103 articles were made classified statistics based on the following five research domains: the basic theory research, design and development research, teaching application research, management and evaluation research, and other researches on Flash and Edutainment. (As shown in Fig. 2)

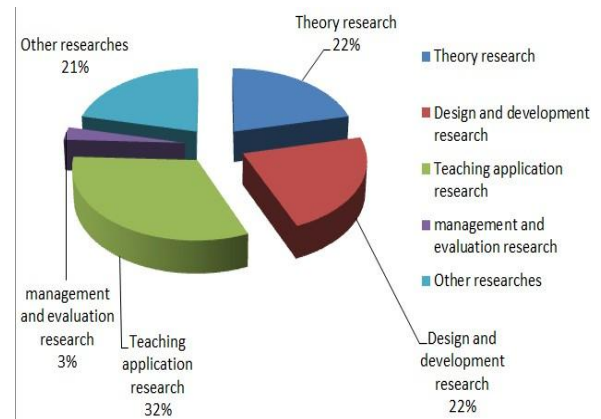


Fig. 2. Flash and education game this paper study content classification statistics.

Compared to results of the research made by YangRong Sha, Yang Gai and Tian Jian in 2010 [3], the teaching application research participated more in the field of Educational Technology. First, the theory research is the first step in any research, and good theory can well guide the practice. Secondly, in the field of Educational Technology, people pay more attention to design, development and the teaching application study based on the theoretical research, which more or less engages the characteristic of subject of education technology: using techniques to optimize education, teaching process, and then improve education, teaching effect, efficiency and benefit. [4] Again, as in recent years, the rapid of its development is very fast, and its research has no longer stop in the theoretical research, but more focus on the teaching application research, and the management and evaluation of the research. In addition, other research (including education and research, the fusion of game education function value education and learning psychology research) is less, of which the proportion is only 3%.This shows that our attention for the social impact of concern over the problem is not enough. Flash and education game requires more complete and effective evaluation management system to support, to promote education industry chain.

### C. Changes of the Research Center

Fig. 3 depicts the research trend of the research content about Flash and Edutainment from 1999 until 2010(October). As shown in the graph, the basic theory research, design and development research, and teaching application research are still the focus of the change.

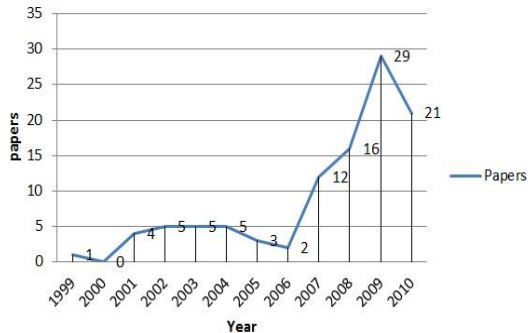


Fig. 3. Flash and education game research content changing trends.

Based on the statistics, the first theory research on Flash and Edutainment is the paper Flash Animation Bit by Bit—How to Make Objects Move along Fixed Routes [5] published on China Educational Technology in 2001. This research belongs to the field of basic knowledge research, and it made a preliminary study on learning and design of Flash.

The Study of Online Game Role of the Network Education published on Distance Education in China in 2003 [6] made a systematic discussion of the educational games. From the game concept, this article proposed that online game is a human to machine/human interaction. Based on the above, they tap the value of online games, especially the potential of education.

Research 2004 release of the "Fourth China's online game market research" shows that students are now a major Chinese online game users and power consumption, accounting for the user of the total 32.1%, ranking first in all kinds of users. The education game industry in its infancy, market positioning, product development, marketing, sales and many other aspects have not yet formed a complete industry value chain. Educational games, but still unique, with a broad space for development.

In 2005, Shang Junjie put forward the concept of "light game" [7], namely "light game" = education software + mainstream game intrinsic motivation. Ma Yingfeng advanced development network game type activities with education combining curriculum is the best game balance point of view [8]. Design and development, Wang Zhiwen based on Flash ActionScript moves in the copy editing object drawing ideas and methods for success in solving the general can be expressed as explicit function forms of elementary function graphic problem [9].

In 2006, the focus of research is in the fusion of education function, value problems and the research. Yang Hui, Wang Lu advanced game learning community [10], it is a virtual schools which developed based on network technology, virtual reality technology and game technology, etc. Tao Kan puts forward the value of education game is not can provide recreation functions to almost all ages, but that it contains individual with "environment" in the process of interaction

between gradually construct function. In other words, the learning factors included in the process of game plays a construction of subtle function role to the knowledge, thinking, ability and psychological aspects of the each participant. [11]

In 2007, various types of researches are beginning to show a significant upward trend. And the researches' focuses are not just theoretical research, but teaching application research, design and development research and other research. Ro Wen and other researchers applied research for the problems of network resources based on development and application of Flash in terms of features and unique advantages of building application architecture of Rich Internet Application based on Flash [12]. Gao Huaiwei described design principles in the task of educational game: the type of target according to the teaching level courses in different fields of knowledge, the cognitive level of the player and the game itself, the structure of the task carried out in four areas game mission design, and describes the methods of the game to achieve the task [13]. Yu Changying made Exploring, diagnostic type, and cooperative competition type and heuristic-- four teaching strategies used in primary and secondary education [14]. Wang Lu and others designed the role of teachers in the educational game through the educational games "Monkey King", and propose that the process of learning is the interactive activities of students and teachers [15].

In addition, with the rise of mobile learning, mobile learning resource development has become the focus of attention; Adobe has introduced a mobile development platform. Yang Wenzheng described the advantages of Flash Lite developing mobile learning resources, processes and key technologies with examples and their potential applications are discussed. Flash and educational games as a new field of ubiquitous learning gained more attention [16].

In 2008, besides Flash games research and education management and evaluation aspects, there are further developments in every aspect. Content analysis [4] and case study approach [17] were used in studying the application of educational games. Yun Ruwei proposed e-learning as the game essentially is a creative game design and production staff, bearing the specific purpose of education and entertainment computer software. And further put forward the e-learning game five main attributes: targeted, rules, strategic, and edutainment of freedom [18]. Bian YunBo, Li Yi's European and American Computer Game Review on Research and Education for the domestic education of the game which broaden the research vision of educational games to China have brought some enlightenment [19]. Shang Junjie Chinese University of Hong Kong and other Information Technology Education Promotion Center (CAITE) development of "Flirting Scholar", "farm Rhapsody" and "4D" and other situations like educational games, a series of related experimental study, the motivation of educational games, effectiveness and a number of issues were discussed [20]. Ma Xiaoqiang raised the educational value of online games criterion that is immersive, entertaining, serious and responsible GM, good game modes, four aspects of a reasonable business model [21].

2009 Educational Games of the study have a rapid development, especially the design and development of a hot spot. Wei Ting summarized changes and trends of the design,

design approach and research content. Educational games with the gradual deepening of the study, more and more attention to the user psychological research, such as intrinsic motivation of the user analysis, development of multiple intelligences, emotional attitudes and values analysis.

In other areas, edutainment has in-depth development. With the Delphi method (also known as an expert survey method), some experts tried to classify the electronic through the formation of expert teams, non-meeting rounds of survey forms, comments, feedback summary, the convergence and the convergence system of indicators and other aspect.

By the October 2010, teaching applied research into Flash and education the focus of the game. The study area includes not only the application strategy, application and effect of mode, but also including the application of attitudes. Shang Junjie and other developed areas in southeastern China, through a sample survey of school principals to understand the principals of educational games used in classroom teaching approach and application of educational games outlook. The lack of quality educational games and worry about the effectiveness of educational games educational games into the current biggest impediment to classroom instruction, students do not know how to learn, teachers do not know how to teach the principals of the greatest concern. Principals believe that educational games such as the comprehensive practical activities in the curriculum may have greater application value, want to provide close integration of academic teaching materials and educational games resource package [22]. In other research, education and the integration of game research, education, research and education function of the value of psychological research and learning to get more attention. Researchers pay more attention to emotional design, more concerned about the user / learner experience. Ma Hongliang proposed to foster social responsibility into education online games [23].

#### IV. CONCLUSIONS AND REVIEWS

Through analysis, we can see that our education technology field to Flash and education game, the research has obtained certain achievement, and with the deepening of the research. The focus of attention, and its research orientation and research field and will happen big changes. It puts forward the Suggestions and recommendations:

##### A. Better Design

In the field of educational technology, Flash and educational games is based on theoretical research in progress, more input into the design, development and teaching in applied research, which to some extent, the educational technology consistent with its own characteristics - using Technology to optimize the education, the teaching process, to improve the education and teaching effectiveness, efficiency and effectiveness [4]. Good design is the educational games in education, the key to achieve good results. Starting from the design to provide a new perspective on "how to learn" it, as "Why learn (motivation and commitment)" as the important design considerations, and further explore how to further the "Why study", which with other design positively related.

With advances in computer technology and the

popularization of the application, more and more IT companies are concerned about early education. For children in the digital age, information age, parents, daily life and more computer-based, computer education and life into the family, the software has an impact on education, development of an important factor. However, our software for pre-school stage of education, though in quantity, content development is moving very quickly, but the quality of the software is not optimistic. Based on this, the design characteristics for pre-school children, parent-child relationship to help pre-school children to develop the software themselves, it becomes particularly important.

##### B. Assessment of Management System

As in recent years, the rapid development of educational games, we cannot stop at the theoretical research, but should pay more attention to their instructional application, and start managing and Evaluation. Our educational games educational technology on the social impact of such concerns is not enough. We need to study and create a more complete and effective evaluation management system to support the development of educational games. In addition to positive comments, they should face up to its potential problems. For example: Internet addiction, video game violence, lack of motivation on the real life, resulting in alienation, social interaction and so cold. Researchers need to address these problems, in addition, more should consider the solution will be the destructive force, and guide for improving strength.

Haugland / Shade Developmental Software standards from the children, teachers, technology, starting three children made the evaluation of ten software evaluation.[24] Professor Guo Liping make high-quality early childhood education software[25] should have features including age appropriateness, controllability, clear guidance, extensible, complexity, operational independence, non-violent, process-oriented, interactive, simulation of authenticity and can be transformed in ten areas.

##### C. Game Classified Mechanism

Gradually entering the public as electronic games and entertainment for young people vulnerable to the growing impact of generating more serious, and its educational significance has been more and more attention. However, due to non-standard video game development and management, game operations are not standardized, non-standard rules of the game selection and other factors, the public has a deep concern for the game, the game has always been excluded from mainstream education, the quality of education cannot be effectively Enhanced the educational value of the potential should not play.

##### D. Edutainment Industrialization

Flash and education game operation and industrial development problems are paid more attention by people day by day. Although the existing research is less, there will be more researches oriented to this shift. More schools, research structures and enterprises are advocated to cooperate, and then promote the development of the edutainment together.

Software applications aimed at pre-school use of computer capabilities to support and promote children's learning and development. Pre-school early education software is an effective way. However, the current software market

situation is complicated and unorganized, good and bad, which is the main reason for the background of different software providers, different values, the understanding of early education may not keep pace with the development of education in the form.

Further research will focus on family education, and design software, Flash-based pre-school children, and trying to develop a suitable pre-school children's educational software, provide a scientific basis for the pre-study, and further designed for parents of pre-school software, and the use of Flash technology achieved.

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