

Development of a Micro-Learning Video on the Use of Libraries for Users of Local University Libraries in China

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Abstract- Orientation education for incoming first-year students is a recurring responsibility for university libraries, constituting a crucial element of their reader services. Traditional methods, such as training lectures, field visits, and distributing printed materials, have limitations in addressing many students' challenges in a short timeframe. Librarians often struggle to address every question promptly, hindering first-year students from fully absorbing the extensive training content and leading to suboptimal outcomes. This research aims to enhance library entry education by creating video resources and applying them to teaching practices, thereby elevating the effectiveness of library entry education and student learning outcomes. The author developed a questionnaire and conducted pre-tests to test the hypothesis, selecting two student groups as experimental subjects. The experimental group underwent video-based teaching practices—post-tests and questionnaires collected data after the experiment. Results confirmed the hypothesis, demonstrating that video-based library entry education enhances student enthusiasm, initiative, and interest. Flexible use of video resources improves learning efficiency and outcomes, enabling students to grasp subject knowledge more rapidly and comprehensively.

Index Terms— Entrance Education, Video Resources, Video Teaching, Learning Effect.

INTRODUCTION

Abroad, the concept of micro curriculum was first proposed by Professor David Penrose of San Juan College in New Mexico in 2008. Professor David Penrose made this note for micro class: Micro class is equivalent to a framework for exploring knowledge. We will tell you where to dig the direction and what target to look for. We will also monitor the whole process. In the online degree program in the field of occupational safety at San Juan College, the micro

course designed by David Penrose includes short online teaching videos, as well as after-school tasks and teaching activities. Micro class exists as a knowledge pulse, which can produce the same teaching effect as the traditional classroom.

In China, the concept of micro class was first put forward by Tiesheng [1] of the education information network center of Foshan Education Bureau. Tiesheng [1] divided the development of micro-courses in China into three main stages: paying attention to the composition of micro-course resources, micro-course teaching activities, and the construction of micro-network courses (micro-video courses). Micro course is a new situational online video course that takes micro-teaching video as the main carrier and is designed and developed for a certain subject knowledge point (such as key points, difficulties, doubts, test points, etc.) or teaching links (such as learning activities, themes, experiments, tasks, etc.) [2]. Jianli [3] of South China Normal University believes that a "micro class is an online teaching video aimed at explaining a certain knowledge point, in the form of short and concise online video, and for learning or teaching application."

Jiahou [4] of Shanghai Normal University defines a micro course as a Micro course, which refers to a small course within 10 minutes, with clear teaching objectives, short content and focusing on one problem. Through the above scholars' definition of the concept of micro class, we can see that micro class has the

following characteristics: (1) micro class is short with micro video as the main carrier; (2) Micro class is not only a micro video clip, but also has its teaching design; (3) Micro class is applied to the teaching process, which needs to be combined with other elements such as study plan, courseware, exercise, learning task list, students' learning activities and so on; (4) The use of micro-courses is flexible, which is convenient for learners' mobile learning, network learning, ubiquitous learning, etc. Based on the above definition and characteristics of a micro-course, the author believes a micro-course is a resource package to explain a certain knowledge point, with video as the core carrier and other resource elements. The teaching process not only includes teaching micro videos within 10 minutes but also includes micro courseware, micro-teaching plan, learning task list and other resources, and supports flexible learning and teaching methods.

Traditional library entry education adopts the form of PPT to explain library knowledge intensively, mostly in the form of text, with little picture content. It focuses on theoretical teaching, overemphasizes data and knowledge theoretical views, and lacks intuition and visualization. For students, it is relatively abstract and difficult to understand, making it difficult to attract students' interest on behalf of college students. A single form of education has greatly reduced the effect of admission education.

Short video technology can be well combined with library education and training. Currently, many colleges and universities carry out library entry education through lectures and training courses to provide students with a more systematic library introduction and help students form a basic understanding of the library. However, in practical work, we often encounter such a situation. Even if the information is introduced in detail in library education, many student readers will ask relevant questions. The reason is that the enrollment education of most colleges and universities and other freshman education are mainly carried out when first-year students enter the University. First of all, the arrangement of students' lectures is inefficient. Second, many students have not been to the library during the training, so they cannot combine the training content with practical operations. Third, many schools have only one training in the library, and many students come to the library less frequently. When they encounter problems, it takes them a long time to enter the library for education, and the training content has long been forgotten. Short

video technology can solve these problems well: first, a short video can present the training content more intuitively, such as how to retrieve the required books, the process of borrowing and returning books, the method of booking seats and the skills of using the database. Secondly, the library can shoot different training videos according to the knowledge points, which is convenient for students and improves learning efficiency. Finally, after the video is released, readers can watch it at any time and repeatedly, which can effectively solve the common problems readers face.

The purpose of video library access education is to cultivate students' ability to understand, master, retrieve, analyze and obtain literature information in the environment of complex information content to make better use of the library, develop good learning and reading habits and high information literacy, and improve their independent ability.

So far, no unified definition of micro video exists in the online video industry and academia. Related names include the initial short film, short film, later digital short film, and now short video, micro video, short film, microfilm, etc. [5]. Zhang Lijun, chairman of the board of directors of the first video group and vice chairman of the China Internet Association, explained that "micro video refers to a video with a duration of 3-5 minutes, but it is not only called micro video but also depends on the online terminal so that the micro video can be extended to mobile terminals such as mobile phones to meet the use demand" [1], [6].

In the field of media, the more recognized definition of micro video is put forward by Gu Yongqiang, CEO of youku.com: "Micro video is a general term for video clips that are as short as 30 seconds and as long as no more than 20 minutes, with wide content and diverse video forms, and can be recorded or played through a variety of video terminals. Short, fast, refined, public participation and randomness at any time and anywhere are the biggest characteristics of micro video [2].

Mi [7] believes the so-called "micro-video" refers to micro-video resources with teaching significance. Micro video is a complete knowledge module and knowledge point, often about 2-20 minutes. It is a micro-teaching video resource composed of multiple knowledge atoms. Chinese scholars have defined the connotation of micro video from the education perspective, which is very helpful for educators to

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understand the connotation of micro video in education and teaching.

From the initial field of mass media to the field of education, the influence of micro video is still expanding, which benefits from two characteristics of micro video: first, micro video is essentially a video resource, and the video resource itself is rich and vivid; Second, a micro word limits the length of video resources. The micro video has the characteristics of "short." Compared with other forms of information, these two characteristics make people love micro video. Therefore, a micro video is a short video clip with a certain theme. Its application can involve all aspects of study, work and life.

Microlearning is the abbreviation of micro-learning, first proposed by Austrian learning expert Lindner in 2007. Microlearning is a new type of learning that grows in the new media system, content micro and media micro [8]. Microlearning is a learning activity that deals with relatively small learning units and focuses on a short time [9]. From a practical point of view, Microlearning aims at learning units with relatively few contents and learning activities with short duration.

The core of information-based teaching theory is information technology and curriculum integration theory, 'which can only be formed based on scientific and information-based learning theory and teaching theory [10]. The rational use of modern educational media in library entry education can break the restrictions of some teaching conditions, make the teaching work efficient and low consumption, and obtain greater gains at a small cost to optimize the teaching process and achieve the maximum effect in the possible range.

THE STUDY

In this section, we should initially capture the library's overall appearance and each section's specific distribution. This will enable students to comprehend the internal layout of the library. Subsequently, we should take photos of each department within the library. Next, we should capture the distribution position of books and newspapers in the collection, allowing students to understand the arrangement of documents. Finally, photographs should be taken of the library's opening hours and entering and leaving the library. The opening schedule should be documented, with the commentator demonstrating how to use the

library card for swiping in and out. This segment primarily illustrates finding books through commentator shots, aiming for clarity. Rules for book placement and close-up shots of books on shelves should be interspersed. The process of showcasing books on the library's official account and website homepage is also photographed, ensuring the completeness of the search process. Finally, a static image of the library is used as the background for post-production drawings of book reading and related library rules. In this segment, the commentators mainly demonstrate the relevant operations of using self-service lending and returning machines for book returns and renewals, payment of fines for overdue book returns, reporting losses, and reissuing and activating library cards. Additionally, using the equipment to reserve seminar rooms and self-study rooms in the library is showcased, accompanied by explanations with subtitles.

The teaching goal represents the level of knowledge and ability that students should attain through learning. Teachers' instruction should align with teaching objectives, and students' mastery of knowledge is integral to achieving these objectives. The curriculum standard outlines clear objectives and requirements for the contents of units and chapters in the textbook. Before designing micro-videos, teachers should thoroughly examine the teaching objectives in the curriculum standards, meticulously prepare learning objectives for students, and ensure that the content standards of micro-videos meet the requirements of teaching objectives. In the pre-teaching preparation process, teachers can determine the type of micro-video based on selected content, prepared micro-video teaching objectives, and existing teaching hardware or software resources.

Micro-videos for teaching can be classified according to various criteria. Some Chinese scholars have categorized them based on factors such as time length, production technology, teaching methods, teaching links, and usage categories. By considering the external form of teaching methods and the cognitive activities of students within these forms, teaching activities in primary and secondary schools in China can be classified into five categories: information transmission based on language, direct perception, practical training, appreciating activities, and guiding exploration.

- 1) **Concept Explanation:** Explanation micro-videos primarily use language as the main means of information transmission. They convert technical concepts, principles, laws, and principles into language prompts, explaining and describing events and their logical relationships. These videos feature language transmission and a substantial amount of knowledge content.
 - 2) **Operation Demonstration:** Demonstration in teaching involves the teacher's presentation to facilitate students' imitation learning. Operation demonstration micro-videos showcase movement skills knowledge, such as tool use, operation essentials, steps, and precautions, enabling quick mastery of essential skills.
 - 3) **Test Display:** Experimental micro-videos intuitively illustrate things' evolution processes and phenomena' development dynamics. Students can observe dynamic processes through these videos, breaking the restrictions of conditions and allowing for a visual and intuitive grasp of learning content.
 - 4) **Emotional Presentation:** Emotional presentation micro-videos are suitable for conveying emotional attitudes, values, and teaching activities dominated by appreciation. They concretize and visualize abstract content, directly impacting students' emotional values.
 - 5) **Event Description Class:** Event description is narrative, serving as teaching content or related background introduction. Event description micro-videos are instructive and can be used as media materials with the same content as textual descriptions.
- 3) Statistical and accumulated data from the experiment are used to calculate variance. If $(f > 1)$ and $(P < 0.05)$, there is a significant difference in pre-test and post-test results.
 - 4) Researchers accumulated data for self-directed learning, analyzed educational content and goals for library entry, planned learning and library usage abilities, identified behavioral goals, and conducted student analyses.
 - 5) The learning process uses video to cover the library entry, including learning objectives, creative thinking, architectural knowledge, pre-test, points, post-test, student satisfaction assessment, and checking pre-test and post-test.

Researchers experimented with 30 randomly selected students, checking for incomplete items in the content and verifying the effectiveness of activities and educational media on teaching. The performance test, combined with pre-test and post-test, is essential for evaluating school performance. It measures students' teaching and learning progress in a specific subject, providing insights into the effectiveness of executive theory and learning. The library entrance education achievement test (pre-test and post-test) includes 40 multiple-choice questions covering entrance education achievement and a post-test questionnaire. Researchers used performance tests for accurate score demonstration, understanding the effectiveness of students, and evaluating test score validity and reliability. The pre-test and post-test scores, with 20 items each, were designed to assess students' knowledge and skills across various difficulty levels. A questionnaire was also developed to gather student feedback on the survey process and to understand their opinions on educational media. The researchers carefully planned the questionnaire for student satisfaction to analyze students' views on educational media and created a questionnaire for students based on learning objectives and content.

At this stage, considering micro-video users' characteristics, teaching objectives and contents, and micro-video media characteristics, the design should focus on functions, framework structure, and specific forms of expression. A corresponding script should be written according to a specific format.

FINDINGS

- 1) The library entry education video experiment follows a pre-test and post-test design as a group.
- 2) Measurement, statistics, and accumulation involve pre-test and post-test methods. The questionnaire collects satisfactory data, using mean and variance, with the F-test applied to dependent samples.

A total of 30 students were randomly selected for the experiment. Descriptive statistics were conducted on the pre-test scores of students in these two classes. The average pre-test score was 54.5, with a standard deviation of 15.993.

Table 1 Pre-test Results of Micro Video Application in Library Entry Education

Items	N of Samples	Min	Max	Mean	Std. Deviation	Median
Pre-Test	30	20.000	85.000	54.500	15.933	55.000

Table 2 Comparison of Pre-test and Post-test Results for Micro Video Application in Library Entry Education

	Video (Mean ± Std. Deviation)	F	p
	.0 (n=30)	1.0 (n=20)	
Score	54.50±15.99	72.25±16.74	14.243
			.000**

The above table illustrates the use of analysis of variance (ANOVA) to examine the score differences among various video samples. According to the table, different video samples exhibit a statistically significant impact on scores ($P < 0.05$), indicating variations in scores. A detailed analysis reveals that the video demonstrates a significance level of 0.01 for scores ($F = 14.243, P = .000$). The specific comparison indicates that the average value of Video 0.0 (54.50) is significantly lower than that of Video 1.0 (72.25). In summary, diverse video samples exhibit significant variations across all scores.

CONCLUSION AND EVALUATION

After the experiment, the average score of the post-test was observed to be higher than that of the pre-test. The results of the ANOVA test indicate a significant difference ($P < .05$), with Cohen's $f = .545 > .40$, indicating a large effect size. The teaching experiment on the application of library educational videos is deemed effective. The questionnaire survey results reveal that nearly 90% of students are positive and satisfied with the technical level of micro-video teaching resources.

Regarding the impact of using micro-video teaching on students' learning interests and attitudes, 90% of students believe that the application of micro-video improves their learning interest, 100% feel it enhances their learning enthusiasm, and 100% express a preference for teachers using micro-videos for teaching. Regarding improving learning effects through micro-video applications, 40% of students are greatly satisfied, and 56% express satisfaction.

Additionally, the author investigated middle school students' views on teachers' teaching methods and the role of micro-video in after-school learning. Fifty-three percent of students desired task-based micro-video teaching supplemented by teachers' instruction, while

23% believed that micro-videos should be supplementary. Ninety-seven percent of students find micro-videos helpful for after-school learning. The results from the post-test and questionnaire survey following the experimental teaching indicate an improvement in students' academic performance. Students exhibit a positive attitude toward the application of micro-videos in teaching. Using library access education videos positively impacts students' learning attitude and effectiveness. The discussion of the experimental results is outlined below:

- 1) Knowledge displayed in micro-video format is easy for students to master. Micro-videos, with their small knowledge points or modules, enable students to internalize and master information easily. Micro-videos featuring local details allow students to perceive learning content more clearly, contributing to knowledge mastery. Rational and logical knowledge presented through micro-videos is emotionally accessible, aiding students in emotional and knowledge mastery.
- 2) Applying micro-videos in teaching stimulates students' learning interests and improves enthusiasm. Students express a liking for teachers using micro-videos in library entry education. Micro-videos make learning admission education interesting, fostering more active engagement in general technology subject knowledge. The rich sensory experience of micro-videos often makes content more vivid and interesting to students.
- 3) The application of micro-videos in library entry education enhances students' learning effects. Micro-video application improves students' test scores, driven by changes in learning attitudes—higher learning efficiency results from students' subjective learning initiative. Ninety-seven percent of students believe that micro-videos are helpful for

after-school learning, indicating students' willingness to use micro-videos in their free time.

- 4) Micro-videos can meet students' personalized learning needs. The flexible use of micro-videos in and after class allows teachers to share resources easily. Students can download videos according to their learning status and needs, accommodating different foundations and levels.

The author conducted a teaching experiment on the design, production, and application of micro-videos in library entry education. The experimental conclusions drawn from the analysis of results confirm the experimental hypothesis, demonstrating that using micro-videos in library entry education improves students' learning enthusiasm, initiative, interest, efficiency, and learning effects. Teachers should prioritize students in designing teaching activities and selecting resources, ensuring scientific and student-centered resource development. Continuous learning and practice are essential for teachers to produce micro-video resources to meet teaching needs.

The convenient sharing of resources is a significant advantage of micro-video teaching resources. Sharing resources within the school, LAN fosters knowledge dissemination and student learning. Resource sharing with experts and peers facilitates learning and experience exchange. Communication enables teachers to learn production skills and application methods, enhancing teaching experience and improving teaching efficiency. The exploration of information-based teaching methods contributes to the accumulation of teaching experience and improved teaching effects. Video teaching resources breakthrough teaching difficulties and key points, avoiding repeated work and increasing teaching efficiency.

The author will continue researching and producing more updated general technology micro-video teaching resources, promoting their application in teaching. This research serves as a teaching practice exploration of information-based teaching resources, providing valuable experience applicable to similar schools. The author hopes this research's findings can serve as a reference for library practices.

SUGGESTIONS

Future studies should explore innovative directions by integrating emerging technologies like augmented reality or virtual reality into library entry education, assessing their impact on student engagement.

Investigating adaptive learning platforms with artificial intelligence algorithms and incorporating gamification elements could enhance the educational experience. New objectives should focus on evaluating long-term learning outcomes, measuring transferable skills, examining technological accessibility, and exploring teacher training programs. A mixed-methods approach, comparative studies across diverse populations, user experience design analysis, and longitudinal surveys can provide comprehensive insights into the effectiveness of micro video resources. Encouraging collaborative research involving multiple institutions and stakeholders will contribute to a nuanced understanding of library entry education's evolving landscape, technology integration, and its impact on student learning outcomes.

REFERENCES

- [1] H. Tiesheng, "Micro courses: the new trend of the development of regional education information resources," *Res. Audio-v. Educ.*, vol. 10, pp. 61–65, 2011.
- [2] H. Tiesheng, H. Mingyan, and L. Min, "Three stages of micro curriculum development in China and their inspiration," *J. Distance Educ.*, vol. 4, pp. 36–41, 2013.
- [3] J. Jianli, "Micro course and its application and impact," *Inf. Technol. Educ. Prim. Second. Sch.*, vol. 4, pp. 13–14, 2013.
- [4] L. Jiahou, "The Meaning and Development of Micro-lecture," *Inf. Technol. Educ. Prim. Second. Sch.*, vol. 4, pp. 10–12, 2013.
- [5] S. Yan, "Research on the History of Micro video Development," *Softw. Guid. (Education Technol.)*, vol. 11, pp. 33–35, 2011.
- [6] T. Sangsawang, "Instructional Design Framework for Educational Media," *Procedia - Soc. Behav. Sci.*, vol. 176, pp. 65–80, 2015, doi: 10.1016/j.sbspro.2015.01.445.
- [7] W. Mi, *Content Design of Micro video Courses for the Era of Fragmented Learning*. Shanghai: East China Normal University, 2013.
- [8] M. Lindner, "What is Microlearning?," in *Micromedia and Corporate Learning*, 2007, pp. 52–62.
- [9] H. Guan and C. Fengying, "Research on the teaching application effect of micro video teaching resources - Taking Birth of Traditional Popcorn as an example," *Softw. Guid. J. (Educational Technol.)*, vol. 4, pp. 6–8, 2015.
- [10] H. Kekang, "New Development of Educational Technology Theory and Practice since the 21st Century," *Mod. Educ. Technol.*, vol. 10, p. 8, 2009.