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Video Course Development on Basic Safety and Practice Training for Inland River Crew

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Abstract

According to the "Report of China Crew development", there are 731,234 registered inland river crew, it is 54% of all the registered Chinese crew. At the end of 2015, the national inland waterway navigation mileage of 12.63 million km, an increase of 427 km over the previous year. Grade channel 65,400 km, accounting for 51.8% of the total mileage, an increase of 0.2%. The rapid development of China's shipping industry need lots of crew, especially inland river crew. Due to the inland river crew is widely distributed and the educational level is uneven. It is a challenge for marine department to train these crew members. At the same time, not all of the training project can implement in the ship. This research aim to design and develop a video course for inland river crew. These course based on cognitive psychology, use appropriate audio-visual language accord with inland river crew media literacy.

1. Introduction

Video course as a technology in education (video guideline, video case-studies and videos embedded in multimedia webpage) integrated many educational theories (modeling, scaffolding, co-construction, situated learning) into of high quality visual-audio materials in high education. These courses can provide a vivid learning environment and a tool to promote e reflective practice among student and teachers [1-5]. Despite these strong benefits for high education, less case reported on using video course for river crew. Because these learners with the trait of adult learners are different with university students, knowledge in video course should be designed in order to fi the trait of these adult learners. By the way, there is abundant research concerning on technology use in education [6], there is no information specifically about what factors mediate the use of video methods in river crew education. Therefore, this study aimed to identify these extent issues to which video is used in river crew education. And then a suite of video course was designed and developed for inland river crew training as a case study to explore these issues more broadly.

2. Video Course on Basic Safety and Practice Training for Inland River Crew

Now days, the ship towards the large-scale, fast, professional, modern direction, the

crew training and the requirements of the standard is also higher and higher [7]. The STCW(International Convention on Standards of Training, Certification and Watchkeeping for Seafarers)78/10 Convention Manila amendment of chapter VI of the "emergency and occupation safety, security, health care and survival function" to keep the crew including basic safety, skilled lifeboat operation, fire and other senior competence to modify every 5 years to provide evidence for those who maintain competency; can be implemented in the ship's training program, the competent authority may accept the experience and practice in the training of the crew. But as for how to maintain can not be implemented in the ship training project competence and method "did not reach a consensus". In chapter VI of the STCW rules, the training items that cannot be implemented on board are shown in Table 1 and table 2 [8]

Table 1. *The Minimum Standards of Competence for Personal Survival Skills.*

NO.	Possible of training on ship	Remarks
1. Wear a life jacket	Possible	
2. Wear and use life jackets	Impossible	The only feasible way to train the content is in the water, the operation is not safe at sea.
3. Jumped into the water from a certain height	Impossible	This is unsafe when there is a security threat to the surrounding waters.
4. The life raft under the condition of wearing a life jacket	Impossible	The ship life raft is generally closed and can only be used in case of emergency.
5. Swim in a life jacket	Impossible	It is dangerous to swim in the sea mainly due to sunny weather, sharks, hypothermia and other potential hazards.
6. Floating without a life jacket	Impossible	May lead to drowning, etc.
7. Put on life raft from the ship and in the water jacket	Parts of possible	Although it is feasible to board a lifeboat on board, it is neither practical nor safe to board a ship from the sea.
8. Take the initial action after landing on the lifeboat to increase the chance of rescue	Parts of possible	Use lifeboat viable It is not feasible to use a lifeboat
9. Current or at anchor	Parts of possible	Use lifeboat viable It is not feasible to use a lifeboat
10. Operation of lifeboat equipment	Parts of possible	Smoke signal is limited to emergency use The use of lifeboat viable It is not feasible to use inflatable life raft.
11. Operation positioning equipment	Possible	

Table 2. *The Minimum Standards of Competence for Fire Protection and Fire Fighting.*

NO.	Possible of training on ship	Remarks
1. Use a variety of portable fire extinguishers	Impossible	
2. Use self-contained respirator	possible	
3. Put out small fires, such as electric fire, oil fire, propane fire	Impossible	Arson and improper safety on board, especially on tankers and ships carrying dangerous goods
4. Use water to extinguish larger fires (spray and scatter gun)	Impossible	
5. Use foam, dry powder, other suitable chemical fire extinguishing agent	Impossible	
6. Use a lifeline but not to enter or pass through a high expansion foam compartment.	Impossible	It is not feasible to spray the cabin on the ship, especially the machinery, such as the high expansion foam
7. Wear self-contained respirator in closed spaces filled with smoke extinguishing	Impossible	It is very difficult to prepare a cabin full of smoke, so it is impossible to work on board
8. Use of water mist or other suitable fire extinguishing agent to extinguish the fire in the cabin or in the simulated engine room	Impossible	It is impossible and dangerous to make such a condition on board
9. Use water spray gun and scatter gun, chemical dry powder or foam nozzle to put out the fire	Impossible	This type of oil fire is dangerous
10. Wearing a respirator in a smoke filled place for survival.	Some conditions	Assume that the approved smoke making device is available on board.

Amendments to the STCW convention in Manila by Chinese of shipping industry is a great opportunity to perform as a breakthrough, improve training quality of shipping talents, fundamentally improve the competitiveness of Chinese crew [9]. But as the number of seafarers in China is huge, once every five years the quality of performance training in economic and operational constraints under the premise of how to carry out, for the crew and the shipping enterprise is a huge test, the specific performance in the following areas：

First, the crew ashore training, training facilities and equipment will be limited and the impact of the huge number of crew, training quality is difficult to control;

Second, shipping companies and individual crew costs increased significantly;

Third, the crew is affected by all kinds of training. The crew of the shipping enterprise or crew is in short supply, which is unfavorable to the stability of the crew.

3. Concept Framework

A conceptual framework was developed to show the foundation of the research in this paper. This conceptual framework was based on theoretical and empirical literature that models how the video courses that we developed in inland

river crew training.

Bill, the famous American scholar of comparative politics, and the definition of the model by Hardege Leif is: "pattern is a theoretical and simplified form of representation of reality" [10]. Inland crew basic safety and practical training video course development mode is under the guidance of modern education theory, a reasonable structure and establish training objectives of inland shipping personnel, it can provide guidance for curriculum development and curriculum development experience summary, this study proposes the inland crew basic safety and practical training video curriculum development model as shown in Figure 1.

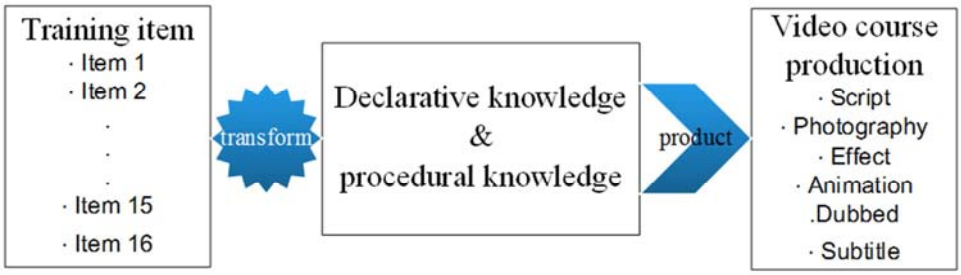

Figure 1. *The development mode of video curriculum.*

This framework shows a rationale for how to use the design and develop the video course.

The purpose of the video course is to promote the inland river crew the knowledge of basic safety and practice. So what is knowledge? One opinion is that the process of acquiring knowledge is the information processing. In this perspective, it is often assumed that there are two distinct kinds of knowledge, whose information processing procedure are different: declarative and procedural knowledge [11]. The declarative knowledge refers to a representation of an object, and these knowledge link to the content of information can be described by text, picture and language. On the other hand, the idea of procedural knowledge refers to cognitive dispositions of skills that can be formed as a consequence of constrain behavioral sequences in a series of action, and can be described by video, animation and multi-media.

3.1. Course Contents

Table 3. *Course Content of Basic Safety and Practice Training for Inland River Crew.*

Training item
Item 1: Use of portable dry powder fire extinguishers
Item 2: Use of portable carbon dioxide fire extinguishers
Item 3: Use of portable foam fire extinguishers
Item 4: Fire hose (Pi Long) connected with fire hydrant, water gun
Item 5: Life jacket
Item 6: High dive training
Item 7: Mouth to mouth resuscitation
Item 8: Mouth to nose breathing
Item 9: Supine chest compressions
Item 10: Prone back artificial respiration
Item 11: The method of artificial chest breathing with arm lift
Item 12: Chest compressions
Item 13: Use a bandage to cover the wound
Item 14: Use a bandage to cover the wound
Item 15: Fracture fixation
Item 16: Handling of spinal injury patients

This study is based on the 2010 amendments to the "people's Republic of China inland ship crew competency examination, assessment and Certification Rules" and "inland ship crew special training examination and certification procedures", combined with the inland ship crew basic safety training crew and special training materials revision, on the basis of research carried out on the ship to the inland crew practical training the development of specific content, as shown in table 3.

3.2. Knowledge Classification

In fact, foreign countries have long been the introduction of video into the field of education, the second half of twentieth Century in the year of 30s, radio, sound film, tape recorder has been applied in the field of education. In many of the audio-visual education research, DELL is the representative, in 1946 he wrote "teaching method" in the audio-visual "Tower of experience" theory has become at that time and later mainly according to the theory of audiovisual education.

The form of the basic safety and practical training courses of the inland river crew is the same as that of the film and television. But the video course is different from the general public entertainment video, it is the voice and picture as a carrier to transfer "education / teaching" information as a medium. That is, through the combination of sound and picture of the knowledge and skills needed to master the knowledge of the inland river crew. The representation of knowledge is the form of psychological representation of the thing, thought and practice that the individual knows in the mind. The storage and presentation of information are presented in human brain. In cognitive psychology, characterization represents the relationship between the internal world and the external calibration of the organism, can be used in two levels: one is the neural level, namely neural representation of knowledge; the two is the psychological level, the mental representation of knowledge or subjective.

According to the criteria of learning psychology classification, the training content is decomposed into a specific knowledge point. From the perspective of the film and television production process, this step belongs to the writing of the text script. Also belong to the relevant professional and film and television creative staff work together. In this process,

the film and television creative staff to do the work is "translation", is the basic safety training of inland waterline training professionals can guide the shooting of a shot.

3.3. Video Production

Figure 2 show the follow chart of video course development.

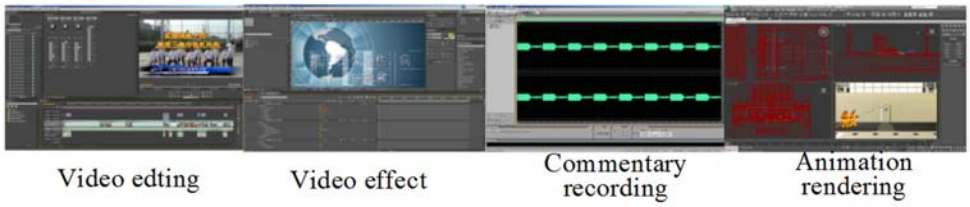

Figure 2. *Video course production follow chart.*

4. Factors Related to Video Course Development

There are four factors related to video course development, each listed below.

4.1. The Relationship Between Video Courses and Knowledge

Video course is the way to combine the auditory sense and vision sense transmission of teaching information. It is important to consider the representation of different types of knowledge before the development of video courses. At present, the research on the classification of knowledge has been more mature, this study uses the method of dividing the knowledge into declarative and procedural knowledge. For inland river crew training, declarative knowledge is mainly based on the processes and norms of the operation. The procedural knowledge is more emphasis on experience, proficiency, but also includes the experience, attitude, values and other implicit knowledge. Obviously, declarative knowledge can be expressed with data symbols and formulae, axioms and text, easy storage, exchange and sharing, the declarative knowledge is very suitable for display through video courses, can play a role in the demonstration. The contents of this study are very strong operability, process, very suitable for audio and video display.

4.2. The Relationship Between Video Courses and Education

Before using technology in education, two side of aspect should be considered. One aspect is that integrate technology use [12] [13], including funding and time [14], and (2) development of a culture that supports, promotes, or pushes technology use, particularly by providing a model of successful implementation by a colleague. Likewise, three factors hinder technology use: unclear institutional design [15], cost, technical, times [16], and lack of adequate support for integration [17].

Video course is a visual representation of knowledge, and it is a process of interaction between the object and the subject. The main difference between video course and other knowledge communication process lies in the cognitive characteristics of the visual representation. The representation of video courses is not only related to the types of knowledge, but also with the cognition of learners. Therefore, it is necessary to pay attention to the relationship between the learners' "watching" behavior and the visual representation of the meaning. The video course is to show the training content in audio-visual way, so as to stimulate the audience's sense of vision. For the 16 training contents mentioned in this study, the editing and post production are carried out from the perspective of the crew, and each process is displayed in a small step.

4.3. The Relationship Between Video Courses and Teachers

Different type of teachers hold different attitude to video course. The few studies that have examined this factor found significant differences between technology use related to distinctions between research university teachers, polytechnic university teachers, and community college teachers. The implications of these differences are that they identify which educational settings most need to focus on improving their technology use.

Video course is a visualization of "knowledge products", the producers must grasp skilled production tools, namely technology, film and television production technology; at the same time, but also brought about by the cultural background and the knowledge structure of the difference makers creative selection process concerned. The latter often determines the final shape of the training video course presented to the inland river crew.

Producers in the process of production in practice should be from "what is the expression of a given symbol of knowledge" (what is) and how to use symbols to express the given knowledge "(so to speak), with the function of visual representation of these two aspects, using the visual characterization methods of various forms of production and dissemination of various types knowledge.

4.4. The Relationship Between Video Courses and Crew Cognition Style

Students' being self-directed learners and having good critical thinking, problem solving, communication, and time management skills are factors related to educators' technology use. Lack of student preparation to use technology can hinder its integration [18].

Video courses and movies, television, although belong to audiovisual works, but its audio-visual language and film, television, audio-visual language is very different. Film and television emphasize the natural fluency in the use of audio-visual language, and the main purpose of video courses is to transfer knowledge. So rhythm, slow down action and different scope of shot are the key element that can be effecting the communication effect. At the same time, in the detail action clip, subtitles, animation and other expression types are also important.

5. Conclusions

Video courses have a wide range of coverage, low cost, targeted, content updates and real, intuitive and so on, is a very suitable method for training needs of the crew training model. The crew can be trained and self-taught at any time and any place. At the same time, these video courses can also be used as teaching resources in the Internet, the enterprise internal network. The development of the basic course of safety and practical training of inland water crew is the training course suitable for the specific situation of our crew.

Adult learners are different from university students, their learning visual literature literacy may led misunderstanding for video course. In the future work, a preview video will be produced in order to classify the adult learners that can provide individual video course for them.

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