A Study on the Pooling Mechanism of Computerized Teaching Resources for Tourism Related Subjects with Higher Vocation Education—A Case Study on Chengdu Vocational Education Group for Tourism

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Abstract. The higher vocational education, as an integral part of China’s higher education system, is under the mission to meet the huge social demands for application-oriented talents. With the development of modern information technologies, characterized by internet and multimedia, computerization has become one of the features of modern education. This study, based on the development of the VR teaching/training system with Chengdu Vocational Education Group for Tourism, investigates, theoretically and practically, the pooling mechanism of teaching resources.

Introduction

The higher vocational education, as an integral part of China’s higher education system, is under the mission to meet the huge social demands for application-oriented talents. Both the science and technology have experienced all-round development since the beginning of the 21\textsuperscript{st} century, especially in modern information technology characterized by internet and multimedia, making computerization one of the features of modern education. A question that requires an immediate answer has been raised: with which strategy shall teaching resources be treated so that they can be sustainably exploited, properly allocated and fully utilized and, on this basis, modernization can be accomplished in China’s higher vocational education?

Literature Review

Education Computerization

The concept “computerization” originated from Japan in 1960s. Then in 1990s, two of its derivatives—“computerized education” and “computerized vocational education” were initiated in China. Niu Longfei (2013) et al., has, after thorough analysis of computerized service platforms and VR-based teaching/training systems, etc., visualized the future curriculum and teaching system with higher vocational education; and Chen Jin (2014) has proposed to fuel the educational reform by treating premium vocational education resources with modern information technologies.

Though considerable research outcomes have been achieved, especially in recent years, in China in its computerized higher vocational education, the method was confined mainly to
case study with focus on merely resource development. Multi-perspective study is lacking as yet in this field, and study in resource pooling, e.g. in strategy, mechanism and facilities, is but insufficient.

**Pooling College Resources**

Borrowing from successful cases in foreign countries, China has found its own ways of pooling college resources, mainly comprising institutional combination, collaboration in running schools, setting up independent colleges and college towns and college alliance, etc.[1]

The studying in pooling college education resources appears prosperous – but only in the sense of occurrence. [2] Most of the studies provide only general and even superficial knowledge about this topic without adequate field investigation or originate, not to say revolutionary, results: they are theoretical, general and of limited applicability, and, hence, are unqualified guides for our practice.

**Definition of Computerized Resources for Higher Vocational Education**

Computerized teaching resources, known otherwise as digitalized teaching resources, are the kind of teaching resources that are developed or collected by the staff, are processed in a digital manner or exist in a digital form, show features of expressiveness, share-ability and interactivity, can be presented on multimedia or internet, and seek for self-directed exploration or communication in students.

For illustration, a list of computerized teaching resources are shown below as classified according to different criteria:

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constituents</strong></td>
<td>Hardware</td>
<td>Computer, projector, multi-touch screen, camera</td>
</tr>
<tr>
<td></td>
<td>Software</td>
<td>Education software, courseware, video, audio, online curriculum, database</td>
</tr>
<tr>
<td><strong>Generation</strong></td>
<td>Technical</td>
<td>Digital hardware and audio resources for education, teacher-student interactive platform</td>
</tr>
<tr>
<td></td>
<td>Informative</td>
<td>E-text book, multimedia courseware, multimedia test bank, multimedia teaching media</td>
</tr>
<tr>
<td></td>
<td>Intelligent</td>
<td>Information resources such as thought, attraction and innovation that are generated during the process of computerized teaching</td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td>Multimedia</td>
<td>CAI courseware, video &amp; audio interactive resources, lesson plan, multimedia materials</td>
</tr>
<tr>
<td></td>
<td>Management Data Base</td>
<td>Teaching &amp; research management information resources</td>
</tr>
<tr>
<td></td>
<td>Library Data Base</td>
<td>Inquiry &amp; retrieval service resources</td>
</tr>
<tr>
<td></td>
<td>Dynamic/General Data Base</td>
<td>Resources for campus news release, Q&amp;A and software download</td>
</tr>
<tr>
<td><strong>Presentation</strong></td>
<td></td>
<td>Text, picture, animation, audio, video, webpage</td>
</tr>
<tr>
<td><strong>Carriers</strong></td>
<td></td>
<td>CD, IP, webpage, resource base</td>
</tr>
<tr>
<td><strong>Purposes</strong></td>
<td></td>
<td>Public, exclusive, disciplinary, teaching and learning resources</td>
</tr>
</tbody>
</table>

Computerized teaching resources are widely informative, conveniently retrievable, incrementally heritable, interactively transmissible and remotely sharable. For this study, the term “computerized teaching resources for higher vocational education” or a similar
expression is defined as the sum of the content of higher education, auxiliary resources for lecturing and learning, computerized tools and service platforms (as technical carriers) that are developed with computers, communication technologies and/or network technologies, etc., and are to be presented digitally.

**Pooling Education Resources**

The word “pooling” has two constituent parts: to develop in common (i.e., to co-develop) and to utilize in common (i.e., to share).

“To develop in common” shall be understood literally. The developers may include internet operators with strong development capability and direct and indirect resource users as well as the government and its education agencies as policy-makers, the higher education institution and other teaching and research institutions as keepers of talents and resources.

“To utilize in common” shall be understood in two senses: for the first, the constitution, structure, function, regulation and allocation of the economic system shall be arranged to highlight the pursuit of being and doing “in common”, and, for this purpose, all movements shall be organized, synergized and regulated; for the second, all achievements from the pursuit shall be “utilized” by sharing. The term integrates both the goal and the approach, both of which contribute to the pursuit in an interactive manner. To utilize in common education resources is to, by rationalizing the allocation, optimize the existing education resources and their utilization and invigorate the stock of education resources, so that all education resources will be kept, enjoyed and utilized in common among all participants to reasonable degrees. [3]

The two parts—development and utilization are both inter-independent and inter-conditioned: development aims for utilization; and utilization fuels the development and guarantees its sustainability.

**Theoretical Basis**

**Theory of Creative Education**

The creative education, based on the belief that creativity is inborn to all people and can be enhanced by education and training, aims to promote creativity in students and, ultimately, to bring up “creative” talents. The concept of “creative” talent will be integrated into the objective of the initiative—to develop disciplinary education resource bases for higher vocational education, in order to cultivate creativity and originality in students in their learning, application and creation.

Creativity, in the essential sense, is based on originality and practicality. Hence, the development of computerized teaching systems must be aimed to cultivate creativity, not simply to impart knowledge. Under the systems, teaching will proceed following the procedure “exploration—discussion—creation” with focus on abilities of learning, problem finding, questioning, analysis, resource organization and problem solution as well as on the ability to use what is learnt for creative research.

**Economic Analysis: Principal-agent Theory**

The main purpose of Principal-agent Theory is to reconcile the benefits of both sides of the trade. It is fulfilled by choosing or designing a contract that authorizes the agent to act on behalf of the principal and, at the meanwhile, requires the agent to act for the benefit of the principal, i.e., by avoiding agency problems with a optimized contract. [4]
In practice, computerized teaching resources are exclusive, whose accessibility is determined by the keeper; while, by ownership, they belong to the whole society and should be made non-exclusive in that they are developed with investment from and under the organization of the government—the accessibility mechanism should be reformed with coordination of the government so that they will be made accessible to all users on a charge-free basis.

Being public or quasi-public by nature, computerized education resources have widespread externalities during the process they are being allocated and used, giving rise to problems in benefit distribution, maintenance and charging, etc., and, accordingly, impairing, to some degree, the enthusiasm of participants.

Under the condition of insufficient availability of education resources, the current allocation system inevitably leads to problems such as uneven distribution and even inequitable opportunities. As a response, the roles of and relations among the government, school and enterprise should be rationalized and specified and, on this basis, an innovative system that helps rationalize the allocation and optimize the utilization should be created to replace the current.

Case Study

Chengdu Vocational Education Group for Tourism ("CVEGT") was founded in June 2009 with approval from Chengdu Education Bureau. With Chengdu Polytechnic and Chengdu Culture & Tourism Group as joint initiators, Chengdu Vocational Education Group for Tourism has now 66 organizational members, comprising 32 tourism enterprises and 34 secondary/higher vocational schools.

The development of computerized teaching resources will not go without a long-standing mechanism for school-enterprise collaboration. Given that, CVEGT has made Detailed Rules for Carrying Out School-Enterprise Collaboration, etc., in which the responsibilities, rights and powers are determined between the school and the enterprise, and, step by step, established the regional “school-enterprise collaboration community”; and a managing board has been established under CVEGT with organization by Chengdu Polytechnic and Chengdu Culture & Tourism Group and participation by all other members in order to reconcile benefits among all sides and ensure the soundness and sustainability of the collaboration.

For the development of computerized teaching resources for tourism related subjects, Chengdu Polytechnic takes as objectives to bring up talents of technical excellence and to develop life-long learning systems and as the key points to develop, design, integrate and store VR-based teaching resources. Furthermore, to better meet the demand for independent learning and serve the vocational education, it has built channels for quality resources search and bases for resource integration in collaboration with companies and industry unions as well as an environment for open-access teaching resources that highlights inclusiveness, diversification, interactivity and practicality.

The Preliminary Operation System with “Integrated Industry & Education, Co-developed Resources, and Shared Achievements”

For the purpose of the development of computerized teaching resources for tourism related subjects, both the mechanism with a well-running industry-education-research-application cycle as the framework and a VR teaching system as the core that highlights “industrial orientation, resource co-development, curriculum reform, educational practice and social
service”, and the operation system with “integrated industry & education, co-developed resources, and shared achievements” have been established with institutional guarantee from CDCTG. (See Fig. 1.)

The Preliminary Open-access Platform for Social Service

The operational system of CVEGT Production-Sale Program, the facilities for CVEGT Production-Sale Department – the technological service center and the tourism training and evaluation center, and the operational system, personnel and equipment of VR Teaching Center are all brought into full play to provide social service. First, to better serve the industry and the society with the VR based training system, application oriented technical services are provided on the basis of CVEGT mechanism for technical service and the S&T service center under CVEGT, mainly including occupational standard development and technical consulting; second, on the basis of enhanced co-developability and share-ability of the system, one-on-one assistance is provided to other schools as CVEGT members through the CVEGT production-sale platform, making full use of the VR training system as a pioneer in this field among peer schools; and third, on the basis of the CVEGT linking mechanism between secondary and higher vocation educations, the initiative of “disciplinary leader” has
been launched, making full use of the VR training system as a pioneer in this field among peer schools and expanding the accessibility of the VR training system to schools as CVEGT members.

**Conclusion**

To develop resources in common is to enhance the professionalism and efficiency in the development; to utilize resources in common is to expand their accessibility. The two parts promote each other: to develop them in common is to utilize them in common better, and vice versa. As a complicated issue, the pooling of education resources involves various challenges that exist in the government as well as the school, in the ideology as well as the practice, in the regulation as well the evaluation, etc.. Only after all the challenges or hindrances have been identified and well studied can our measures be both exactly targeted and effective, and only by solving problems relating to the obligations, rights and powers can the pooling initiative end up a success.

**References**


