Developing a Constructionism Training Framework to Reskill Chinese Language Teachers in Reading Teaching

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ABSTRACT

To bring up Chinese teachers' teaching performance, this research proposes a Constructionism-based training framework with the integration of theories including Constructionism, Cone of Learning, and Education 5.0. This research aims to 1) Leap-frogging Education 5.0 under the frame of Cone of Learning theory; 2) Develop a Constructionism training framework to promote teaching performance. The proposed framework utilizes constructionism to form three main components name as domain knowledge, intellectual tools, and learning environment. Domain knowledge is extracted from the literature review in terms of Chinese reading teaching, the selection of intellectual tools is based on the active learning theory, and the learning environment is designed based on the proposed Cone of Learning in Education 5.0 concepts.

Keywords: Education 5.0; Constructionism; Knowledge Management; Chinese Reading; Teacher's Training

1. INTRODUCTION

The first version of the Cone of Experience was developed over 70 years ago, and this original criterion would be too primitive to apply under today's modernized education situation. Standing at the crossroad of the technology booming era, industry 5.0 would not be so far away from human beings' social evolution path. Saeid Nahavandi (2019) states that "Industry 5.0 will pair human and machine to further utilize human brainpower and creativity to increase process efficiency by combining workflows with intelligent systems." And Industry 5.0 will go beyond the automation revolution as replaced by a human-centric solution where humans and autonomous machines are well synergized [1].

According to the Ministry of Education of China [2], the curriculum criterion of the Chinese language course has divided the Chinese language skills into five aspects: literacy skill, reading skill, composition skill, oral communication skill, and comprehensive learning skill. Concerning the defects that inherited in the previous training of reading teaching, a Constructionism-based training framework was proposed to reskill Chinese language teachers to promote their teaching ability in terms of reading. The integration of three fundamental aspects are ensuring the predomination against the previous training. Moreover, the concepts of Education 5.0 will be leap-frogged to support the creation of a favorable learning environment.

2. LITERATURE REVIEW

2.1. Cone of Experience

The latest version of the Cone of Experience reveals that active-learning techniques would help students obtain up to 90% retention. It is a pictorial device used to explain the interrelationships of the various types of audio-visual media, as well as their individual "positions" in the learning process. The cone's utility makes efforts to teachers in selecting instructional resources and activities [3]. On most occasions, the effectiveness of the learning activity or learning experience plays a decisive role in determining the outcomes of learning. The extensive work of Dale, as formulated in his Cone of Experience model, provides the feasibility to evaluate the effectiveness in terms of the efficiency of teaching activities. Recently, technologies have been adapted to support the educational activity to be more productive and more efficient, and the goal of using technology is to enhance human performance for both learners and learning facilitators [4]. Beneficial from his research, this learning by doing process has become known as experiential learning or active learning. Nowadays, this theory still proposes wise suggestions for teachers when they need to choose instructional methods, and remind them of the importance of involving students in the process strengthens knowledge retention [5].

2.2. Education 5.0

Witnessing the rapid growth of the global economy history, people tend to realize that industrial revolutions have been

the accelerant for boosting the prosperity of the economy as well as the path of social modernization [6]. Realizing the in-coming new generation of industry, more significant concepts and requirements have been proposed by researchers to cope with this human-centric solution. Zimbabwe Library [7] published a paper titled Doctrine for the Modernization and Industrialization of Zimbabwe through Education, Science, and Technology Development to achieve Vision 2030. From this publication, several concepts and requirements were proposed by the Zimbabwe government in terms of higher education, including critical thinking, creative thinking, innovativeness, entrepreneurial mindset, job-creator mode mindset. Before long, Takamitsu Sawa [8] released an article on The Japan Times magazine states that the reforming education for society 5.0 needs students to obtain the ability of logical thinking, normative judgments, diverse standpoints thinking, and problem identification and problem-solving. Reiner Frey [9] also has been advocating involving meditation into universities and schools by enhancing students' holistic personalities and reinvention of humanity. While the development of the artificial intelligence makes contributions in personalized learning and customized learning content [10], other human-centric aspects suggestions are nominated to teachers including visual and aural excitement infusion, practice fundamental skills rigorously through fun, gamified tests, build innovative ideas, products and services, developing enough curiosity to create knowledge, take facts from study and apply knowledge in the different situations with alternations, and the last is the team working.

2.3. Constructionism

Three critical concepts of constructionism were captured by reviewing the existing research, including domain knowledge (problem-solving), learning environment, and intellectual tools. Problem-solving can be referred to as the identification of domain knowledge, which acts as the prominent factor along the learning process [11]. In the case of this research, the domain knowledge will be captured in terms of the teaching process of reading in primary school. The proposed Cone of Learning in Education 5.0 will be taken as a reference and criterion in order to create a favorable learning environment for students with a higher percentage of engagement, motivation, as well as concentration. According to Constructionism, intellectual tools could transform the knowledge and understanding of intellectual products with support from the class community and peer scaffolding.

3. RESEARCH METHODOLOGY

3.1. Research Framework

Start from the core of the figure below (Figure 1), three aspects of Constructionism were covered as each angle of this framework. Problem-solving will be achieved by identifying the domain knowledge of Chinese language reading teaching, which is addressed by the concept of Knowledge and Innovation Management. Once the specific domain knowledge of enhancing Chinese reading ability captured, it will set the foundation to the whole Constructionism framework and back up the problem-solving methods that have been adopted during the teaching process.
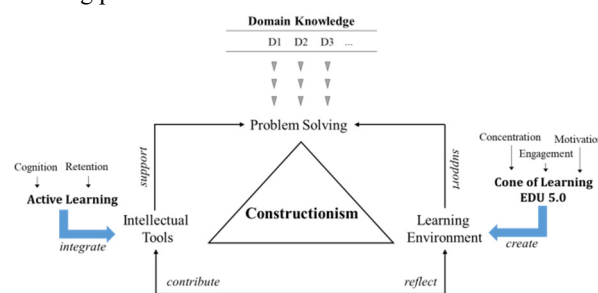

Figure 1 Constructionism-based research framework

As the second aspect, intellectual tools aim at integrating the effective teaching process from active learning, which could increase students' retention rates and cognition levels. Taking advantage of the proposed Cone of Learning in Education 5.0, a more concentrated, more engaged, and more motivating learning environment is expected to be created to provide a favorable learning environment for the students. The concept of Education 5.0 will ensure that the expected learning environment is eligible for breeding the fresh ways of thinking, which were required under the new generation of industry and economic circumstances.

3.2. Proposing a Constructionism-based Training Framework

3.2.1. Domain Knowledge

The domain knowledge in terms of teaching Chinese language reading was captured from the literature review. According to Shanshan Zhang [12], except the individual factors of students like a low knowledge level of fundamental Chinese language and inadequate motivation toward Chinese language reading, the over-general teaching objective, the casual selection of the reading content, the formalized reading teaching method, and the unpresented pertinence on students' evaluation are also possible to blame. Thus, her research argued that the teaching objectives should be clear and concrete; the

teaching content should not be unique but more fundamental; the teaching process should comply with the reading content, and the in-class evaluation should be pertinent to individuals. As for the reading teaching, several methods were provided according to different reading contents: instructing, discussion, question-and-answer, practicing, multimedia presenting.

Another research paper holds a similar view that the strategies for the Chinese reading class should focus on five perspectives, which are the delicate setting of the teaching objectives, the correct understanding of the teaching contents, the selection of the proper method of teaching reading, the optimization of learning and teaching process of reading, and lastly, the careful generated evaluation ways on students [13]. Besides, Qingchun Sun's research (2013) has emphasized some teaching methods which could improve a student's reading ability: 1. Obtaining some basic understandings by various forms of vocalized reading; 2. Increase the reading speed by stressing the subvocalized reading, timing reading training, and daily accumulation; 3. Expand the reading materials by encouraging necessity-oriented in-class reading and interests-oriented after-class reading; 4. Strengthen compliance between reading and speaking, reading, and writing. All the domain knowledge captured above is required to be refined when proposing the Constructionism-based training framework.

3.2.2. Intellectual Tools

The selection of intellectual tools that could cover the concepts of active learning is divided into two categories: IT tools and Non-IT tools. In order to achieve the expected research output, this research would like to suggest the Kahoot as the IT tool, and other tools like brainstorming, workshops are provided as Non-IT tools. Kahoot is a collaborative tool that could enhance the class engagement and stimulate the whole class learning, while other Non-IT tools perform the active learning concepts, which could increase their cognition level and retention rates when involving in a learning activity.

3.2.3. Learning Environment

The learning environment will be supported by the newly proposed Cone of learning in Education 5.0 concept in this research. From the literature review, the previous generations of education are always coping with the industrial and economic situation. Having enjoyed the benefits which were brought by Education 4.0, we are standing at the tide as exploring and embracing the upcoming generation—Education 5.0. Based on the Cone of learning, this research would like to propose another version of this theory by capturing the concepts of education 5.0 but remaining the retention rates as the same to the previous one. Concerning the ideas which were mentioned by the Zimbabwe government, the Japan Times,

and other researchers, several concepts were captured and integrated into the Education 5.0. Furthermore, different learning processes are also provided as accesses for achieving the concepts which were required by Education 5.0.

4. RESULT AND DISCUSSION

4.1. Result for Research Objective 1

Various learning and teaching process were discovered to meet the requirements of those concepts. The Cone of Learning in Education 5.0 will be presented as follow (Figure 2). The author remains the retention rate as the same to the former one and substitutes some outdated learning processes with new approaches that could modify the learning process to address the Education 5.0 concepts and requirements. Besides, information and technology tools are also integrated into this framework when considering the actual learning situation.

Cone of Learning in EDU 5.0		
Retention Rate After 2 Weeks	Learning Process	Nature of Involvement
90% of what we say and do	Having a Workshop for Creative Problem Solving	Active
	Applying Fresh Knowledge through Team Collaboration	
	Completing Skill-based Task and Assignment	
70% of what we say	Presenting Ideas after Doing a Brainstorming	
	Giving Reasonable Comments	
50% of what we hear and see	Taking Gamified and Individualized Exercise	Passive
	Participating in a Discussion	
	Watching a Demonstration	
	Taking Personalized Remote Learning	
30% of what we see	Having Multimedia Lectures	
20% of what we hear	Hearing an Oral Lecture	
10% of what we read	Reading Materials	

Figure 2 The proposed Cone of Learning in Education 5.0

In terms of different rates of retention, different learning processes that present the integration of the Education 5.0 concepts are provided accordingly. Having a multimedia lecture may not reach a higher retention rate under the modern education condition as it did in those years when Edgar Dale first proposed the Cone of Experience. Education 5.0 encourages individuals ready and able to apply critical thinking, creative thinking, entrepreneurial mindset, problem identification and problem-solving, and team working. The Cone of learning in Education 5.0, which is proposed in this research, has addressed most of the mentioned concepts properly and ready for teachers' application in their teaching processes.

4.2. Result for Research Objective 2

This section will draw an elaboration on the proposed Constructionism-based training framework. Concerning the three aspects of Constructionism, the domain knowledge will be refined as the proper teaching method, effective teaching strategy, and pertinent teaching feedback. The intellectual tools will cover both IT tools and Non-IT tools, including Kahoot, Mentimeter, brainstorming, and workshop. And the creation of the learning environment will take advantage of the active learning process in the form of the creative problem-solving workshop for promoting slow learners reading ability (Figure 3). And the detailed training structure and manual descriptions will be followed right after the image below.
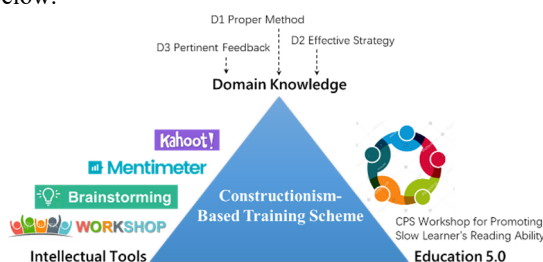

Figure 3 The Constructionism-based training framework

Part I. Introducing and Engaging [Intellectual Tool-Non-IT] [5 minutes]

Besides the general introduction of this training framework, individual brainstorming on "What will contribute to a student's reading ability?" is required at the beginning of this training. Individual thinking on this topic is encouraged to be a silent process, thus Post-it notes should be distributed among teachers for their noting. The ideas should be ready to present in the following section.

Part II. Posting and Sharing [Intellectual Tool-IT] [10 minutes]

Ideas and opinions generated by individuals are encouraged to be posted and shared through the Mentimeter, which is an online interactive presentation platform. Through the Mentimeter, all the posted ideas will be automatically combined and synthesized according to the semantics. The algorithm will visualize the present ideas from the teachers in terms of Chinese language reading teaching.

Part III. Lecturing [Problem Solving] [40 minutes]

Comments and conclusions are suggested on the ideas presented on the Mentimeter by the trainer. Afterward, the domain knowledge will be given to teachers through ordinary lecturing. The domain knowledge was obtained and refined from related research papers, and this research will cover three aspects in terms of Chinese language reading teaching:

Domain knowledge 1: Proper teaching method

1.1 Lecturing (The most common way of teaching reading. This method may be suitable for all reading materials, especially for serious literature such as historical records, biographies, and masterworks.)

1.2 Discussion (Group discussion is encouraged when the reading materials with a certain degree of depth and difficulty. The discussion will help the students to understand the reading materials while increasing the class engagement.)

1.3 Questioning and Answering (When the reading material is heuristic or contains lots of flat facts, questioning and answering teaching methods may be perfectly applied. This Q&A method will stimulate cognition development by transforming the way of thinking into an interesting process.)

1.4 Practicing (The content of reading material could be properly understood through the reading out aloud practice. This way of reading may force the students to sense the emotions of the writers by experiencing the tunes and rhythms. Various styles of reading aloud are provided as alternatives according to the content of reading material: demonstration reading; leading reading; together reading; individual reading and role-play reading.)

1.5 Multi-media Presentation (An efficient way of presenting the related information with the assistant of information technology. Expository reading materials that seek the creation of a shared understanding by demonstration and illustration are particularly compatible with this teaching method. Through the multi-medias, the digitalized and visualized information will simplify the understanding process of the students, and accelerate the learning process.)

Domain knowledge 2: Effective teaching strategy

2.1 Increase reading speed (The reading speed is crucial for the school students whose reading comprehension skill is destined to be evaluated every Chinese language examination. Three aspects of efforts could be made to improve their reading speed: firstly, cultivate the silent reading habits; secondly, timing-training on reading comprehension; thirdly, the daily reading contents accumulation.)

2.2 Expand reading content (The curriculum criterion of Chinese language course has required the first learning period students should read more than 50,000 words after class. Thus, the reading content should be expanded in the form of in-class reading plus after-class reading.)

2.3 Strengthen reading input and output (To strengthen the reading output of the students, reading plus writing and reading plus presentation are encouraged to be performed. It will provide a sense of obtaining by practicing the writing and presentation after reading, and higher levels of cognition of the students are also under the cultivation.)

Domain knowledge 3: Pertinent teaching feedback

3.1 Student oriented comment (When commenting on a student in terms of Chinese language reading, the teacher is suggested to give pertinent feedbacks according to the individual's performance instead of using consistent phrases. Reasons are encouraged to be attached once the positive and negative comments were given.)

3.2 Various accesses (Inspiration and excitation should be the main focus of giving the comments. And when giving

the individualized reading comments, different phases should be adopted in case of the aesthetic fatigue.)

Part IV. Prompt Evaluation [Intellectual Tool-IT] [20 minutes]

The prompt feedback will be obtained through the Kahoot, also an online platform for reviewing the learning result by participating and competing in some designed quizzes among students or groups. Taking advantage of Kahoot, students' learning results could be roughly reviewed promptly through a gamified competition, in other words, examination. This competition will design and list some knowledge-based quizzes which already introduced before, and let the students compete by completing the multiple choices. The designing of the Kahoot may refer to several steps. Please note that the Internet should be available long the whole process of training, and at least one mobile device is required for the trainees.

Part V. Workshop [Learning Environment] [45 minutes]

A creative problem-solving workshop for promoting a slow learner's reading ability will be held at the end of this training. Retrieved from the education 5.0 concepts, creative thinking, problem-solving, team collaboration could be carried in the form of a workshop, and this active learning process could also make contributions to a higher rate of retention. This activity is intended to create a learning environment for all the trainees to focus on the obtained problem of the slow learner issue. And it requires all the participants' engagement to complete the utilization and internalization process of the introduced domain knowledge, which were mentioned in the previous section.

5. CONCLUSION & GENERALIZATION

Please note that the Constructionism-based training framework was proposed based on the researches which have been conducted on the case study. Other subjects may still utilize the proposed training framework by re-capturing the domain knowledge in a specific domain—for example, the domain knowledge in English teaching and Mathematics teaching. In general, when the training objectives, trainees, acquisition of domain knowledge, selection of intellectual tools, and creation of a good learning environment are combined organically, the designed training framework is effective. Nevertheless, the actual implementation of the proposed training framework is still suspended. Please refer to the forthcoming study once the testing has been landed.

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