Research on Curriculum Evaluation System for Advanced Ability Cultivation: Taking the Exhibition Major as an Example

Fang Cheng
Department of Exhibition Economy and Management, School of Tourism Management, Wuhan Business School, Wuhan, Hubei, China

Abstract: With the continuous transformation of various industrial structures in China, the focus of talent cultivation has gradually shifted from quantity to quality. High quality talents are the key to completing the development and transformation of the country and various regions, while high-level abilities are the key indicators for evaluating talent quality. However, currently, as an important subject of high-level talent cultivation in Chinese universities, there are still problems such as non heuristic teaching, single thread communication and interaction, and inability to teach students according to their abilities in teaching practice. Therefore, based on the theories of high-level learning and visible learning, this article takes the exhibition major as the research object, further improves the existing high-level ability evaluation system, forms a more systematic high-level skill evaluation system, provides theoretical guidance for the development of more operable evaluation tools, and ultimately promotes the cultivation and improvement of students' high-level abilities.

Keywords: Advanced Abilities; Course Evaluation; Grounded Theory; Advanced Learning; Visible Learning

1. Introduction

The transformation and development of our country have put forward higher requirements for the transformation and development of talents. The relevant policy reports in our country have repeatedly mentioned and discussed the importance of innovative development, first-class innovation, and high-quality talent cultivation. The key to talent cultivation lies in curriculum reform. In 2019, the Ministry of Education issued the "Implementation Opinions on Building First Class Undergraduate Courses", which clearly stated that courses are the core elements of talent cultivation, and the quality of courses directly determines the quality of talent cultivation. To deepen education and teaching reform, we must implement the results of teaching reform into curriculum construction, providing strong support for cultivating outstanding talents. Among them, curriculum construction should be guided by high-level, innovative, and challenging aspects. Therefore, cultivating high-level talents has become a key factor in higher education. The key objectives, However, in current educational practice, there is still a teaching method of indoctrination, and there is relatively little communication and interaction between teachers and students; At the same time, the level of students varies greatly, making it difficult to cultivate personalized higher-order abilities [1]. In order to enable students to possess higher-order abilities such as analysis, synthesis, and evaluation, a more systematic and specific evaluation and assessment system for higher-order abilities must be designed to ensure that the cultivation of higher-order abilities is implemented as a practical and feasible goal in teaching practice during the education process. Therefore, this article conducts a systematic analysis of the current status and existing evaluation systems of advanced ability training education practices, and uses grounded theory to explore a more systematic and targeted evaluation system for advanced ability courses.

2. Literature Review

All printed There are relatively more studies on higher-order abilities both domestically and internationally, but for systematic evaluation tools, foreign systems are relatively mature. For example, in 1973, Alverno College in the United States implemented a competency based curriculum that used competency assessments and teacher feedback to evaluate student performance, rather than traditional tests [2]. They focus on eight abilities, mainly including

critical thinking, social skills, interpersonal relationships, etc., which are considered the foundation for achieving advanced thinking abilities in liberal arts education. Afterwards, organizations in the United States and the European Union successively proposed relevant concepts and evaluation systems, but mainly assessed their abilities in various aspects through test questions, which have universality in ability but lack specificity, and have weak guidance for teaching practice. In recent years, domestic scholars have also begun to conduct more research on the cultivation of higher-order abilities, and have focused more on the influencing factors, dimensions, and the construction of simple evaluation systems for higher-order abilities. From the existing research in China, it can be seen that the factors that affect students' higher-order thinking and abilities mainly include teaching conditions [3], teaching objectives, and teaching activities [4]. However, research on teaching evaluation systems mainly focuses on qualitative case studies, and there is relatively little research on the development of systematic evaluation systems. Moreover, the focus is more on high school students, and there is insufficient quantitative research on the construction of high-level evaluation systems in universities. Therefore, this article takes university teachers and students as research objects, and combines grounded theory with existing research. Establish a more systematic evaluation system for high-level capability assessment, and test the reliability and validity of the questionnaire tools in the evaluation system to develop reliable evaluation tools.

3. Theoretical Basis and Framework Construction

3.1 Conceptual Analysis

In current research on higher-order abilities, they are mainly defined from two perspectives: educational goals, ability dimensions, and connotations. Among them, the concept proposed by Zhong Zhixian (2004) has been widely applied in China. He believes that higher-order abilities are the nine major abilities for learning higher-order knowledge, developing higher-order thinking, and achieving knowledge transfer. These abilities are not isolated or dispersed, but are a whole of abilities centered on higher-order thinking. Problem solving, innovation, decision-making, critical thinking, information literacy, teamwork, compatibility, acquisition of tacit knowledge, self-management, and sustainable development abilities[3]; From the perspective of goals, higher-order abilities are defined as psychological characteristics with higher-order thinking as the core, aimed at solving poorly constructed problems or completing complex tasks [5]; Regardless of which perspective is used to define higher-order abilities, higher-order thinking is the core part. Zhong Zhixian (2005) believes that higher-order abilities are developed through the process of higher-order learning, which is meaningful learning that learners use higher-order thinking based on higher-order knowledge [6]. From the existing conceptual definitions, it can be seen that higher-order abilities are not a static concept, but a dynamic development process that is influenced by multiple factors and centered on higher-order thinking for higher-order learning. Therefore, in the process of forming an evaluation and assessment system for higher-order abilities, it should also be a systematic and dynamic evaluation system. This article analyzes existing research on higher-order abilities, higher-order learning, and higher-order thinking, and combines the characteristics of this study to break down the nine dimensions of higher-order abilities defined by Zhong Zhixian (2004), namely problem-solving, innovation, decision-making, critical thinking, information literacy, team collaboration, compatibility, acquisition of tacit knowledge, self-management, and sustainable development abilities [4]. The article defines higher-order abilities as the four major abilities of higher-order learning knowledge, developing higher-order thinking to achieve knowledge transfer, namely problem-solving ability, decision-making ability, critical thinking ability, and creative thinking ability, while the other five abilities are evaluated as the main dimensions of higher-order thinking in higher-order learning.

3.2 Theoretical Basis and Framework Construction

The research on higher-order abilities and higher-order learning is flourishing both domestically and internationally. Based on his research on higher-order learning, Professor Zhong Zhixian, a domestic scholar, systematically proposed the concept of higher-order learning in his book "Informationized

Teaching Mode". The so-called higher-order learning is meaningful learning conducted by learners based on higher-order knowledge, using higher-order abilities, especially higher-order thinking. Essentially, higher-order learning and meaningful learning are the same, including five characteristics: active (positive/conscious), constructive (explanatory/ reflective), intentional (reflective/regulatory), authentic (complex/situational), and cooperative (collaborative/communicative) [5]. The higher-order learning theory emphasizes that learning activities require learners to have active awareness of the process of learning and higher-order thinking. Under the domination of this awareness, learners of any age group and in any teaching environment can develop higher-order abilities as long as they have the willingness. This article uses the framework of this theory to evaluate the formation process of higher-order abilities, namely higher-order learning. At the same time, these five characteristics of higher-order learning overlap with the connotations of the five dimensions of information literacy, teamwork, compatibility, acquisition of tacit knowledge, self-management, and sustainable development abilities in higher-order abilities [6]. However, the content scope of higher-order learning characteristics is broader. Therefore, according to the theory of higher-order learning, a dynamic evaluation system from higher-order learning (higher-order thinking) to higher-order abilities can be formed [7].

It can be seen that the theory of learning is based on the theory of high-order learning construction proposed by Harty (2015), which is different from the teaching design based on the ability and literacy of innovative talents. Harty's model for cultivating high-order abilities is built on "effective factors"[8]. In his research, he found that teachers, teaching environment, curriculum design, and students have important influences on the cultivation of high-order abilities. He believes that high-order learning does not develop high-order thinking and abilities from task construction, but develops from three levels: the physical world, subjective world, and conceptual world. That is, the process of high-order learning starts with mastering surface facts and concepts, then connects surface knowledge with the mastery of thinking methods to form a deep understanding, and finally moves towards it. Build, and divide the ultimately formed higher-order abilities into intellectual skills Five dimensions: verbal information, cognitive strategies, motor skills, and attitudes. From the visible learning theory, it vties are generated, developed, and formed by higher-order learning in specific contexts [9]. Therefore, based on existing research and theories, this section proposes the following preliminary research framework for this study, as shown in Figure 1 below:

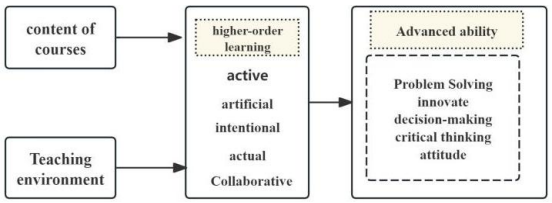

Figure 1. Initial Research Model Diagram

4. Research Design

4.1 Research Methods and Case Selection

This article is based on the grounded theory as the research method theory, with a preliminary research framework as the foundation. Through interviews with cases and text analysis of basic teaching materials, a more systematic evaluation and assessment system for high-level ability development is further summarized. And taking Wuhan University of Business as the research object, interviews were conducted with its exhibition professional teachers, and relevant teaching materials were collected. Through analyzing and summarizing the interview text and teaching text, concepts were summarized. This article conducted in-depth interviews with 8 teachers in the exhibition major and collected and summarized teaching plans and courseware outlines for 4 required courses and 4 professional courses. A total of 80000 words of text analysis materials were obtained, and data encoding was carried out based on the initial framework concept. During the encoding process, new concept measures were extracted to further improve the high-level ability evaluation system.

4.2 Case Analysis

This section is mainly based on the theoretical framework above to conduct an in-depth analysis of the practice of the case university in the process of cultivating high-level abilities. The analysis is mainly based on the analysis framework in the previous section, and the specific results of the grounded analysis of the interview documents are used to expand and

refine the original analysis framework. The analysis process is mainly divided into three parts: influencing factors of high-level abilities, high-level learning characteristics, and high-level abilities. The main elements in each part are analyzed, and the specific analysis is shown in the following text.

4.2.1. Factors influencing higher-order abilities

According to data collection, the cultivation of advanced abilities in the teaching practice process of the case university is mainly influenced by students' personal characteristics, teaching conditions, teaching content, industry characteristics, etc. The specific influencing factors include students' personal characteristics, teaching conditions, teaching content and methods, and industry characteristics in four main categories. Compared to the original framework, it has added 2 dimensions. Based on the interview data of 8 interviewees, it can be found that the above different elements contain different combinations of more specific factors. The specific case evidence materials corresponding to each element are shown in Table 1 below:

Table 1. Summary of Evidence for Cases of Factors Influencing Higher Level Abilities

Main category	Sub category	Content segmentation	source
Personal characteristics of students	Student learning objectives	academic record	A small number of children are very serious in class, and I have noticed that they put in more effort and have better logical thinking when solving problems during the process of revising papers for different courses and doing homework in class. (Teacher A). Some students may pay more attention to academic performance, so they tend to be more proactive and positive in class and completing tasks (Teacher C). I think some competitions or planning activities inside and outside the classroom are good ways to cultivate advanced abilities. During this process, many students who hope to achieve good grades will participate more. We also actively seek students to form teams, but we find that the division of labor between teams formed by students is better, and the progress of tasks will be relatively faster (Teacher E).
		practice	Some students are eager to exercise their practical skills, and they will participate more in projects, competitions, and even internships during holidays. They will actively contact teachers for guidance, which may sometimes be more effective in developing students' comprehensive abilities than classroom tasks. (Teacher B)
	Student personality traits	Mature, stable, and calm	Sometimes I feel that a student's personality can also affect their ability to acquire higher-order skills. For example, some children with more mature personalities have more comprehensive data collection and clear logic when completing tasks (Teacher F)
teaching conditions	Teaching tools	Multimedia, online platforms, teaching software	I feel that the availability of professional teaching tools in the teaching and research department can also affect students' application abilities during the teaching process. For example, in design courses, it is necessary for the training room computer to have corresponding software. Currently, the software for displaying designs is not fully equipped on all training computers (Teacher G)
	Teaching resources	Teaching cases, teaching courseware, teaching practice bases, teaching funds	For schools and majors like ours that offer practical teaching, I believe that practical resources and funding are relatively important for cultivating students' advanced abilities. For example, many courses have practical projects, but funding is limited, and sometimes it is not easy to complete small tasks through collaboration. Therefore, practical teaching resources are still very important (Teacher D)
Teaching content and methods	content of courses	Teaching objectives, inspiration, adaptability of cases, and phased evaluation	In our profession, the teaching process of cases and case decomposition, as well as operations, have a significant impact on the cultivation of students' higher-order abilities. In this process, it is important to ensure that each student reaches a basic level without hitchhiking, and to evaluate the course as a task is crucial (Teacher B)
	teaching method	Interactivity and fun	The teaching methods of teachers are still very important for cultivating students' abilities. The learning initiative of college students needs to be mobilized. I have listened to the lectures of award-winning teachers in competitions, and their classroom interaction, guidance, and skills are very good. Only by listening to the lectures can students learn knowledge and develop their abilities (Teacher C).
industry characteristics	not have	College interaction frequency and industry maturity	Although our major has developed earlier in terms of business format, its scale has only expanded in recent years. Due to the relatively small scale of many companies in the industry, the professionalism in personnel recruitment is not strong, and the interaction between universities is also insufficient. This affects our students' opportunities to go out for internships and gain a deeper understanding of the industry, which has an impact on their professional judgment (Teacher E).

From the analysis, coding, and induction of the interview data mentioned above, it can be seen that the factors influencing higher-order abilities summarized in the case study have two additional dimensions compared to the initial framework: student characteristics and industry characteristics. Student characteristics are more heavily influenced by the students themselves, and the teaching process can guide their behavior, but the impact on their goals and personality is relatively small. Therefore, this dimension is not included in the initial framework. However, students are important subjects in the evaluation of higher-order abilities, and this article regards them as an important subject in the evaluation of higher-

order abilities. Therefore, the final framework not only includes teachers' evaluation of students' higher-order abilities, but also students' evaluation of their own higher-order abilities. Industry characteristics are influenced by the overall environment, and school teaching can provide industry support but is not the main factor. Therefore, industry characteristics are not included in the dimensions, and the influencing factors still include two dimensions: teaching environment and teaching content.

4.2.2 Advanced Learning Features

According to data collection, interviewed teachers generally believe that students' higher-order learning should be proactive, constructive, intentional, authentic, collaborative, integrated, and other six main category dimensions. An additional dimension has been added to the original framework. Based on the interview data of 8 interviewees, it can be found that the above different elements contain different combinations of more specific factors. Due to space limitations, this section omits the relevant evidence materials of the existing dimensions in the initial framework and only presents the evidence materials of the expanded dimensions. The corresponding specific case evidence materials are shown in Table 2 below:

Table 2. Evidence of Extended Dimension Data for Higher Order Learning Features

Main category	source
Integrated	When some students complete comprehensive classroom assignments, applying knowledge from different disciplines can help improve the overall quality of the assignment. For example, when analyzing the market, applying relevant knowledge of consumer psychology can lead to more careful profiling of market users (Teacher A). Many of us, such as competitions and event planning, require students' ability to integrate disciplines. For example, in the planning process of a project, it requires the logical integration of multiple disciplines and skills such as marketing, psychology, design, drawing, and project management. Therefore, students' integration ability is very important (Teacher E).

From the above interview data, it can be seen that the teacher believes that in the process of students' advanced learning, in addition to the five categories already in the framework, an "integrated" dimension has been expanded. At the same time, through the lesson plans and outlines of eight case teachers, it can be seen that many group activities clearly stipulate the comprehensive application of multidisciplinary knowledge, and for the completion of practical tasks, all cases have "comprehensive design" experiments. Therefore, it can be seen that integration is an essential learning feature in the process of students completing course tasks and forming advanced abilities. Therefore, add this category to the framework dimension.

Regarding the dimension of higher-order abilities, it can be found through the encoding of interview data that there are no unnecessary expansion dimensions. The existing dimensions can comprehensively measure higher-order abilities, so we will not provide examples of evidence for the corresponding dimensions here.

From the above research, it can be seen that the evaluation of higher-order abilities is a dynamic and multi-party process, and the evaluation of teachers alone is not enough to reflect the level of students' higher-order abilities. Students' own evaluation of their higher-order abilities is also an important reference indicator. Therefore, this article extends the evaluation system of higher-order abilities from a single teacher evaluation to a teacher student dual evaluation. The dynamic process of evaluating high-order abilities from two perspectives, and the formation of high-order abilities cannot be achieved by a single overall evaluation. It requires certain dimensions of high-order ability evaluation for different learning tasks. Therefore, the evaluation system is also divided into stage evaluation and overall evaluation. Based on the above grounded research and theoretical foundation, this article proposes a new theoretical model as shown in Figure 2 below.

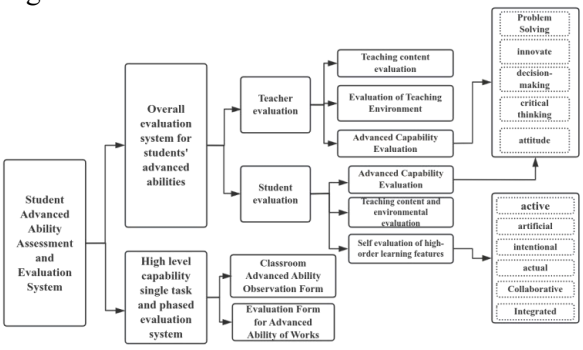

Figure 2. Theoretical Model Diagram of High-Order Capability Evaluation System

5. Research Conclusion and Prospect

Based on the above research content, it can be found that the evaluation of students' higher-

order abilities is not just a static evaluation process, but a dynamic process from environmental influence to learning and then to ability formation. In this process, the assessment of higher-order ability evaluation also needs to be carried out from two dimensions: teachers and students. This is because, for example, higher-order learning characteristics, although teachers can observe from students' works and the process of completing tasks, dimensions such as construction and intention are the embodiment of thinking in the process, which is relatively difficult to observe in reality. Therefore, it is necessary to supplement students' self-evaluation to make the evaluation system more complete and sufficient. In addition, there may be differences between students and teachers in the environment, teaching content, and final evaluation of higher-order abilities from two dimensions. Evaluating can better grasp the differences between the two, Weaken the information gap, promote further teaching reform and teacher-student communication.

This paper only completed the model construction of the evaluation system, but the model needs to be applied in practice, and further design and development of specific evaluation questionnaires are needed.

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