A new decade for social changes
Evaluation of an occupational competency-based curriculum and its impacts on learning outcomes

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Abstract. This study explores the expectations of enterprise recruiters regarding job seekers in terms of required competencies and how higher education should contribute to preparing students for future employment. This study employs an occupational competency-based pedagogical model. Based on in-depth interviews with ten senior workers in the aviation and education industries, a four-year longitudinal qualitative research was conducted. After the conclusion of the training program, data on the employment status of research participants were collected. Further, a holistic interpretation and validation was provided for the competency-based pedagogical model. The results demonstrate that students developed stronger learning motivation and better employability because of a competency-based curriculum and training.

Keywords. enterprise education, competency-based education, university education, entrepreneurship education, competent pedagogy, entrepreneurial ability, occupational competency standard, integrated competency, employee training methods

Introduction

In recent years, the issue of college students’ employment after graduation has received extensive attention. Furthermore, there is growing interest in developing behaviors, attributes, and skills that allow individuals and groups to create change and cope with higher levels of uncertainty and complexity through education. Interest in entrepreneurship education has been increasing because of the proliferation of entrepreneurship programs over the last few decades (Valerio, Parton, and Robb 2013). Entrepreneurship education (EE) enhances people’s intention to launch a business (Noel 2000) and contribute to economic growth and job creation (Falkäng and Alberti 2000), and awareness regarding the importance of EE is growing (Carland and Carland 2004). Highfield, Lee and Hardie (2020) argue that education must provide students the tools and ability to navigate and find success in their unknown future. The EE curriculum can support young people to develop competencies like resilience, independence, innovativeness, and the ability to recognize opportunities that enable them to live productively and rewardingly in the post-COVID-19 environment. EE has expanded rapidly in higher education institutions around the world (Fretschner and Weber 2013), driven by entrepreneurship’s promise as a vehicle for promoting economic renewal and growth (Greene and Saridakis 2008). A major premise underpinning the expansion of EE is that entrepreneurship can be learned (Fretschner and Weber 2013) and students’ entrepreneurial
intentionality can be developed (Pittaway and Cope 2007), ultimately facilitating business start-ups (Nabi, Holden, and Walmsley 2010). EE is an important approach for entrepreneurs to acquire resources and enhance innovation abilities and characteristics. Further, by integrating various knowledge and value systems, EE can build multilevel learning channels for entrepreneurs, which can facilitate their general ability development and professional ability improvement among other aspects. Entrepreneurial competence mainly refers to individuals’ ability to identify opportunities and develop necessary resources and capital (Arthurs and Busenitz 2006; Kettunen, Kairisto-Mertanen, and Penttilä 2013). To provide students with foundational knowledge and stimulate entrepreneurial thinking (Gibb et al. 2013), competency-based education (CBE) has been introduced in various countries worldwide with the aim of improving the transition from the school environment to the workplace, which students encounter after graduation. CBE became essential because graduates often possess sufficient knowledge but lack the skills and attitudes required to function efficiently in a workplace (Harm, Loek, Rob, Martin, and Renate 2004). Educators, policymakers, and researchers have been contemplating how to integrate employability training to all educational levels (Lackeus 2015). However, enterprise education research tends to focus on learning outcomes (Fayolle 2008; Jones and Iredale 2010; Peltonen 2015), and teachers face difficulties in identifying best practices for embedding enterprise education into their programs during the instruction process (Fiet 2001b; Solomon 2007; Seikkula-Leino et al. 2015). There is a need for both further exploration of how educators interpret enterprise education (Hoare and Ruskovaara 2015; Peltonen 2015) and for tools that support teachers to develop their enterprise teaching skills (Ruskovaara and Pihkala 2013). The Commission of the European Communities underscored the importance of EE in Green Paper: Entrepreneurship in Europe, identifying EE as both a critical factor in achieving economic, social, and sustainable development (Hameed and Irfan 2019; Isa 2019; Sadewo 2020; Sam and van der Sijde 2014; Saraiva and Paiva 2020 Von Graevenitz, Harhoff, and Weber 2010) and an essential key to fostering creativity and innovation (Boldureanu et al. 2020; Welsh, Tullar, and Nematı 2016). Therefore, scholars have indicated the need for universities to become more entrepreneurial (Gibb, Haskins, and Robertson 2013; Taatila 2010). Some scholars have also argued that in addition to focusing on promoting entrepreneurship, universities must promote entrepreneurship in teaching and research (Paiva, Alves, and Sampaio 2019). After a systematic review of EE in higher education institutions, Othman and Othman (2019) concluded that institutions must develop curriculums designed for achieving the outcome of entrepreneurship education. Further, research has shown that university-level entrepreneurship education is critical in fostering entrepreneurial intentions and attitudes among undergraduate and postgraduate students (Yomi-Akinola and Adedapo 2019). However, traditional teaching methods remain dominant in entrepreneurial programs part of higher education (Blenker et al. 2011; Kyrö and Carrier 2005; Solomon 2007). These pedagogies focus merely on knowledge transmission (Kyrö and Carrier 2005), which stultifies the shaping of an entrepreneurial mindset (Kirby 2004). Thus, in higher education contexts, there is a lack of coherence between traditional pedagogical approaches and expected learning outcomes (Kyrö 2005; Mwasalwiba 2010). The Ministry of Labor of Taiwan recently passed an initiative entitled “Competency-based Education,” aiming to introduce entrepreneurship to students at all levels through competency-based programs. However, the initiative’s details, including objectives, content, methodology, and assessment, have not been provided to teachers. Conceptual heterogeneity and ambiguity in the field can also be explained by the use of terms such as knowledge, skill, ability, and learning outcome (Zlatkin-Troitschanskaja and Kuhn 2010). The distance between educational vision and current teaching practices can be
bridged through the adoption and use of appropriate pedagogy, which has been tested and proven to contribute to individuals’ holistic development (Ebert-May et al. 2011; Herodotou et al. 2019). To explore entrepreneurship programs in higher education, this study developed an education sciences course that aims to cultivate a sense of initiative and entrepreneurship in students. The course was delivered using a “through” approach to enterprise education. With a focus on student employment, work task description, corresponding behavioral indicators, and a pedagogical model for knowledge and skills were developed. The course was designed according to the taxonomy of the Occupational Competency Standard (OCS), including curriculum instructions and practical operations, intended learning outcomes, and related assessments. Based on students’ feedback on the course and a follow-up analysis of their employment situation after program completion, this study presents constructive research results.

Literature review

1. Entrepreneur Education

Enterprise education, which is immensely popular in the United Kingdom (Lackeus 2015), aims to equip learners with an enhanced capacity to generate ideas and the skills to make them happen. It focuses primarily on personal mindset, efficacy, and personal capabilities that young people will need in the future (Draycott and Rae 2011). Enterprise education can be complemented with specific courses on entrepreneurship at higher education levels aimed at helping learners to gain employment. This is a basic progression model that could overcome the issue of diversity in the definitions of entrepreneurship, learning outcomes, and teaching methods in enterprise education (Gibb 2008; Hytti 2008; Blenker et al. 2011; Rasmussen and Nybye 2013). The concept of “competence” has been introduced in higher and vocational education to more effectively link the classroom with the workplace; instead of the mere accumulation of knowledge, students are expected to focus on understanding the content of education and training and practical application (Koenen, Dochy, and Berghmans 2015; Mulder 2012). Competence is a combination of knowledge, skills, and attitudes required to solve problems in a given context (Baartman et al. 2007; Mulder 2012). Enterprise education research no longer considers static knowledge adequate for helping learners to thrive in continuously changing societies (Penaluna and Penaluna 2015). Lackeus (2015) discovered that entrepreneurial research commonly sets enterprise education in opposition to traditional education. While the former is regarded as individualized, process- and project-based, cooperative, experiential, and multidisciplinary, the latter is perceived as standardized, content-centered, and passive. Enterprise education challenges traditional teaching practices, which are geared toward paid employment and designed with the aim of indoctrinating students to obey and reproduce facts (Sagar 2015). It enhances students’ learning motivation and engagement and fosters deep learning (Lackeus 2015; Sagar 2015) and creative and innovative teaching methods for student-centered learning. However, little is known about how EE increases intentionality; Zlatkin-Troitschanskaia and Kuhn’s (2010) report shows that although several countries attach great significance to CBE, there is barely an effective system for or comprehensive research evaluating the abilities that students must acquire from higher education. Therefore, learning is what enterprise education requires (Gibb 2005; Balan and Metcalfe 2012; Bell 2005; Peltonen 2015; Penaluna and Penaluna 2015). However, innovative teaching methods alone are insufficient to promote effective learning; the theory of constructive alignment advocates coherence between learning outcomes, teaching and learning activities, and assessment (Biggs and Tang 2011). The same coherence is acknowledged as a feature of
courses designed through competence-based approaches (Baartman et al. 2007) and in enterprise education (Lackeus 2015; Penaluna and Penaluna 2015). To achieve this aim, teaching staff must become entrepreneurial themselves (Peltonen 2015). Gibb (2005) also contended that teachers should have sufficient practical experience. Penaluna and Penaluna (2015) argued that educators should design a learning environment that allows growth and learning. Peltonen (2015) concluded that from teachers’ perspective, enterprise education is a matter of professional development and pedagogical renewal. Thus, teachers should be considered entrepreneurial agents rather than mere executors of curriculum guidelines. A Nordic research stream on pedagogical entrepreneurship focuses on teachers’ entrepreneurial competences as an integral aspect of their professional competence (Peltonen 2015). Leffler (2002) argued that pedagogical entrepreneurship involves teachers acting as entrepreneurs while developing students’ entrepreneurial competences and objectives of enterprise educational activities.

2. Competent Pedagogy

In the context of developing students’ entrepreneurial competences, McClelland (1973) first introduced the concept of competency, arguing that individuals’ attitudes, perceptions, and traits are critical factors influencing their performance and that competency has a stronger and better predictive validity for performance than intelligence quotient (IQ). According to McClelland (1973), behavioral traits and attributes can be used to predict one’s job performance. High-performing individuals often demonstrate sound judgment, detect problems and take action, and set challenging goals. Common behavioral characteristics identified in high performers are collectively referred to as competencies—a measure used to gauge job performance. Thus, intelligence is not the sole factor determining job performance, and competencies including cognitive skills, behaviors, personality traits, and other elements affect job performance. The concept of competency was first proposed in the 1970s and was in its infancy at the time. Chisholm and Ely (1976) suggested that competencies involve knowledge, skill, and attitude. Guglielmino and Carroll (1979) identified three dimensions for the competencies of mid- and high-level managers: conceptual, interpersonal, and technical skills. Chisholm and Ely (1976) observed that knowledge refers to the content of duties an individual should understand at work, skills indicate one’s ability to apply knowledge to solve problems; and one’s attitude can be known from daily communications and observations; further, these three aspects interact with one another. In the 1980s, Hager and Gonczi (1996) held that the behavioral indicators for competency development involve knowledge and skills, which is consistent with the findings of Chisholm and Ely (1976). When developing models describing targeted student learning outcomes, Mislevy and Haertel (2006) considered two perspectives: the learning goals declared in study curricula and regulations and the labor market’s professional and social requirements—that is, the current expectations of employers and skills and learning of higher education graduates. McLagan (1980) noted that competencies include knowledge, skills, and abilities. Glosson and Schrock (1985) argued that competencies involve five elements: ability, knowledge, skills, judgment, and attitude and rationality. Albanese (1989) proposed that competencies include both professional skills and personality traits. In the 1980s, researchers began to narrow down the scope of competencies to three components, namely, knowledge, skills, and attitudes, with some discussions on personality traits. From the 1990s onward, no significant breakthrough has been made in terms of the defining the essential components of competencies; Fletcher (1992), for example, shared the same view as previous research findings.
Bovatzis (1982) further identified motives, self-image, and social roles as critical constituents of competencies. Spencer and Spencer (1993) included personality traits, motivation, and self-concept as constituent elements of competencies. However, their outlooks have rarely been adopted in subsequent studies.

In Taiwan, government authorities define occupational competency standard as the combination of abilities (including knowledge, skills, and attitudes) required for achieving the main tasks of a particular occupation (or career). This definition is in line with the conceptualizations of the 1980s. Human capital is characterized by three main features: early ability (whether acquired or innate); knowledge and qualifications acquired through formal education; skills, competencies, and expertise acquired through training on the job (Blundell et al. 1999; Miller 1996). With the introduction of the concept of competencies, a number of researchers have successively expanded related research. For example, Bovatzis (1982) defined competency as an underlying characteristic of a person that results in effective and/or superior performance in a job; a job competency may be a motive, trait, skill, aspect of one’s self-image or social role or a body of knowledge that an individual uses. Ulrich et al. (1995) defined competency as the knowledge, skills, and abilities possessed or demonstrated by an individual.

3. Capability

Interest in EE has been increasing because of the proliferation of entrepreneurship programs over the last few decades (Valerio, Parton, and Robb 2013), and EE has been introduced across the world. The European Commission (2012) has been urging its member states to implement EE, with the aim of honing entrepreneurial skills in students. EE was also found to enhance individuals’ intention to launch a business (Noel 2000) and contribute to economic growth and job creation (Falkäng and Alberti 2000). EE has been adopted across Asia, including in China, Indonesia (Wu and Wu 2017), Singapore (Ho et al. 2018), and Malaysia (Din et al. 2016); in most of the European Union countries; and in the United States, with the European Union countries taking a more practical approach (Ierapetritis 2017). Global interest in entrepreneurship grew as the economy shifted its focus to small and medium-sized (SME) businesses as a solution to unemployment (Jones and Iredale 2014; Pepin 2018). In Finland (Komulainen et al. 2009) and Sweden (Fejes et al. 2019), EE is a part of the curriculum at all grade levels and across all subjects. The term entrepreneurship education is used to describe this concept in the United States and enterprise education is used in the United Kingdom (Lackèus and Middleton 2015). In New Zealand’s curriculum, students are to explore what it means to be “enterprising” (Ministry of Education 2011). Thus, enterprise and entrepreneurship students are encouraged to be innovative and creative (Gibb and Ramsey 2011), use their initiative, and be adaptable (Dahlstedt and Hertzberg 2012; Smith and Price 2011).

Therefore, awareness of the importance of entrepreneurship education has been on the rise (Carland and Carland 2004). In the United States, the O*NET database comprises occupational data accumulated from various industries, including information on the knowledge, skills, abilities, educational backgrounds, experiences, and work styles required for a given occupation. Japan, as a major economy in Asia, has been a global leader in promoting CBE. Japan has introduced the Occupational Competency Evaluation Standard, a set of evaluation systems composed of items such as type of occupation, jobs, duties, and detailed abilities. Regardless of business size and number of employee positions, all enterprises can use this system to design and establish a set of required work ability combinations. Australia has developed the most mature application of occupational competency standards, effectively
integrating OSC training programs, assessment guidelines, and qualification certification into a linkage system. The principal mechanisms include the Australian Qualifications Framework (AQF) training packages and the Australian Quality Training Framework (AQTF). Since 2000, Singapore has been promoting the construction of the National Skills Recognition System (NSRS) for constructing occupational competency standards and obtaining skill certification. Its goals are to establish occupational competency standards for various industries in Singapore, combine training systems to develop a certification mechanism, and further improve the quality of Singapore’s human resources to enhance the competitiveness of its industries. With the advent of globalization, the rapid development of science and technology, and the dramatic changes and challenges brought about by the advancement of knowledge-based economies, improving productivity and competitiveness is a major aspect of human resources development for the government of Hong Kong. In its endeavor to establish a mechanism to integrate qualifications in relation to school education and occupational training and to implement ability and technical certification, the Hong Kong Education and Manpower Bureau released a summary report, titled “Establishment of the Qualifications Framework and Its Associated Quality Assurance Mechanism,” in November 2002. The report outlines plans to establish an OCS system. Judging from the level of importance these countries have attached to the promotion of occupational competencies, the necessity of developing competency-based curricula in higher education is self-evident.

Spencer (1993) divided competencies into two categories: “clearly visible” competencies and “hidden” ones. The former category includes knowledge and skills, whereas the latter involves motives, traits, and self-concept. These five competencies are described as follows:

1. **Knowledge**: Refers to the information that an individual has in a specific area and can only indicate what a person “can do” but does not predict what a person “will do”; it is difficult to assess whether a person can apply knowledge to work on improving job performance.

2. **Skills**: Refers to individuals’ ability to perform a specific physical or mental task, including analytical and cognitive ones.

3. **Motives**: Refers to an individual’s intention to perform a behavior, driving a person to achieve a specific action or goal.

4. **Traits**: Refers to physical characteristics and consistent responses to situations or information.

5. **Self-concept**: Refers to a person’s attitude, values, or self-image.

Spencer (1993) analyzed these five competencies in terms of the ease of training and development, highlighting that knowledge and skills tend to be visible and are relatively external characteristics of people; therefore, these are easier to train and develop. By contrast, motives and traits are the deepest hidden qualities of people; therefore, they are difficult to mould and develop. In a public education or schooling context, EE experiences can be designed to teach students about, for, or through entrepreneurship. Learning about entrepreneurship has been described as learning the “what” and “how” of entrepreneurship (Nabi et al. 2018) through presentations of associated theories and knowledge (Lackéus 2015). Learning for entrepreneurship refers to preparing students to start a business (Caird 1990; Moberg 2014) with technical, practical, and teacher-guided instruction (Elahi 2019; Sirelkhatim and Gangi 2015), whereas learning *through* or *in* entrepreneurship is to experience real-life ventures.
Piperopoulos and Dimov (2015) to develop skills and competencies in entrepreneurship (Caird 1990; Lackéus 2015; Moberg 2014; Sirelkhatim and Gangi 2015).

Cardy and Selvarajan (2006) define competencies as characteristics associated with effective performance, arguing that employees with such characteristics show “significant positive differences” from those without the same. In other words, companies can effectively enhance organizational performance by developing individuals’ competencies and introducing employees with high-performance knowledge, skills, abilities, and traits. In addition to applications in the field of human resource management, the concept of competencies has also been applied to school education by some researchers. For example, Kaplan and Midgley (1997) discussed the concept of “perceived competence in learning” (PCL) in the context of higher education. PCL is defined as the current perceived level of skill or the perception of an individual’s ability to complete tasks in different areas (Ryan and Deci 2009), including motivation, metacognition, and strategic planning for self-regulated learning (Boekaerts and Corno 2005; Wolters 2003). Friedrich et al. (2013) deemed PCL akin to self-efficacy beliefs. In other words, when students actively engage in a course and recognize it as helpful in improving their ability, their learning motivation and effectiveness increase significantly. This study intends to address an issue discussed in the literature—that is, the near absence of an effective system for CBE and specific approaches to evaluating the ability students acquire from CBE learning at present by using an OSC-based curriculum design to verify whether CBE aids in improving students’ employability.

Based on the above literature discussion, the hypothesis of this study is:

H1: The curriculum design of OCS has a significant impact on the realization of entrepreneurship education in CBE.

H2: The curriculum design of OCS has a significant impact on students' perceived learning motivation.

H3: Students' perception level has a significant impact on learning motivation.

H4: Students' motivation to learn has a significant impact on knowledge acquisition.

H5: Students' learning motivation has a significant impact on ability development.

H6: Students' motivation to learn has a significant impact on learning skills.

H7: Motivation to pursue knowledge and competency traits have a significant impact.

H8: Motivation to improve one's own abilities and competency traits have a significant impact.

H9: The motivation to improve one's ability and the self-concept of competence have a significant impact.

H10: Competency traits have a significant impact on improving organizational performance.

H11: The self-concept of competency has a significant impact on improving organizational performance.
Methodology

1. Operational definition of OCS functions

The OCS function refers to the combination of knowledge, skills, attitudes, or other characteristics that should be possessed by individuals and organizations to successfully complete a task or to improve the present and future performance of individuals and organizations; in short, it is to enable continuous improvement of work capabilities. For example: When a nurse helps draw blood during a health check, what are your expectations for a nurse? Do you want to be able to complete the blood draw at one time, or be gentle and friendly, or use a sterilized needle to draw blood. The above expectations are the job functions that nurses must have to perform blood drawing work. Imagine using unsterilized needles or if the needles are not in place at one time, you must think that the nurse is incompetent. By way of example, nurses perform the function of drawing blood, which requires knowledge of the location of blood vessels, as well as the knowledge and skills of syringes to draw bodily fluids and blood; of course, nurses are expected to serve with a warm and cordial attitude while drawing blood.

To complete the current job, what abilities are required, and what knowledge, skills, and attitudes are these abilities composed of? Through functional training design to understand the needs of enterprise employment, you can clearly describe the performance, knowledge, skills and attitudes to be able to have the ability, which helps to plan the development plan of training, establish the ability certification system and standards, and improve the quality of training services. For enterprises, functions turn talent development and management into a science that can be quantified and optimized, and become functions that can identify work performance, formulate relevant functional standards, and measure the ability of employees, job competence, and the performance of each department. The functional gap and the level of preparation of talents make training and recruitment performance management, enterprise inter-personalization, and consistent standards. Each company has different core values, missions, visions, and business strategies. It reflects the different attributes of the company through the development of functions, and uses the performance of high-performance employees to formulate an exclusive functional model as a reference for evaluating work performance and...
talent development. Based on this, this study divides functions into three categories: professional functions, core functions, and management functions according to their attributes.

![Figure 2. Attributes of the function](image)

First of all, professional function refers to the ability to be engaged in specific professional work. For example: electromechanical integration ability, circuit design ability, etc. The second is core functions. Core functions refer to the capabilities that every member of an organization needs to have. These capabilities will vary with organizational strategy and culture. For example: quality, customer orientation, innovation, integrity, etc. The third is the management function, which refers to the ability that workers in management positions must possess. For example: strategic planning, team building, etc. Enterprises can formulate the required functional models according to the needs of the organization and the ability development of employees, for example, in order to propose the management capabilities of cadres and formulate management functions to strengthen professional capabilities. To develop professional functions, we must understand the basic spirit of professional functions, core functions, and management functions of functions, so as to clearly plan the company's training plan. The application function in the enterprise can be used as a reference for evaluating and predicting the needs of human resources in the enterprise, and as a reference for recruitment and selection, training and development, and performance appraisal. In schools, functions can be used to develop courses that meet the needs of the industry, and functions can be used to strengthen training and coaching as the basis for capacity building. For individuals, it is possible to understand the ability requirements of enterprises to employ people and the career reference path for their future career development.

2. ADDIE mode of OCS training program

This research takes the flight attendant function as the research object to develop a training program, develop teaching and evaluation strategies for job tasks, consider training effectiveness, design a training program, describe the details of curriculum planning and execution, record relevant matters, and explain Expected results and auditing requirements, for target students, explain the nature of the work performed by flight attendants, the ability and performance that students participating in the training need to improve, and what changes need to be made to acquire those knowledge and skills. In a public briefing session, explain to the
whole class the hours of the course, the location of the class, the teaching and training objectives, what learning outcomes the learning objects need to achieve, what learning mode to use to achieve the training objectives, the learning content and teaching methods of each course, Conduct a functional gap analysis to confirm what complete functions are required to be a flight attendant, design a curriculum map, and plan the sequence logic of the curriculum. In the monitoring and inspection part, the methods to monitor and test the quality of the course are pre-planned before the course starts to ensure that the training objectives are achieved. This study adopts the expert meeting method to discuss with the experts the responsibilities, work tasks, behaviors, knowledge skills and attitudes used at work, and integrates the information collected from the interview data to write the first draft of the function, and then ask the experts to confirm.

The core of the course is to use learning, to develop according to the ability and level to be engaged in the work of flight attendants, and to plan the content of the course according to the results of functional analysis. The function is like a ruler, telling us the ability to work and standards, we can find out the current ability of the target learning object, as well as the gap to meet the requirements of the function. By clearing the gap in the defined ability by the function, it helps us to find out the performance behavior that the target learning object has not yet achieved. Reinforced knowledge skills and attitudes, using training objectives to link functional requirements, so that learning outcomes reach the level of workplace competency requirements. Training objectives, course units, and assessment methods are designed according to the functional level, responsibilities, work tasks, and behavioral performance of functional benchmarks. Evidence of learning outcomes is formulated against the work output and behavioral indicators of functional benchmarks to systematically design teaching. According to the ADDIE mode, the detailed planning of the curriculum is carried out to achieve the predetermined teaching goals and obtain the ideal teaching effect. The course design adopts the ADDIE model of Hodell, C. (2005), which divides the flight attendant's functional requirements into five stages, so that the course design can be structured and systematic.
Figure 3. ADDIE Model
3. Design teaching and training objectives

The teaching and training objectives are like the compass of the course, pointing out the direction of students' learning and the learning performance that should be achieved. Therefore, the teaching and training objectives of this study include the observable behavioral performance in work tasks and the connotation of knowledge and skills to be acquired, so as to establish the relationship between teachers and students. The common norms and consensus between the teachers allow the teachers to confirm that the students have achieved learning results, and let the students predict that the training content is in line with their future work needs. When writing the teaching training objectives, compare the behavioral indicators of the function and the corresponding knowledge skills and attitudes, and specifically describe the behaviors that students need to show and the learning results, as the basis for guiding the teaching content and evaluating the functions. One is to use “verbs” to describe the behaviors and actions that students want to perform in the learning process. For example, according to the teaching and training objectives of beauty consultants, the behavior indicators of beauty consultants require that they can identify the needs of customers, set appropriate makeup according to the skin quality and characteristics of customers, and independently complete the work of communication, cleaning and maintenance, and design makeup. In order to achieve the training goal of the ability level of beauty consultants, students will not only know color science, understand the principles of color makeup, and use color makeup tools, but also need to be able to judge customer needs, comprehensively apply color makeup products and tools. Comprehensive performance, using verbs to explain students The level of function to be performed and required. The second focus of the writing of teaching objectives in this study is to use the SMART principle of Doran, George T. (1981) to fully describe the teaching and training objectives.

![SMART Principle](image)

Figure 4. The SMART Principle Doran, George T. (1981)

The specific part should be very specific and clear, clearly stating the specific purpose or specific event to be achieved, and having a clear and specific scope. Therefore, this study
specifically divides the work of flight attendants into three parts, namely T1 boarding Pre-

service, on-board service at T2, inspection and handover after landing at T3. The measurable
part of Measurable, the spirit of OCS is that the goal must be measurable, so as to clearly
determine whether the established goal has been achieved. This study named this goal
"behavioral index", which clearly defined that students must learn and complete it
independently. For example, P1. Will check the emergency escape equipment on the plane, P2.
Will operate the equipment of the air kitchen and be able to prepare meals and drinks
independently, P3. Be able to skillfully guide passengers to sit in the correct posture, P4. To be
able to proficiently complete the broadcast on the plane and provide complete flight
information, etc., we have set 35 behavioral indicators that students must learn according to the
work flow of the flight suit.

The Achievable part, when designing the OSC course, we focus on that the goal must
be achievable and the ability is within the reach. If the requirements are too high, it will not
help students learn the abilities that they need to have on the job site, and even cause setbacks
and lead to learning willingness. Therefore, in this study, the selection was conducted in the
form of an open briefing session, and the students’ language scores (including English, Korean
and Japanese) in the previous academic year were used as the prerequisite for the selection of
students. Students must have the qualifications to pass the foreign language test before
participating, selection for this course. In the related part of the Relevant, the goal must be
related to other goals. A course often has multiple teaching and training goals, and each teaching
and training goal must be in sequence or related, so as to gradually cultivate students' abilities.
The study planned the work of flight attendants according to the sequence of the service process.
While training in the course, students could also learn the sequence of the overall work. In the
time-based part, the teaching and training objectives must be time-limited, so as to track the
progress of execution, set the time and training situation, and complete the learning task in a
specific situation. The training of the flight attendant OCS is 72 hours in total, each unit After
the learning is completed, the teacher will conduct unit assessment to confirm the learning
situation of the students to determine the follow-up action plan. Learning method, the flight
attendant's OCS course is carried out in the form of physical classes. Teachers and students
conduct face-to-face learning, with professional classrooms, so that students can learn in a
practical way. After the learning is completed, the actual work experience in the workplace is
arranged. Cooperation gives students the opportunity to practice in real workplaces, and also
gives companies the opportunity to observe students' performance. If they encounter students
with excellent performance, the company will provide students with the opportunity to become
full-time employees.

4. Teaching Outcomes Evaluation

The 4 principles of assessment in this study are validity, which effectively reflects
actual work, reliability, and consistency if the same assessment is performed by different
assessors and other assessors will make the same decisions, to make the assessment reliable.
Fairness, providing various evaluation methods, making the evaluation flexible, clear in the
process, suitable for reviewers with different needs and characteristics, objectively considering
all evidence evaluation, open and transparent, and meeting all reasonable adjustment
requirements. Flexibility, suitable for assesses with diverse learning styles, using methods
appropriate to the assesses situation and function, and held at a time and place that is convenient
for both parties.
The steps to be performed are 1. There is evidence and participation. The test papers or practice checklists used in the assessment should be sufficient to demonstrate functional evidence. During the evaluation process, students will be fully aware of the standards and procedures they are being evaluated for, so as to achieve a fair evaluation. 2. Retain learning evidence. Students keep the learning images in the form of video recordings in the usual classrooms and practical operations, as proof of completion of learning, and as a reference for future review, use objective evidence to prove ability, and maintain evaluation fairness. 3. Allow students to participate. Students are not passively waiting for evaluation, but should actively participate. In the process of participating in the process of collecting results and evidence to prove their ability, the teacher acts as a companion and guides how to collect evidence. Demonstration of their own competence through assessment, and confirmation of student performance and application through assessment, helps to assess the quality and effectiveness of education and training.

5. Theory and implementation of OCS and CBE

This study used OCS for curriculum design. Based on the competency theory of Spencer (1993), choose a career as a goal, establish related behavioral indicators, and combine five competencies. Both visible and hidden abilities are included, especially knowledge, skills, motivation, traits, and self-concept. The participating experts include a Korean Air flight attendant with 17 years of flight experience, three EVA Air flight attendants with more than 20 years of flight experience, a Japan Airlines flight attendant with 27 years of flight experience, and China Airlines flight attendant with 31 years of flight experience. 1 Cathay Pacific flight attendant with 12 years of flight experience, 1 Palau flight flight attendant with 15 years of flight experience, 1 professor-level university course expert with 25 years of teaching experience, and 1 senior advisor to government departments. Experts collectively reviewed the competency plan developed in this study. The design goal of OCS is to address the problem of Zlatkin-Troitschanskaia and Kuhn (2010) that although countries around the world attach great importance to CBE, there is almost no effective systematic or comprehensive research to assess the ability of students to acquire from higher education study. Ulrich et al. al. (1995) defined competence as the knowledge, skills, and abilities that an individual possesses or demonstrates. Therefore, this study refers to the competency theory (Figure 5) of Spencer (1993) as the basis, and the designed OCS training program clearly presents the competency combination required by CBE, including behavioral indicators representing competencies, traits, self-concept, motivation, knowledge, and skills.
When planning the content of OCS, this research considers the commonality of the professional talents' competency requirements of different enterprises in the industry, as well as the necessity of reflecting the competencies of specific occupations. Therefore, the OCS training system is not limited to a specific industry category. Various industries can use the OCS system for manpower training planning. Using OCS units to define the scope of work can formulate personnel training plans for each occupational category. Such a design can reflect the commonality and necessity of competencies required by similar industries, and the development and validation of curriculum research frameworks based on OCS theory through appropriate competency analysis methods can be widely used in all walks of life. When designing vocational ability, this study also defines the operational definition of vocational ability according to the complexity of the work, and divides the ability index of OCS into six levels. Level 1 competencies are the ability to perform routine and repetitive tasks in predictable and routine situations, with close supervision and clear instruction. This stage generally does not require special training, education or professional knowledge and skills, such as workers on the production line, repeating the same actions. The second level is the ability to perform tasks as instructed under continuous supervision in most predictable and routine situations. This requires the development of simple judgment and understanding skills, such as product classification and inspection. This stage should have basic knowledge and skills. The third level of competency is the ability to perform tasks independently under general supervision in partially changing and unconventional situations, which requires a certain level of professional knowledge and skills as well as judgment, such as the work of flight attendants, when encountering emergency situations. The situation can be judged immediately and dealt with urgently. Level 4 competencies are the ability to independently perform planned and designed tasks, requiring only light supervision, the ability to perform work tasks in changing situations, requiring skilled skills and a high level of expertise, and the ability to make judgments and decisions competencies, such as marketers. Level 5 competencies must be able to perform tasks autonomously with minimal supervision in complex and changing situations, which requires applied, integrated and systematic expertise and skills, as well as strategic thinking and
judgment skills, such as department managers. The sixth-level ability refers to the ability to use comprehensive professional knowledge and skills to independently complete professional and innovative tasks in highly complex and changeable situations, which requires the ability of lateral thinking, decision-making and originality, such as the boss of a company. In this study, the OCS curriculum training system was designed as a module, and Spencer's (1993) competency theory was expanded to include job responsibilities, work-related tasks, work output, behavioral indicators, functional levels, knowledge, skills, attitudes, self-concept, judgment, fully present the entire training module and explain the execution method in detail, and provide it to enterprises or educational institutions that need personnel training. As a reference for training talents, OCS can plan and train different levels of training according to different ability indicators. Personnel is the biggest contribution of OCS in CBE. In the part of the functional connotation table, this study uses the explicit knowledge and skills of competency mentioned by Ulrich et al. (1995) to achieve training goals in a standardized way, and the explicit attitude, judgment, and self-concept of competency are obtained through observation and literature derivation as students pursue their goals.

![Occupation Competency Standard](image)

**Figure 6. Occupation Competency Standard**

**Sample size and sampling methods**

The study was conducted over a four-year period, and students' intent to participate in the research course was used to validate their motivation to learn. Before the start of the course, we held a briefing session on OCS-based teaching, explaining how the course was conducted and the evaluation criteria. Students who showed a high willingness to participate were selected into the experimental group to implement the CBE-based OCS teaching module. The other students were in the control group to implement the traditional teaching method and track the employment of the students after the students finished their training. According to the opinions of experts and the analysis of the manpower demand of enterprises, this study uses the
function of flight attendant as an example of OCS course design. The course is designed as a 72-hour course, including 4 hours of safety inspection, 4 hours of pre-flight service preparation, and 4 hours of passengers getting on and off the plane. Guidance, 12-hour in-flight broadcast drill, 16-hour cabin safety equipment use drill, 12-hour in-flight catering service, 4-hour duty-free sales, 4-hour flight briefing, 12-hour paper-and-pencil quiz, and practical assessment. The teaching method adopts narrative teaching, teacher demonstration, and students' practical operation drill. The teacher first explains the key points and operation methods of the course, and then demonstrates the operation in person and guides the students to carry out practical exercises. In the final practical assessment, students are required to perform all the operations taught in the course. Through the structured training of this teaching module, students can integrate into the workplace more smoothly after entering the workplace.

The sample is from the students of the University's Air Transport Service Department. The research was carried out continuously for 3 years. A total of 243 students in the experimental group were selected through interviews to implement OCS teaching. Free registration, the prerequisite is to pass the foreign language proficiency certification, and then conduct face-to-face interviews from the registered students, so that the students can fully understand the implementation of the OCS course and obtain the consent of the students for data collection.

**Data sources and collection instruments**

The source of the research data is 243 students who have implemented OCS teaching. The data collection is a questionnaire survey of students who have received OCS course training. The questionnaire is designed with a 5-point Likert scale. The questions of the questionnaire refer to Pintrich et al (1991) The Learning Motivation Scale has a total of 40 questions, and students are invited to give feedback on the teaching mode of OCS. In the part of statistical analysis, SPSS 2.4 is used as a research tool, and the questionnaire data is converged by factor analysis method to analyze the correlation coefficient, hoping to understand the students' learning motivation for the OCS training course module and the performance feedback when they enter the workplace after completing the training.

Variable items that retain high explanatory power after convergence:

(CBE): I want to be able to learn competency based education

(OCS): The course modules of OCS meet the needs of the competencies I want to develop

(PCL): I will take courses that I find useful

(MOT): I feel that OCS is important, so actively strive to participate in this course

(KNG): OCS courses improve my professional ability

(SKL): OCS courses enhance my expertise

(ABT): OCS courses improve my professional skills

(TRA): I will strive for good grades in course subjects that I find useful

(SCT): The OCS course gave me confidence and a sense of achievement for the future

(OGT): The OCS course made me perform better at work

**Data analysis methods**

The purpose of this study is to design a set of efficient OCS training modules that can be widely used in functional training planning in any position, while addressing Zlatkin-Troitschanskaia and Kuhn's (2010) report that although some countries attach great importance to CBE, almost There is no effective system or comprehensive research to assess the
competencies that students must acquire from higher education. OCS uses the goal of Competency based education (CBE) through long-term planning and experimentation to design a competency-based education spirit. Teaching the module, and actually implement the course to verify the implementation effect of the OCS module.

Table 1: Statistical analysis results of the questionnaire

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**. Correlation is significant at the 0.01 level (2-Tailed).
P-Value<.0006,.001

The path analysis of the research results of the correlation coefficient is as follows:
Spencer (1993) divides competencies into two categories: "obvious" competencies and "hidden" competencies. The former category includes knowledge and skills, while the latter category includes motivation, traits, and self-concept. Emphasize that knowledge and skills are often visible, relatively external characteristics of people, and these are easier to train and develop. In contrast, motivations and traits are the deepest hidden qualities of a person; therefore, they are difficult to shape and develop. In the context of public education or school education, vocational education experiences can be designed to teach students about entrepreneurship. While traits and self-concept are not easily quantifiable, can "hidden" competencies be inferred by quantifying "obvious" competencies? For people with competency traits, in the case of strong PCL, will this trait lead to strong learning motivation? In the same way, people with strong self-concept will have a stronger motivation to complete their goals in the case of strong PCL? Through the data collection of the questionnaire, the correlation coefficient of H7 is .870, the correlation coefficient of H8 is .944, the correlation coefficient of H9 is .942, and the correlation coefficient of H10 is .976. From the data point of view, H7: the motivation of pursuing knowledge is related to The influence of competency traits is significant. H8: The influence of motivation and competency traits to improve one's ability is significant. H9: The motivation to improve one's own ability and the self-concept of competency have a significant influence. H10: Competency traits have a significant impact on improving organizational performance. And H11: The self-concept of competency has a significant impact on improving organizational performance. These two research hypotheses are derived from the literature. Cardy and Selvarajan (2006) define competency as the characteristics associated with effective
performance, arguing that employees with these characteristics show "significant positive differences" from those without these characteristics. In other words, companies can effectively improve organizational performance by developing individual competencies and bringing in employees with high-performance knowledge, skills, competencies, and traits. In addition to its application in the field of human resource management, the concept of competency has also been applied to school education by some researchers. Therefore, this study assumes that people with competency traits and competency self-concept have a significant impact on improving organizational performance because they have positive motivation to become people with high knowledge, skills and abilities. In this part, the correlation coefficient of H11 is .804, and the correlation coefficient for H12 is .821, so the effect of the research hypothesis for H11 and H12 is significant.

**Ethical considerations**

Through the establishment of an execution module for OCS, this study bridges the gap in the literature due to the lack of in-depth discussion on the implementation process of OCS despite its universally recognized importance. All college students enrolled in this study voluntarily participated in the experimental research after they were provided a briefing and their intention of participation was ascertained. All subjects agreed to the data collection during this study and the follow-up survey on the employment effectiveness of students one year later. Students’ personal data were anonymized to ensure zero risk of personal data leakage.

**Results**

This study attempts to use explicit variables that can be quantified and measurable, through actual implementation verification and literature theoretical derivation, to standardize the unmeasurable personality traits and self-concept through knowledge, technology and ability. The OCS functional teaching module is developed, which can be widely used in all walks of life. Business executives can also use the OCS module to find and train employees with competencies in the shortest time to improve organizational performance. This part should be the biggest contribution of this study. However, although we have established a training mechanism for this module, the most important and difficult part is that this module needs to be designed and operated by professionals with practical experience, such as chefs, planning managers, flight attendants, etc. Teachers themselves must have held this position before they can plan courses and teaching materials. The traditional teaching method of case study cannot be applied to the teaching module of OCS. Objectively speaking, the OCS training module may be more suitable for use in organizations or enterprises. When the training module is completed and personnel training is carried out in the future, personnel training at each stage can be carried out according to the job level and the curriculum training map. However, for traditional university education, if the teachers themselves have no workplace experience, it may still be difficult to implement. Therefore, it is suggested that universities can cooperate with enterprises to plan courses according to the needs of enterprises, and may adopt the method of collaborative teaching between teachers and teachers, so that OCS courses can be implemented at the stage of university education, and students can smoothly enter the workplace after completing the training, which can not only help students find employment smoothly, but also save the time and cost of manpower training for new recruits. For enterprises, there should be a considerable degree of help.

In this study, 6 stages of OCS courses were conducted for 3 years, and a total of 243 students were trained. After completing the training, a total of 67 students entered Airline C, a
total of 42 students entered Airline E, and a total of students entered European and American Airlines. 26 students, 33 students entered the airport VIP room, 55 students entered the airport duty-free shop service, and 20 students entered the airport transit hotel service. Tracking student employment results shows that students who complete OCS training are in good employment after graduation. It shows that the curriculum module of OCS has a significant effect on promoting students' employment development.

**Discussion**

Zlatkin-Troitschanskaia and Kuhn (2010) demonstrated that although countries globally attach great significance to CBE, there is barely an effective system for or comprehensive research evaluating the abilities that students acquire from higher education learning. To solve this problem, the present study explored the planning of EE curriculum. However, no EE-related reference books were available in the market. Therefore, our development of teaching modules started from the analysis of work procedures. A thorough breakdown of steps, focus of work, and methods of operation for each work item of flight attendants was recorded in detail in the table of competency compositions, offering participants a clear picture of each step. From the development of instructional materials to the conclusion of the curriculum and the follow-up survey on students’ employment status, the entire process lasted for four years. The flight attendant occupation was selected as an example for research primarily because it is a dream job for college graduates. Many youngsters aspire to work as flight attendants, an occupation that enables them to travel around the globe. However, with too many applicants competing for too few job vacancies, the threshold for entry to the aviation industry remains relatively high. Additionally, people are curious about the occupation of flight attendants. Therefore, this study examined this occupation and used it as an example for constructing an OCS model. The established OCS module can be widely applied to different occupations, and this study can serve as a reference for human resource departments in designing personnel training programs in the future.

**Conclusions**

This study explores the teaching model of OCS to further help higher education students enter the workforce smoothly after completing higher education and training. Before implementing the research course, the teacher clearly explained the course objectives to the students and determined that the students had a strong motivation to learn. During the course, in addition to receiving information, students should also actively process homework records, collaborate with classmates in the same group, discuss and develop flight plans, and perform all in-flight work projects. This study details student learning content, assesses student learning, and tracks student learning outcomes and subsequent employment status. The findings of this study echo those of Biggs and Tang (2011): innovative teaching methods alone are not sufficient to promote effective learning, a constructive theory of consistency should be used to promote the relationship between learning outcomes, teaching and learning activities, and assessment consistency. Baartman et al. (2007) argue that courses designed through competency-based approaches and corporate education should have the same coherence. To achieve this goal, teaching staff must have their own workplace experience (Peltonen 2015), and Gibb (2005) also advocates that teachers should have sufficient practical experience. (Peltonen 2015) concluded that from a teacher's perspective, corporate education is a matter of professional development and pedagogical renewal. Therefore, teachers should be seen as entrepreneurial agents, not just enforcers of curriculum guidelines.
Therefore, this study tracked the employment status of students after graduation after the training, and used the results to evaluate the teaching effect of the OCS module. OCS-based courses focus on learning motivation, traits and self-concept, initiative, autonomy, creativity and risk-taking. Additionally, students are allowed to set their personal goals and assess whether they have achieved these goals in their learning through OCS-based teaching practices. This gives students a degree of autonomy that helps them achieve their employment goals. This study reviewed the competency literature in higher education and developed an OCS curriculum module based on teachers' personal work experience and expert opinion. Therefore, students can gain practical experience from OCS studies and learn about occupational phenomena in the process, and through such course training, students' future employment need not be limited to the aviation industry. We believe that with sufficient entrepreneurial drive and extensive learning, students can be confident and competent in any relevant occupation.

Limitations

To develop an in-depth competency-based curriculum design, this study limited its scope to the occupational specialization of teachers as airline flight attendants, and future research could incorporate different types of occupations to develop a curriculum for broader OCS competencies and expand learning outcomes scope of research and follow-up investigations. Another area worthy of follow-up research is the correlation between student motivation and personality traits. In our briefing on the OCS teaching module, differences in learning motivation and traits between students who showed initiative and hesitant participation were a variable of great interest to us. However, due to time constraints, this study focuses on the construction of the OCS teaching model, and further research will be conducted in the future to explore how the differences in learning motivation and personality traits can assist students with lower learning motivation to move towards a more active learning direction.

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