

Evaluation of the comprehensive thematic teaching effectiveness and technique/technology in culinary vocational education

Thematic
teaching
effectiveness

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Abstract

Purpose – The research aims to discuss technical and vocational students' long-term and complete evaluation of learning effectiveness under school-wide thematic teaching design.

Design/methodology/approach – This study adopted a mixed qualitative and quantitative approach to measure the learning effectiveness of thematic teaching in technical vocational schools using the Kirkpatrick model. Qualitative research conducted in-depth interviews with 32 interviewees, including students, parents, teachers, graduate alumni and the supervisors of off-campus internship units. Quantitative research conducted a questionnaire survey on vocational students. A total of 221 valid questionnaires were collected. In addition, this research conducts another quantitative survey on cooperative enterprises to compare the actual effect of the implementation of the school-wide thematic teaching students with the others, and a total of 35 valid questionnaires were collected.

Findings – The results of the research found that the effectiveness of thematic teaching method can achieve the expected goals of each level of Kirkpatrick model. The students taking thematic teaching are significantly better and fitting in the industry expects. Therefore, this research suggests the comprehensive introduction of school-wide thematic teaching to other school operators.

Originality/value – This research is the first study used the Kirkpatrick model to evaluate the effectiveness of school-wide thematic teaching design in hospitality education and providing a practical case for schools. This research combined qualitative and quantitative research methods to investigate the effectiveness of the teaching method through multiple perspectives. Through the feedback from supervisors of the hospitality industry, the school-wide thematic teaching design provides a good foundation for technical and vocational graduates.

Keywords Interdisciplinary teaching, Thematic teaching, Literacy, Kirkpatrick model, Soft and hard skills

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1. Introduction

Taiwan's technical and vocational education is facing the influence of the internal and external social environments, which has brought many hidden concerns to the surface, including the dilemma of the academic gap, students' low motivation to learn, credential

inflation, lack of employment power in the workplace and lack of enrollment under the impact of a low fertility rate (Hsia, 2017; Lin, 2016; Lin and He, 2015). According to the results of a survey conducted by the Ministry of Science and Technology of the Executive Yuan, among young people aged 25–26, only about 50% of the graduates from Universities of Science and Technology and general universities consider themselves to have “learned something” (Ministry of Science and Technology, 2015).

The old education system and regulations have made technical and vocational education influenced by the social culture of “emphasizing academics over skills.” Higher vocational education is gradually withering, and the curricula of technical colleges and universities are converging with those of ordinary universities (Chang and Chen, 2017; Wu *et al.*, 2014). As the above shows, it seems that technical and vocational education is gradually losing the purpose and function of “practical application,” industry interface and cultivation of talents; therefore, how to align the curriculum and consider new teaching designs in technical and vocational education is an issue that cannot be delayed, but needs urgent attention and discussion (Chang, 2019; Chen, 2012; Liu and Liu, 2014; Wu *et al.*, 2014; Wu and Chien, 2014).

One of the solutions to this dilemma of the gap between learning and application seems to be found in the design of thematic teaching. The reason for this is that the business management problems faced by the practical world are usually complex and multi-faceted, and the design and learning of thematic teaching is quite suitable for the characteristics of the talents required by the practical world. A number of studies have shown that the thematic teaching method involving web-based curriculum planning integrates various areas of knowledge into one teaching activity, which helps students to connect learning experiences horizontally and vertically to form a complete body of knowledge, while reducing the number of subjects and the burden of learning hours, resulting in superior learning results and social value (Chumdari *et al.*, 2018; Kao, 1998; Sari *et al.*, 2019; Tsai, 2001). In terms of competency development, thematic teaching cultivates interpersonal relationships through peer interaction and cooperation, and students are able to demonstrate the characteristics of responsibility and self-management (Huong *et al.*, 2018; Kratochvílová, 2010; Min *et al.*, 2012; Wardani, 2020).

In 2014, Taiwan promulgated the General Framework of the 12-year National Basic Education Curriculum Guidelines, which was officially implemented in the 2019 school year (also known as the 2019 Curriculum Guidelines). In the 2019 Curriculum Guidelines, “literacy” is defined as: the knowledge, ability and attitude that an individual is indispensable for comprehensive development and to meet the needs of life situations. It includes 3 aspects of “autonomous action”, “communication and interaction”, “social participation” and 9 corresponding items derived (Tsai and Chen, 2013). A flexible learning curriculum was established at the national junior high school and elementary school levels to adopt an inquiry-based curriculum with a unified theme, which strengthens the integration of various knowledge skills and life application skills by combining multiple issues across fields/subjects. At the secondary and higher education levels, cross-disciplinary subjects, topics, experiments, or exploratory experiences are also offered to give students a cross-disciplinary/disciplinary integrated curriculum (Ministry of Education, 2020), which shows that cross-disciplinary integrated curriculum design and teaching implementation is the most important way to implement the philosophy and goals of the 2019 Curriculum Guidelines (Tseng, 2016).

Since thematic learning is based on the principle of integration, learning activities combine the basic competencies of several types of course content and link them to other concepts they have mastered from the learning experience, not only integrating the subject content, but further emphasizing the application of integrated knowledge, making learning close to life and providing students with meaningful learning experiences (Chen, 2010; Judge, 2009). Therefore, it is consistent with the cross-disciplinary integrated learning emphasized in the 2019 curriculum, which can avoid duplication of course content and wasted teaching time when teaching in separate subjects (Marsono *et al.*, 2019).

With the rapid development of science and technology, thematic teaching is also adjusted along with social trends. In terms of specific operations, in addition to cross-disciplinary learning, it is more integrated into the concept of science and technology. For example, STEAM (Science, Technology, Engineering, Art, Mathematics) education is carried out in a way that combines science, technology, engineering, art, mathematics and other cross-fields and subjects (Maeda, 2013). Through thematic learning and “learning by doing,” students’ learning cognition can be created through practice or experiments, which can enhance students’ learning motivation and develop self-learning ability. For example, through the use of technology to build a self-owned educational MOODLE platform and APP programs, it can present excellent works for mutual observation, dialectical discussions between teachers and students, repeated practice of certificates, reflections on internship experience, teaching field records, etc. Both make full use of online and offline mixed themed results presentations, and maximize the effectiveness of the school through the integration of virtual and real.

In general, the difference between thematic teaching and traditional system teaching is that thematic teaching is mostly unified and related to themes, and the selection of teaching materials is centered on life experiences, students’ interests, teacher-student co-construction, and social issues. The traditional teaching style is mostly scattered, fragmented, and independent, the selection of teaching materials is dominated by standard textbooks and teachers, and students mostly receive knowledge passively (Hsia, 2017; Kao, 1998; Tsai, 2001).

In order to recognize the results of student learning, it is necessary to evaluate the quality of teaching, and the value of teaching methods can be recognized through evaluation of their effectiveness (Lin and Cheng, 2016; Posavac, 2015). In view of the above-mentioned characteristics of thematic learning, it is most suitable to use the Kirkpatrick model that incorporates the learners’ learning process and knowledge application into the evaluation when evaluating learning effectiveness (Kirkpatrick and Kirkpatrick, 2016; Reio *et al.*, 2017).

In summary, the thematic approach allows teachers more flexibility, students more room for development and creativity, and teaching that responds to the changing social landscape. It is clear that the thematic teaching method is very suitable for industry and technology-oriented technical vocational colleges and universities, and the spirit of the thematic teaching method of integrating subjects to explore specific topics is also consistent with the cross-disciplinary integration of the 2019 curriculum. Previous studies on thematic teaching have remained too fragmented, focusing on single courses, staged or experimental courses (Fauziah *et al.*, 2020; Li, 2012; Tsai, 2001; Wang, 2011), or on national primary and secondary schools (Chien and Chen, 2018; Huong *et al.*, 2018; Tseng, 2005; Wang, 2011). There is still no research on the effectiveness of school thematic curriculum design, focusing on technical students as the main participants, and exploring the difference in learning effectiveness between thematic teaching and general teaching methods.

2. Purpose of the study

This study adopted a mixed qualitative and quantitative approach to measure the learning effectiveness of thematic teaching in technical vocational schools using the Kirkpatrick model. Based on the above-mentioned previous literature and the importance of the research topic, the purpose of the study is as follows:

- (1) To investigate the influence of the comprehensive thematic teaching method on the comprehensive introduction of technical and vocational education in hospitality and tourism.
- (2) The investigate Kirkpatrick model to measure the feasibility of a comprehensive thematic approach in the vocational education of hospitality and tourism.

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- (3) To investigate the differences between the holistic thematic teaching method and other teaching methods in terms of vocational student learning effectiveness.

3. Literature review

3.1 Thematic teaching of “spot,” “line,” and “area” in food and beverage vocational schools

The effectiveness of thematic teaching nationally and abroad can be summarized as, starting from the concept, deepening students’ learning, achieving learning transfer, having a positive impact on the practicality of the practical course, helping to enhance students’ confidence and strengthen their communication skills, and guiding students to reflect. Especially in today’s education field, where the new curriculum emphasizes cross-disciplinary literacy, thematic teaching is an appropriate teaching method (Chan and Chen, 2018; Fauziah *et al.*, 2020; Huong *et al.*, 2018; Li, 2012; Rissanen *et al.*, 2016; Tseng, 2005; Wang, 2011; Wu and Yeh, 2003). Many studies have confirmed that thematic teaching can promote students’ soft skills (Fadillah, 2014; Han *et al.*, 2015; Kovalik, 2014; Mills and Treaguest, 2003; Wu and Yeh, 2003). Some scholars have also suggested that this learner-centered approach to learning through investigation or responding to questions can lead to the acquisition of both knowledge and skills (Wang, 2018). However, most of the current research studies on thematic teaching are less focused on technical and vocational education, which requires more soft and hard skills than other forms of education (Marsono *et al.*, 2019).

The so-called “hard skills” refer to professional knowledge and skills, whereas “soft skills” are “basic work skills” such as communication and coordination, problem solving, teamwork, interpersonal relationships, temporary reactions, technology applications and professional ethics.

Tchiboza (2010) pointed out that continental countries divide the literacy in the school curriculum structure into subject-specific literacy and generic literacy. It is clear that literacy education not only retains subject-specific knowledge, but also strengthens the comprehensive and overall performance of using cross-disciplinary capabilities in real situations and experiences (Han, 2009). It can be seen that literacy education echoes the concepts of soft skills and hard skills. The design of technical and vocational education focuses on the learning process with both soft and hard skills. The biggest difference from general education is that it can cultivate the practical ability of “learning transfer”; that is, the ability to apply what is learned can be transferred to practical work (Wen, 2016). However, in the current teaching scene of Taiwan’s technical and vocational schools, the teaching is overly academic due to the overemphasis on the technical aspects, or due to the influence of advancementism (Li and Chen, 2015; Technical and Vocational Education Policy Framework, 2019). As a result, the teaching module of many technical and vocational schools is still relatively traditional, and there is a lack of preparation training for the thematic teaching that can improve students’ soft and hard skills. Schools and departments often encounter many difficulties when implementing the program, or eventually choose to give up.

From the above discussion, it is clear that the fundamental attribute of technical and vocational schools is that they are very suitable for thematic teaching, which can cultivate students’ soft and hard skills. However, in many technical and vocational schools, it is difficult to learn both skills among practice-oriented, degree-oriented, and academic-oriented teaching; therefore, thematic teaching has not been popularized. However, the introduction of school-wide thematic teaching seems to be able to effectively balance the learning of students’ soft and hard skills. Wen and Yang (2017) pointed out that a comprehensive (school-wide) introduction of thematic teaching can achieve the best learning effect. However, as far as we can find in literature, the thematic curriculum, which emphasizes learning-by-doing and a teaching style based on thematic events, has mostly been implemented at the elementary and junior high school levels, mostly in life science and technology, computer information,

environmental education, or nature courses, which are limited by the time, space, content, and teachers' lack of experience in the present school system (Chang, 2018; Chen, 2007; Wang, 2011). Most of the studies on thematic teaching focus on the establishment of a model for curriculum development, curriculum evaluation, or case studies, and are mainly single-course, phased (6 months–1 year), and experimental studies. However, only a few academic studies have focused on the overall effectiveness of the introduction of school-wide thematic teaching in catering technical and vocational schools.

In addition, most technical and vocational students learn better in practical teaching than lecture teaching. The purpose of secondary technical and vocational schools is to cultivate knowledge and skills that can be applied in real situations and quickly connect with the industry and society which is similar to the concept of thematic learning. So whether the applicability of thematic teaching can become a normal teaching method? There is no research has investigated the long-term learning outcomes of students. Therefore, we are exploring how to deepen and localize the thematic teaching method in catering in secondary technical and vocational schools. How can the curriculum be innovated? It is important to explore the effectiveness of teaching, how to respond to the needs of today's catering industry and education policy, and how to prove that the effectiveness of school-wide thematic teaching is better than other approaches. The idea of this study is that, given the nature of thematic learning content, it is obviously important to have a comprehensive understanding of the different stages of students' learning process, and the relative assessment of the final learning results (compared to other technical vocational schools) is crucial.

3.2 The Kirkpatrick model's results level is even more important for career-oriented technical and vocational schools

Unlike traditional assessment models, the Kirkpatrick model is characterized by exploring the learner's journey from knowledge acquisition and skill acquisition to practical application, including reaction, learning, behavior and results levels (Kirkpatrick and Kirkpatrick, 2016; Reio *et al.*, 2017). It is the most widely used learning effectiveness assessment model in the world (Bubb and Earley, 2007; Chung, 2017; Reio *et al.*, 2017). The Kirkpatrick model has been used in medical education and training for nearly 60 years, and has evolved to be used in computer science, business and social science, and even in teaching. However, it can be found in the literature that the Kirkpatrick model is mostly applied to digital information teaching (Badu, 2013; Fadhilah *et al.*, 2018; Li, 2019; Lin *et al.*, 2007), university courses (Badu, 2013; Chang and Chou, 2015; Lin, 2018; Praslova, 2010), health science courses (Dehghani and Raadabadi, 2019) and on-the-job training courses for faculty and staff (Farjad, 2012; Tsai, 2010), etc., and its applicable subject areas are still expanding (Alsalamah and Callinan, 2021a). Analyzing various evaluation methods of education and training, the Kirkpatrick model is the most widely used and most popular evaluation model of learning effectiveness in the world (Alsalamah and Callinan, 2021a, b; Bubb and Earley, 2007; Chung, 2017; Reio *et al.*, 2017; Srivastava and Walia, 2018). The characteristics of the Kirkpatrick model seem to be more suitable for the teaching characteristics of both "soft and hard" in technical and vocational schools.

However, the Kirkpatrick model has its practical limitations: (1) most educational studies prefer to use the lower level of the Kirkpatrick model; (2) the model tends to ignore other important assessment factors such as contextual factors; and (3) there is a lack of evidence on the causal chain between levels (Alliger and Janak, 1989; Bates, 2004; Cahapay, 2021). The purpose of this study was to examine the effectiveness of thematic teaching and learning in higher vocational schools, both in terms of the results of school-thematic teaching and learning. In order to present a complete picture, all stages of the study, from internal learning to external internship and even work experience have been included in the scope of the study,

eliminating the hindrance of the majority of literature that focuses on the first two levels of the Kirkpatrick model.

Most studies using the Kirkpatrick model use quantitative research, using questionnaires or performance measures as analysis data (Chen *et al.*, 2018; Dehghani and Raadabadi, 2019; Farjad, 2012; Fadhilah *et al.*, 2018; Terttiaavini *et al.*, 2020). Inevitably, the aforementioned suspicion that other important evaluation factors are easily overlooked has also been adopted in qualitative research (Badu, 2013; Chan and Chen, 2018; Chang and Chou, 2015; Labayo, 2022; Tsai, 2010) to obtain richer and more diversified analysis data through in-depth interviews to remedy this shortcoming. This study also uses qualitative and quantitative research to break through the limitations of Kirkpatrick model.

As for the Kirkpatrick model, there is a lack of evidence to prove the cause-effect relationship between the levels, but most studies still use the Kirkpatrick model to evaluate the effectiveness of educational training, and the results have high reliability and validity (Alsalamah and Callinan, 2021b; Badu, 2013; Chen *et al.*, 2018; Dehghani and Raadabadi, 2019; Farjad, 2012; Fadhilah *et al.*, 2018; Labayo, 2022; Srivastava and Walia, 2018; Terttiaavini *et al.*, 2020). In summary, the Kirkpatrick model is an appropriate tool for analyzing the effectiveness of school-wide thematic teaching and learning in this study.

Different scholars have different considerations and practices when applying the Kirkpatrick model. Due to practical limitations, most studies only focus on the first three levels of reaction, learning, and behavior. However, as the width and depth of learning and training effectiveness become increasingly important, the fourth level of "results" assessment is gradually gaining attention in industry and academia (Li, 2008; Lin *et al.*, 2011; Reio *et al.*, 2017). However, the effectiveness of assessment at the results level is most likely to be interfered with by factors such as trainers' own lack of understanding of the assessment mechanism, the time gap between the end of learning and the demonstration of teaching effectiveness, and complex factors affecting learners' behavior not being able to be easily distinguished, which affects the difficulty of assessment (Chen *et al.*, 2018). Therefore, "results level" assessment is used very infrequently in practice due to its high difficulty in implementation and large variation in identification (Li, 2019; Liao *et al.*, 2019), or is replaced by simple and obvious items, such as test scores of course examinations. In view of this, most of the field studies combine behavioral and results levels (Chang and Chou, 2015; Chen *et al.*, 2018; Vizeshfar *et al.*, 2018). Based on the above arguments, it can be seen that combining the third (behavioral) and fourth (results) levels of assessment is also useful for evaluating training results (Tsai, 2010).

However, the important nature of learning in evaluating the effectiveness of teaching in technical and vocational schools lies in the ability to extend students' learning activities to the industry so that students can respond and learn in real situations, and only in this way can the true effectiveness of technical and vocational education be seen. However, the application of Kirkpatrick's model in the past literature is still incomplete. There is no research that considers the reaction, learning, behavior and results levels of the Kirkpatrick model in the context of a higher education school where school-wide thematic teaching is adopted.

With the implementation of the 2019 curriculum, thematic teaching has become a trend in schools at all levels, but relevant studies from the point (Huang and ChanLin, 2007; Yang and Wang, 2002), to the line (Li, 2012; Lin and Lu, 2005; Wang, 2011), and to the facet have not yet been explored to assess the learning effects of thematic teaching and the "facet measurement." This study therefore aimed to present in detail the final student learning results of the school-wide thematic instructional design through a complete research methodology design.

4. Methodology

The thematic teaching curriculum in this study is based on the K-School thematic teaching curriculum, and the content of the course was jointly developed by the professional teaching

team. The teaching activities were designed according to the objectives of the curriculum, and the learning effectiveness was examined through qualitative and quantitative methods, especially from the five perspectives of students, alumni, teachers, parents, and supervisors from industry, in order to more comprehensively and objectively evaluate the real effectiveness of thematic teaching in K-School.

4.1 Research field and objects

This study will focus on K-School, which was founded in 1953 and has been in existence for over 60 years. The school does not have a uniform or textbook in the curriculum and breaks down the restrictions of sub-disciplines, with more than 20 thematic activity courses throughout the three years of senior high school study. The level of difficulty ranges from shallow to deep, and the scale from small to large, providing students with a stage for diversified expression and appropriate exploration which is currently the only school in Taiwan that has fully implemented thematic teaching. This study was designed using a combination of qualitative and quantitative methods, with students, parents, teachers, alumni, and supervisors of external internship units of K-School for the 2019 academic year as the target population.

Teddlie and Tashakkori (2009) point out that mixed research refers to the process of using qualitative and quantitative methods simultaneously or sequentially in a single study or multiple studies to form research questions, data collection, data analysis and interpretation of results, and to adequately link and discuss the relationship between qualitative and quantitative results in the interpretation of results. Therefore, it has multiple check, complementary, stepping-stone and clarification functions (Sung and Pan, 2010; Creswell and Plano Clark, 2007; Tashakkori and Teddlie, 2003). For example, when evaluating the effectiveness of mobile tour machines for museum visitation instruction, both the duration of the visit and the perception of the visit are different aspects of the same phenomenon, so using a mixed-method with qualitative and quantitative study approach is more helpful in understanding the overall phenomenon (Sung *et al.*, 2008).

Therefore, this study was designed to use both qualitative and quantitative methods to conduct interviews and surveys with students, parents, teachers, alumni, and supervisors of external internships in the 2019 school year of K-School. A mixed-methods case study was conducted to complementarily explore the different roles of the system in assessing different learning levels of the curriculum. Before the qualitative and quantitative tests are administered, instructions are given to students, parents, teachers, alumni and supervisors of external internships, including the principles of clear notification of the researcher's obligations, informed consent, full voluntary participation, anonymity and privacy protection, unconditional withdrawal from the study, and fair treatment of subsequent learning rights not affected by the study.

Taiwan has undergone a series of educational reforms since the 1990s, and schools have opened and developed one after another, which also reveals the trend of school operations toward diversification and specialization. K-School is also situated in the context of this wave of educational reforms. The school-wide thematic teaching of K-School is constructed by teachers and students through four major types of project: exhibitions, festivals, entrepreneurship, and public welfare. In addition to conforming to the core literacy, it is also integrated into the school's characteristic planning courses, and adopts real integration with the industry and event issues as teaching design. For example, the graduation exhibition is in line with the trend of borderless cuisine and is combined with local public service marketing, while the implementation of teaching adopts a project management group approach, allowing students to develop proposals, supplemented by learning mind maps, Gantt charts, and other tools to assist in the execution schedule and cost budget and publicity

design. The results are checked through the project implementation meeting. Experts, parents, and community members are invited to participate and give feedback at the presentation meeting. Finally, a closing report is produced to reflect on the learning process. Overall, the thematic curriculum allows students to fully realize their cooperation, responsiveness, and execution in different situations through different projects, as well as to develop their cross-disciplinary problem-solving and presentation skills, in line with the industry's integrated teaching of hard and soft skills.

With the advent of the era of smart technology, thematic teaching is also introduced into STEAM education in K-School. Through cross-disciplinary integrated learning, in addition to cultivating logical thinking in science, engineering, mathematics, etc., it is also necessary to develop artistic aesthetics. What's more important is to keep up with the advancement of technology, such as the original catering + STEAM courses. Starting from life, using the dynamic five-sense experience, adopting the "Hands On, Minds On" method, exploring the extension of food and cooking techniques to science such as safety, hygiene, ingredients and nutrition. Learn about dining trends so students can design meals that meet modern needs. Finally, integrate what students have learned in the past to create an image of restaurant operation management. From the above, we can see that the catering situation combines the "cross-field, hands-on, life application, problem-solving, and five-sense learning" in STEAM education (Maeda, 2013). Guided by thematic teaching, students will have the ability to adapt to the changes and challenges brought about by global trends through the spirit of students' active learning, participation in practice, independent creation and ability to discover problems.

For technical and vocational schools, the essence of learning lies in whether the content of students' on-campus learning activities can be extended to the field of off-campus industry, so that students can respond to changes and learning in real situations. A longitudinal study is the only way to fully evaluate the true effectiveness of technical and vocational education. However, due to the difficulties of continuous tracking of samples and consistency of sampling across time, this study investigated school-wide thematic teaching, based on Kirkpatrick's model, and carried out continuously and dynamically at four levels: reaction, learning, behavior and results, and through the collection of qualitative and quantitative data and the selection of participants at different levels, the cross-sectional study was approximated to a progressive longitudinal study in order to obtain complete evaluation results. For example, for the reaction level and learning level, the interviewees were second and third grade students, teachers and parents; for the behavioral level, in addition to the above participants, the interviewees included alumni who had graduated within 2 years; in terms of the results level, the interviewees were conducted with alumni who had graduated within 2 years and those who had graduated more than 10 years ago, as well as industry executives with different years of experience in the industry. Therefore, it can be seen that the collection of qualitative data had a progressive and continuous dynamic. In the quantitative study, some of the second and third grade students who had experienced thematic teaching for years were asked to self-evaluate the Kirkpatrick model by using a quantitative questionnaire to examine their learning effectiveness in terms of reaction, learning, and behavior during the school process; another part of the study was to observe the work performance of interns or graduates who had received thematic teaching in their companies compared to employees who had received other forms of education, and to examine the learning effectiveness of the Kirkpatrick model at the results level using a quantitative questionnaire.

4.2 Qualitative research

4.2.1 Development of qualitative questions. This study was designed to investigate the Kirkpatrick model in order to understand the extent to which students apply the knowledge

and skills they have learned in the school. This study conducted multi-party research by investigating the perception of various objects. This study used a semi-structured interview outline and divided the interviewees into three categories. The first category includes students, teachers, and parents, and the interview content included the reaction level, the learning level, and the behavior level. An example is as follows:

Question 1. Looking back at the traditional education before high school, what do you think is the biggest difference between traditional education and K-School thematic teaching?

The second category is alumni. Due to the time constraint of learning transfer and proposed evaluation after a period of time away from the thematic teaching, the interview content included the behavioral level and the results level, with a total of seven questions. An example is as follows.

Question 2. Do you think the thematic learning and school culture at K-School is helpful for your work in catering industry?

The third category is for the supervisors of the industry; as they only see the results of the students' learning during internship, the interview content is at the result level, with seven questions. An example is as follows:

Question 3. Compared with other internship students of the same age or from the same period from other schools, what advantages do you think the students of K-School have?

4.2.2 Qualitative data collection. This study examined the impact of school-wide thematic teaching, and is essentially an exploratory analysis, so an in-depth interview method was the most appropriate approach. This study was conducted at the end of March 2020, using a semi-structured interview outline, and five types of interviewees, namely school students, parents, teachers, alumni and supervisors of the industry, who were selected using the purposive sampling method. In addition to the representativeness of the sample, the number of respondents should also be saturated. For students (see Table 1), 10 respondents were selected, taking into account cuisine types, grade, gender, and work duties. For teachers (see Table 2), a diverse perspective of different generations and professional experiences was adopted to increase the heterogeneity of the faculty, and 4 teachers were selected. In order to clarify the school's operation and teaching philosophy, 1 parent representative from each grade was

Item	Category	Number of participants	Percentage	Item	Category	Number of participants	Percentage
Gender	Male	5	50.00	Years of experience	Within 6 months	2	20.00
	Female	5	50.00		1-2 years	3	30.00
					Over 3 years	1	10.00
Grade	Grade 2	7	70.00	Job Duties	Non Infield	4	40.00
	Grade 3	3	30.00		Outfield	2	20.00
Cuisine Type	Chinese	1	10.00		Beverage	3	30.00
	Western	3	30.00		Shop	1	10.00
	Baking	6	60.00	Non	4	40.00	

Source(s): Authors' own work

Table 1.
Basic information of respondents – students ($n = 10$)

selected from the K-School Parent Association for each grade, and 1 parent whose child graduated within one year and 1 parent whose child graduated more than 10 years ago were selected for comparison (see Table 3). For alumni (see Table 4), a total of 9 were selected from three categories, taking into account the balance of cuisine type, job position, and willingness to pursue higher education. For supervisors of the industry (see Table 5), a total of 4 were selected, taking into account the balance of job titles, years of experience, and industry categories.

In order to enhance the validity of the research analysis, Triangulation of Data Sources (TDS) was used as a reliability check, and the validity of the experts was examined and semantically revised by three experts who teach in the field of hospitality education or thematic teaching to suit different research participants (see Table 6).

4.3 Quantitative research

4.3.1 *Development of quantitative questionnaires.* The design of the quantitative questionnaire of this study refers to the research content of many scholars (Chen and Wang, 2006; Lin, 2018; Tsai, 2010; Wu, 2016), and based on the practical situation of the implementation of school-wide thematic teaching in K-School, the Kirkpatrick model was integrated into four levels, namely “reaction level,” “learning level,” “behavior level,” and “results level,” to check whether students’ self-assessment and other practitioners’ assessments improved the knowledge, attitude, and skills related to the thematic teaching method. However, the quantitative scale cannot tell what specific competencies are acquired in thematic teaching. The quantitative data were therefore supplemented by the concepts extracted from the qualitative interviews, with the hope that this qualitative and quantitative approach could be used to construct the whole picture and make the study more credible. The quantitative questionnaire consisted of five sections: basic personal information, reaction level (7 items), learning level (4 items), behavior and results level (9 items), and advice to school (1 item), totaling 21 items. Except for the open-ended question on suggestions to schools, the rest of the items were based on a five-point Likert scale, and respondents were asked to respond to the extent to which they agreed with the descriptions of the items.

In order to examine the applicability of the quantitative questionnaire, this study used exploratory factor analysis to establish its construct validity. Principal component analysis was used to extract the eigenvalues greater than one, and the maximum variation method was used to conduct the orthogonal rotation to obtain the negative factor loadings of each question and close the constructs to confirm its construct validity. Cronbach’s alpha was used to verify the reliability of the scale.

In order to confirm the reliability and value of the questionnaire before collecting data, a pre-test was carried out. A total of 60 participants from second and third grade were selected as the sample for this pretest, and the sample size was in line with the suggestions of

Item	Category	Number of participants	Percentage	Item	Category	Number of participants	Percentage
Gender	Male	0	0.00	Age	Under 30	2	50.00
	Female	4	100.00		31–40 years old	1	25.00
Years of teaching experience	Less than 3 years	3	75.00	41–50 years old	1	25.00	
	More than 3 years	1	25.00	Education level	University Graduates	4	100.00
	More than 15 years						

Source(s): Authors’ own work

Table 2. Basic information of respondents – teachers ($n = 4$)

Item	Category	Number of participants	Percentage	Item	Percentage	Number of participants	Percentage	
Gender	Female	4	80.00	Number of years your child was in school or graduated	80.00	First years	1	20.00
	Male	1	20.00			Second year	20.00	20.00
Age	40-50 years old	3	60.00	Children's work/part-time jobs by industry	20.00	Third year	1	20.00
	51-60 years old	1	20.00			Graduated 1 year	1	20.00
	Over 60 years old	1	20.00			Graduated for 11 years	1	20.00
Education level	Junior high school	1	20.00	Children's work/part-time jobs by industry	20.00	Catering	3	60.00
	High school	2	40.00			Business	1	20.00
	Vocational school	2	40.00	Children's work/part-time jobs by industry	40.00	No work experience	1	20.00

Source(s): Authors' own work

Thematic teaching effectiveness

Table 3. Basic information of respondents – parents ($n = 5$)

Table 4.
Basic information of
respondents –
alumni ($n = 9$)

Item	Category	Number of participants	Percentage	Item	Category	Number of participants	Percentage
Gender	Female	6	66.67	Cuisine type	Chinese	1	11.11
	Male	3	33.33		Western Bakery	3	33.33
		6	66.67			2	22.22
willingness to pursue higher education	Bachelor Industry-academic class	1	11.11	Chinese dessert	3	33.33	
	Further study overseas	2	22.22	Catering infield	3	33.33	
Continuing education	Did not further study	6	66.67	Catering outfield	2	22.22	
	Tourism Management department	1	11.11	Apparel Industry	1	11.11	
	Western culinary	2	22.22	Insurance Industry	1	11.11	
	Did not pursue further study	2	22.22	No job experience	2	22.22	

Source(s): Authors' own work

Thematic teaching effectiveness

Item	Category	Number of participants	Percentage	Item	Category	Number of participants	Percentage
Gender	Female	3	75.00	Job position	Human Resources Manager	3	75.00
	Male	1	25.00		Human Resources Specialist	1	25.00
Age	26–30 years old	1	25.00	Years of experience in the catering industry	Less than 5 years	1	25.00
	31–40 years old	1	25.00		6–10 years	1	25.00
	51–60 years old	2	50.00		26–30 years	2	50.00
Industry	Catering	2	50.00	Number of years of cooperation with K-School	Less than 5 years	1	25.00
		2	50.00		6–10 years	1	25.00
	Hotel	2	50.00		11–15 years	2	50.00

Table 5. Basic information of respondents-supervisors of the industry (n = 4)

Source(s): Authors' own work

Experts	Positions	Teaching experience
A	Academic Affairs Director	16 years
B	Teacher and best-selling author in the education category	8 years
C	Professor teaching in a university related to catering and travel tourism	20 years

Table 6. Background information of the experts for assisting in reviewing the interview protocol

Source(s): Authors' own work

Comrey (1988) and Wu and Chang (2014), who mentioned that the pretest sample size should be three to five times the number of pretest questions. A total of 60 questionnaires were sent out and 56 were returned, with a valid questionnaire return rate of 93.33%. Hee (2014) pointed out that the Cronbach's alpha should be greater than 0.70, and after reliability analysis, the overall and three levels of Cronbach's alpha were greater than 0.90. The KMO value for the validity component was 0.85 and the Barlett's spherical check approximate chi-square distribution was 967.99 ($p < 0.001$), thus demonstrating the suitability of the pretest questionnaire for exploratory factor analysis.

4.3.2 *Quantitative data collection.* In this study, the questionnaires were administered to 221 s and third graders. Because the first graders were still adapting to the thematic teaching method, and it was difficult to observe the behavior transfer and results stages. A description of the study was given in each class prior to administration, including the purpose of the study, voluntary participation, the principles of anonymity and confidentiality, unconditional withdrawal from the study, and that subsequent learning rights would not be affected by the study. A total of 221 online anonymous questionnaires were sent out, and each question was set as a mandatory reaction. All 221 valid questionnaires were collected, with a valid return rate of 100.00%. The basic information of the valid sample is shown in Table 7.

5. Results

5.1 Qualitative analysis

5.1.1 *Analysis units.* The qualitative data analysis process for this study was divided into three parts: analysis units, category development and reliability, and category validation.

Item	Category	Number of participants	Percentage	Item	Category	Number of participants	Percentage
Gender	Female	98	44.34	Cuisine type	Chinese cuisine	59	26.70
	Male	123	55.66		Chinese dessert	29	13.12
Grades	Second year	80	36.20	Western cuisine	Baking	86	38.91
	Third year	141	63.80		Waiter/waitress	45	20.36
Working experience in the catering industry	Yes	173	78.28			2	0.90
	No	48	21.72				

Table 7. Demographic data for the effective sample of quantitative analysis

Source(s): Authors' own work

The interviews were audio-recorded with the consent of the respondents and were transcribed verbatim. The transcribed verbatim drafts were analyzed by content analysis, which is regarded as a scientific and objective research method that provides a wide range of analysis and understanding of the direction of historical development, with the characteristics of objectivity, science, systematization, and obviousness (Berelson, 1952). Kassirjian (1977) pointed out that the first step of the content analysis method is to determine the appropriate units of analysis. Two experts (Judge A and B, see Table 9), both of whom have rich experience in teaching catering and travel education, conducted open coding for the transcribed data and labeled the sentences or paragraphs in the verbatim transcript. They analyzed a total of 581 original units of analysis, deleting 36 units and adjusting 4 units to extract 549 units after joint discussions. Table 8 shows the classification of the analysis units, where the questions are the original content of the questions, and the Kirkpatrick model levels are indicated.

5.1.2 Classification development and reliability. After identifying the basic units of analysis, the two experts then classified and named the relevant conceptual units (Strauss and Corbin, 1998). After completing the classification and naming procedure, the third expert (Judge C, see Table 9) conducted the interjudge reliability among different experts, and 2 weeks later the same experts, Judges A and B, conducted the intrajudge reliability at different times to check their reliability.

$$\text{Reliability test} = \frac{(\text{number of cards required} - \text{number of excluded cards})}{\text{number of cards required}} \times 100\%$$

Keaveney (1995), Ronan and Latham (1974) and Wang *et al.* (2000) suggested that the reliability test must be above 80% for this classification procedure to be reliable, and the extracted information can be used for further analysis of the results. The total reliability of interjudge (classification among different experts) of expert C was 99.44%; the total reliability of intrajudge (classification of the same expert at different times) of experts A and B was 100%, which shows that the reliability values are higher than 0.80, thus confirming the reliability of their classification methods.

5.1.3 Qualitative analysis results. The coding of this study is based on the principle of three codes: For example, "T1-1-1" is the unit code of the first teacher's interview, after the experts read the verbatim transcript; for example, "T1-1-1" is the first unit of the first question of the

No.	Assessment level	Questions	Original Unit	Deleted unit	Adjusted unit	Final Unit
1	Reaction	What is the biggest difference between traditional education and K-School thematic teaching?	80	-1	-2	77
2	Reaction	Which do you prefer, traditional education or K-School themed education?	67	-6	-18	43
3	Reaction	What would you like to see in the curriculum of K-School's thematic education?	119	-4	17	132
4	Learning	Do you think there are any specific competencies developed in thematic teaching? In what courses or situations did you learn them?	100	-5	-2	93
5	Learning	Of the seven core soft skills (self-discipline, reflection, thinking, learning, expression, leadership, and relationship) that K-School wants students to cultivate, what do you think are the top three that students improve the most?	None	None	None	None
6	Behavior	How do you apply the above competencies in your courses, training, or catering-related work? Can you give me an example?	68	-8	6	66
7	Results	Has the thematic learning at K-School brought any real benefits or positive feedback to the current catering work?	35	-5	-2	28
8	Results	In the actual catering workplace, what do you think makes you stand out more than other students who graduated from other schools?	28	-2	-1	25
9	Results	[Supervisors of the industry]What do you think are the advantages of K-School students compared to other intern students of the same age or at the same time?	7	-1	3	9
10	Assistance	[Teachers]Do you think the current K-School curriculum is in line with literacy-oriented teaching?	11	-1	0	10
11	Assistance	[Teachers] What is the biggest difficulty you have encountered in thematic teaching? What do you think is the biggest difficulty you have encountered in implementing thematic teaching in your school and in other schools?	39	-2	3	40
12	Assistance	[Supervisors of the industry] What are the first impressions and characteristics of K-School students in the workplace?	15	-1	0	14
13	Assistance	[Supervisors of the industry] What do you think are the competencies that the industry needs now?	12	0	0	12
Total Unit			581	-36	4	549

Thematic teaching effectiveness

Table 8.
Classification of analysis units

Source(s): Authors' own work

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first teacher interviewed that was marked by experts A and B together, and so on. Respondents were coded with capital letters, with T being teachers, P being parents, G being alumni, ST being current students, and C being practitioners. The results were analyzed in order to answer the following questions.

1. [Overall Result] K-School Curriculum meet the literacy education of the 2019 curriculum

The respondents were asked to indicate what they thought the current curriculum design and implementation were doing better or were lacking in the core literacy of the 2019 Curriculum Guidelines. The four interviewed teachers agreed that all of these core literacy items are reflected in the K-School thematic instruction, but only to a greater or lesser extent in the curriculum, especially the “Interpersonal and Teamwork” item, which is the most frequent part of the K-School curriculum.

For example, “C2 interpersonal relationships and teamwork,” from the first grade to the third grade, I will continue to work in different classes, groupings and so on. At the end, they will understand what kind of person is not suitable for teamwork, and how they should cooperate with different types of people. (T5-14-2)

2. [Overall Result] Specific ability development of students in thematic teaching in K-School – specific ability acquisition, learning field

Respondents mentioned the learning of expression and word processing skills most frequently in the thematic teaching in K-School.

My soft skill is really a lot better, before, when I spoke in front of many people I would start to blush, and then my hands would be very shaky, but when I was in the final report, I was able to make a presentation to three or four hundred parents, and then I felt super cool when I finished speaking. (ST4-8-5)

As for the learning areas, respondents mentioned project organization, group reports, and so forth.

Personally, I prefer the presentation part. I feel that I can learn something different every time . . . I report in class, and I learn more about oral expression and presentation skills. (G10-3-1)

3. [Overall Result] Among the seven core soft skills that K-School aims to cultivate in students, the items in which students make the most progress and the areas in which they can be practically applied

Judge	Work experience	Teaching experience	Background information
A	11	11	Rich experience in teaching secondary education in catering and travel, and has served as the head of the Tourism Division for 2 years
B	19	13	4 years of experience in higher education and teaching in the hospitality industry
C	18	18	University professor with many years of experience in teaching higher education in hospitality and tourism

Source(s): Authors' own work

Table 9. Interjudge and intrajudge expert data sheet

This question was designed for students in the thematic learning program. Among the seven core soft skills developed by K-School, the most improved ones were expression, leadership, self-discipline, and thinking skills.

In terms of leadership, for example, sometimes we are in the kitchen, we have to inform the orders and deliver dishes, then we have to find a way to control the whole procedure. You have to find out how to command the waiters to serve each table correctly and on time. (ST8-10-3)

4. [Overall Result] First impressions and characteristics of K-School students by the internship unit and the abilities required by the industry

The internship supervisors believe that the catering industry is looking for people who are proactive and outgoing, and they also recognize the K-School students fitting this trait.

We need lively stuffs, because now the restaurant is more inclined to have a story, or to be thematic. People don't just go to eat, they want this restaurant to further bring some kind of imagery. We also observed the situation that customers hope to have more interaction with the waiters. So waiters must be positive, willing to talk with the guests. (C3-17-2)

5. [Reaction level] Satisfaction with the arrangement of course content in K-School thematic teaching

The average rating of all respondents in terms of satisfaction with the course content was 3.77 out of 5. Most of the respondents said they were satisfied with the content of the courses, such as projects, activities, fieldwork, and so on. Although the course was tiring, they enjoyed it because the atmosphere was fun and they enjoyed learning.

I really like doing projects, any of them, such as field events, graduation ceremonies, or presentations, I think they are all fun, really! Although the process is very tiring. (G2-4-1)

It is not only knowledge improvement, but also technical, interpersonal, and operational improvement. (ST2-3-2)

6. [Behavior and results level] Substantial benefits or positive feedback of thematic learning to work

Respondents perceive the substantial benefits or positive feedback of thematic learning to work, including proposing innovative work models and being willing to return to work after the internship.

That is, you are welcomed to come back after graduation. Because you have worked with us for a year. We understand you and you also understand the job. You are a very powerful helper. Since, if we hire a new person outside, we do not start from zero, but negative! (C3-11-2)

7. [Behavior, and Results Level] In the field of catering work, what is the more prominent part of the students who have experienced thematic teaching than the graduates of other schools?

Respondents believe that after 3 years of thematic teaching at K-School, the more prominent parts of the students who have experienced thematic teaching than the graduates of other schools are better coping skills, professional catering skills, more proactive, and stronger presentation skills.

I think both soft and hard skills would do, and the hard skills must be the service skills and knowledge of food ingredient. (G7-12-1)

And then they can take the initiative to actively cooperate with the supervisor, the supervisor only needs to speak once and they will understand; this is the quality of what the majority of students in K-School have, and supervisors are very fond of them, because whenever supervisors speak they will understand. (C3-12-3)

5.2 Quantitative analysis

5.2.1 *Descriptive, reliability and validity analysis.* Table 10 shows that the mean score of students' learning effectiveness in the "reaction level" of the thematic teaching in K-School is 4.02. For the "learning level", the average score was 4.10, and for the "behavior and results level," the average score was 4.06. In general, all levels scored more than 4, showing a more positive perception. The construct reliability at each level was greater than 0.90, the eigenvalues were higher than 3.89, the factor loadings (FL) were greater than 0.71, and the overall cumulative explanatory variance was 75.86%, indicating that this scale had a certain level of reliability and validity.

5.2.2 *Independent sample t-test of the teaching results of thematic teaching (K-School) and non-thematic teaching (other schools).* In order to test the actual effect of the school-wide thematic teaching (K-School) and non-thematic teaching (other schools' catering departments), this study adopts the intentional sampling method. A survey is invited to the catering industry who have hired K-School interns and post-graduation alumni. The supervisor was asked to fill in the online questionnaire according to the actual situation of off-campus internships/jobs of interns and alumni of K-School and other schools, including 4 catering department of vocational high schools and 2 catering department of general high schools. A total of 40 online questionnaires were issued, with 40 valid questionnaires, and the valid questionnaire rate was 100%. The descriptive statistics of respondents' background information are presented in Table 11.

In addition, the results of the Kirkpatrick model were analyzed at the hierarchical level as shown in Table 12. The results of the analysis revealed that thematic teaching (K-School) had higher mean scores than non-thematic teaching (other catering schools) at levels of reaction, learning, behavior, and at the results level, all of which also achieved significant differences.

5.3 Cross-tabulation analysis of qualitative and quantitative data

In this study, the qualitative and quantitative data were cross-referenced. As for the reaction level, the conclusion of the qualitative analysis showed that students, parents, and teachers were more satisfied with the arrangement of the curriculum content in K-School thematic teaching. And the mean of the quantitative analysis was 4.02, which also showed a higher level of agreement. Especially in the well interaction between teachers and students in the class (4.22), and the satisfaction level of thematic teaching was even better than that of traditional education (4.17). As for the learning level, the qualitative results showed that thematic teaching is effective in terms of developing students' specific competencies and core soft skills. The quantitative analysis also showed that there is a positive view (4.10), especially when students believe that thematic teaching is effective in terms of developing core competencies (4.11), knowledge, skills and attitudes towards training/off-campus internship (4.15). Finally, at the behavioral and results levels, the qualitative analysis showed that thematic learning has positive feedback and substantial benefits for the workplace, and it is more prominent in the catering workplace compared to other school graduates, with a quantitative figure of 4.06. The positive view is particularly evident in the fact that thematic teaching improves work ethics (4.09), strengthens competencies (4.09) and has a positive impact on the internship unit as a whole (4.09).

Measurements	<i>M</i>	<i>SD</i>	FL	Characteristic value	Cumulative explanation of variance (%)	Cronbach's α	Thematic teaching effectiveness
<i>Reaction level</i>	4.02	0.71		4.88	24.38	0.94	<hr/>
The course content of K-School's thematic teaching meets my personal needs	3.95	0.80	0.71				
I am satisfied with the content of the K-School thematic teaching.	3.86	0.86	0.75				
The teachers interacted well with us in the K-School thematic teaching	4.22	0.79	0.50				
I am satisfied with the lectures given by the teachers of K-School thematic teaching	3.95	0.81	0.74				
I am satisfied with the teacher of the thematic teaching	3.97	0.83	0.77				
In general, I am more satisfied with the thematic teaching in K-School than with the traditional education in the past	4.17	0.83	0.57				
In general, I am satisfied with the learning of K-School thematic teaching	4.00	0.88	0.69				
<i>Learning level</i>	4.10	0.73		3.89	43.83	0.90	
I believe I can learn seven core competencies (1. self-discipline 2. reflection 3. thinking 4. learning 5. expression 6. leadership 7. relationship) from the K-School thematic teaching	4.11	0.78	0.72				
I believe that the knowledge, skills, and attitudes I have learned from the K-School thematic teaching will be useful for the practical training/off-campus internship	4.15	0.83	0.62				
I am confident that I will be able to apply the knowledge, skills, and attitudes I have learned in K-School thematic teaching to practical training/off-campus internship	4.05	0.87	0.61				
I will apply the knowledge, skills, and attitudes learned in the K-School thematic teaching to the training/off-campus internship	4.07	0.85	0.53				

Table 10. Summary of the results of the analysis of students' learning effectiveness under thematic teaching in K-School ($N = 221$)
(continued)

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Measurements	<i>M</i>	<i>SD</i>	FL	Characteristic value	Cumulative explanation of variance (%)	Cronbach's α
<i>Behavior and results level</i>	4.06	0.74		6.41	75.86	0.96
During the training/off-campus internship, I will apply the knowledge, skills, and attitudes I have learned in the K-School thematic teaching	4.07	0.82	0.67			
Applying the knowledge, skills, and attitudes learned in the K-School thematic teaching can strengthen my ability to train practical training/off-campus internships	4.09	0.81	0.69			
Applying the knowledge, skills, and attitudes learned in the K-School thematic teaching can improve the effectiveness of my training/off-campus practice	4.08	0.84	0.71			
Applying the knowledge, skills, and attitudes learned in the K-School thematic teaching can enhance my sense of accomplishment in training/off-campus internships	4.06	0.85	0.80			
I think what I have learned from the K-School thematic teaching can improve the quality of training/off-campus internships	4.03	0.87	0.73			
I think what I have learned from the K-School thematic teaching can improve the efficiency of training/off-campus internships	4.01	0.88	0.76			
I think what I have learned from the K-School thematic teaching can improve my satisfaction with the training/off-campus internship	3.99	0.90	0.78			
I think what I have learned from the K-School thematic teaching can improve the work ethic of training training/off-campus internships	4.14	0.83	0.59			
I think what the K-School thematic teaching have taught has a positive impact on the overall training/off-campus internship unit	4.09	0.83	0.61			

Table 10.

Source(s): Authors' own work

Item	Category	Times	Percentage	Item	Category	Times	Percentage
Gender	Male	7	17.50	Years in the current company	under 1 year	2	5.00
	Female	33	82.50		1–2 years	8	20.00
Age	21–30 years old	8	20.00	3–5 years	11	27.50	
	31–40 years old	16	40.00	6–10 years	11	27.50	
	41–50 years old	13	32.50	11–15 years	2	5.00	
	51–60 years old	3	7.50	16–20 years	3	7.50	
Education Level	Elementary school and below	0	0.00	over 21 years	3	7.50	
	Junior high school	0	0.00	Years of Cooperation between the Company and K-School	under 5 years	22	55.00
Senior high school	3	7.50	6–10 years		9	22.50	
Years of Experience in the Hospitality Industry	College Graduated	30	75.00	Number of Interns and Graduates Hired	11–15 years	8	20.00
	School and Above	7	17.50		16–20 years	0	0.00
Years of Experience in the Hospitality Industry	under 1 year	1	2.50	21–25 years	1	2.50	
	1–2 years	5	12.50	under 10 people	10	25.00	
	3–5 years	8	20.00	11–50 people	19	47.50	
	6–10 years	8	20.00	51–100 people	5	12.50	
	11–15 years	8	20.00	over 101 people	6	15.00	
	16–20 years	5	12.50				
	over 21 years	5	12.50				

Source(s): Authors' own work

Thematic teaching effectiveness

Table 11. The descriptive statistics of respondents of thematic teaching (K-School) and non-thematic teaching (other schools) teaching achievements

Matched group	School	Number	Average	Standard error	t-test
Reaction Level	K-School	40	4.22	0.41	3.09**
	Others	40	3.88	0.55	
Learning Level	K-School	40	4.20	0.46	2.75**
	Others	40	3.88	0.57	
Behavior and Result Levels	K-School	40	4.24	0.43	2.68**
	Others	40	3.94	0.56	

Note(s): *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Source(s): Authors' own work

Table 12. Independent sample t-test (dimension) of teaching outcomes of thematic teaching (K-School) and non-thematic teaching (other schools)

6. Conclusions and recommendations

6.1 Conclusions

6.1.1 The importance of school-wide thematic teaching. This study used qualitative in-depth interviews and quantitative questionnaires to study technical and vocational schools that adopted school-wide thematic teaching. The results of this study also showed that school-wide thematic teaching not only developed students' professional competence in food and beverage, but also helped students develop personal characteristics of initiative and expression, echoing the studies of Kovalik (2014) and Mills and Treagust (2003). In addition,

the 2019 curriculum, which was created in reaction to the change of global education reform perspective, adopts a cross-disciplinary curriculum design and a teaching environment co-constructed by teachers and students under the approach of literacy-oriented education. This is echoed in the studies of scholars such as [Chang \(2019\)](#) and [Tseng \(2016\)](#), which showed that school-wide thematic teaching is a teaching method with certain teaching effectiveness for the implementation of cross-disciplinary literacy education, which shares the same view as previous studies ([Kao, 1998](#); [Wang, 2018](#); [Chan and Chen, 2018](#)).

6.1.2 Thematic teaching is effective for enhancing students' soft and hard skills. Both the qualitative in-depth interviews and the quantitative survey results showed that the students who received the thematic teaching improved their practical skills in food and beverage operations, as well as their interpersonal relationships. In the study, the students mentioned that their own adaptability, motivation, and expressiveness were better than those of other school students, and the results of the paired sample comparison showed that the hospitality industry executives also agreed that thematic teaching had developed students' soft strengths, including self-discipline, reflection, thinking, learning, expression, leadership and relationships. This result is also in line with the findings of previous studies ([Fadillah, 2014](#); [Han et al., 2015](#)).

6.1.3 The directors of the hospitality industry company had positive opinions of students studying in the thematic teaching school. This study examined the substantial effectiveness of school-wide thematic teaching (K-School) compared with non-thematic teaching (other schools' catering departments), and the results of the study showed that supervisors of the industry believe that thematic learning students meet the needs of the companies. The company executive is satisfied with their work performance, and also agree that the knowledge, skills, and attitudes of the interns/alumni from thematic teaching are beneficial to their work. The results of the study showed that thematic teaching is more advantageous and that the interns and alumni who graduated from thematic teaching school have higher quality of work and better work efficiency. This result is also in line with the research on the effectiveness of thematic teaching conducted by [Wu and Yeh \(2003\)](#), [Chumdari et al. \(2018\)](#), and others, and it can better bridge the gap between the learning and practice. Although it can be seen from the quantitative data that the effectiveness of thematic teaching is better than that of non-thematic teaching, the quantitative data alone cannot represent the whole picture. In order to avoid being too arbitrary, we supplement it with qualitative data or other credible evidence to construct the whole picture and avoid generalization in order to see the whole picture.

6.2 Research contribution

6.2.1 Kirkpatrick's model of the "result level" in assessment and curriculum design. Most of the existing technical and vocational education programs are designed to focus on the three levels of reaction, learning, and behavior; that is, they are concerned with students' real reactions in the classroom, their progress after learning, and the changes in their abilities after the training. According to [Li \(2008\)](#), the time and difficulty of Kirkpatrick result level assessment are the greatest, but the significance of this level to the organization is the most important. Technical and vocational education is employment-oriented, so it is especially important to expect students to be "employed upon graduation."

Therefore, this study proposes that the result level can integrate student self-assessment, teachers' visits, observation and feedback from the industry. For the required abilities, the industry will focus on "resilience," "catering specialty," "expression ability," "activeness." The substantial benefits or positive feedback on the workplace are considered by "proposing innovative work models" and "intention to return to work after internships." Therefore, it can be seen that the technical and vocational education curriculum design must take into account the linkage of actual situation and close to needs of the industry. This research used the

Kirkpatrick model to evaluate the effectiveness of thematic teaching, especially the results level. Through the feedback from supervisors of the industry, it can be seen whether the employment of technical and vocational graduates will be ultimate great foundation, which can reflect the technical and vocational education. Therefore, this study proposes that the Kirkpatrick model is the most suitable tool for measuring the effectiveness of thematic teaching in technical and vocational education, and can improve the applicability of multiple assessment tools.

6.2.2 A new way to cultivate talents in technical and vocational education: comprehensive implementation of thematic teaching. Technical and vocational education that focuses too much on theoretical knowledge or practical operation seems to be unable to meet the needs of the future; the school-wide thematic teaching in technical and vocational education can lead to the discovery of problems in reaction to phenomena. It can integrate the cross-disciplinary application of learning, create a contextual stage for students to explore and put into practice, and integrate students' challenges in the workplace with various acquired abilities to achieve practical application, which is a good way to achieve unity of learning and application.

This study used the Kirkpatrick model of reaction, learning, behavior and results levels in the school-wide thematic instructional design in Taiwan, and is the first study of learning effectiveness in school-wide thematic instructional design. At the same time, this study combined qualitative and quantitative research to investigate the effectiveness of the teaching method through multiple perspectives, such as parents, industry, and schools. The results showed that school-wide thematic teaching is suitable for developing students' problem-solving and teamwork skills, and for applying the knowledge learned in daily life (Wang, 2018). And it is effective and satisfactory because of the commonality in the nature of education. The results of this study on the impact of school-wide thematic teaching on students also mirror the results of previous studies on a single discipline, a single academic year, and a single theme. It is clear that the findings of this study are not limited to the discipline cluster of hospitality, but are also applicable to the overall development of other disciplines.

6.2.3 The Kirkpatrick model explores the application of the school thematic teaching and learning effectiveness assessment practices. The teaching design of K-School is divided into phasalized grade-specific learning, thematic project learning, and socialized real-life learning, with thematic teaching throughout the three years of learning, from simple to deep, from easy to difficult. For example, the ultimate goal is to equip students with the ability to run a restaurant, through the selection of categories of projects, from curriculum planning, discussion, proposal to implementation is co-constructed by teachers and students. Moreover, the teaching syllabus, in addition to the core literacy is also integrated into the school's special planning curriculum. The teaching design is designed to align with the industry and incorporate current issues. Finally, the learning process is evaluated and reflected upon, and the realistic thematic teaching process is fed back to the school for timely adjustment and revision (see Figure 1).

In order to recognize the results of student learning, it is necessary to evaluate the quality of teaching and learning, and the value of teaching methods can be recognized through effectiveness evaluation (Lin and Cheng, 2016; Posavac, 2015). According to the characteristics of thematic learning, the Kirkpatrick model, which incorporates the learners' learning process and knowledge application into the assessment, is most suitable for evaluating the effectiveness of learning. The learning process and practice from the learners' learning of knowledge, acquiring skills to the practical application of skills can provide a complete picture of the effectiveness of learning (Kirkpatrick and Kirkpatrick, 2016; Reio et al., 2017). Furthermore, by analyzing the Kirkpatrick model's connotations, assessment indicators, stage curriculum strategies, integrated contextual arrangements, comprehensive thematic teaching, and multiple assessments at various levels, and incorporating the qualitative or quantitative effectiveness data in this study can reflect

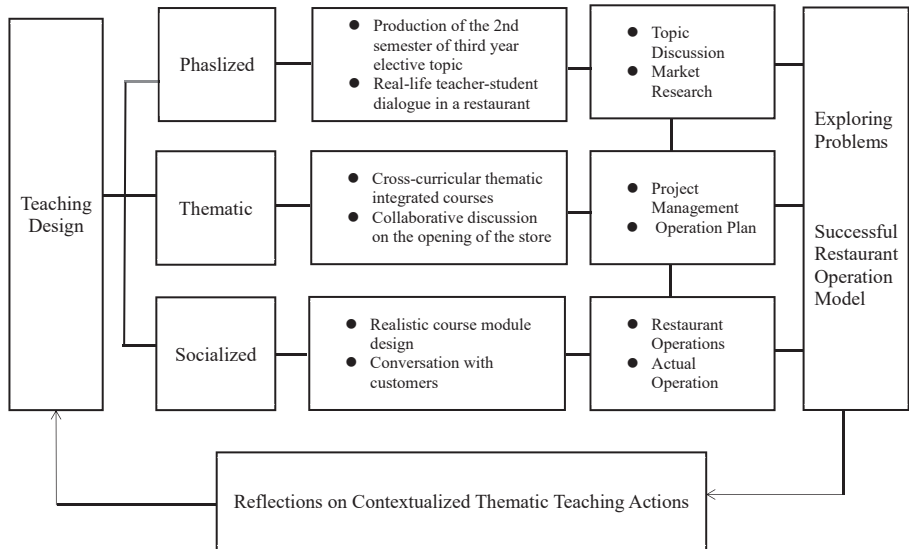


Figure 1.
Thematic teaching and learning design

Source(s): Authors' own work

each other. Moreover, it is evident that the Kirkpatrick model is quite suitable for evaluating the effectiveness of thematic teaching (see Table 13).

However, considering the limitations of the Kirkpatrick model in practical application, other important assessment factors, such as the influence of contextual factors, may be overlooked when evaluating the learning outcomes of educational training, which shows that the contextualization of the training model is indeed crucial. This study has validated the practical experience of the comprehensive implementation of thematic teaching from the excellent performance of students in K-Schools. Accordingly, based on this, a systematic and scientific framework has been designed for the implementation of thematic teaching through the support and attention of the senior management at the school level, and the overall comprehensive introduction of thematic teaching as the starting point. First, setting up the training target, then creating the industry context, and then introducing the comprehensive thematic curriculum, and subsequently evaluating the feedback from multiple feedbacks and incorporating the real evaluation of the industry. Moreover, we evaluated the effectiveness of the comprehensive thematic teaching and learning introduction, so that it can be gradually adjusted and corrected to achieve the best. Furthermore, based on this, we propose that in the future, when other schools implement teaching and learning in technical vocational education, they can also set up thematic practical curriculum for contextual application according to the industry style. This is supplemented by the Kirkpatrick model for assessing learning effectiveness, as shown in Figure 2.

6.3 Research limitations and suggestions for future research

This study provides a good basis for the teaching effectiveness of the comprehensive implementation of thematic teaching. However, according to the Kirkpatrick model, it is difficult to examine the long-term career development and achievement of students. It is suggested that subsequent studies should extend the time period and conduct long-term observation or data collection on the same study participants so that long-term trends can be seen to provide more reliable and consistent evidence. Secondly, this study was an

Levels	Content	Evaluation Indicators	Curriculum strategy	Integration of contextual arrangements	Comprehensive topics Teaching	Diversity Assessment	Qualitative or quantitative evidence of effectiveness (mean score)
1 Response	Satisfaction	<ul style="list-style-type: none"> Internal Professional Accreditation 	<ul style="list-style-type: none"> 1st Semester of first year students culinary arts and service course foundation concept building 2nd semester of first year student and 1st semester of second year student On-campus internship fieldwork 	<ul style="list-style-type: none"> Role plays in class Into role positioning 	<ul style="list-style-type: none"> Caterers' various self-identification simulations EX worship ceremony executes various restaurant festival programs annual dishes, Dragon Boat Festival, Christmas Off-campus internship Various reality among industries Topics to explore 	<ul style="list-style-type: none"> Students Teachers 	Students believe that thematic teaching develops core competencies (4.11)
2 Learning	Knowledge	<ul style="list-style-type: none"> Pre/post test Observation Interviews 	<ul style="list-style-type: none"> 2nd semester of first year student and 1st semester of second year student On-campus internship fieldwork 	<ul style="list-style-type: none"> on-campus restaurant operations Simulation of real-life training 	<ul style="list-style-type: none"> executes various restaurant festival programs annual dishes, Dragon Boat Festival, Christmas 	<ul style="list-style-type: none"> Teachers Parents Industry supervisors 	Effective in terms of knowledge, skills and attitude towards training/internships (4.15)
3 Behavior	Migration Learning	<ul style="list-style-type: none"> Industry Feedback Organizing Experience 	<ul style="list-style-type: none"> 2nd semester of second year student and 1st semester of grade third year student Off-campus internships connect to the industry 	<ul style="list-style-type: none"> Off-campus real-world industry validation capabilities and weekly back-to-school finishing experience 	<ul style="list-style-type: none"> Off-campus internship Various reality among industries Topics to explore 	<ul style="list-style-type: none"> Teacher Industry supervisors 	Thematic learning has positive feedback and tangible benefits for the workplace (4.06)

(continued)

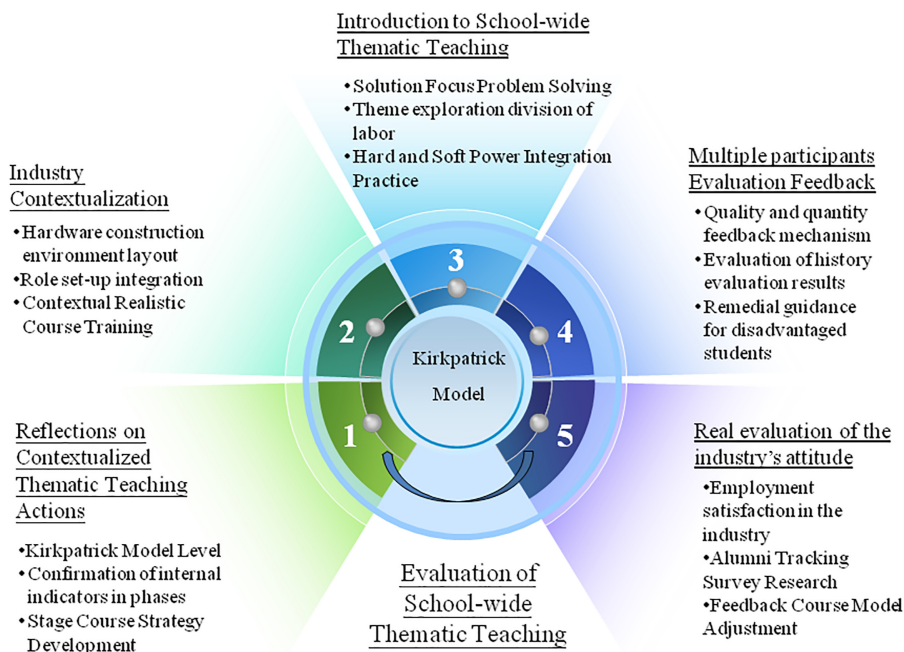
Thematic teaching effectiveness

Table 13. Kirkpatrick model for the evaluation of the effectiveness of thematic teaching

Table 13.

Levels	Content	Evaluation Indicators	Curriculum strategy	Integration of contextual arrangements	Comprehensive topics Teaching	Diversity Assessment	Qualitative or quantitative evidence of effectiveness (mean score)
4 Results	Impact on results	<ul style="list-style-type: none"> Project Execution Effectiveness Off-campus Feedbacks 	<ul style="list-style-type: none"> 2nd semester of third year students' integration of theory and practice in the implementation of large-scale projects 	<ul style="list-style-type: none"> Students as CEO Forming a project team Presents programs to the entire campus Showcase project results 	<ul style="list-style-type: none"> Through various projects Theme achievement exhibition Proposal planning solutions Off-campus real problems Tracking alumni Back to school advancement program 	<ul style="list-style-type: none"> Students Teachers Parent Industry supervisors 	More prominent in the catering workplace than other school graduates (4.06)
5 Reality	Industry Satisfaction	<ul style="list-style-type: none"> Reduce Employee Turnover and Increase Productivity 	<ul style="list-style-type: none"> Proposes to optimize workflow after graduation and return to the industry 	<ul style="list-style-type: none"> Soft and hard force in the industry's true industrial state 		<ul style="list-style-type: none"> Alumni Industry supervisors 	Thematic teaching to improve work ethics (4.09), enhanced capabilities (4.09), positive impact on the whole internship unit (4.09)

Source(s): Authors' own work



Thematic teaching effectiveness

Figure 2. Schematic diagram of the evaluation of the effectiveness of the introduction of school-wide thematic teaching method

Source(s): Authors' own work

exploratory study, further empirical studies are needed to validate it. It is suggested that future studies can adopt a quasi-experimental research method to clarify the improvement of students' learning effectiveness by using an experimental and control group research design, so as to provide stronger and more powerful evidence. In addition, this study adopts a mixed-method approach to collect qualitative and quantitative data from multiple participants in an attempt to realize the authenticity of the data through first-hand data, but there are still many qualitative and quantitative methods that can be applied. It is suggested that a systematic and scientific approach of unified analysis can be used to reconstruct, which may lead to different results and developments, and to propose new concepts to enhance theoretical and practical contributions. Finally, this study examined the effectiveness of school-wide thematic teaching by the widely accepted Kirkpatrick Model. There are still many factors that have not yet been considered, such as the new additional elements to the Kirkpatrick Model, called the New World Kirkpatrick Model (Kirkpatrick and Kirkpatrick, 2021), which proposes the concepts of engagement, relevance, confidence, commitment, reinforcement, encouragement, rewards and supervision, and suggests that future studies can adopt them as references for effectiveness assessment.

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