International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

# Research ON ICVE-based Blended Learning in Vocational College Business Teaching

**Yingying Zhang**
Assumption University (Bangna Campus), Thailand
E-mail: 20958288@qq.com, ORCID ID: https://orcid.org/0009-0006-0159-0956

Received 17/04/2024 Revised 14/05/2024 Accepted 25/06/2024

**Abstract**

**Background and Aims:** In the context of the digital era, the traditional single teaching method can no longer meet the needs of modern teaching. Therefore, this paper adopts the SPOC teaching mode to study the impact of the mode on students' academic performance and to understand students' perception of its use by carrying out the ICVE blended teaching research. It helps improve the teaching strategies and methods of this mode and the quality of talent cultivation.

**Research Methodology:** A quasi-experimental design was used to compare students' problem-solving abilities, specific knowledge, and specific skills to assess the impact on students' academic performance, and an open-ended questionnaire was used to investigate students' perceptions and experiences.

**Results:** Conducting ICVE blended instruction resulted in a significant improvement in students' academic performance. At the same time, the model produced better learning experiences and positive impacts.

**Conclusion:** Carrying out ICVE blended teaching effectively improves the learning effect. In the actual teaching, based on the characteristics of business teaching in vocational colleges, the improvement and optimization of teaching methods are carried out, which provides a strong basis and reference for colleges and universities to implement this teaching mode better.

**Keywords:** ICVE; SPOC; Blended Learning; Vocational College

## Introduction

Blended learning combines traditional face-to-face lectures with online learning, enabling the sharing of educational resources and interaction in the learning process through digital technology. In contemporary education, more and more universities implement blended learning programs, integrating the advantages of traditional classroom teaching and online learning to provide students with more independent and flexible learning opportunities (Garnham & Kaleta, 2002).

With the popularity of the Internet and the demand for information technology in education, catechism (Massive Open Online Courses) came into being, becoming a large-scale, wide-coverage, open, and shared learning resource (Goldbergetal., 2015).SPOC (Small Private Online Course) is more popular than MOOC, focuses on a specific group of students, provides students with personalized learning needs, and helps to focus on students' learning progress. SPOC is regarded as an emerging model of teaching and learning after the MOOC era ((Lee, 2021). In early experiments, Professor Fox demonstrated that the use of MOOC resources as SPOC teaching materials can enhance student learning, improve classroom teaching effectiveness, and significantly increase learning enrolments (Fox, 2013).

ICVE ((Intelligent Connected Vocational Education), an important platform for conducting blended learning and SPOC courses, was developed by China Higher Education Press.

Although blended learning has been widely used, it still faces many challenges, such as



Citation Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

underutilization of information technology, poor instructional design, and unclear subject position (Kaur, 2013). To get rid of traditional teaching methods and techniques, it is necessary to break the original single teaching method, insufficient teaching interaction, imperfect evaluation system, difficulties in managing student learning, and lack of teaching resources. "student-centered" is the main body (Kember, 1997), project-based teaching, and heuristic teaching (Kokotsaki et al., 2016). Of course, blended teaching also puts new demands on teachers' teaching level, teaching information technology skills, and practical skills.

In today's digital era, teaching informatization and blended learning have become important trends in education. To carry out blended learning, how teachers should design the course, whether ICVE-based blended learning can improve the learning effect, and how the students' experience of course learning is, there is an urgent need for researchers to conduct relevant experimental studies.

## Objective of Research

The purpose of this study was to validate the effectiveness of the blended teaching model, and three research objectives were established for this purpose. These objectives provide directions for blended instruction in ICVE for teaching in vocational colleges, as well as provide useful references for future curriculum development and teaching practices. The specific objectives include:

1) To develop a method of ICVE-based blended learning into vocational college business teaching.

2) To compare students' performance after ICVE-based blended learning activities.

3) To determine students' perceptions of ICVE-based blended learning.

## Literature Review

**Blended learning.** Blended learning is a learning model that combines online and offline teaching methods. It is centered on the effective integration of the two, making full use of their respective strengths to achieve a more comprehensive and flexible learning experience (Garnham & Kaleta, 2002). Traditional classroom teaching is an important foundation for blended learning. By integrating online resources, the limitations of space and time are broken. Students can learn at any place and time, making effective use of fragmented time. Blended learning provides students with more flexible learning opportunities, enhances the effectiveness of traditional teaching, and enables students to better adapt to diverse learning needs (Bryan, 2016).

Many scholars have identified the advantages of blended learning. For example, students' academic performance improves (Al-Qahtani et al., 2013); students have more autonomy, which helps foster creative thinking (Luaran et al., 2015); and the sense of community and teamwork is enhanced (Rovai & Jordan, 2004). Students are less stressed and more satisfied (Luaran et al., 2015). Blended learning enhances the learning experience and is effective in improving student achievement (Alshwiah, 2009; Sahni, 2019).

**21st century skills.** As society changes and evolves, people need to acquire a range of abilities and skills known as 21st-century skills, which have been defined as "the ability to be resilient, creative, problem-solving, and an excellent team player" (Duncan, 2009). Although there are many different definitions of 21st-century skills, the core remains excellent communication, teamwork, expertise, problem-solving, and creative thinking.



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

The importance of 21st-century skills cannot be overlooked and are often qualities that students develop during their university studies, and these skills should be integrated into the professional courses they take (Binkley, et al., 2012). Skills are closely related to students' professionalism and even directly determine graduates' future careers. Business school students need to have 21st-century skills because, in recruitment, companies or organizations usually want to find employees who already have these skills to adapt more quickly to the work environment. To equip students with the skills needed for the 21st century, business teaching needs to change (Gupta & Garg, 2021).

**problem-solving skills.** One of the 21st-century skills is the ability to solve problems. The problem-solving process involves identifying the problem, trying out approaches, analyzing, providing different insights, making the best use of resources, and finally coming up with an overall solution (Rahman, 2019). It requires learners to continuously explore and solve new problems to achieve satisfactory results (Stice, 2007). This includes finding solutions from known conditions and existing knowledge.

Delialioğlu (2012) argues that schooling should focus on problem-solving and develop effective problem-solving attitudes and skills in students. Successful problem solvers need a variety of skills such as identifying problems, obtaining information, communicating in teams, developing strategies, providing alternatives, inspiring ideas, and summarizing (Wu et al., 2013). Problem-solving skills are measured by instruments such as questionnaires, tests, interviews, and reflective journals (Guo et al., 2020). This study focused on exploring students' observation and critical thinking skills in learning. Teachers set up teaching modules, introduced case studies, and encouraged students to solve problems through data collection and information analysis, which were ultimately assessed in a written report.

**specific knowledge.** Specific knowledge is one of the key skills of the 21st century and includes an understanding of the theory and practice of a specialized field (Hadiyanto, 2019; Ahlstrom, 2014). For example, the field of business involves knowledge of marketing, finance, products, and law. Students can acquire this knowledge through courses, research, and practice, and should have foundational knowledge in the field by the time they complete their degree (Krisantia 2021). Specific knowledge is crucial for students' future careers. The specific knowledge that graduates acquire through their studies plays a key role in employment. Most companies recruit new employees with the expectation that graduates will already have the necessary professional competencies to be able to perform their jobs with minimal supervision (Andrews & Higson, 2008).

"Specific knowledge" emphasizes understanding and knowledge, including course-specific knowledge, connecting to the subject matter, practical content, and answering professional questions. Assessment methods are varied, such as Likert scales, written tests, experiments, or discussions. Due to the diversity of specific knowledge, choosing the appropriate method is crucial (Guo et al., 2020). This study focuses on the specific knowledge that students need to acquire about corporate brand planning and promotion, including brand awareness, positioning, image, and product planning.

**Specific skills.** Specific skills include knowledge and skills to apply them more broadly to specific areas of work (Hadiyanto, 2019; Ahlstrom et al., 2014; Marando, 2012). Vocational education should focus on practical application of skills, not just theoretical knowledge (Smeby, 2007). Students need to be actively involved in practice to enhance their level of professionalism and competence. Specific vocational skills are required differently across industries, e.g. in business, competencies such as leadership, sales skills, communication skills, data analysis, etc., are required and are usually


Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

acquired through professional training and examinations. Specific knowledge and specific skills are in some cases interrelated, emphasizing the complementarity of theory and practice (Van de Ven & Johnson, 2006).

Students are expected to acquire expertise in 'specific skills', learning theoretical knowledge and applying it in practice, including brand strategy, positioning, communication, product innovation, extension, and marketing. Through the programmer, students can acquire brand design and management skills and improve brand management. The development of professional skills can deepen students' understanding of brand management. In this study, students are required to write a "branding plan", combined with a real enterprise project, and the teacher provides standardized guidance and advice throughout the learning process, which is ultimately assessed by marks.

**Perception.** Perception is an individual's perspective on the world and is influenced by socio-cultural factors (Markus & Kitayama 2014). Ingold (2002) argues that perception is an important process of interpreting and organizing sensory information in the environment to make sense of the world around us. Perception involves the brain selecting, organizing, and interpreting sensory information to form meaningful experiences. Individual experiences, expectations, and cultural backgrounds influence this process. McDonald (2011) states that perception involves the complex organization and understanding of sensory information and the acquisition of knowledge through cognitive processes. These concepts reflect the complexity of human perception and create unique, personalized experiences for individuals.

Perception is the way an individual views the world, and things, and makes sense of sensory information (Qiong, 2017). It is through qualitative methods of gathering perceptual information that a glimpse into an individual's unique perspective and experience in terms of thinking, opinions, beliefs, and emotions can be gained (Mann, 2023). Measuring perceptions can be done in a variety of ways and with specific tools such as questionnaires, interviews, and observations for assessing students' learning strategies (Guo et al., 2020). In this study, the researcher advocated the use of open-ended questionnaires through semi-structured interviews to prompt respondents to freely express their attitudes, experiences, challenges, strengths, etc., towards the use of the ICVE platform.

## Conceptual Framework

During the first week of preparation for instruction, the researchers quizzed the students on problem-solving skills, specific knowledge, and specific skills. For the subsequent sessions, the experimental group used a blended learning approach and the control group used a traditional teaching method, and students in both groups were post-tested in the eighth week of the experiment. The experimental group was given an open-ended questionnaire at the end of the test, and student perceptions were analyzed and summarized through the content of the interviews. The whole experiment lasted for eight weeks and the researcher came up with the following research framework.



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

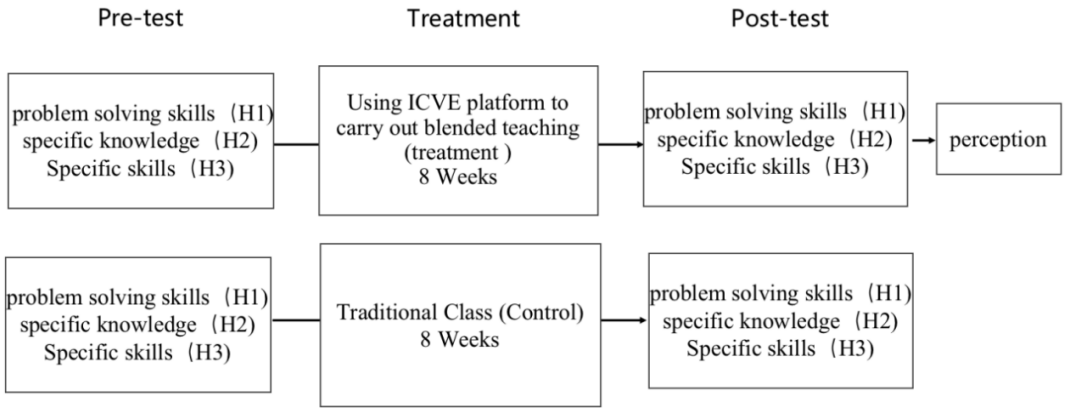


**Figure1.***Conceptual Framework*
**Note:** Constructed by the Author

This study examines the effectiveness of a blended learning model based on the ICVE platform in teaching higher education business, taking into account three key variables: problem-solving ability, specific knowledge, and specific skills. Based on the research objectives and prior research, the following hypotheses are summarized:

**Table 1** *List of Hypotheses in the Study*

| Hypotheses (Null and Alternative) | Statement | Literature Support |
|---|---|---|
| $H_0$1 | There is no difference in problem-solving skills between the experimental group and the control group. | （Hadiyanto, 2019） |
| $H_a$1 | There is a difference in problem-solving skills between the experimental group and the control group. | |
| $H_0$2 | There is no difference in specific knowledge between the experimental group and the control group. | (Ahlstrom et al., 2014; Marando,2012;Washer , 2007) |
| $H_a$2 | There is a difference in specific knowledge between the experimental group and the control group. | |
| $H_0$3 | There is no difference in specific skills between the experimental group and the control group. | (Ahlstrom et al., 2014; Marando,2012;Washer , 2007) |
| $H_a$3 | There is a difference in specific skills between the experimental group and the control group. | |

**Note:** Constructed by the Author


Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

## Methodology

This study used a mixed research method, combining quantitative and qualitative analyses. The students were third-year students majoring in cultural industry operation and management at Sichuan Cultural Industry Vocational College in Chengdu. The quasi-experimental research method compares the experimental group and the control group, with pre-tests and post-tests at the beginning and end of the teaching, respectively, to verify the student's academic level through their grades. Qualitative aspects were mainly participated by students in the experimental group in open-ended questionnaires to obtain richer and more comprehensive information about students' learning.

**Research Instruments :** This study assesses students' problem-solving abilities, specific knowledge, and specific skills. Specific assessments include a professional theory exam, case studies, and writing a proposal. All test questions will be randomly selected from the STE (Self-Taught Higher Education Examinations) question bank, which is the main authority on specific knowledge in this study. An open-ended questionnaire will be administered to the experimental group of students after the completion of the test to obtain their views, insights, and suggestions on blended learning.

Assigning appropriate weights to multiple tests by developing appropriate assessment criteria and standards for different course contexts is one way of assessing courses (García-Alberti et al,.2021). In the comprehensive assessment, the test is worth 100 points, of which 20% is for problem-solving skills, 20% for professional knowledge, and 60% for professional skills. Differences in learning can be reflected in the scores of students at different levels of task completion.

1. Case Analysis

Case analysis is the practice of applying professional judgment to decision-making or problem-solving situations (Bannon, 2014). The methodology concludes by analyzing cases. Case studies require testing the process of observation and reflection where students gather relevant information and analyze it through synthesis to draw appropriate conclusions. The case study is subjective and needs to be assessed based on steps and answer point criteria, i.e. for each correct answer, a corresponding proportion of marks is awarded.

2. Professional Knowledge Examination

Students are assessed on their theoretical knowledge using objective questions such as multiple-choice, multiple-response, and judgment questions.

3. Writing the Planning

Planning is essential to the successful execution of a task. According to the company's vision, goals, and objectives, the plan serves as a roadmap for implementing the planned activities (Haag, 2013). The plan is a detailed document that provides comprehensive guidance and support for the project. According to the curriculum, the professional skills will be assessed under the topic of "brand planning", which is integrated with real companies or projects, and a proposal will be prepared, which includes five modules, including a brand overview, market analysis, positioning, construction, marketing, and promotion, based on the completeness, feasibility, clarity, innovation, and promotion of the proposal. The proposal will be graded according to completeness, feasibility, clarity, innovation, and operability.

4. Questionnaire

An open-ended questionnaire was used for the experiment, which contained six questions regarding students' perceptions of ICVE-based blended learning. These questions contained questions



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

that included course knowledge understanding, learning experience, differences from traditional instruction, advantages, barriers to learning, and factors that facilitate learning (Yashwant, 2020).

1）How did your participation in blended learning deepen your understanding of the course knowledge?

2）Describe your experiential learning using the ICVE platform.

3）How do these ICVE-based blended learning courses differ from traditional classroom instruction?

4）What other benefits do you think of using the ICVE platform??

5）What do you think are the factors that hinder learning?

6）What do you think are the promoting factors of learning?

**Validation of the Research Instrument**

The test questions used in the study were taken from the STE exams and the standards of the school graduation design planning programmer, and the open-ended questionnaire was used to test the validity of the questions by three experts.

1. Validity of the Performance Tests

The professional knowledge and case study test questions are from STE questions, which is a Chinese self-test undergraduate examination organized by the National Examination Committee and is authoritative. The validity of the Performance Tests is from STE questions. STE is a Chinese self-study undergraduate examination organized by the National Examination Board, which has authoritative status.

2. Validity of the Questionnaire

Three experts with rich educational experience were invited to evaluate the questionnaire items. The questionnaire items were measured using the content validity of the overall scale (S-CVI) and proved to be valid.

**Table 2** *The results ratings on a 6-item Scale by Three Experts*

| Question | Expert1 | Expert2 | Expert3 | Number in Agreement | Item CVI |
|---|---|---|---|---|---|
| 1 | 4 | 3 | 4 | 3 | 1.00 |
| 2 | 3 | 4 | 3 | 3 | 1.00 |
| 3 | 4 | 3 | 3 | 3 | 1.00 |
| 4 | 3 | 4 | 4 | 3 | 1.00 |
| 5 | 4 | 4 | 3 | 3 | 1.00 |
| 6 | 3 | 4 | 4 | 3 | 1.00 |
| Proportion relevant: | 1.00 | 1.00 | 1.00 | Mean I-CVI = (1+1+1+1+1+1+1+ 1+1+1)/6 = 1.00 | |

**Note:** Constructed by the Author

**Data Collection and Analysis:** Two different research methods were adopted for this study; data collection included a test-based approach and an open-ended questionnaire. Data was analyzed using



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

Jamovi software and an independent samples t-test was applied to assess the effectiveness of blended learning on the ICVE platform, which is a quantitative research tool. Meanwhile, the open-ended questionnaire provided qualitative data for the study, where students expressed their views on blended learning using the ICVE platform through the Questionnaire Star software. The researcher used thematic analysis to provide in-depth analyses and comprehensive summaries of the students' responses.

**Population and Sample Size:** Eighty-one junior students majoring in cultural industry operation and management at Sichuan Vocational College of Cultural Industry were the subjects of this study. After graduation, the students will mainly seek employment opportunities in the cultural industry, including cultural enterprise operation, brand management, and product creative planning. Due to the nature of the major, there are more female students than male students. The age of the students ranged from 18 to 22 years old, with an average age of about 20 years old.

The researcher divided the 81 students into an experimental group (42) and a control group (39), and there was a high degree of similarity between the two groups in terms of gender, age, and professional background. It should be noted that these students often lack positive learning attitudes and independent learning abilities, find theoretical knowledge boring and abstract, but show great interest in practical learning and related learning involving future careers, but lack proper learning plans and methods. Based on the student's learning characteristics, the same teacher develops the teaching plan and conducts the lessons during the eight weeks of teaching.

**Sampling Strategy:** This study uses purposive sampling which is a non-probabilistic sampling technique in which the researcher purposively selects individuals or groups of individuals that meet the requirements of the study to satisfy the objectives and questions of the study (Etikan et al,.2016). This method is non-probabilistic and the probability of sample selection is unknown and is based on the researcher's judgment in selecting the sample. The researcher chose appropriate participants, increased control of the experiment, and addressed the research objectives and questions. After the teaching task was completed, the experimental group was subjected to an open-ended interview, a research method or questionnaire that has no limitations and the respondents were free to provide their views, suggestions, and opinions (Guest et al., 2006), which helped the researcher to get a more complete picture of the respondents' information and suggestions.

## Results

### Demographic Information

Junior students majoring in cultural industry operation and management at Sichuan Vocational College of Cultural Industry participated in the assessment of three aspects: case study, specific knowledge, and specific skills.

There were 42 students in the experimental group, including 34 female students (81%) and 8 male students (19%). There were 5 students (12%) under the age of 20 and 37 students (88%) between the ages of 20-24.

In the control group, there were 39 students, of whom 32 (82%) were girls and 7 (18%) were boys. Four students (10 percent) were under 20 years of age and 35 (90 percent) were between 20 and 23 years of age.

### Descriptive Statistics of Variables



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

There are three variables in this study which are problem-solving skills, specific knowledge, and specific skills.

**Table 3** *The mean and standard deviation of the problem-solving skills test scores of the two groups*

| GROUP | PRE-TEST | | POST-TEST | |
|---|---|---|---|---|
| | MEAN | S.D. | MEAN | S.D. |
| CONTROL GROUP （N=39） | 70.36 | 5.388 | 81.33 | 2.775 |
| EXPERIMENTAL GROUP （N=42） | 69.9 | 3.449 | 85.21 | 3.346 |

**Note:** Constructed by the Author

1. problem solving skills. The sample size of the experimental group is 42 people, the mean score of the pre-test is 69.9 points and the standard deviation is 3.449; the mean score of the post-test is 85.21 points and the standard deviation is 3.346. The sample size of the control group is 39 people, the mean score of the pre-test is 70.36 points, and the standard deviation is 5.388; the mean score of the post-test is 81.33 points, and the standard deviation is 2.775.

**Table 4** *The mean and standard deviation of the specific knowledge test scores of the two groups*

| **GROUP** | **PRE-TEST** | | **POST-TEST** | |
|---|---|---|---|---|
| | **MEAN** | **S.D.** | **MEAN** | **S.D.** |
| CONTROL GROUP （N=39） | 69.95 | 3.356 | 80.05 | 2.901 |
| EXPERIMENTAL GROUP（N=42） | 71.79 | 5.871 | 86.57 | 4.401 |

**Note:** Constructed by the Author

2. specific knowledge. The sample size of the experimental group is 42 people, the mean score of the pre-test is 71.79 points and the standard deviation is 5.871; the mean score of the post-test is 86.57 points and the standard deviation is 4.401. The sample size of the control group is 39 people. The mean score of the pre-test is 69.95 points and the standard deviation is 3.356; the mean score of the post-test is 80.05 points and the standard deviation is 2.901.

**Table 5** *The mean and standard deviation of the specific skills test scores of the two groups*

| **GROUP** | **PRE-TEST** | | **POST-TEST** | |
|---|---|---|---|---|
| | **MEAN** | **S.D.** | **MEAN** | **S.D.** |
| CONTROL GROUP （N=39） | 71.64 | 3.124 | 82.95 | 3.371 |
| EXPERIMENTAL GROUP （N=42） | 70.33 | 6.007 | 85.76 | 5.834 |

**Note:** Constructed by the Author



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

3. specific skills. The sample size of the experimental group is 42 people, the mean score of the pre-test is 70.33 points and the standard deviation is 6.007; the mean score of the post-test is 85.76 points and the standard deviation is 5.834. The sample size of the control group was 39 people, the mean score of the pretest was 71.64 points, and the standard deviation was 3.124; the mean score of the post-test was 82.95 points, and the standard deviation was 3.371.

**Hypotheses Testing**

The following are the $H_0$ and alternative hypotheses:

1) $H_0$1: There is no difference in problem-solving skills between the experimental group and the control group.

$H_a$1: There is a difference in problem-solving skills between the experimental group and the control group.

**Table 6** *Post-test mean and standard deviation of two groups – problem-solving skills*

| | MEAN | S.D. | N |
|---|---|---|---|
| CONTROL GROUP IMPROVEMENT | 10.97 | 5.565 | 39 |
| EXPERIMENTAL GROUP IMPROVEMENT | 15.31 | 3.346 | 42 |

**Note:** Constructed by the Author

Based on the data, it can be seen that the control group improved their scores on the pre-and post-test (M = 10.97, S.D. = 5.565) and the experimental group improved their scores on the pre-and post-test (M = 15.31, S.D. = 3.346).

**Table 7** *T-test for problem-solving skills between the experimental group and control group*

| | MEAN DIFFERENT | S.D. | Sig. | N |
|---|---|---|---|---|
| CONTROL GROUP AND EXPERIMENTAL GROUP IMPROVEMENT | -4.34 | 5.02 | 0.000 | 81 |

**Note:** Constructed by the Author

Regarding hypothesis 1, the independent samples t-test was calculated to compare problem-solving skills of improvement between the two groups. The t-test was significant, t = -4.209, p = 0.000. The $H_0$ was rejected. The result indicated the difference in problem-solving skills between the experimental group and the control group.

2) $H_0$2: There is no difference in specific knowledge between the experimental group and the control group.

$H_a$2: There is a difference in specific knowledge between the experimental group and the control group.



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

International Journal of Sociologies and Anthropologies Science Reviews
Volume 4 Issue 5: September-October 2024: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

**Table 8** *Post-test mean and standard deviation of two groups - specific knowledge*

| | MEAN | S.D. | N |
|---|---|---|---|
| CONTROL GROUP IMPROVEMENT | 9.97 | 5.565 | 39 |
| EXPERIMENTAL GROUP IMPROVEMENT | 14.79 | 7.691 | 42 |

**Note:** Constructed by the Author

Based on the data, it can be seen that the control group improved their scores on the pre-and post-test (M = 9.97, S.D. = 5.565) and the experimental group improved their scores on the pre-and post-test (M = 14.79, S.D. = 7.691).

**Table 9** *t-test for specific knowledge between the experimental group and control group*

| | MEAN DIFFERENT | S.D. | Sig. | N |
|---|---|---|---|---|
| CONTROL GROUP AND EXPERIMENTAL GROUP IMPROVEMENT | -4.81 | 7.13 | 0.002 | 81 |

**Note:** Constructed by the Author

Regarding hypothesis 2, the independent samples t-test was calculated to compare specific knowledge of improvement between the two groups. The t-test was significant, t = -3.242, p = 0.002. The $H_0$ was rejected. The result indicated the difference in specific knowledge between the experimental group and the control group.

3)H03 There is no difference in specific skills between the experimental group and the control group.

Ha3 There is a difference in specific skills between the experimental group and the control group.

**Table 10** *Post-test mean and standard deviation of two groups - specific skills*

| | MEAN | S.D. | N |
|---|---|---|---|
| CONTROL GROUP IMPROVEMENT | 11.31 | 4.384 | 39 |
| EXPERIMENTAL GROUP IMPROVEMENT | 15.43 | 7.222 | 42 |

**Note:** Constructed by the Author

Based on the data, it can be seen that the control group improved their scores on the pre-and post-test (M = 11.31, S.D. = 4.384) and the experimental group improved their scores on the pre-and post-test (M = 15.43, S.D. = 7.222).

**Table 11** *t-test for specific skills between the experimental group and control group*

| | MEAN DIFFERENT | S.D. | Sig. | N |
|---|---|---|---|---|
| CONTROL GROUP AND EXPERIMENTAL GROUP IMPROVEMENT | -4.12 | 6.34 | 0.003 | 81 |

**Note:** Constructed by the Author



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

Regarding hypothesis 3, the independent samples t-test was calculated to compare specific skills of improvement between the two groups. The t-test was significant, t = -3.129, p = 0.003. The $H_0$ was rejected. The result indicated the difference in specific skills between the experimental group and the control group.

**perception**

An open-ended questionnaire survey of 42 students provided insights into the effects and experiences of blended learning. Nvivo software was used to assist in the analysis. The study found that this pedagogical approach had a positive impact on facilitating student learning, while also revealing some challenges.

1. How does blended learning deepen your understanding of course knowledge? Students believe that blended learning effectively combines theory with practice and deepens their understanding and application of course knowledge. It enhances flexibility and autonomy in learning, promotes discussion, experience sharing, and cooperative learning among students, and improves teamwork and communication skills.

2. How is the learning experience on the ICVE platform? Most students thought that the ICVE platform was very rich in functions, allowing them to access more learning resources, submit assignments on the platform, and increase interaction with teachers and classmates. Some students said that the platform needs to be improved to avoid flashback, lagging, re-logging, and other phenomena.

3. How is ICVE blended learning different from traditional teaching? Most students think blended learning is more interesting compared to traditional teaching. Students said that the flexibility of blended learning has a great advantage in that they can arrange their time according to their personalized learning needs. the ICVE platform also offers convenience, such as signing in and completing learning tasks and tests that can be operated anytime, anywhere, and so on.

4. What are the other benefits of using the ICVE platform? Students believe that the ICVE platform is more convenient for independent learning as it enables them to flip through course knowledge and mark course content, record course notes, etc. at any time. At the same time, the platform is very rich in learning resources, providing explanations of course knowledge points from different schools and teachers.

5. What are the factors hindering learning? Students indicated that the platform needs to be functionally optimized to avoid technical problems such as server delays and account merging. Problems such as slow network speed and poor network connection also affected the learning experience and learning progress. In addition to technical and network issues, the attractiveness of the course content was also talked about. Of course, the most crucial factor is individual self-discipline and learning ability.

6. What were the factors that facilitated learning? The key factors identified by the students were whether the course was interesting, whether the learning atmosphere was favorable, and whether the teacher's explanations stimulated the students' interest in learning. Good personal study habits, a desire for knowledge, and a clear plan for the future are also factors that promote learning.

## Discussion

1. research question 1: What is the methodology for introducing ICVE blended learning into the teaching of business studies in vocational colleges and universities?



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

According to the researcher, the curriculum of ICVE blended learning needs to be carefully designed by teachers. The main steps include:

(1) Course preparation

Firstly, mastering the students' learning situation, such as analyzing their subject interests, background, and learning styles, and gaining a deeper understanding of their knowledge of the course. Teachers use the ICVE platform to design interactive content, and detailed course content, and integrate practical cases and course resources according to the actual situation of students.

(2) Course Design

Teachers divide the course into 5 modules with 25 tasks and upload the course resources and course question bank to the platform. Classroom lectures, case analyses, cooperative discussions, and other teaching methods are used to solve the difficult points of the course. Through the integration of industry and education, real enterprise projects are introduced into the classroom to help students carry out project planning.

(3) Course Implementation

Before class, the teacher uploads the course resources to the platform, previews the knowledge, provides students with opportunities for independent learning, and stimulates students' interest in learning.

During the lesson, teachers set teaching tasks, group discussions, flipped classrooms, classroom practice, and other methods that can be carried out in the classroom to make students proficient in the course content.

After class, teachers provide knowledge extension, online homework, and course feedback, so that students can complete the coursework independently and provide feedback.

These teaching methods enhance students' independent learning and teamwork abilities and provide students with diverse learning experiences. Students will become more proficient in the course content by participating in real projects that closely integrate theory and practice.

2. research question 2: How did the students who participated in ICVE blended learning perform?

Participants were divided into an experimental group (42 students) and a control group (39 students). Blended learning using the ICVE platform was tested in three areas: case studies, specific theories, and specific skills. The following are the results of the study:

(1) Problem solving skills

Experimental group: pre-test mean 69.9, post-test mean 85.21.

Control group: pre-test mean 70.36, post-test mean 81.33.

Both groups had similar scores on the pre-test, and the experimental group showed significant improvement in the post-test, which was 3.88 points higher than the control group.

The t-test was significant, $t = -4.209$, $p = 0.000$. The $H_0$ was rejected. The result indicated the difference in problem-solving skills between the experimental group and the control group.

(2) Specific knowledge

Experimental group: pre-test mean 71.79, post-test mean 86.57.

Control group: pre-test mean 69.95, post-test mean 80.05.

Both groups had similar pre-test scores and significant differences in post-test mean scores, with a 6.52-point advantage for the experimental group.



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

The t-test was significant, t = -3.242, p = 0.002. The $H_0$ was rejected. The result indicated the difference in specific knowledge between the experimental group and the control group.

(3) Specific skills

Experimental group: pre-test means 70.33, post-test means 85.76.

Control group: pre-test mean 71.64, post-test mean 82.95.

Both groups had similar pre-test scores and the experimental group had a post-test mean score advantage of 2.81 points.

The t-test was significant, t = -3.129, p = 0.003. The $H_0$ was rejected. The result indicated the difference in specific skills between the experimental group and the control group.

The data showed that ICVE-based blended learning significantly improved students' problem-solving, specific knowledge, and specific skills. These findings support the effectiveness of blended learning in brand planning and promotion courses and provide valuable lessons for teaching business courses in similar vocational colleges.

3. Research Question 3: Students' perceptions of blended learning in ICVE.

Analyzing the results of the open-ended questionnaire survey of the 42 students in the experimental group, it was found that blended learning has had a positive impact on facilitating student learning, while at the same time facing some challenges.

Students have a positive attitude towards ICVE blended learning, believing that this learning method can effectively combine theory and practice, which not only deepens the understanding of course knowledge but also enhances discussion, experience sharing, and collaborative learning. Students reported a better learning experience on the ICVE platform, where they can view learning resources anytime and anywhere, complete assignments on the platform, enhance interaction with teachers, and learn more flexibly and autonomously.

Compared with traditional teaching, students find blended learning more interesting and convenient. The platform's resource management, assignment management, and note management functions are also advantages of the ICVE platform. Students consider the attractiveness of course content, interest in learning, the learning environment and study habits, as well as plans and aspirations, to be key factors in facilitating learning. However, some factors can affect learning, such as technical problems with the platform such as slow response times, network delays, and repeated logins and logins. Lack of self-discipline and unreasonable time management are some of the factors that hinder learning, in addition to individual self-learning skills.

## Conclusion

This study focuses on the practice of blended learning application of the ICVE platform for teaching higher vocational business courses. Against the background of the current teaching needs of the new era, the wide application of blended learning in the field of education provides an important opportunity and motivation for the study. This study aims to explore the effect of the practical application of the ICVE blended learning model in teaching, as well as students' experiences and perceptions of this teaching model.

The study elaborates on the concepts of blended learning, SPOC, and ICVE platform, and establishes the theoretical framework and hypotheses of the study. By analyzing the connection between the study population and the characteristics of the discipline, problem-solving ability, specific



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

knowledge, and specific skills were identified as the main variables of the study. In terms of research design, the study adopted a quasi-experimental approach to reveal the positive effects of the ICVE blended learning model in improving students' academic performance by comparing the data of the experimental and control groups.

The experimental results show that the implementation of the ICVE blended learning model in business teaching in higher vocational colleges and universities effectively improves students' academic performance and verifies its practical effect in actual teaching. This finding not only provides new teaching strategies and methods for business teaching in higher vocational colleges but also provides valuable references for university policymakers and teachers.

To further understand students' experiences and perceptions, the study used an open-ended questionnaire to conduct the survey. Students generally agreed that the ICVE platform provided more flexible and diverse learning methods, which effectively stimulated their interest in learning. At the same time, students also put forward some valuable suggestions, such as enhancing the technical stability of the platform, focusing on individual differences, and improving the learning environment. These suggestions will provide important references for future research and improvement strategies.

In summary, this study verifies the effectiveness of the ICVE blended learning model in teaching business in higher vocational colleges and universities through empirical research and receives positive feedback from students. The results of this research are important for improving teaching quality and student learning outcomes and also provide a reference for future research and improvement strategies. This may involve more flexible curriculum design, richer integration of learning resources, and smarter learning support systems, which will more effectively promote the innovation and development of education and teaching.

## Recommendation

In the ICVE blended learning model, the role of the teacher has changed dramatically. Teachers are no longer the traditional transmitters of knowledge but act more as mentors and advisors. Modern education has changed from the traditional " teacher-centered" to "student-centered ". The need for individualization of students is also becoming more and more obvious, with different students having different needs and learning states. Students can learn independently according to their learning plan and rhythm, and teachers need to adjust the teaching plan and curriculum arrangement according to the student's learning situation. Through the platform's rich resources and teachers' full guidance, it helps students stimulate their interest in learning and better master the learning content blended learning breaks the traditional teaching mode, helps educators to innovate and reform, and provides new ideas for the teaching mode of business in higher vocational colleges and universities. Future research can continue to explore the effectiveness and applicability of the ICVE blended learning model and carry out multifaceted empirical research. Focusing on the analysis of student learning outcomes in different disciplines, grades, and geographical contexts to provide reference for specific educational scenarios.

## References

Ahlstrom, A.W., Yohalem, N., David, Ji, P., Hillaker, P., & David, P. (2014). *From Soft Skills to Hard Data: Measuring Youth Program Outcomes*. New York, USA: William T. Grant Foundation.

Al-Qahtani, A.A., & Higgins, S.E. (2013). Effects of traditional, blended and e-learning on students'



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

achievement in higher education. *Journal of computer-assisted learning*, 29(3), 220-234.

Alshwiah, A.A.S. (2009). *The Effects of a Blended Learning Strategy in Teaching Vocabulary on Premedical Students' Achievement, Satisfaction and Attitude toward English Language.* Published Master Thesis, Arabian Gulf University.

Andrews, J., & Higson, H. (2008). Graduate employability,' soft skills' versus 'hard' business knowledge: A European study. *Higher education in Europe*, 33(4), 411-422.

Bannon, S. (2014). Case studies in introductory courses. *Journal of Business Case Studies (JBCS)*, 10(3), 293-302.

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first-century skills. *Assessment and teaching of 21st-century skills*, 17-66.

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining Twenty-First Century Skills. *In P. Griffin, B. McGaw, & E. Care (Eds.), Assessment and Teaching of 21st Century Skills. (pp. 17-66).* Dordrecht: Springer. http://dx.doi.org/10.1007/978-94-007-2324-5_2

Bryan, A., & Volchenkova, K.N. (2016). Blended learning: definition, models, implications for higher education. Вестник Южно-Уральского государственного университета. Серия: Образование. *Педагогические науки*, 8(2), 24-30.

Delialioğlu, Ö. (2012). Student engagement in blended learning environments with lecture-based and problem-based instructional approaches. *Journal of Educational Technology & Society*, 15(3), 310-322.

Duncan, A. (2009). *Statement from US Secretary of Education Arne Duncan on results of NAEP Arts 2008 assessment.* Washington, DC: US Department of Education.

Etikan, I., Musa, S.A., & Alkassim, R.S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.

Fox, A. (2013). From moocs to spocs. *Communications of the ACM*, 56(12), 38-40.

García-Alberti, M., Suárez, F., Chiyón, I., & Mosquera Feijoo, J. C. (2021). Challenges and experiences of online evaluation in courses of civil engineering during the lockdown learning due to the COVID-19 pandemic. *Education Sciences*, 11(2), 59.

Garnham, C., & Kaleta, R. (2002). Introduction to hybrid courses. Teaching with Technology Today, 8 (6). Retrieved October 3, 2006. http://www.uwsa.edu/ttt/ articles/garnham.htm

Goldberg, L. R., Bell, E., King, C., O'Mara, C., Mclnerney, F., Robinson, A., & Vickers, J. (2015). Relationship between participants' level of education and engagement in their completion of the Understanding Dementia Massive Open Online Course. *BMC Medical Education*, 15(1), 1-7

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59-82.

Guo, P., Saab, N., Post, L. S., & Admiraal, W. (2020). A review of project-based learning in higher education: Student outcomes and measures. *International journal of educational research*, 102, 101586.

Gupta, J., & Garg, K. (2021). Reflections on blended learning in management education: a qualitative study with a push-pull migration perspective. *FIIB Business Review*, https://doi.org/10.1177/23197145211013686

Haag, A. B. (2013). Writing a successful business plan: An overview. *Workplace health & safety*,



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

61(1), 19-29.

Hadiyanto, H. (2019). The EFL students' 21st-century skill practices through e-learning activities. *Indonesian Research Journal in Education. 3*(2), 461-473. https://doi.org/10.22437/irje.v3i2.8036

Ingold, T. (2002). Culture and the perception of the environment. *In Bush base, forest farm (pp. 38-56).* Routledge.

Kaur, M. (2013). Blended learning challenges and future. *Procedia-social and behavioral sciences*, 93, 612-617.

Kember, D. (1997). A reconceptualization of the research into university academics' conceptions of teaching. *Learning and instruction*, 7(3), 255-275.

Kokotsaki, D., Menzies, V., & Wiggins, A. (2016). Project-based learning: A review of the literature. Improving schools, 19(3), 267-277.

Krisantia, I. (2021). Visual therapy through the application of plants and design elements in landscape**.** IOP Conference Series Earth and Environmental Science. 737(1), 012008. DOI:10.1088/1755-1315/737/1/012008

Lee, J.H. (2021). From MOOC to SPOC: Fable-Based Learning. In Blended Learning: Re-thinking and Re-defining the Learning Process. *14th International Conference, ICBL 2021, Nagoya, Japan, August 10–13, 2021, Proceedings 14 (pp. 16-25).* Springer International Publishing.

Luaran, J.E., Jain, J., Alias, R., & Hussin, A.A. (2015). Blended learning: Examining student satisfaction willingness and stress in learning English. *In the 8th Annual International Conf. on E-Learning*

Mann, P. (2023). *Professional Competencies Needed by Licensed Professional Counselors in Working with the Homeless Culture.* Doctoral dissertation, Capella University.

Marando, A. (2012). *Balancing project management hard skills and soft skills.* Massachusetts, USA: Brandeis University.

Markus, H.R., & Kitayama, S. (2014). Culture and the self: Implications for cognition, emotion, and motivation. *In College Student Development and Academic Life (pp. 264-293).* Routledge.

McDonald, S.M. (2011). *Perception: A concept analysis.* International Journal of Nursing Terminologies and Classifications, no-no. doi:10.1111/j.1744-618x.2011.01198.x

Qiong, O.U. (2017). A brief introduction to perception. *Studies in literature and language*, 15(4), 18-28

Rahman, M.M. (2019). 21st-century skill ' problem-solving: Defining the concept. Rahman, MM (2019). 21st Century Skill "Problem Solving": Defining the Concept. *Asian Journal of Interdisciplinary Research*, *2*(1), 64-74.

Rovai, A.P., & Jordan, H.M. (2004). Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Review of Research in Open and Distributed Learning*, 5(2), 1-13.

Sahni, J. (2019). Does blended learning enhance student engagement? Evidence from higher education. *Journal of E-learning and Higher Education*, 2019, 1-14.

Smeby, J. C. (2007). Connecting to Professional Knowledge. *Studies in Higher Education,* 32, 207-224. http://dx.doi.org/10.1080/03075070701267251

Stice, J.E. (2007). *Teaching problem solving.* Teachers and Students Sourcebook: Alternative Teaching Methods.



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717

Van de Ven, A.H., & Johnson, P E. (2006). Knowledge for theory and practice. *Academy of Management Review*, 31(4), 802-821.

Wilson-Ahlstrom, A., Yohalem, N., DuBois, D., Ji, P., Hillaker, B., & Weikart, D. P. (2014, January). From soft skills to hard data: Measuring youth program outcomes. *In Forum for Youth Investment. Forum for Youth Investment. The Cady-Lee House, 7064 Eastern Avenue NW*, Washington, DC 20012-2031.

Wu, S.Y., Hou, H.T., Hwang, W.Y., & Liu, E.Z.F. (2013). Analysis of learning behavior in problem-solving-based and project-based discussion activities within the seamless online learning integrated discussion (SOLID) system. *Journal of Educational Computing Research*, 49(1), 61-82.

Yashwant, A. V., Arayambath, B., Murugaboopathy, V., Kommi, P. B., Prashad, K. V., & Rajasekaran, U. B. (2020). Comparative Evaluation of the Effectiveness of Blended Learning Versus Traditional Learning in Cephalometrics for Undergraduates. *Journal of Indian Orthodontic Society*, 54(1), 24-30.



Citation
Zhang, Y. (2024). Research ON ICVE-based Blended Learning in Vocational College Business Teaching. International Journal of Sociologies and Anthropologies Science Reviews, 4 (5), 469-486; DOI: https://doi.org/10.60027/ijsasr.2024.4717