

Design and Development a Role-Playing Entrepreneurship Learning Module for High School Students in Shandong, China

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Abstract

Entrepreneurship education is increasingly important as it aims to enhance students' entrepreneurial competencies as well as their critical thinking, creativity, leadership, teamwork, and problem-solving skills. Conventional classroom-based entrepreneurship education, however, often fails to give students the opportunity to put their entrepreneurial knowledge into practice while they are still in high school. This study aimed to design and validate a Role-Playing Entrepreneurship Learning Module (RPB-ELM) for high school students in Shandong, China. The study employed Phase 2- Design and Development Phase in Design and Development Research (DDR) approach employing quantitative expert-validation by means of a two-round Delphi study. In total, 30 experts from the fields of entrepreneurship education, role-playing and experiential learning, instructional design and high school education were validated in the study's evaluation. The RPB-ELM comprises six units: entrepreneurial concepts and mindset; business opportunity identification and market research; business model development and planning; financial literacy and resource management; marketing, branding, and customer acquisition; and leadership, teamwork, and problem-solving. The evaluation criteria comprised four key dimensions: Content Validity; Instructional Design and Pedagogy; Usability and Feasibility; and Effectiveness and Impact. In terms of level of agreement between the panel of experts for the four dimensions, there was an increase in the level of agreement between Round 1 and Round 2 evaluations for all four key dimensions. In particular, the level of agreement for the RPB-ELM in terms of Content Validity was (100.0%) that all experts were in agreement, followed by Effectiveness and Impact (97.3%), Instructional Design and Pedagogy (95.3%), and Usability and Feasibility (93.3%). There was, however, a need for further refinement of two items, namely scenario realism and workload manageability, both of which received (76.7%) agreement. The findings indicated that the RPB-ELM has strong content validity, appropriate instructional design, is of practical feasibility, and has great potential for supporting entrepreneurship learning.

Keywords: Entrepreneurship Education, Role-Playing, Experiential Learning, Design and Development Research, Delphi Technique, Entrepreneurial Competencies, High School Students, China

Introduction

Entrepreneurship education aims to equip high school students with creative thinking, initiative, opportunity recognition, financial literacy, leadership, teamwork and problem-solving skills and knowledge, which can enable them to transform ideas and opportunities into value through appropriate attitudes and skills (Bacigalupo et al., 2016). In order to equip high school students with necessary skills and knowledge for future study, careers and entrepreneurship, entrepreneurship education has been increasingly shifted from knowledge-based teaching to competency-oriented and active learning in China. Structured entrepreneurship education and experiential activities can effectively equip students with various entrepreneurship competencies (Shao et al., 2024; Zhai & Chen, 2024). Experiential learning within Chinese entrepreneurship education also affects students' self-efficacy and entrepreneurial intentions (Vankov & Wang, 2024). Experiential learning can facilitate better learning outcomes for entrepreneurship education as students can put knowledge into practice through various meaningful activities and simulated scenarios in order to acquire necessary skills and knowledge for entrepreneurship (Motta & Galina, 2023).

However, most of the current entrepreneurship education fails to provide high school students with real-life entrepreneurial experiences and environments. To this end, the role-playing approach could be considered to enable students to play the roles of entrepreneurs, to make decisions, to communicate and cooperate with each other, and to solve problems encountered in running entrepreneurial ventures. Experiences provided by role-playing can foster development of communication and cooperation skills and other skills necessary for 21st century citizens (Aura et al., 2023). Hence, it is necessary to design a structured role-playing entrepreneurship module for high school students in Shandong, China. The objective of this study is to design a Role-Playing Entrepreneurship Learning Module for high school students. The module includes six units (i) entrepreneurial concepts and mindset; (ii) business opportunity identification and market research; (iii) business model development and planning; (iv) financial literacy and resource management; (v) marketing, branding, and customer acquisition; and (vi) leadership, teamwork, and problem-solving.

Literature Review

This literature review is for establishing a theoretical and empirical basis for the learning module Role-Playing-Based Entrepreneurship Learning Module (RPB-ELM) for high school students in Shandong Province, China. Literature review including expert content validity, Delphi expert consensus, learning module design and pedagogy, role-playing, usability and feasibility, entrepreneurial competencies, the Chinese context for education, effectiveness and impact, and module revision. Using Design and Development Research (Richey & Klein, 2007), the review draws on literature in experiential learning (Kolb, 1984) and in entrepreneurship competency (Bacigalupo et al., 2016). Thus, the literature review provides a basis for the systematic design, validation and refinement of the RPB-ELM.

Validation of the content of modules in education includes learning content, activities, assessment procedures and learning outcomes. This type of validation is important and has been demonstrated in the higher education environment using systematic expert judgment (Alqahtani et al., 2023). Validation and reliability of an instrument are two important indicators (Amirzadeh et al., 2024). The reliability of an instrument is to measure how much a test is reliable in order to obtain consistent results. Expert validation of the RPB-ELM content

is required to ensure that the entrepreneurial competencies, critical thinking skills, and learning achievements of high school students in China are properly addressed. This literature review is based on Design and Development Research (Richey & Klein, 2007). The process of designing, testing, revising and refining an educational intervention in various ways is described by McKenney and Reeves (2021) in their Design Research approach. Recently, Govindasamy et al. (2023) and Md. Aris et al. (2024) utilized Design and Development Research to systematically design and develop learning modules for educational purposes. Consequently, the Delphi expert review can serve as an iterative process to revise the RPB-ELM based on the feedback received from the experts in Round 1 and measure whether stronger expert consensus has been achieved in Round 2.

To equip high school students in Shandong, China with practical entrepreneurial knowledge and skills that would facilitate their transition into entrepreneurs, the RPB-ELM is designed based on an experiential learning model and a role-playing pedagogy (Aura et al., 2023; Hsu & Wu, 2023; Fioravanti et al., 2022; Kao et al., 2025). According to Kolb (1984), learning can be conceptualised as a process consisting of four stages: the learning experience, the reflective observation of the learning experience, the conceptualisation of the learning experience, and the experimental application of the learning experience. In the RPB-ELM, entrepreneurial skills are learnt through practical role-playing within different scenarios and entrepreneurial roles (Biddle, 1979). For instance, as market analysts, startup CFOs, entrepreneurs, and team leaders, students would engage in various activities that require them to make entrepreneurial decisions within given scenarios (Fioravanti et al., 2022; Kao et al., 2025). By going through different entrepreneurial scenarios and roles, students would gain hands-on experience in managing various aspects of entrepreneurial ventures. To equip students with necessary skills to become successful entrepreneurs, the RPB-ELM enables students to engage in critical thinking and to apply entrepreneurial knowledge and skills that they have acquired in class to real life situations.

In addition to being theoretically sound, an educational module must also be usable and feasible for implementation. A resource or system is usable when users can complete tasks efficiently and effectively. According to Nielsen (1994), usability evaluation is critical for improving the design of educational resources. Pilot studies or testing can help to identify potential problems or barriers to implementation. For example, Otis et al. (2020) conducted a mixed-method pilot study that incorporated both usability and feasibility testing. Ritzhaupt et al. (2020) underscored the importance of not only designing an educational intervention but also evaluating it. For the RPB-ELM, the aspects related to usability and feasibility comprise the module's clear instruction, easy-to-navigate design, sufficient resources, realistic and appropriate scenario, adequate time for activities, facilitation by teachers, manageable workload of students, and practical implementation in classrooms. In line with Man et al. (2002), the entrepreneurial competency is multi-dimensional and cannot be limited to having knowledge of business concepts. Comprises several dimensions of entrepreneurship as a competence that can be learned and developed through entrepreneurship education (Bacigalupo et al., 2016). Furthermore, an entrepreneurship education program must be able to cater to the different learning needs of students (Liu et al., 2022). The different course characteristics and student needs differences are relevant to teaching effectiveness (Liu et al., 2022). For the RPB-ELM, therefore, the Module seeks to

integrate students' entrepreneurial intention with practical skills of identifying business opportunities, financial management, marketing, leadership, teamwork, and critical thinking.

In assessing the effectiveness of entrepreneurship education, change in the students as a result of the education provided rather than mere satisfaction, they derive from the program is what matters. This change can take the form of higher student engagement and application of higher-order thinking in a business simulation, for instance (Hsu & Wu, 2023). As Motta and Galina (2023) assert, experiential learning is an important direction of entrepreneurship education programs globally. In terms of enabling students to cultivate an entrepreneurial mindset, experiential pedagogies are crucial (Nzembayie et al., 2026). An important study within the specific Chinese context evaluated the impact of an experiential entrepreneurship education intervention in enhancing the self-efficacy of participants and their entrepreneurial intentions (Vankov & Wang, 2024). Hence, assessing the RPB-ELM for its ability to enhance the RPB-ELM outcomes of entrepreneurial competencies, critical thinking skills and learning achievement through pre- and post-intervention assessment would be warranted. In design and development research, as initially proposed by Richey and Klein (2007), evaluation of the design during the development stage often reveals flaws in the design that need to be fixed prior to testing for effectiveness (Ritzhaupt et al., 2020). These design problems relate to ease of use and implementation (usability), which should also be identified and addressed in a systematic manner (Nielsen, 1994).

The novelty of the Role-Playing-Based Entrepreneurship Learning Module (RPB-ELM) include a) the integration of six sets of entrepreneurial competencies and critical thinking into six units of experiential learning, b) the use of simulation-based role-playing in structured forms of entrepreneurial problem-solving and decision-making in collaborative settings, c) the structured reflection on learning and application of what has been learned in a practical sense, d) the Design and Development Research (DDR) process that includes needs assessment, design, expert validation, usability testing, and quasi-experimental assessment, and e) the application and effectiveness assessment of the newly developed module in high school classes in Shandong Province, China.

Methodology

This study was conducted in Phase 2: Design and Development of the Design and Development Research (DDR) methodology (Richey & Klein, 2007). The study employed a quantitative research approach and was used to gather measurable data from the experts' judgments regarding the proposed Role-Playing Entrepreneurship Learning Module (Creswell & Creswell, 2023).

The Delphi technique was applied in two rounds of surveys by using a structured questionnaire to achieve consensus among the experts. Thirty experts from relevant fields of entrepreneurship education, role-playing and experiential learning, instructional design and high school education were selected. The experts' evaluations about the proposed module were collected within the frame of Shandong, China. The Delphi survey contained four sets of constructs, with three items for each of the constructs, for a total of 20 items to be evaluated by the experts. The four perspectives include (i) Content Validity, (ii) Instructional Design and Pedagogy, (iii) Usability and Feasibility, and (iv) Effectiveness and Impact. The assessment instrument included indicators that measured the following aspects of the six-unit module:

appropriateness, clarity, practicality, pedagogical quality, and expected educational effects. All quantitative data from the two rounds of the Delphi survey were analyzed using descriptive statistics as well as expert consensus analysis. The results from Round 1 showed areas of need for refinement, whereas results from Round 2 indicated whether, in the end, even stronger consensus on the Role-Playing Entrepreneurship Learning Module for high school students in Shandong, China had been reached after refinement.

Finding and Discussion

The two-round Delphi study involving 30 experts analyzed the Role-Playing Entrepreneurship Learning Module (RPB-ELM) from four perspectives: (i) Content Validity, (ii) Instructional Design and Pedagogy, (iii) Usability and Feasibility, and (iv) Effectiveness and Impact. The level of consensus among the experts was measured by comparing the mean, interquartile range (IQR) and percentage of agreement between Delphi Round 1 and Delphi Round 2.

Table 1

Delphi Round 1 and Round 2 Results: Content Validity

Item	Focus	Mean R1	Mean R2	IQR R1	IQR R2	Agreement R1 (%)	Agreement R2 (%)	R2 Decision
A1	Entrepreneurial competency coverage	6.467	6.567	1.00	1.00	100.0	100.0	High consensus
A2	Critical-thinking development	5.500	5.600	1.00	1.00	86.7	100.0	Accepted
A3	Relevance of role-play, simulations and reflection	5.867	5.867	0.00	0.00	86.7	100.0	High consensus
A4	Alignment of outcomes and objectives	5.833	5.867	1.75	0.75	93.3	100.0	High consensus
A5	Cultural and contextual appropriateness	5.900	6.000	1.75	0.00	90.0	100.0	High consensus
Overall A	Content Validity	5.913	5.980	2.00	0.00	91.3	100.0	Strong consensus

Table 1 shows the content validity of the RPB-ELM has been significantly improved after Delphi Round 2. The overall mean and the expert agreement have increased from 5.913 and 91.3% in the Delphi Round 1 to 5.980 and 100% in the Delphi Round 2 respectively. In addition, the overall IQR has decreased from 2.00 in the Delphi Round 1 to 0.00 in the Delphi Round 2. All five items in the Delphi Round 2 had 100% agreement. In terms of the items' mean scores, A1 (Entrepreneurial competency coverage) had the highest mean score of 6.567 followed by A5 (Cultural and contextual appropriateness) which improved to 6.000 from 5.333 in the previous round, while A3 (Relevance of role-play, simulations and reflection) remained stable with a mean score of 5.867. In summary, strong expert agreement on content validity indicates that RPB-ELM has adequate coverage of intended entrepreneurial competencies, critical thinking skills, role-playing activities, program learning outcomes and cultural context, and that the refinements made following Round 1 of the Delphi process increased agreement and reduced IQR in Round 2.

The findings from the Delphi survey support the view that RPB-ELM content has been adequately covered for intended entrepreneurial competencies, critical thinking skills, role play activities, learning outcomes and cultural context. In addition, the levels of agreement and associated reduction in the IQR between Delphi Round 1 and Round 2 have effectively addressed areas of previous lack of agreement through the refinements that have been incorporated into the module content. These findings are in line with Alqahtani et al. (2023) who stress the importance of systematic expert judgement to determine the content validity of an educational intervention instrument. In addition, the content validity of RPB-ELM has been found to be of a high quality, thus warranting further development and use of the module (Amirzadeh et al., 2024). Furthermore, findings from the two rounds of Delphi survey suggest that application of DDR has been effective in terms of facilitating the processes of iterative expert evaluation and subsequent refinement of a human based educational intervention (Richey & Klein, 2007; McKenney & Reeves, 2021).

Table 2

Delphi Round 1 and Round 2 Results: Instructional Design & Pedagogy

Item	Focus	Mean R1	Mean R2	IQR R1	IQR R2	Agreement R1 (%)	Agreement R2 (%)	R2 Decision
Item	Focus	Mean R1	Mean R2	IQR R1	IQR R2	Agreement R1 (%)	Agreement R2 (%)	R2 Decision
B1	Effectiveness of role-play	5.533	5.700	1.75	1.00	93.3	100.0	High consensus
B2	Balance of theory and experiential activities	5.667	5.967	1.00	0.00	93.3	100.0	High consensus
B3	Realism of entrepreneurial scenarios	4.767	4.867	0.75	0.00	66.7	76.7	Revision required
B4	Coherence and sequence of six units	6.133	6.367	1.00	1.00	100.0	100.0	High consensus
B5	Reflection, feedback and knowledge transfer	5.900	6.033	1.00	0.00	96.7	100.0	High consensus
Overall B	Instructional Design & Pedagogy	5.620	5.787	1.00	1.00	90.0	95.3	Strong consensus

Table 2 shows the score for the Instructional Design and Pedagogy of the RPB-ELM improved from the first to the second round of the Delphi study. The mean score for the total set of criteria increased from 5.620 (SD = .9183) to 5.787 (SD = .9133). The percentage of agreement among the experts rose from 90% to 95.3%. The highest mean score for Round 2, corresponding to the highest score for B4, the coherence and sequence of the six units, was 6.367 with 100% agreement among the experts. B1, B2, B4, and B5 reached 100% agreement in Round 2. However, the mean score for B3, the realism of the entrepreneurial scenarios, was 4.867 with only 76.7% agreement among the experts. Thus, B3 needed further fine-tuning.

The findings of the revised BPF indicate that experts see strong points in the RPB-ELM, particularly with regards to a coherent instructional structure, an appropriate balance of theory and experience, and the effective integration of role-play, reflection, and feedback. These are points of strength for the RPB-ELM as they support the Experiential Learning Theory of Kolb (1984), which posits that learning occurs through experience, reflection, conceptualization and experimentation. The revised BPF findings are also consistent with those of other researchers on experiential learning (Motta and Galina, 2023) and role-playing (Aura et al., 2023). Notably, however, there was less consensus on the B3 issue of entrepreneurial scenarios. To strengthen the pedagogical quality of the RPB-ELM, it would be helpful to make the scenarios more realistic, the decisions made by students and their consequences more real, and the business cases studied by students more realistic as well.

Table 3

Delphi Round 1 and Round 2 Results: Usability & Feasibility

Item	Focus	Mean R1	Mean R2	IQR R1	IQR R2	Agreement R1 (%)	Agreement R2 (%)	R2 Decision
Item	Focus	Mean R1	Mean R2	IQR R1	IQR R2	Agreement R1 (%)	Agreement R2 (%)	R2 Decision
C1	Feasibility in higher education	5.333	5.400	1.00	1.00	73.3	100.0	Accepted
C2	Implementation with existing resources	5.067	5.167	1.00	0.75	66.7	90.0	Accepted
C3	Student engagement and motivation	5.867	5.933	1.00	0.00	90.0	100.0	High consensus
C4	Practical and valid assessment	5.167	5.467	2.00	1.00	70.0	100.0	Accepted
C5	Manageable workload	4.633	4.867	1.75	0.00	50.0	76.7	Revision required
Overall C	Usability & Feasibility	5.253	5.367	2.00	1.00	71.3	93.3	Consensus achieved

Table 3 shows the results from the assessment of the Usability and Feasibility of the RPB-ELM in the two rounds of the Delphi study. While the overall mean increased from 5.253 in Round 1 to 5.367 in Round 2, the percentage of agreement among experts increased from 71.3% to 93.3% in both cases. This means that consensus has been achieved in the second round. As for the individual criteria, C3 (Student engagement and motivation) received the highest mean score ($M = 5.933$) with 100% agreement among the experts. Likewise, C1 (Facilitation support) and C4 (Practical and valid assessment) also reached 100% agreement. However, while C2 (Implementation with existing resources) reached 90% agreement, C5 (Manageable workload) was the weakest criterion with a mean score of 4.867 (76.7% agreement).

Results show that experts perceived the RPB-ELM to be usable, feasible, engaging, and practical enough for educational implementation. The significant increase in agreement between Delphi Round 1 and Round 2 likely resulted from refinements to the RPB-ELM during the Delphi process (Ritzhaupt et al., 2020). The module's usability was likely enhanced during the Delphi process (Nielsen, 1994). However, concerns regarding the workload of teachers

and students need to be addressed by simplifying the activities, controlling the duration of each activity, providing clear facilitation instructions, and specifying manageable requirements for both teachers and students in order to enhance the practical implementation of the RPB-ELM.

Table 4

Delphi Round 1 and Round 2 Results: Effectiveness & Impact

Item	Focus	Mean R1	Mean R2	IQR R1	IQR R2	Agreement R1 (%)	Agreement R2 (%)	R2 Decision
Item	Focus	Mean R1	Mean R2	IQR R1	IQR R2	Agreement R1 (%)	Agreement R2 (%)	R2 Decision
D1	Entrepreneurial achievement	5.100	5.200	1.00	1.00	86.7	90.0	Accepted
D2	Critical-thinking enhancement	5.933	6.000	0.75	0.00	100.0	100.0	High consensus
D3	Self-efficacy and entrepreneurial intention	5.733	5.800	1.00	0.75	93.3	96.7	High consensus
D4	Collaboration, leadership and problem-solving	5.800	5.867	1.00	0.75	93.3	100.0	High consensus
D5	Sustainable and transferable outcomes	5.700	6.000	1.00	0.00	96.7	100.0	High consensus
Overall D	Effectiveness & Impact	5.720	5.773	1.00	1.00	90.0	97.3	Strong consensus

Table 4 shows the consensus among experts in relation to the Effectiveness and Impact dimension in two rounds of the Delphi study. The overall mean from 5.720 in Round 1 to 5.773 in Round 2 and an increase in the level of agreement from 90% to 97.3% were found. All mean scores of the five items, D2 (Critical-thinking enhancement) and D5 (Sustainable and transferable outcomes) even reached the highest score of 6.000 (100% agreement). For D4 (Collaboration, leadership and problem-solving) 100% agreement also was reached. D3 (creativity and innovative outcomes) reached 96.7% of agreement, whereas D1 (Entrepreneurial achievement) reached the lowest score of 5.200 (90% agreement). However, this dimension still accepted by the experts.

The expert panel considered the RPB-ELM would be very effective in developing critical thinking, and increasing students' entrepreneurial self-efficacy and intention, as well as their capacity for collaboration, leadership, problem solving, and for generating sustainable and transferable learning outcomes. Their views on this dimension are consistent with those of Hsu and Wu (2023) who reported the engagement and higher-order thinking of students in simulation-based learning. Their views are also consistent with Motta and Galina (2023) who emphasized the need for experiential learning and teaching in entrepreneurship education. The views of the expert panel are also consistent with Vankov and Wang (2024) who provided empirical evidence of the impact of experiential education on entrepreneurial self-efficacy and intention. The RPB-ELM therefore has great potential for achieving educational goals and these views need to be tested in actual implementation with students in formal education.

Table 5

Priority Items Requiring Revision Following Delphi Round 2

Item	Area	Round 1 Mean	Round 2 Mean	Agreement R1	Agreement R2	Issue Identified	Revision Required in RPB-ELM
B3	Scenario Realism	4.767	4.867	66.7%	76.7%	Role-play scenarios did not sufficiently reflect authentic entrepreneurial challenges.	Strengthen scenario realism using role cards, evidence packs, realistic constraints, decision consequences, and authentic business cases.
C5	Workload Manageability	4.633	4.867	50.0%	76.7%	Concerns about workload, activity duration, and implementation demands for students and instructors.	Introduce time-boxed activities, core/extension tasks, output limits, reusable materials, and clearer facilitation guidelines.

Table 5 shows the two priority items in need of further refinement after Round 2 of the Delphi study. Although their means increased and the degree of agreement improved, B3 (Scenario Realism) still fell short of the desired level of agreement among the experts and thus was one of the two items to be refined further. The same was true for C5 (Workload Manageability), whose means increased from 4.633 to 4.867 and whose degree of agreement rose from 50% to 76.7%.

The research findings further stress the importance of iterative revision of RPB-ELM. In line with Richey and Klein (2007) and McKenney and Reeves (2021) researcher working within the boundaries of educational design research. Therefore, B3 could profit from more authentic business cases, more realistic constraints, more and more diverse role cards and more severe decision consequences. C5 could be improved by limiting the time for single activities, by structuring them into core and extension tasks and by using reusable resources for the facilitation of the different tasks. Furthermore, more and clearer facilitation guidelines for the different phases of the activities would be necessary.

Conclusion

The Role-Playing Entrepreneurship Learning Module (RPB-ELM) was successfully designed and validated in the context of Design and Development Research Phase 2. The two-round

Delphi study involved 30 experts in the field of education and/or entrepreneurship. Overall, strong consensus was obtained for all module components in the second round of the Delphi study, include Content Validity, Instructional Design and Pedagogy, Usability and Feasibility, and Effectiveness and Impact. The RPB-ELM is valid, pedagogically appropriate, feasible for implementation and potentially effective for entrepreneurship learning. Some fine-tuning is however required for scenario realism and for managing the workload of this module.

From a practical pedagogic perspective, the RPB-ELM offers teachers and educators within and outside of Shandong, China, a number of structured and embedded features including experiential learning through role-playing, use of critical thinking, financial literacy, marketing, leadership, teamwork and problem-solving to transform entrepreneurship education from a largely teacher-centered subject to more active and student-centered learning.

The study was confined to the design of the RPB-ELM and its expert validation; hence findings are based on the perceptions of experts in the field of entrepreneurship and relevant educational context. In addition, two of the module components, namely the realistic entrepreneurial scenarios for role-playing and the manageable workload of the module for teachers, did not reach the same level of consensus as the other components.

Future studies could further refine the scenarios of entrepreneurial ventures as well as decrease the workload of the module's implementation. Pilot-testing the RPB-ELM with students and teachers from various high schools is necessary to study its usability and to gain experience in practical implementation of the module. The effectiveness of the RPB-ELM in improving a set of entrepreneurial competencies, inculcating critical thinking, enhancing self-efficacy, fostering teamwork and problem-solving skills, as well as boosting learning achievement could be studied in experimental or quasi-experimental studies. In addition, it is necessary to adapt and validate the RPB-ELM for use in various schools and educational settings in China's provinces and regions.

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