

Design Thinking Transforms Teaching Approaches and Curriculum Development for Entrepreneurship Education

Chibing Gong

Guangdong Polytechnic of Water Resources and Electric Engineering, Guangzhou, China.

SpencerGong@qq.com

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Abstract. Current entrepreneurship education focuses on planning and forecasting. Future entrepreneurship education should concentrate on students' actions in a complex and unpredictable environment. The feasible method is to use design thinking to transform entrepreneurship education. First, design thinking meets all the principles for designing learning environments in entrepreneurial education and is a new teaching approach; then, design thinking can be used in the curriculum development of entrepreneurial education through six modules.

1. Introduction

Entrepreneurship can promote economic development and increase employment opportunities. Many countries have launched initiatives to develop entrepreneurship education vigorously. In recent decades, entrepreneurship education has flourished since the first entrepreneurship course was started at Harvard University in 1947, and countless entrepreneurship courses have been developed and implemented around the world including China. The European Commission concludes that investing in entrepreneurship education is one of the best investments in Europe. The current entrepreneurial education usually adopts causal logical thinking focusing on planning and forecasting. Many courses take business planning as the main content, and the topics are still planning and forecasting. In the classroom of entrepreneurship education, teaching is still the primary approach, and guests are also invited to give lectures.

Future entrepreneurship education should train students to master survival skills in a rapidly changing business environment. Applying effect logic thinking [1] in entrepreneurship education can cultivate students' ability to compete in a complex and unpredictable environment. The feasible method is to transform entrepreneurship education with design thinking.

2. Design thinking

The meaning of design thinking is to think like a designer. After the concept of design thinking was put forward by Harvard Design Institute in 1987, it attracted widespread attention. Design thinking has been used in the fields of art, industrial design, architecture, engineering, commerce, and education, etc. In the past decade, design thinking has gained the attention of entrepreneurial educators [2,3,4,5].

Design thinking focuses on human needs and creatively solves problems. It interacts between the three spaces of inspiration, conception and realization. Through the tools and methods refined by designers, design thinking integrates human needs, technical feasibility, and business value to achieve better solutions.

Design thinking is a methodological system that solves real problems in innovative ways. These problems are usually uncertain and wicked, and design thinking can provide creative solutions for them. Design thinking is to consider and tackle real issues like designers. The designer's way of thinking is different from others. It is related to designing products, services, and processes rather than the design results.

Design thinking is a cyclic iterative process of obtaining user needs, continuous analysis, and creation. This innovation includes the definition of the problem, the conception of the solution, the prototype production, and the feedback, etc.

In practical applications, many scholars have developed different models for design thinking. Although there are many types of these models, their core connotations are the same.

The Stanford Design Institute proposed a representative EDIPT design thinking model [6]. The model includes five stages of empathy, definition, ideation, prototype, and test. The specific content and role of each step are different.

3. Design Thinking Transforms Teaching Approaches for Entrepreneurship Education

From a constructivist perspective, ten principles should be followed for the planning learning environment in entrepreneurship education [7]. In the learning process of entrepreneurship education, teachers will become supporters or coaches for students. Students manage their learning processes. Design thinking conforms to these principles. Design thinking changes the way of entrepreneurship education. It can be used as a new teaching approach to entrepreneurship education, which effectively improves the learning effect of entrepreneurship education.

The first principle is the test. Students can ask the right questions in tests. Through discussion of these questions, students reflect on the process they have gone through to create new knowledge. In the process of reflection, the role of teachers is crucial. Teachers should not give responses but should let students create answers and solve problems independently. Design thinking can explore many possible solutions through the brainstorm and rapid prototyping.

The second principle is that students set their learning goals. From a constructivist perspective, students have learning goals. Teachers help students propose their learning goals so that students will work harder to achieve goals. Design thinking observes the world from the user's point of view, understands the user's problems, and builds empathy. The goal is to find better answers for users.

The third principle is that students look for specific content on-demand to achieve their goals. According to the learning goals, not the requirements in the syllabus, students look for relevant content and learn purposefully. The first process of design thinking is the inspiration which requires the active search for information.

The fourth principle is to test students properly. In design thinking, you can evaluate whether a solution is better from three aspects: business feasibility, technical feasibility, and commercial value. It is recommended to develop clear evaluation rules for students and evaluate their performance through competition.

The fifth principle is to build interactive and social cognitive conflict activities. Design thinking occurs through the interaction and collaboration of multidisciplinary teams. This interaction and cooperation can solve wicked problems. When the team has new ideas applied to production practices, it will inform the stakeholders of the company. This behavior of sharing ideas is consistent with the sixth principle and promotes the unlimited communication of information among students in the classroom.

The seventh principle encourages students to reconstruct information to gain new insights. The second process of design thinking is ideation. What team members see and hear during the first process will lead to useful solutions. These may be new products or interactive experiences in various ways.

The eighth principle is that the role of teachers is to open up new ways of thinking by solving problems from different angles and even questioning the issues raised by students. The manager does not determine the design thinking process. All team members should put forward as many ideas as possible and contribute to all stages of the process.

The ninth principle is to cultivate student autonomy, morality, and responsible behavior, which can be achieved through the cooperation of design thinking.

The tenth principle is to enjoy learning and thinking. The design thinking process is usually based on a multidisciplinary and informal collaborative environment that promotes creativity and innovation, and members enjoy this process.

Design thinking meets all of the above principles of designing an entrepreneurial education learning environment. Design thinking can be used as a new teaching approach to help students quickly understand and learn entrepreneurial behavior.

4. Design Thinking Transforms Curriculum Development for Entrepreneurship Education

Design thinking transforms curriculum development for entrepreneurial education. The following describes how to use design thinking to develop and design courses for entrepreneurial education [8].

A different student team with a multidisciplinary background needs to be formed to participate in the development and design of the course of entrepreneurship education. Teachers distribute projects that require challenges and choose projects that are unfamiliar to students, which can help expand students' horizons and allow students to face and identify these challenges. The curriculum development and design of entrepreneurship education include the following six modules: finding problems, explaining problems, conceiving solutions, prototypes, solutions and futures, and performance evaluation.

4.1 Finding problems

Finding problems is achieved by collecting relevant information. Students need to get out of the classroom and collect user experience and professional data. The team needs to establish empathy for the user and get a lot of information about the problem, and at this time, a solution may be obtained, but at this stage, the focus should be on finding the problem rather than trying to solve it.

Interviews are a powerful tool for gathering information and gaining insights. The team must choose not only direct users but also indirect other related users. The questions asked in the interview are usually open-ended questions that have multiple answers and are easy to answer to carry out more in-depth follow-up questions.

The purpose of observation is to understand the user. By observing for time of at least 60 minutes, the team can understand the user's needs at this time and can find out the user's behavior. During the observation period, the focus should be on what happened and related actions without thinking about solutions.

4.2 Explaining problems

After the team has collected a lot of information about the problem, it needs to be analyzed and summarized. What are the needs of users? What can we learn from it?

When identifying requirements, the team must not only consider the functional physical conditions in the solution but also pay attention to cognitive needs such as user-friendliness and emotional needs. When analyzing requirements, teams should look for patterns, structures, and relationships to gain a deeper understanding of the elements.

4.3 Conceiving solutions

After the group has explained the problem, it is time to start conceiving the solution. Students think in creative ways and come up with many seemingly crazy ideas. Although some of them fail, don't criticize them. Ask the team to brainstorm at least 50 solutions.

4.4 Prototypes

In the prototype module, the team should sort and group more than 50 answers to find several practical solutions. Then these solutions are quickly prototyped through sketches, Lego bricks, and 3D printing. The team can show users a simple prototype and get feedback for further improvements. As the number of prototypes continues to decrease, the functionality of prototypes more and more meets the needs of users.

4.5 Solutions and futures

In this module, the team shows the final solution required by the user to the relevant personnel or displays the prototype in the relevant exhibition. The team should also develop a plan, such as the team members, resources, and implementation schedule needed to complete the solution.

4.6 Performance evaluation

Future entrepreneurial education focuses on the learning process and dilutes the results. Therefore, in the performance evaluation module, there is no need to consider the so-called solution. The focus is on how well the various modules have achieved in the learning process. The assessment results should be given based on the relevant logs and reflection reports recorded by students in each module.

5. Summary

Design thinking can be used to transform the current entrepreneurship education. Design thinking is a new teaching approach in entrepreneurial education and can be used in the curriculum development of entrepreneurial education.

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