

Research on Design Thinking Transforming the Curriculum of Entrepreneurship Education

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Abstract—Current entrepreneurial education focuses on planning and forecasting. Future entrepreneurship education should center on students' actions in a complex and unpredictable environment. The feasible method is to use design thinking to transform entrepreneurship education. How to integrate the twelve characteristics of design thinking into the curriculum content of entrepreneurship education is thoroughly discussed.

Keywords: *design thinking, entrepreneurship education, curriculum content*

I. INTRODUCTION

Many countries attach great importance to the development of entrepreneurship education because entrepreneurship can significantly develop the economy and increase employment opportunities. In recent decades, entrepreneurship education has flourished in many countries, including China. However, current entrepreneurial education still has shortcomings: In many courses, business planning is still the main content, which focuses on planning and forecasting. Entrepreneurship education is still based on lectures, and some experts are also invited to give lectures.

In the future, entrepreneurship education should train students on how to master the skills of corporate survival in a rapidly changing environment. At this time, effect logical thinking should be adopted [1], which focuses on students' actions in unpredictable and complex business environments. The feasible method is to use design thinking to transform entrepreneurship education.

II. DESIGN THINKING

Since the Harvard Design Institute put forward the concept of design thinking in 1987, it has attracted widespread attention. Design thinking is widely used in many fields. Over the past decade, entrepreneurial educators have begun to value design thinking [2], [3], [4], and [5].

Design thinking is an approach of thinking and solving real problems like designers. It is different from others. It describes designing products, services, and processes rather than the design results.

Design thinking interacts among the three spaces of inspiration, conception, and realization, and integrates human needs, technical feasibility, and business value to achieve better solutions.

Many scholars have developed different models for how to apply design thinking in practice. Although there are many models, their connotations are the same.

The double diamond model was proposed by the British Design Institute. In the dual diamond model, the first diamond represents the problem space, describing the divergence process and fusion process of finding and defining the problem; the second diamond represents the solution space, describing the divergence process and fusion process of the development and delivery solutions. The solution space and the problem space need to be coordinated, and the solution is directed to a specific problem. In the respective problem space and solution space, it is also subdivided into separate other activities, and there is an internal iterative process.

III. DESIGN THINKING TRANSFORMS THE CURRICULUM OF ENTREPRENEURSHIP EDUCATION

Design thinking can transform the curriculum of entrepreneurship education. Incorporating the twelve characteristics of design thinking into the curriculum content of entrepreneurship education [6] and can significantly improve the effectiveness of entrepreneurship education.

A. Solving wicked problems

Design thinking helps solve uncertain and wicked problems. The wicked problem is that people do not understand the problem until a solution is formulated. Secondly, there is no perfect solution to the wicked problem. Under specific resources such as time, funds, or skills, a better solution can be obtained.

Most entrepreneurial problems can be considered uncertain and wicked problems. If the entrepreneur does not understand the customer, the related business can be continuously improved. There are no right or wrong solutions but only better solutions. These problems are unique. The entrepreneur does not know whether it is correct, but only tests the business in the real world.

B. Design thinking model

The dual diamond model consists of a problem space and a solution space. Each space is subdivided into separate other activities, but the two spaces need to be coordinated. The solution needs to be adapted to the relevant problem.

The dual diamond model can be incorporated into new entrepreneurship education. Students first need to start with a specific customer or problem and then seek a solution. Rather than instructing students to start with an idea and then write a business plan that identifies potential target markets.

C. Divergent and fusion thinking

In different activities of design thinking, divergent thinking, and fusion thinking are used. Divergent thinking focuses on a variety of possible solutions without choosing or evaluating them. Fusion thinking concentrates on narrowing the choices and choosing better solutions.

In the above dual diamond model, discovery and development activities use divergent thinking, while definition and delivery activities use fusion thinking. In the problem space, divergent thinking can understand the user's various needs in-depth, and then fusion thinking discusses these requirements critically, and chooses to define specific problems into the solution space. In the solution space, divergent thinking can develop multiple ideas, prototypes, and solutions, and then fusion thinking can focus on a few solutions, and finally choose a better solution.

Many courses in entrepreneurship education generally use fusion thinking. The purpose of a business plan is to minimize risk, not to explore different potential opportunities. Therefore, in the new entrepreneurship education, divergent thinking and fusion thinking should be used at the same time, and divergent thinking should be used more to explore potential market opportunities and cultivate students' creativity.

D. Iteration

Different models in design thinking include iterative loops. Iterations show that production processes always change dynamically. Through iteration, designers can get feedback, adjust strategies, and approach better solutions.

In traditional entrepreneurial education based on business plans, there is the only plan and no iteration. In the new entrepreneurial education, we should try to iterate between the problem space and the solution space until we realize the fit between the two. Within each space of problem space and solution space, there will also be smaller iteration loops.

E. T-shape

Design thinking team members should be T-shaped talents. Each member of the team has not only solid fundamental knowledge and skills in this discipline but has also high academic attainment. They are indicated by the vertical line of the letter T; they also have a keen interest in other subject areas, so that they can cross disciplines

Boundaries, out of the trap of professional thinking, which is represented by the horizontal line of the letter T.

To be a T-shaped person, the student needs to be motivated to learn and improve, to ask questions that may be common to others, to continually challenge each other's assumptions, and to listen to each other in order to better understand, identify and accept relevant differences and undertake related responsibility.

In the field of entrepreneurship, the importance of teams is significant. In most cases, the professional areas of the entrepreneurial team members need to cover all significant aspects of the business, such as marketing, sales, operations, engineering, etc. Cultivating T-shaped talents in entrepreneurship education helps members of the entrepreneurial team to expand their knowledge and skills in other fields and become composite talents so that entrepreneurs have a variety of professional skills and actively respond to various emergencies.

F. Multidisciplinary team

Design thinking team members should be composed of multiple subject backgrounds and roles. Such multidisciplinary heterogeneous teams can analyze user concerns from multiple perspectives, which is usually better than homogeneous teams. Multi-disciplinary teams do not produce more ideas, but they can produce better ideas through collision and competition. Each team member must contribute to the project. The team size is recommended to be between three and six people.

Inter-academic entrepreneurship education courses should be established in universities. This kind of multidisciplinary entrepreneurial education teacher team is better than a homogeneous teacher team limited by a college. At the same time, it recruits students who participate in entrepreneurship education across the school, forming different professional mixed entrepreneurship education classes, grouping students of these different majors, and letting these students of different majors cooperate with each other, these students can generate better ideas with each other, and improve the entrepreneurial ability of teamwork.

G. Self-confidence

Creative self-confidence can be described as one's trust in creative problem-solving ability, which is a contextual adaptation to the theory of perceived self-efficacy. Individual-specific background belief systems affect one's ability to accomplish tasks and achieve goals.

Cultivating students' creativity is one of the key learning goals of entrepreneurship education courses. In the process of applying design thinking, the student's learning process is divided into several smaller entrepreneurial projects, allowing students to seize multiple opportunities for success, thereby fostering self-confidence in creativity.

H. *Intuitive thinking*

Expert-level designers often use intuitive thinking in the decision-making process because they have accumulated rich experience in many past projects. When using intuitive thinking, they also need to consider other relevant facts and use intuitive thinking as additional filters. These filters are then used to evaluate the collected facts and eventually transform them into new products.

Cultivating intuitive thinking in the field of entrepreneurship usually refers to the performance that entrepreneurial experts have only required time and hard work. Therefore, in the new entrepreneurship education, we should pay attention to intuitive thinking and stimulate students' intuitive thinking. In the process of entrepreneurship, the intuitive thinking of entrepreneurs is critical.

I. *Studio learning*

Designers learn in the studio. The environment, such as past completed works and new works being designed in the studio helps designers to immerse themselves in the process of solving problems. The studio can build a competitive learning environment, provide a natural dialogue space, and create a productive multidisciplinary team atmosphere.

To use design thinking in entrepreneurship education, we should build a suitable learning environment and a learning atmosphere conducive to communication. This kind of studio-like physical place is not only a place for students to learn, prototype, practice tests, and other entrepreneurial processes, but also the primary place for teachers to give lectures, case studies, and in-class practices. Therefore, in the layout of the studio, we must pay attention to the impact of vision on entrepreneurship education. For example, the internal space layout of the studio is not fixed and can be freely changed by students according to the needs of the team and the project. It is necessary to arrange movable sofas, whiteboards, tables and chairs, projectors, movable walls, etc. within the studio. The colors are colorful, with past successful projects and certificates of merit, equipped with necessary tools such as knives, crayons, and white paper, so that students can learn freely in the studio, immerse them in the project, inspire each other, and experience the learning process of entrepreneurship.

J. *Prototype*

Design thinking focuses on the prototype. The process of creating a prototype is not only a process of trying new things but also a periodic process.

Prototype solves problems by getting feedback. Expressing ideas through non-verbal prototypes helps reveal problems and seek opportunities, and often yields fruitful insights. The prototype is characterized by continuous do, try, and fail, iterative, and continuous improvement.

Incorporating prototype in entrepreneurship education, through the process of creating prototypes of new things, students can cultivate the spirit of adventure. Through

prototype, students create new products or service processes in entrepreneurship, and test and obtain feedback in the market so as to continuously improve the entrepreneurial process.

K. *Result thinking*

Design thinking is result-oriented which makes divergent thinking target-oriented, with clear direction around the goal of the result. Unlike ordinary educational thinking, looking for results with logic as the starting point, in the case of violating logic, thinking cannot get the expected results. The focus of result-thinking is the result, and logic serves the result, and each logic points to the result. The result is the starting point and the ending point of thinking.

Entrepreneurship is a process from scratch. It requires hard work by entrepreneurs. Starting a new business is a direct goal. In entrepreneurship education, we must pay full attention to result thinking, adhere to the result thinking orientation, and continuously integrate entrepreneurial resources around the result goals to ensure the effectiveness of entrepreneurship education.

L. *Visual communication*

Design thinking emphasizes visual communication. In every link of design thinking, visual communication is required. Visual description is an essential process in product design. Diagrams express the design process, and drawing presents the prototype. At the product seminar, this visual communication makes communication smoother.

In entrepreneurship education, visual communication methods in design thinking are used, such as mind maps, to clearly express the hierarchical relationships and resources of entrepreneurial projects through a combination of charts and text so that that entrepreneurial team members can communicate more precisely and more efficient. This visual communication method makes entrepreneurship education more comprehensive and systematic and enhances students' creativity. It makes the process of entrepreneurship education more visual and exciting, which helps to stimulate students' interest in learning. It reduces the teaching difficulty of entrepreneurship education.

IV. CONCLUSION

Design thinking can transform current entrepreneurial education. This paper discusses in detail how to integrate the twelve characteristics of design thinking into the curriculum content of entrepreneurship education. And it will be used in entrepreneurship education in the future.

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