

Influence of Practicum Venture Process on Engineering Students: Experience and Learning Outcomes of Entrepreneurship Course

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Abstract : Entrepreneurship education is a challenge for the educators in delivering the outputs. The aim of this entrepreneurship course is to inculcate entrepreneurial mindset and encourage the students to pursue entrepreneurship as career. This paper discusses the practice adopted by the educators while teaching entrepreneurship to engineering students in the university. It is an evaluation and interpretation of the pedagogy used as well as the activity which is designed for the course. The implementation of the activity along with continuous evaluation followed and the output has been presented through this paper. While preparing the activity various practices adopted by universities were considered and activity named “practical venture” has been designed. This activity makes the students to run their own venture in the campus with all the support provided by the university. The intention of this activity is not to measure the success of the venture but to make the students undergo into the realistic environment which entrepreneur's go through. The students' teams are made to work on customer interviews, solution

offered, developing market viable product (MVP), test marketing, financial planning and go to market strategy. A rubric has been constructed to assess the students learning from this course. The results of this paper can be used by the entrepreneurship educators in designing the entrepreneurial curriculum.

Keywords : Entrepreneurship, Teaching, Innovation, universities, entrepreneurship education

1. INTRODUCTION

The early research has found that school environment is important in influencing the students towards entrepreneurship and innovation (Zhang Yan & Lu Rong., 2020) and this environment is influenced by teachers' innovation, entrepreneurship ability and teaching philosophy (Zhao Xinyan & Lai Meijian., 2020). Universities are focusing on entrepreneurship and innovation through introducing entrepreneurship programs, establishing entrepreneurship cells and conducting entrepreneurial activities, funding the startups through institute incubation centers. The effectiveness of entrepreneurship programs depends upon students and faculties own entrepreneurial literacy. There is a need for the instructors to provide more explicit instructions to tasks which has less prior experience and guidance for team interaction and providing mentorship to improve self-efficacy to uplift the potential success of their project (Epstein et al., 2021). The educators teaching entrepreneurship

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and their effectiveness in delivering impactful teaching has relevance between perceived behavior and teaching experience which has effect on attitude (Sghari & Bouaziz, 2021). Teachers taking the role of entrepreneurship educators have high professional teaching ability and scientific research ability, which has fixed professional teaching due to which they are unable to play the guiding role in teaching entrepreneurship and innovation which is resulting in ineffective teaching of entrepreneurship and innovation (Yuan Zhang., 2021). Teachers with rich teaching experiences are also facing the challenges of understanding market changes which is affecting the process of teaching entrepreneurship. In entrepreneurship education the team formation mode has its impact, randomly assigned team members has faced challenges in handling uncertainty and seeking feedback from potential stakeholders when compared with students self-selected teams as they are less diverse (Warhuus et al., 2021). The system of teaching entrepreneurship using startup cases as assignment has showed progress in development of design and business thinking components and change in internal and external motivation to startup a project along with a desire to continue working on technological innovation (Solodikhina A., 2021). Entrepreneurial training and university environment along with entrepreneurial culture helps in building more entrepreneurial attitude among the students (Valencia Arias A et al., 2021) which needs to be implemented in encouraging students to choose entrepreneurship as their career.

A. Practicum venture

The students who have opted for entrepreneurship specialization after successful completion of “essentials for entrepreneurship” a foundational course is required to implement practicum venture in the follow up course. The course is named as advanced entrepreneurship and the students' teams has to implement their venture on a small scale. In the process of implementation, they will perform all the process which an entrepreneur performs. The aim of the course is to teach the students the required skills to develop venture and learn necessary skills to sustain. The procedure for implementing practicum venture is as follows

Step 1 Running a problem interview

The student's teams have to identify more than 10 potential customers who are in need for a solution for

the problem student's teams has identified as an opportunity. The interviews are focused to understand the need for the problem worth solving, identify the existing solutions and their performance, understand what needs to have in solution and must to have in the solution and nice to have in the solution and finally should find the problem that is accurate to offer a solution that has potential to scaleup.

Step 2 Customer analysis

In this step students perform value proposition of the solution they plan to offer. Value proposition canvas is used to describe gain creators and pain relivers for the customers, Offered through their solutions. They also consider the most important jobs of the customers, extreme pain the customer undergoes while performing these jobs and essential jobs which the customers are willing to pay if solved. The canvas proposes the main pain killers and gain creators offered through their solution matching the customers pains and gains.

Step 3 Solution analysis

The proposed solution offered by the students is checked with the feasibility of implementation and the plan proposed to implement it, the students are required to prepare a detail plan in implementing the solution and check does the solution addresses the customers problem effectively. The proposed solution should also check with the current existing alternatives available to the customers and should show how it makes the customer life better.

Step 4 Business Model

In this step students need to build a business model defining customer segments, revenue streams, channels to reach the customers and unique value proposition they strongly offer to the customers. The teams will work on it extensively until they come up with a strong business model.

Step 5 Competition analysis

In this step the students will identify the competitors and their offerings to the customers, the benefits offered by their products and services. The students will work on the benefits they offer to the customers which will make the customers to switch towards their offering.

Step 6 Product and service

The students are supposed to develop a prototype which maps the customers pain points. The prototype should be strong and should showcase the unique value proposition that it offers to the customers. After building the prototype it should be validated by minimum 10 customers and should make necessary changes from the customers' feedback.

Step 7 Financial plan

In this stage the students need to develop a basic financial plan which should include various cost types. The plan should be able to identify the product cost, revenue, product pricing, profit and breakeven point. The venture should also identify the funding sources and the amount of funding required to start.

Step 8 Marketing and sales validation

The teams need to propose a branding strategy and positioning statement to their venture. They should develop a sales plan and sales pitch through which they should impress their prospective customers. They should be able to generate minimum 5 sales leads through their sales pitch.

Step 9 Team commitment

At this stage the students should assess the skills required to take the venture forward. They should identify the external help required to take their venture forward. They should identify the complementary skills required to take the venture forward and should design a team acquisition strategy.

B. The outcomes and experiences of this practicum venture**Outcome of step 1**

This step has helped the students' teams to deeper understand the problem they have selected to solve. It also helped them to clearly describe the pain the customers are undergoing and the alternate solutions customers are adopting to overcome the pains.

Outcome of step 2

This step has helped the students to understand the acute customers whom they intended to serve. This also provided them the understanding of who else can

become their additional customer segments.

Outcome of step 3

This step has improved the student's ability to build a prototype. Validation of their idea through prototype has made them to get inputs from the customers. From the inputs received from the customers they made the necessary changes to the prototype.

Outcome of step 4

At this step the students understood how to develop a strong business model which include multiple customer segment along with early adopters, multiple revenue streams, well defined distribution channel. The value proposition offered to target customers and financial aspects such as customer acquisition cost, economic unit value, etc.

Outcome of step 5

The student's teams at this step started to identify the competitors based on the solutions they offer to the customers. They started to understand the competitive land scape in which they want to compete. They also understood what makes the customers to shift from existing practice towards a new offering

Outcome of step 6

The students have developed prototypes and while interacting with the potential customers they have recorded the responses in form of videos, which they have used for further development of the prototype which is called as market viable product. Market viable product has given them valid feedback from the customers.

Outcome of step 7

At this step students have learnt to develop a realistic financial plan with realistic cost estimate, cost of goods analysis for product and service, break even analysis along with sales projection for one year. They are also clear about how much money they need to reach their targets, how much money they can bootstrap and how much money they required from external investors.

Outcome of step 8

At this step students need to establish their

presence in social media very strongly to create strong branding and positioning. They came up with names to their startups along with logo and plans to reach the target customers are defined.

Outcome of step 9

At this step the teams started to identify the resources which needs to be outsourced. This made the students to network with external resources. This step has made the students to analyze the skills required to build a product or a service.

Measurement of The Impact Of Practicum Venture

Table 1 -A

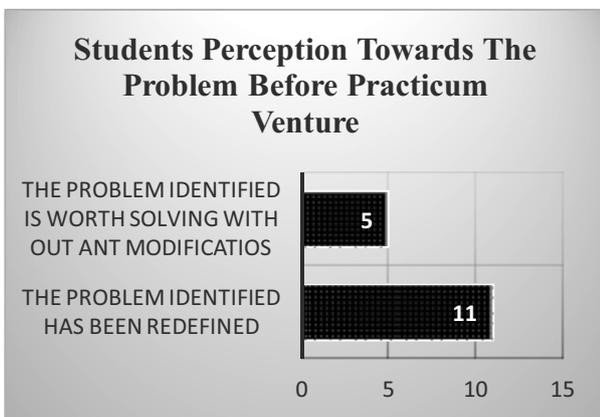


Table 1 -B

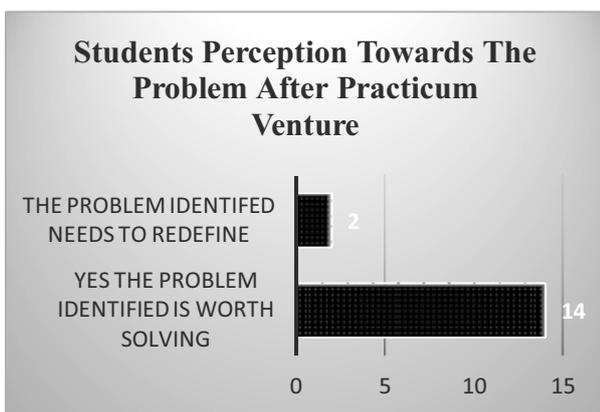


Fig. 1a&1b : Before the practicum venture the students understanding towards problem worth of solving was not clear, but during the process of practicum venture the problem needs to be addressed has continuously undergone changes with 14 teams out of total 16 teams.

Table 2-A

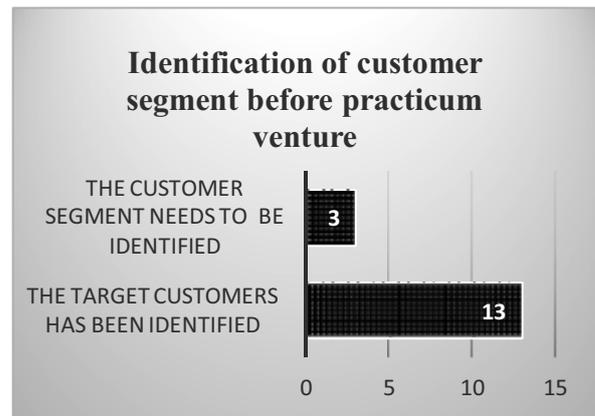


Table 2-B

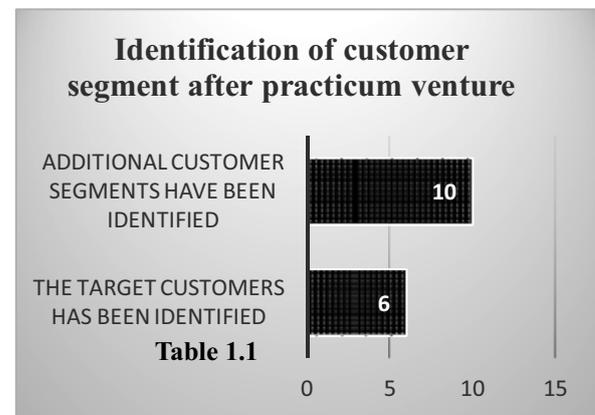


Fig. 2a&2b : Before practicum venture the teams could not clearly define their customer segment, but during the process of practicum venture 10 teams has identified additional customer segments like early adopters and laggards. 6 teams were much clear about their customer segment.

Table 3-A

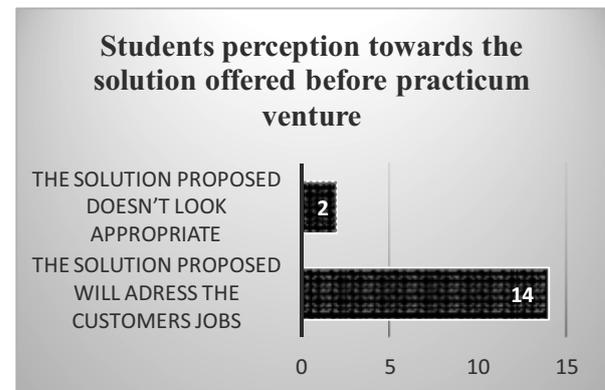


Table 3-B

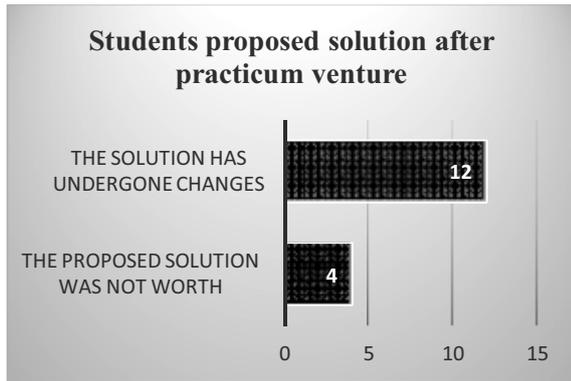


Fig. 3A & 3B : The solution offered during the beginning of the course has been relatively undergone for changes by 12 teams and 4 teams made their opinion that the solution they offer is not worth to the customers.

Table 4-A

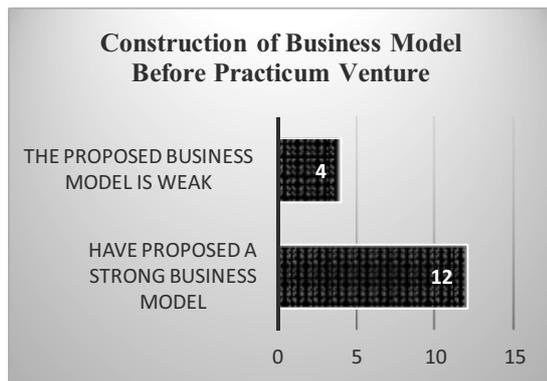


Table 4-B

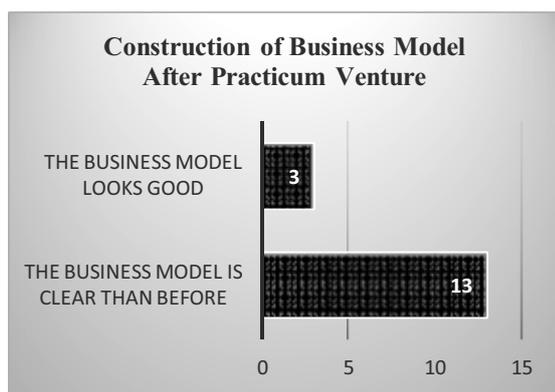


Fig. 4a & 4b : The business model proposed before practicum venture has undergone changes by including details like customer segments, revenue streams, channels of distribution, value proposition proposed and go to marketing strategy has been included by 13 teams and 3 teams have included minor changes.

Table 5-A

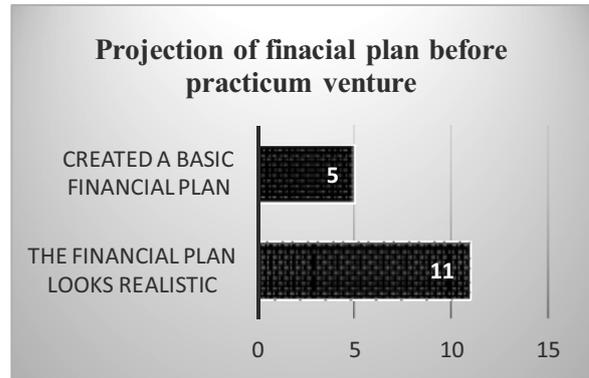


Table 5-B

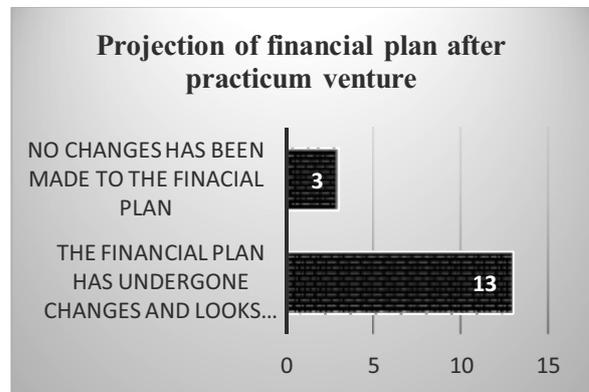


Fig. 5a & 5b : The financial projections before practicum venture were unrealistic but the students' teams felt them realistic and few looked vague. The projection was made realistic by calculating the cost by enquiring with the vendors which made much realistic by 13 teams and 3 teams found it difficult to project.

Table 6-A

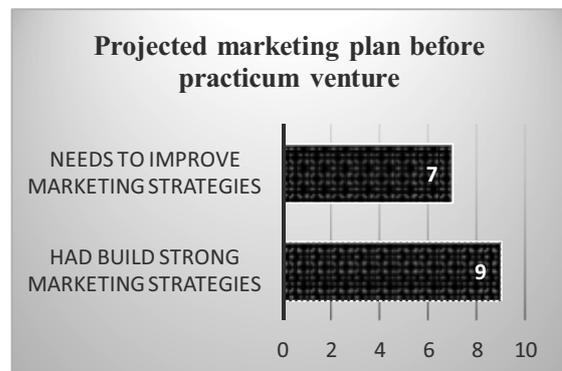


Table 6-B

Fig. 6a & 6b : The student's teams go to market strategy before practicum venture was unclear but after practicum venture the teams realized the cost of different modes of advertising and 13 teams used the social media marketing strategy as their major tool for promoting their venture.

Discussion

This course is part of Entrepreneurship specialization offered for engineering graduates. The students have opted for this specialization in their second year second semester. This course has been offered as the second course, during this course time students were in their third year first semester. A total of 60 students are admitted into this course. To implement this course, one should have foundations for entrepreneurship as a prerequisite where students will have a venture plan with them. Before the course beginning students' opinion regarding their venture is collected through a questionnaire, this instrument was designed based upon the outcome of this course that is "developing entrepreneurial skill". The analysis is made based on the responses provided by the students before and after the course. The results table shows the responses of the students before taking the course and after completion of the course. The opinion of the students has a changed after the course which can be observed from the above tables.

Conclusion

Teaching entrepreneurship is always a challenge, as establishing a venture or starting a startup is never easy. Different methods of teaching entrepreneurship are being implemented by many institutions and universities around the world. Still there is a need to implement and identify effective teaching models in entrepreneurship education. The process of practicum

venture carried is in brief a student venture practiced within the campus. The students are instructed in steps with a specific duration for each step to complete and the work is been evaluated and measured on a five-point rating. The students after each evaluation showed more interest and involvement in developing the venture strategies. This practice has resulted in three teams generating revenues and acquired their customers. The other students have not generated revenue but have developed a startup pitch which has impressed the evaluators. The attempt of making the students think like entrepreneurs has been a major achievement through this practicum venture but it will be too early to suggest it as an effective practice as it need to be practiced over a period and effectiveness of the method needs rigors assessment.

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