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Design Thinking Implementation by Faculty through EPICS Project

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Abstract: In Today's scenario, all the instructor are trying to mould themselves to engage students in learning through doing engineering than just studying engineering to meet the need of the 21st century learners. In this paper, EPICS initiative implementation which promotes doing engineering is being described and also focused on describing the training which team instructor had gone through and what learning's & experiences were gained are explained briefly. The results showed that Instructors enjoyed the training and had lot of learning as they were working with real community partner for whom they developed and delivered the product as per the problem identified using design thinking process. This type of learning experiences can be improved by using better resources and significant time for doing project as the training described in this paper was short duration. The goal of this paper is to identify need of the old age people in terms of support to bare the capacity of weight of a person by depending on table while having food and medicine. The table should have Strong and convenient one. The table should enough to sustain the weight of the old people while having food and medicine. The table should have a ortability based on old age people requirement.

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1. Introduction

Ms.Antonette T. Cummings& James Huff [1], 2013 in the study paper suggesting strategy of assessing a broad set of skills in EPICS and project assessments and programmatic assessment. Purdue University EPICS supports over (N=90) projects distributed across over 31 teams. It is found that multi-layered approach can be implemented to assess learning, programmatic outcomes and community impact.

Andrea Mazzurco&Brent K Jesiek [2], 2014 in the study the paper suggesting some strategies to avoid failures in their design for (N=68), Purdue University found that creating a failure typology that can help engineering students and practitioners avoid negative outcomes of their design. Edward j. Coyle et.al [3], 2005 in this study paper suggesting the quality of projects, teamwork and delivering the project to community partner. Each EPICS team thus functions as a small, but highly capable, engineering design firm with a real customerits project partner from the community. Carla B. Zoltowski& William Oakes [4], 2014 in this paper it is found that shares best practices and lessons learned as the program developed to provide insight for faculty and administrators seeking to develop service-learning, learning through service-learning, or community-based engineering.

By following Andrea Mazzurco&Brent K Jesiek[2] 2014, paper EPICS project is done by faculty by implementing design thinking. Now a days old people at the home or hospital required a portable table for food and medicine by sitting on the bed. By implementing the EPICS design thinking method we proposed a serving table for bed ridden patient in home or hospital or at old age home. When the people unable to get down from the bed the table which we proposed should reach the meet or requirement of old people. Design thinking Activity Given a domain in which the project has to be done. Identified the Project Partner. Product survey has been done on the project depends on feature and cost of the product.

2. Method

Team Formation played an important role in the starting the project to understand the need of community partner and requirement. Understanding among the team members is a big task .Identified a problem with serving table being used for the old people by the home.Estimated and Prepared Specifications to meet the needs of the project.

As a faculty, we got an opportunity to train in EPICS (engineering projects in community service) training program. Our EPICS trainer made us to go through EPICS design process which has 6 phases shown in fig.1.

Project identification

- In this phase, we find a community partner, who is bed ridden old age people from Tirumalagerry, near Traffic Police station, Secundrabad Hyderabad.
- Identified a problem with serving table being used for the old people by the home.
- The table they have not strong and convenient one. The table not enough to sustain the weight of the old people while having food and medicine.

Objective of the project

- Portable
- Convenient to serve food and medicines to the old people by sitting on the bed.
- Rotatable
- Can bear the weight of patient while having food.
- Affordable

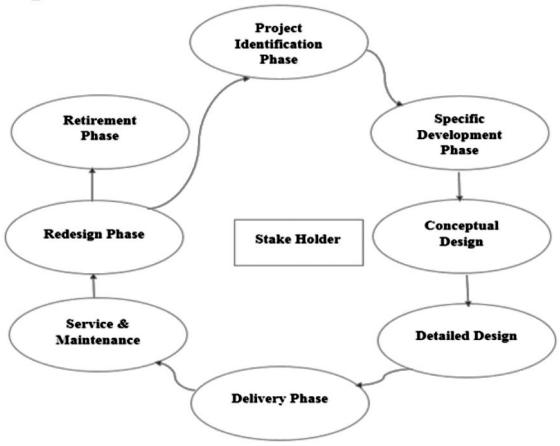

Fig. 1 Design Process

Specification Development

- In this phase, we have discussed with community partner about their problems while having food and medicine on the table.
- We have taken the requirements, inputs from stake holder and we discussed with the team to solve the problem.
- Based on the inputs, we have done product survey, that if any product existing to bare the weight of bed ridden people while having food on table.
- So, with the existing product, we planned to do modifications according to our team ideas

Conceptual Design

In this phase our team came up with individual ideas, somehow not satisfied by all, but tried a prototype sample of project and taken a feedback from the community partner.

- Prototype 1: for the project Serving Table'H' frame at the bottom of the table with wheels, No rotation of tray of the table, Bears light weight,Used light metal in manufacturing tray.Stood on the 4 wheels fixed to the bottom

frame, a rod connects the bottom and top frames, placed a support rod diagonally from vertical external rod to the bottom of the tray, Unable to rotate the tray shown in fig.2

Fig. 2 Prototype of table

- Prototype 2 : Height of the table is adjustable, not portable, Cannot bear more weight, Has Tilting problem.Rectangular base frame in the bottom, Removed support rod, Facilitated with rotation shown in fig.3.

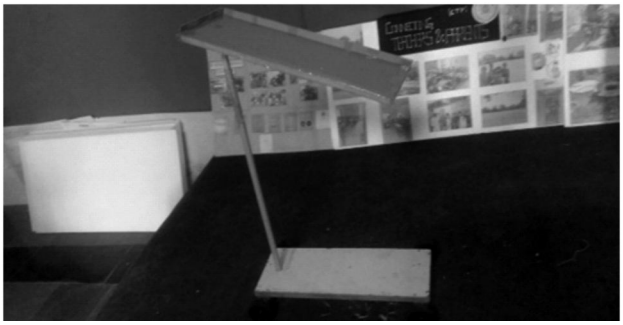

Fig. 3 Prototype of table

- Prototype 3: Used rectangular frame and rod in between the frame for more support to bear weight shown in fig.4.

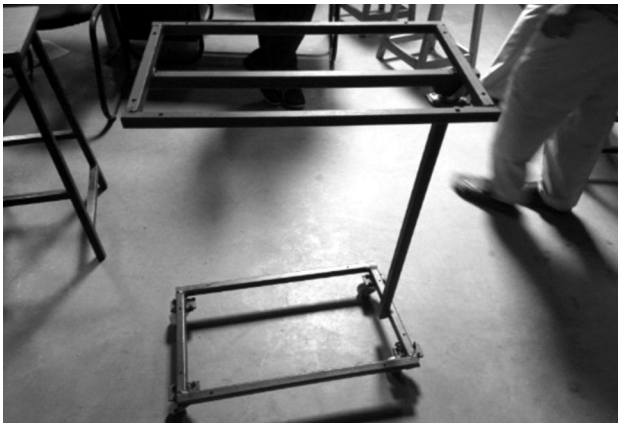

Fig. 4 Prototype of table

Detailed Design

After collecting information of materials and specification design of table drawn in mechanical Catia software by faculty shown in fig.5

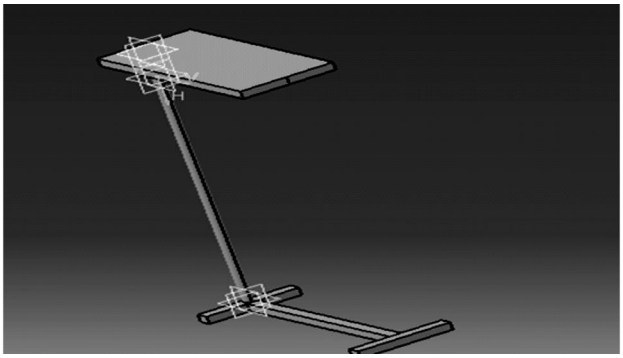

Fig. 5 Table design

Design and fabrication of table as shown in fig.6. It contains advantages of table

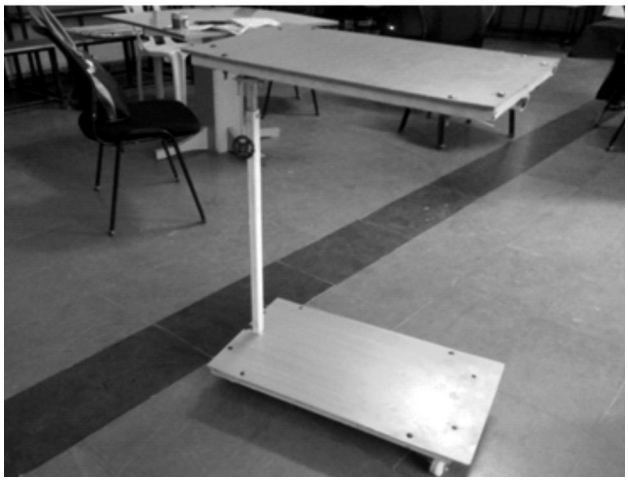

Fig.6 Final design of table

- Used tough metal to bear the weight of the patient
- Facilitated to rotate
- Better portability
- Convenient for the old people on bed
- Facilitated with Height Adjustment
- Locking system to the top tray

Delivery Phase

Project has been delivered to community partner and it can withstand the weight of 60Kg. Feedback given by the community partner is they are very impressed by the project.

Service & Maintenance

As per coordination with the community partner they will maintain the project.

Retirement Phase

- Our product has been designed up to the functional specifications, so our product has been delivered to community partner which we feel satisfied
- Our project has been turned in to product

3. Results

Used tough metal to bear the weight of the patient Facilitated to rotate Better portability Convenient for the old people on bed Facilitated with Height Adjustment Locking system to the top tray. Delivering project to the community partner shown in fig.7. The table can bear the weight up to 60kg. The table is fabricated with less cost within a 1,500Rs. The materials are used is good quality and easily available in the market. Learning from the project is

- Proper Planning
- Decisions making
- Think as part of a team in a social process
- Handle uncertainty conditions
- Good communication in between the team
- Understanding the value of each activity
- Develop the ability and skills
- Improvement of user involvement

4. Discussion

Our project results also similar with the paper of

Fig.7 Delivering Project

training should be given to faculty about how to do the real-time project. While doing project EPICS faculty teamwork, communication and leadership quality improved. Limitation is faculty should show the interest about doing project and should be known about design thinking.

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