Maker Space: A Beginner Way to Imparting Library for Adani Institute of Infrastructure Engineering

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Abstract - Adani Institute of Infrastructure Engineering (AIIE) is established to equip the students to become modern-day engineers and managers primarily for the infrastructure and allied sectors. The Institute is presently conducting three Bachelor Programmes in Engineering. 1. BE- Civil & Infrastructure Engineering, 2.BE-Electrical Engineering, 3.BE -Information & Communication Technology. Adani Institute of Infrastructure Library embarked on a change journey in 2008 for services in support of the education. The concept for creating a maker space for engineering students within the library to foster activity -based learning. Maker spaces are over just places to create things; a maker space may be a physical location wherever people gather to share resources and knowledge, work on projects, network, and build. The NMC Horizon Report: 2015 higher education the paper examines the awareness and importance of library maker spaces. A questionnaire was used for collection of data. Around 50 questionnaires were distributed among the students. A total of 30 stuffed in questionnaires were selected for analysis of the data. While there is a push to include maker spaces in universities, very little is understood regarding the expertise of establishing maker spaces on engineering campuses. Typically, these maker spaces contain 3D printers and laser cutters, and offer facilities to conduct work, personal and collaborative projects. The idea for creating a maker space for engineering library is promotional activity-based learning. Maker spaces are over just places to make things; a maker space may be a physical location wherever people gather to share resources and knowledge, work practical projects, network, and build. Libraries that have lengthy been substitutable with peace and tranquillity are currently thought of as a part in which there have to be a stability between quiet surroundings and social dynamic mood. The intention of this study is to observe the importance of maker space of engineering libraries that is tremendously needed in technological advancements and alteration of ancient systems with new ones. This analysis consists of reviewing the domestic samples, conforming examples to library maker space and inspecting numerous libraries over a duration of time. The outcomes of this find out about indicate that generally, modern libraries have fewer areas for paper books and publications and individual study, instead, bigger spaces are committed to locations for cluster studies and the use of computer and maker space etc. This trade has influenced the function of the library space and maker space.

Keywords: Maker space, 3D-Printing, Engineering libraries, librarians, library marketing, library Users, Adani Institute of Infrastructure Engineering, Infrastructure, Engineering, Innovation

1. INTRODUCTION

Space is one of the main elements in a library and it can play a decisive role in the success or failure of plans. There is a direct relationship between suitable spaces of a library and using its services and study and research in a comfortable, calm, pleasant, attractive and accessible place, which are necessities of such a cultural and spiritual place, entail many fruitful results. Required space of libraries is measured based on standard in which the following elements are included: number of students, number of staffs, their required space and the number of journals available in the collection, to the outcome of this measurement, other elements such as required spaces for deploying non-copy and microform material and services related to them, biographic instructions for groups, required spaces for facilities and different types of services of library technology must be added. On the other hand library is becoming compact day by day due to lake of space and books are compacting with eBook forms and non-print materials are in high demand so we need to utilize all library space. Maker space could fill this space we can use some space of library to create maker space and extend library services among the students and faculties.

A. Maker space: Concept and Background

Space is one of the most valuable assets a library possesses (Chan and Spodick, 2014). Beginning around 2006, the "maker movement" grew out of DIY culture. Libraries took notice and began offering programs and redesigning spaces to address related interests within their communities. The first public library with a maker space was the Fayetteville Free Library. a library maker space is an area and/or service that offers library patrons an opportunity to create intellectual and physical materials using resources such as computers, 3-D printers, audio and video capture and editing tools, and traditional arts and crafts supplies.

II. REVIEW OF LITERATURE

Researcher visited FabLab at CEPT University and go through papers published in peer review journals and conference proceedings. pace is one of the most treasured assets a library possesses (Chan and Spodick, 2014). Beginning around 2006, the "maker movement" grew out

of DIY culture. For appreciation the heritage of maker space. Libraries have keyed into most of these trends by using involving in each and every emergent science as referred to through (Massis, 2014). For the introductory section of the research concept and author used a maker space is a bodily vicinity the place people collect to share resources and knowledge, work on projects, network, and build'. The NMC Horizon Report: 2015 Higher Education Edition.

The successes, failures, and lessons gleaned from the educators that run mounted Maker spaces are the object of this research. From their forged path, other educators might also examine from their successes and mistakes to champion new Maker spaces in educational settings, while saving valuable time and steeply-priced resources.

Constructionist theories of learning closely affect the pedagogy of a Maker space, consisting of the culture, roles, and identities explored. The lecture room dynamic is flipped from a traditional model to a student cantered approach, which provided unique challenges for the librarian. This literature evaluation explores the historical past of Maker spaces, theories, and pedagogy to derives a constructivism classroom. Next, it delves into seven dimensions of Maker spaces.

The meant consequence of this literature overview is to grant a historical past of related literature to the Maker space implementation in education. The Maker Movement is characterized with the aid of a mind-set of ingenuity has roots in the do-it-yourself (DIY) culture. DIY tradition illustrates that each person may want to function an assortment of jobs himself/ herself as an alternative than depending on compensated specialists.

The maker way of life has evolved this thinking with the aid of together with a science component. There is a heavy emphasis on engineering-oriented interests such as: 3D printing, metalworking, electronics, robotics, and usual arts and crafts. Tinkers adopted the nomenclature "makers" after Make magazine in 2005, and the subsequent Maker Faire, which observed in 2006 (Dougherty, 2012).

III. OBJECTIVES OF THE STUDY

1. To highlight the concept of maker spaces and its perceived benefits for engineering libraries.
2. Explore the benefits and usefulness and type of state-of-the-art facilities/equipment available to users in library maker spaces
3. Give students affordable access to expensive tools such as 3D printing, laser cutters, sewing machines, and Virtual reality technologies etc.
4. Engage library users and getting them involved in a real way foster play and imagination

IV. SELECTION OF THE TOPIC

Students used to ask for the stationary materials like stapler, sell tape, glue, cardboard, chart sheets, calculator any many more things. It is observed that some of the students want to make such a good project, but due to lack of time they can't use labs all the time. Author read about maker space sections available in libraries and visited FabLab in CEPT University, Ahmedabad and it will be grateful thing to have separate sections where students and faculties come and create their innovation using makerspace.

V. METHODOLOGY

The online survey techniques were used for data collection. A survey was projected to gather most well-liked information concerning the extent of awareness and importance of library maker spaces, state-of-the art facilities, and comprehensive support to the users. Random sampling technique has been followed for conducting the study. overall 50 questionnaires were distributed among the students, out of that, solely 30 questionnaires were elite for analysis of the data and the analysis of data collected are conferred with the assistance of graphs by using simple statistical techniques, etc. within the light-weight of above data, findings of the study, conclusion and recommendations are fell upon. The study was conducted during 10-17 October 2019.

VI. DATA ANALYSIS AND INTERPRETATIONS

The data collected through survey approaches were analyzed and inferred as per given in graphs here.

A. Department-Wise Awareness

The sample of the population shows that almost all of the respondents are from CIE department 56.2% and 44.8% electrical engineering students has responded (Fig.1).Therefore, it is found that majority of maker spaces awareness is from CIE students.
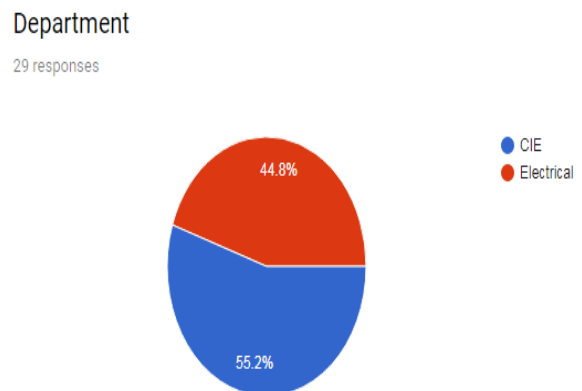

Fig.1 Department wise awareness

B. Gende-Wise Awareness

The sample was collected from library students on gender basis to seek out their opinion relating to awareness and usage of maker spaces in libraries. The Fig.2 shows that 90% male and 10% female respondents are aware about the maker spaces in libraries.
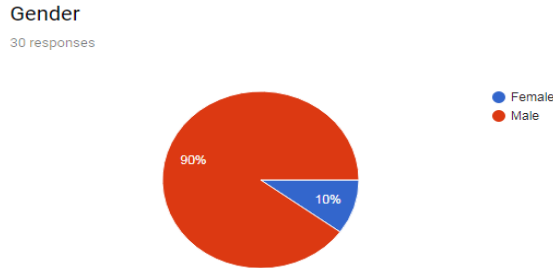

Fig.2 Gender wise awareness

C. Do You Aware of Maker space?

Maker spaces tend to be of recent origin to most of the libraries. Response concerning awareness of maker spaces in libraries has been provided in Fig 3. Data reveals that 50% respondents are aware from electrical engineering branch and 50% of students from CIE branch are conscious of the maker space. Which shows that awareness of maker space among the each branch would be a similar.
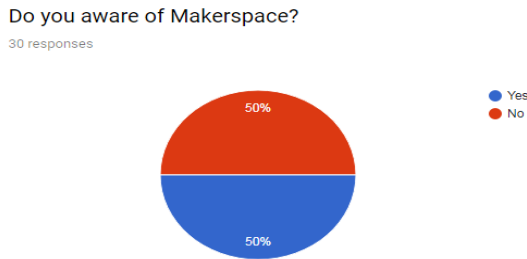

Fig.3 do you aware of Maker space?

D. HaveYou Ever Visited Any Maker Space?

When asked respondents about visiting to a maker space i.e., state-of-the art facilities available in library's maker spaces, 86.7% respondents claimed that they never vested maker space and 13.3% respondent have come cross at least ones to maker space Fig 4.

Fig.4 Have you ever Visited any Maker space?

E. Do you wish Maker space for your library?

The Fig.5 indicates that maximum percentage of respondents (80%) wish to have maker space in their library while 20% respondents are not sure about having maker space in their library. Thus no respondent selected the option "NO" which clearly means that maker space should be developed for engineering library.
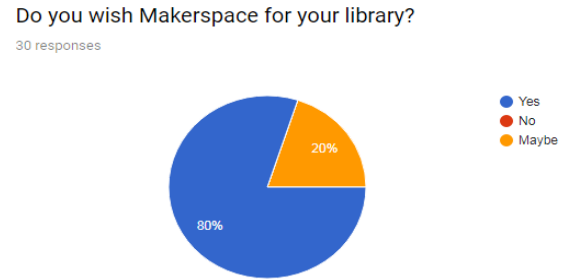

Fig.5 Do you wish Maker space for your library?

F. Which infrastructure/Facilities you required to add in library Maker space?

Respondent's perspective about Facilities to be required for maker spaces in engineering libraries has been exhibited in Fig. 6. It was explored that the majority of respondents 36.7% reported maker spaces as a Gaming zone, 23.3% responded needs Audio-visual production in the maker space and 16.7% responded selected computer programming required in library makerspace.3.3% CNC machine, 6.7% Laser Cutter, 6.7% 3D printing, 3.3% Facilities relating to innovation In civil engineering and 3.3% responded for "All of the above may be" respectively.
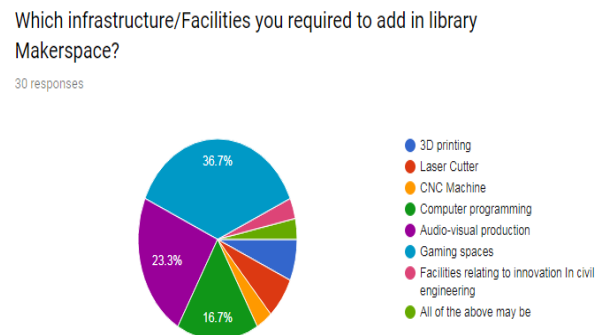
G. Services to be offered by library maker space for users

As far as services offered through maker spaces have been concerned, 50% respondents indicated that their library's maker spaces should be offered "Maker space Fair and exibition" whereas 40% respondents acknowledged that maker spaces provide "Workshops and seminar". Additionally 6.7% respondents shared that maker spaces furnish "orientation programs "while 3.3% respondents are of the view that "services like e-sports gaming can be promoted." (Fig.7).

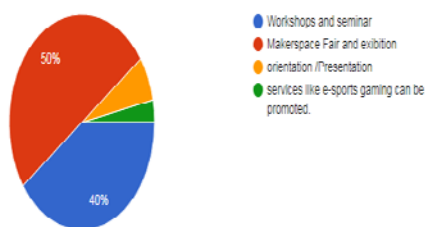Services to be offered by library makerspace for users

30 responses

● Workshops and seminar
● Makerspace Fair and exibition
● orientation /Presentation
● services like e-sports gaming can be promoted.

Fig.7 Services to be offered by library maker space for users

VII. FINDINGS OF THE STUDY

1. Male users (90%) are more aware than female users (10%) about maker spaces.
2. It is noticed that majority of users from CIE (Civil and infrastructure engineering department) (55.2%) and electrical department has (44.8%) student responded.
3. (50%) CIE and (50%) of ELE students are aware about library maker space.
4. (86.7%) of respondents indicated that they are un ware about library maker spaces and (13.3%) responded visited maker space.
5. Majority of respondents (80%) wish to have maker spaces in the library while (20%) responded were not sure about it.
6. An acceptable percentage of respondents, i.e. (37.7%) cited that their library maker spaces are equipped with "Gaming spaces", (23.3%) "Audio-visual production", (16.7%) "Computer programming", (3.3%) "Facilities relating to innovation in civil engineering", (6.7%) "3D printing" and "Laser Cutter", (3.3%) "CNC machine" and (3.3%) responded selected "All of the above may be" respectively.
7. (50%) respondents indicated that their library's maker spaces should be offered "Maker space Fair and exhibition" whereas (40%) respondents acknowledged that maker spaces provide "Workshops and seminar".

VIII. LIMITATIONS OF THE STUDY

Author covered only Adani Institute of Infrastructure library for the research, in India some maker space are available with the Different names like FabLab, hacklabs, hacker spaces, i Create lab, participatory spaces, tech shops etc. but library is not a part of the maker space itself. He want to introduce this concept for engineering libraries in India. This may be hypothetical research only the limitations of this study include the time and resources available during this process. I used textbooks, Articles and online resources available through the internet to complete my research proposal.

IX. CONCLUSION AND RECOMMENDATIONS

Libraries of nowadays don't seem to be simply an area to take a seat quietly and consult books and alternative pedagogic materials however they need fully reworked into a spot wherever users will interact, create and collaborate. Maker spaces are the demand of contemporary libraries and expected to be a growing trend within the years to come. The concept of establishing maker space within the library is a foster creative thinking and invention. Maker spaces are a brand new concept in Engineering Libraries. There's a dire have to be compelled to build models of successful maker Spaces. Continuous training programs are key element of creating successful and inclusive maker spaces. The staff and users of maker spaces are presumed to work along for making a secure and contributory environment. There's a pressing would like of maker spaces within the engineering libraries to introduce new technologies and boost the library's image. It needs an enormous effort both from librarians and users and they are expected to be wakeful enough, have a curious mind and should be smitten by learning and adopting new technologies and ideas. The maker movement is gaining momentum and has a long way to go however its widespread awareness and usage will make this initiative a successful platform.

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