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To Study the use of Portable Partitions for Creating Flexible Teaching Learning Spaces - A Review

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Abstract: *Indian education is being reshaped as the New Education Policy (NEP) is being implemented all over the country. The NEP is giving the students a chance to learn and educate themselves in a very flexible manner. They have the option of selecting subjects they like and can also opt for the teaching learning medium (online/offline) they are comfortable with. Implementing these new rules and regulations of NEP will be a little challenging to the educational institutions as they will need manpower and infrastructure for the smooth execution of the NEP. The educational institutes have limited built-up space in which they will have to accommodate all the necessary amenities prescribed by the government for the implementation of the NEP. More classrooms, laboratories, staffrooms, and other basic amenities have to be built in the already existing building structure. Constructing brick walls and dividing the interior spaces can be difficult and may not solve the problem of space constraint. So, an alternative for fixed walls and fixed partitions has to be thought of. This research is concentrated on one such alternative, portable partitions. Portable partitions can serve the same purpose as walls and can add beauty to the interior spaces. For this study secondary data has been collected from books and previously done research work based on movable/portable partitions, the New Education Policy and the benefits rendered by portable partitions. Results show a comparison between the research works done based on their methodology and the conclusions drawn. Further scope of work has also been discussed based on the research gaps found.*

Keywords: Portable Partitions, Teaching Learning Spaces, Partitions, Interior Design, Multi-Purpose spaces, New Education Policy.

I. INTRODUCTION

The education system of India is in the stage of being remolded. The Indian government has come up with the New Education Policy (NEP) that was implemented all over the country in the year 2020. This policy is very beneficial to the students as it gives them the flexibility to choose their subjects and mode of learning too. There are a number of subjects that have been added to the school and college curriculum under the NEP [41]. This means that the number of classrooms and laboratories and other amenities needs to be increased in the educational buildings. It becomes difficult to accommodate more areas in the already existing building structure. This poses a problem to the academicians. Dividing larger spaces into smaller utility areas or creating multipurpose areas can be a solution to this problem. For this, portable partitions need to be installed in the educational institutes through which multipurpose areas can be created and activities can be switched easily. Also, as per the guidelines given by the government for the implementation of NEP, there have to be flexible teaching learning spaces in the institutes [6]. This is much needed as the classes will be conducted in both online as well as offline modes. Portable partitions can be used to obtain flexible teaching learning spaces in schools and colleges. Portable partitions render the same advantages as of wall if the right material and construction technique is being used. Interior designers have to play a major role in designing portable partitions for these buildings and providing the necessary number of classrooms and laboratories [2].

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1.1 Interior Design

Interior design is a field in which interior spaces of any built structure are designed. Interior designing deals with designing of flooring, walls, ceilings, furniture, furnishings, accessories etc. Interior design can be done in residences, hotels, restaurants, educational institutes, malls, theatres, shopping complexes, and many more [2]. The interior designing of any space mainly depends on the users age, gender, preferences, social, economic, and cultural status, budget, prevailing season, geographical location of the building, and the trending fashion. A built-up space is a basic necessity of humans but at the same time it can be luxurious also. The role of the interior designer is to provide utmost comfort and functionality to the built-up space but at the same time enhancing the ambience too [3].

1.2 Partitions

Partitions also known as room dividers are used to divide large spaces into small areas. Usually, partitions are used to gain visual or sound privacy. Partitions can be of full height that is from floor to ceiling or can be half height depending upon their utility [1]. Various materials are available in the market for the construction of partitions, for example wood, engineered wood, metal, acrylic, fabric, etc. Use of material can be done as per the need for example if the partition is made to block vision, then it should be made of opaque materials like wood, metal, or engineered wood. If partition is used to block partial vision, then translucent materials like tinted or etched glass, acrylic sheet or CNC cut medium density fiberboard can be used for its construction. For gaining audible privacy the partition can be made of dense materials like wood or can be treated with carpet or glass-wool [6].

Partitions can be fixed, for example walls made of brick or concrete. Fixed partitions can be made of other materials also and these can be fixed to the floor or ceiling or walls with the help of fasteners, hinges, or D-buttons. Partitions can also be portable and can be moved from one place to another.

1.3 Portable Partitions

Portable partitions or movable partitions are those which can be ported from one place to another with ease. Portable partitions are of four types.

a. *Sliding Partitions*- Sliding partitions are panels that slide on channels. These channels are either fixed on the floor or ceiling or both.

b. *Folding Partitions*- Folding partitions have panels that are connected to one another with the help of hinges. These panels can fold can gather at one side and when opened can divide the whole space into two areas.

c. *Sliding Folding Partitions*- These partitions are also made of panels that are joined with the help of hinges and are also connected to channels. The panels fold with the help of the hinges and slide at the same time on the channels. These are usually used to divide bigger spans.

d. *Rotating Partitions*- These partitions have panels that have wheels or castors attached to their bottom. They can be rotated here and there with the help of these castors [4].

All the four types of partitions can be operated manually or with the help of a remote control. Special hardware are available in the market for each type of portable partition. These partitions can be readymade, or tailor made as per the requirement of the client.

1.4 New Education Policy (NEP)

The first education policy of India of the 21st century is the NEP 2020 that is replacing the old (NPE) National Policy on Education which was implemented in the year 1986. The strong foundational pillars of the NEP are Equity, Affordability, Access, Accountability, and Quality. This policy is based on the Sustainable Development goals set to be achieved by the year 2030. The aim to this NEP is to transform Indian education into a vibrant knowledge hub and create India into a global knowledge providing superpower country. This NEP also aims at creating the educational institutes like schools, colleges, and universities more flexible, multidisciplinary, and holistic so that the unique qualities and capabilities of the pupils can be enhanced. Under the chairmanship of Padma Vibhushan, Dr. K. Kasturirangan the committee that was formed to draft the National Education Policy in June 2017, submitted the final draft of the NEP on 31st May 2019 to the Honourable Minister of Human Resource Development. This final draft was

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then uploaded on the website of Ministry of Human Resource Development and on the Portal of "MyGov Innovate" for comments/views/suggestions of public and stakeholders [41].

To implement the NEP in schools and colleges, the government has proposed certain changes that should be done in the educational institutes. As per the government norms the teaching learning spaces should be such that they provide more comfort to the students, they should be flexible and should allow different seating patterns, they should be playful with more of outdoors coming indoors, they should have the involvement of the community, should have more multipurpose spaces, the indoors should be well ventilated with ampul amount of light and air coming in, they should provide easy accessibility to portable technology and lastly they should promote creativity over productivity [41].

Flexible Teaching Learning Spaces-

Flexible teaching learning spaces is a basic requirement of the New Education Policy. All the educational institutes need to make their teaching learning spaces flexible in terms of the seating arrangement, circulation flow, room dividers, activities carried out in the enclosed spaces and the physical use of the space [26]. As the students can opt for online or offline mode of teaching learning, the classrooms and laboratories need to be more flexible in terms of the furniture placement and the activities carried out. Flexibility in the TL spaces allows the students to read, write, study, and experiment all in the same space. Students can study in both online as well as offline modes with the help of mentor or on their own [27]. Flexible Teaching Learning spaces can be easily achieved if the room dividers or partitions are not fixed. Portable partitions are a good way to attain flexible TL spaces and multipurpose areas too [28].

II. METHODOLOGY

This research is based on a literature review of the research done previously on related topics. 34 research papers were studied as this is a review research paper. Secondary data has been collected from prior done research work and from books and websites. Research done on portable partitions, their sound absorbing qualities, their advantages, flexible teaching learning environments, creating of multipurpose areas in educational institutes are studied. These research works were studied, compared, and then analyzed and based on these conclusions were drawn.

III. RESULT

After thorough study of the previously done research work related to flexible TL spaces, portable partitions, and materials for construction, the following results were drawn.

As per the norms of the NEP 2020 flexible TL spaces have to be provided by the educational institutes to the students for better learning and training.

Flexible TL spaces increases the concentration of the students and helps them to be more creative. Such a flexible environment enhances the mental and physical health of the students and improves their academic performances. Flexible TL spaces creates a sense of belonging amongst the students and helps developing a positive attitude.

One way of attaining flexible TL spaces is by providing multipurpose areas in the institutional buildings. Large halls can be created and then can be subdivided into smaller areas.

Multipurpose areas can be used for multiple activities by installing portable partitions which can be sliding, folding, sliding folding, or rotating.

Multipurpose areas are good for institutes that have limited space and are missing basic amenities. But while designing multipurpose spaces things like air and light ventilation, furniture placement, circulation, right clubbing of activities should be taken care of.

The major problems faced by institutes in the installation of portable partitions are lack of awareness, budget, sound insulation, light and air ventilation.

Research have been continuously done to improve the sound insulation of portable partitions by adding various insulating materials. The adding of insulating materials should not increase the weight of the panels of portable partitions or else they won't be able to ported. Special hardware has to be designed for adding on the sound insulation.

Portable partitions that are installed in laboratories have to be fireproof. Research is being done on different fireproof or fire-resistant materials that can be used for the construction of the portable partitions but at the same time should not harm the health of the inhabitants.

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Readymade modules of portable partitions need to be made available so that it becomes easy for the institutes to buy and install them. Different types of modules are being studied and designed by researchers that can be easy to install without any skilled labor and should be durable and sturdy.

Sliding portable partitions are more popular amongst the educational institutes as they can be made in panels and the operation is easy, which can be done without any prior training.

In many scenarios flexible furniture can act as portable partition to divide spaces and create circulation areas.

Installing portable partitions is a step towards sustainability, as no brick, cement or concrete is being used for its construction and it need not to be demolished. If not needed, they can be removed easily. In the case of shifting from one floor to another or from one place to another these partitions can be removed and reinstalled at a new location. Also, sustainable materials like natural fabrics, bamboo, recycled glass, recycled acrylic sheet, rattan, etc. can be used for its construction to gain sustainability.

Not much research has been done on the usage of portable partitions in educational institutes and there is a lot of scope to explore. Reasonable materials, hardware and fast installation techniques have to be studied.

Awareness regarding the portable partitions needs to be spread amongst the educational institutes so that they can opt for this option. This awareness can be spread by the interior designers, architects, and government through different campaigns, advertisements, subsidies, competitions, etc.

IV. CONCLUSION

Indian government is trying hard to reform the education system and so has introduced the NEP 2020. This policy demands for flexible teaching learning spaces in all the educational institutes nationwide. Flexible TL spaces can be very well achieved by the installation of portable partitions and omitting the fixed partitions. Laboratories can be converted into classrooms, conference halls can be converted into libraries, classrooms can be merged or divided, staffroom can be doubled into pantry and staff canteen, student's canteen can be converted into entertainment area, etc. with the simple use of portable partitions. Potable partitions are easy to install and are less time-consuming. They can be conveniently ported from one place to another. They can be placed on their desired space and can be removed or opened as and when required thus providing flexibility of space. Portable partitions can be made to block vision by using opaque materials like wood, plywood, MDF, HDF, or metal. Fabric, acrylic sheet, tinted glass can be using for making portable partitions if vision needs to be blocked but at the same time light needs to be transmitted. Additional materials like glass-wool, blankets, foam, thermocol, or carpets can be used on portable partitions to attain sound privacy. Installing portable partitions is a sustainable alternative to replace walls and fixed partitions, as these portable partitions can be reused whereas walls cannot be reused, and their demolition creates a lot of pollution and waste. Thus, portable partitions serve the same purpose as fixed partitions or walls but at the same time give the consumers the advantage of flexible spaces.

More research needs to be done on the installation of portable partitions in the educational institutes. Experiments need to be done to make these partitions budget friendly. Also, more work needs to be done so that these partitions can be made available in the market in the form of modules or panels that can be bought and assembled on site, with no need to construct them. The problem of sound leakage occurs through the hardware used for the portable partitions and so research needs to be done in this direction so that soundproof or sound insulating hardware can be designed. Thus, it can be concluded by stating that portable partitions are a good solution to fixed partitions to gain flexible TL spaces and there is a lot of scope for more research in this field.

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