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Association between management of an educational institute and use of multimedia in classroom

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Abstract

The study has been taken up to understand the association between management of educational institute and multimedia usage in higher education institutions in Guntur district of Andhra Pradesh. Thirty higher educational institutes were selected for the study. Twenty-two recommendations that guide existing multimedia in class a room proposed by various higher educational institutes and official bodies served as a base for identifying the design features that to evaluate the existing usage of multimedia in the class room.

The recommended design guild lines with reference to multimedia in educational building were these includes network requirement, provision of pc, data projector with a screen and video conferencing. Most of the educational institutes have not paid attention to provide advanced equipment related to multimedia such as data projector, crestron touch panel, audio system like microphones, amplifiers and speakers, wireless microphones and digital slate. According to chi Square analysis the type of management and multimedia, year of establishment and multimedia, strength of the college and multimedia were found to have an association in the decisions regarding the provision of multimedia in class rooms.

Keywords: Educational institutes, multimedia, management, classroom

Introduction

Classroom to create teaching learning environment require multimedia components such as data projector, Crestron touch panel, audio system like microphones, amplifiers and speakers, wireless microphones and digital slate and so on. Multimedia activities encourages students to work in groups, express their knowledge in multiple way, solve problems revise their own work and construct knowledge.

Multimedia technology enlightens the educational process by means of better communication between teachers, students and also to create innovative ways to make learning more dynamic. Multimedia applications are operated by teachers and lecturers to transmit information as lecture slides, assessment materials and other learning resources. It can also be operated by students to learn new skills and knowledge without lecturer's guidance.

According to Perkins and Will (2014) ^[2] technology should be provided in classrooms and lecture halls in a manner that supports technology-enhanced learning by making it available and easy to use. Technology must be approached holistically as a part of the classroom design to ensure it functions properly and in an integrated manner to support instruction in a meaningful way. One critical component of effective technology function was the proper installation of technology infrastructure during the design phase. In contrast to the rapid evolution of technology, the physical classrooms in which learning occurs change at a much slower rate. Therefore, the classroom must be designed with infrastructure systems that allow technology components to change without disturbing the architectural envelope of the space.

A smart classroom should have the multimedia devices such as technology media cabinet, projection, technology connection points, function-specific technology and audio-visual systems. Class room should contain a technology media cabinet located against the corridor wall. The media cabinet should contain the room's technology components, which should be controlled using a wireless device. This strategy integrates technology in a non-intrusive manner. It also enables the instructor to provide "shared control" to students or groups, as required for instruction. The media cabinet should contain; a personal computer with wireless keyboard and mouse, a DVD/CD/VCR player, a wireless annotation tablet, a document camera on a pull-out tray, wireless microphones, a wireless control panel and auxiliary input ports for portable devices.

The room infrastructure must support two ceiling-mounted projectors and two side-by-side projection screens. The size of the projection screens should achieve the appropriate image size given the size of the space and student viewing requirements. Screens should be mounted so that a minimum of six feet of whiteboard space. The screens should be of a matte white finish, which provides a viewing angle of up to 45 degrees on each side the center line. Screens were with 10 feet wide. In larger rooms, dual-projection technology should be designed. In smaller classrooms, single projection technology may be designed. Class room should also contain the other components such as wireless internet access, infrared broadcasting to support assisted listening devices, networked control system for remote monitoring and access. The provision of a telephone is optional.

Multiple connection points must be provided at the rate of at least one per team or student group. Each point should connect to the local projection unit and must support connection point must support user devices on multiple platforms.

Advanced technology such as video capture, computer classrooms, specialized equipment, etc., may be provided in select rooms on a function-specific basis (Perkins and Will, 2014) [2].

A Guide to Better Classroom Design at Washington University (2015) [1] suggested to have a better sound control in the class room. They should be equipped with audio-visual systems such as microphones, Creston touch panel, data projector and interactive display. Table touch screen panel is acceptable control system. Provision of audio system like microphones, amplifiers and speakers. Wireless microphones were preferred for teaching. An instructor microphone port should be provided at the teaching station, along with a wired lavalier microphone (ornamental thing). Number of wireless microphone systems the classroom should contain were 4 microphone or receiver system, 1 lapel, 1 countryman and 2 handheld wireless microphones. Back up microphones were required. Each microphone system includes 1 receiver, 2 microphone heads and 2 body packs. Approximate size of crestron touch panel is 5 inches for seminar rooms 10 inches for classrooms and 12 inches to 15 inches for auditoriums. Top of touch able part of screen not higher than 6 feet 5 inches to 6 feet 6 inches from finished floor as same height as a raised chalkboard. Remote controlling and E - control are required to operate the crestron touch panel, the minimum requirements and specifications were data projector should be in 16 X 10 aspect ratio and interactive display should be 80 inches +/- widescreen 16 X 10 aspect ratio, 32 feet maximum distance from interactive display to farthest seat in larger class rooms.

Materials and Methods

The study was carried out in Guntur district of Andhra Pradesh in the year 2020. A list of higher education institutions was made by using random sampling techniques. Thirty higher educational institutes willing to take part in the investigation were chosen for the study included not only universities and colleges but also various professional colleges that provide preparation in such fields as engineering, agriculture, medicine, and pharmacy. An interview cum observation schedule was used for data collection.

Twenty-two recommendations such as network requirement,

provision of pc, data projector with a screen and video conferencing, provision of advanced equipment related to multimedia such as data projector, crestron touch panel, audio system like microphones, amplifiers and speakers, wireless microphones and digital slate that guide existing multimedia in class a room proposed by various higher educational institutes and official bodies served as a base for identifying the features to evaluate the existing usage of multimedia in a class room. It was evaluated in terms of these standard features. To quantify the responses, score 3 was given in case the existing feature was 'fully provided' as per the recommendations. score 2 was given in case the existing feature was 'partially provided' and score 1 was given in case the existing features was 'not at all' provided in the classroom. Thus the probable score each respondent can earn was between 22 and 66. The results were interpreted such that the higher the score, higher was the probability of the design of multimedia as per the recommended guidelines in the class room.

The hypothesis formulated for the study were $H_0 =$ There exist a significant association between the independent variables viz., type of management, year of establishment and strength of the institute and dependent variables of the study. Hence, the chi-square test and regression was used as a statistical tool to study the association and percentage contribution. The year of the establishment of the institution, type of management, and the total strength of the college were identified as independent variables.

Results and Discussion

Background information of the institutes

The type of educational institutes selected for the study were categorized as government, government aided, private and autonomous. Out of total sample 36.66% of the institutes were under the category of private management, 30% of the institutes were under the management of government, 30% of the institutes were under the management of government aided and remaining 3% under the autonomous institutes.

Existing multimedia usage in institutions

Twenty-two recommended standard design guidelines were identified through literature survey for designing class room multimedia. Taking these into consideration, the class room multimedia design in educational institutes was evaluated.

More than 90 percent higher education institutes (93.33%) were found to be as per recommended design guild lines with reference to provision of pc with USB ports. 63.33 percent of the higher education institutes were found to be as per recommendation with reference to the provision of monitor LCD panels and data projector with a screen in class room. More than 60 percent of the higher education institutes were found to be as per recommended design guild lines with reference to provision of data projector with a screen in class room.

Provision of a table top touch-panel for control system, table touch screen panel for remote controlling and e -control was not found in 66.66 percent of the institutes. Audio system was not providing in 56.66 percent of the higher education institutes. Wireless microphones were not provided for teaching in more than 60 percent (60%) of higher education institutes. Speakers and related hard ware and other fittings and fixtures were not provided in majority of the institutes.

Table 1: Educational institutes by multimedia

Design features	Above the recommendations		As per the recommendation		Below the recommendations		Total	
	N	(%)	N	(%)	N	(%)	N	(%)
Provision of PC or laptop in class room. 4 USB ports should be provided on the front of the computer.	0	-	28	93.33	2	6.66	30	100
Monitor should have 19"-22" LCD) or LED	2	6.66	19	63.33	9	30	30	100
Provision of data projector with a screen in class room.	0	-	20	66.66	10	33.33	30	100
Minimum requirements of data projector specifications for 16 X 10 aspect ratio. WXGA (1920 X 1200)	6	20	11	36.66	13	43.33	30	100
Provision of a table top touch-panel for control system.	1	3.33	9	30	20	66.66	30	100
For table touch screen panel remote controlling and e –controls were required to operate.	0	-	10	33.33	20	66.66	30	100
Approximate size of Crestron touch panel was 5 – 10 inches touch screen (glass thickness)	3	10	7	23.33	20	66.66	30	100
Top of touch-able part of screen no higher than 6 feet 5 inches to 6 feet 6 inches from finished floor. (same height as a raised chalkboard).	5	16.66	5	16.66	20	66.66	30	100
Provision of audio system like microphones, amplifiers and speakers.	0	-	13	43.33	17	56.66	30	100
Wireless microphones were preferred for teaching.	0	-	12	40	18	60	30	100
An instructor microphone port should provide for teaching station, along with a wired lavalier microphone. (ornamental thing)	0	-	13	43.33	17	56.66	30	100
Number of wireless microphone systems: 4 microphone/receiver system, 1 lapel, and 2 handheld wireless microphones. Back up microphones were required.	0	-	9	30	21	70	30	100
Each microphone system includes 1 receiver, 2 microphone heads and 2 body packs.	1	3.33	9	30	20	66.66	30	100
Wireless access points enclosure should be required within ceiling design.	1	3.33	7	23.3	22	73.33	30	100
The network requirement should be wired CAT6 or CAT6a data, 1GE minimum, connections were necessary at the teaching station area.	2	6.66	23	76.66	5	16.66	30	100
Speaker should be recessed with walls or incorporated in the ceiling at all the times.	0	-	9	30	21	70	30	100
All surface mounted speakers should have custom colour finish to match adjacent surface. Colour should blend with ceiling	0	-	5	16.66	25	83.33	30	100
An 8-inch full-range speaker should be provided inside the projection booth and/or control room that was tied into the classroom /auditorium sound system for monitoring the audio system from the projection booth	0	-	5	16.66	25	83.33	30	100
Speaker system should be carefully designed for the space to provide uniform coverage of +/- 2DB, 80 to 8000 Hz minimum over the entire seating area of the auditorium for both sound reinforcement and sound reproduction.	0	-	4	13.33	26	86.66	30	100
A camera will be mounted for video conferencing.	0	-	18	60	12	40	30	100
Provision of digital slate	0	-	1	3.33	29	96.66	30	100

The class room in higher education institutes were not found to be as per recommended design guild lines with reference multimedia network requirement, provision of pc, data projector with a screen and video conferencing. Most of the educational institutes have not paid attention to provide advanced equipment related to multimedia such as data projector, crestron touch panel, audio system like microphones, amplifiers and speakers, wireless microphones and digital slate.

Association between type of management, year of establishment, strength of the college and multimedia

H₀: There exist no significant association between the independent variables viz., Type of management, Year of establishment and Strength of the institute and multimedia. There were twenty-two standard design recommendations to measure the variable “multimedia”. Thus the total observations were 22×30 = 660.

Table 2: Association between type of management, year of establishment, strength of the college and multimedia

Independent variables	Multimedia				Level of significance
	Above the recommendations	As per the recommendations	Below the recommendations	Total observations	
Type of management					
Government	3	77	118	198	Significant at 1 percent level
Government aided	4	0	18	22	
Private	4	116	122	242	
Autonomous	10	54	134	198	

Total	21	247	392	660	
X ² value	49.6152				
Probability	<.0001				
Year of establishment					
Below-1990	9	73	138	220	Significant at 5 percent level
1991-2000	10	100	176	286	
2001-2017	2	74	78	154	
Total	21	247	392	660	
X ² Value	11.1605				
Probability	0.0248				
Strength of the college					
Below 1000	8	48	164	220	Significant at 1 percent level
1000-2000	10	86	168	264	
2000-above	3	113	60	176	
Total	21	247	392	660	
X ² Value	79.6337				
Probability	<.0001				

The design recommendations related to multimedia design in class rooms recommended the provision of PC or laptop in class room with 4 USB ports on the front of the computer, 19” - 22” LCD (liquid crystal display) or LED (light emitting diode) monitor, data projector with a screen, table top touch-panel for control system, provision of audio system like microphones, amplifiers and speakers and wireless microphones.

Conclusion

The class room in higher education institutes were found to be as per recommended design guild lines with reference to multimedia network requirement, provision of pc, data projector with a screen and video conferencing. Most of the educational institutes have not paid attention to provide advanced equipment related to multimedia such as data projector touch panel, audio system like microphones, amplifiers and speakers, wireless microphones and digital slate and speaker. According to Chi Square analysis the association between type of management and multimedia was found to be significant at 1 percent level, the association between year of establishment and multimedia was found to be significant at 5 percent level and the association between strength of the college and multimedia was found to be significant at 1 percent level. The type of management and multimedia, year of establishment and multimedia, strength of the college and multimedia were found to be have an association in the decisions regarding the provision of multimedia in class rooms.

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