

**PERCEPTION OF WEB-BASED VERSUS PAPER-BASED  
MEDIA IN HIGHER EDUCATION INSTITUTES OF  
PAKISTAN**

**Kashan Pirzada\***

**Nabeel Rehman\***

**Abstract**

The paper based and web based media has its own importance in academic environment of teaching and learning. The purpose of this study is to differentiate the usage of these media as per the perception in terms of selection criteria of both faculties and students in higher education of Pakistan. And to determine the edge any media perceive over the other in terms of its cost, time saving, easy access and readability. A 32 item perception of web based and paper based usage survey was conducted to 100 faculties and 250 students of SZABIST, Bahria University and PAF-KIET. The findings of this study validate that all the variables means are statistically significant in selecting the preferred media. Majority of the Pakistani faculty members and students prefer the web based media, based on the reliable and efficiency variables. Further study of students' perceptions toward web-based media versus paper based media should be conducted in classes where computer use is not a chief component of their academic profession such as humanities department.

**Keywords:** *Web-Based media, Paper-Based media, Faculties, Student's Perception, Pakistan*

**\* University of Malaya, Malaysia**

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## 1. INTRODUCTION

In the recent era a great revolution in the field technology has taken place, perception of the people immensely change from paper material to web-base material. Web-based materials are widely used for the storage of data, easy access, reliability, cost saving and many other reasons which are highlighted in the literature review. But this research mainly focuses that how web-based versus paper based material have affected the educational scenario of the higher education institutes of Pakistan. Students and instructors both are involved in the usage of paper base media and web base media for learning and teaching environment. (Alexander, 2001) discuss the idea is to identify the effective mode of teaching and learning for instructors and students in order to know the efficiency of both the media in all areas and stages of education. Traditionally paper based media was frequently used in everywhere especially in the educational institutes, but with passage of time phenomena has to be change and advancement of technology in all part of life directly hit to the educational institutes and now most of the work is done through web-based Web-based media. (p. 70). According to (Hatfield & Gorman, 2000). The printed material is easily available on web and users easily reach to that material, web based play a significant impact on educational institutes, different studies highlighted the usage of web based media increases gradually. Users' age and expertise of using the web based media better explain the perception about media selection. Web based media has number of benefits which creates a positive experience in the mind of the users like integrate resources, easy access, cost and time is saved. On the other hand print based media has its own benefits such as, problems are encountered easily, faster reading, no extra cost of electricity and internet is required. An additional benefit of time saving was recognize that, typical approach in conducting quizzes, feedback form the mentor huge time was incur in distribution of papers and in return of paper but modern approach saves the time student and other users directly attempt the quizzes online and fill the form. Bartlett (2001). Linking with this benefit quick result or outcome also motivate the student and other users. (p. 23). With the explosive growth of web-based media the whole world has changed into a global village. Web-based media has involved in every field of life and now-a-days web-based material has been tremendously used by students from school level to university level. Students feel their life is dull without web resources. Brown (1994) Universities are trying to provide better services for web-based media so that students can use and enhance

their knowledge but again the question is how students could be compelled to take the best out of this opportunity. (p. 63)

### 1.1 Factor for Media Selection

There are number of different factors that may help in media selection process of students and faculties in higher education. Following Discussion:

#### 1.1.1 Time Saving for Mentor & Students:

According to Messing (1990) as highlighted previously, web based media saves which actually motivate the mentor and increase its potential in different task. Paper based media consume more time, It was experienced by reading different studies that on average the mentor spent around 45 minutes in rating and recognizing to each project. Six hours for just eight projects and this time vary over subject to subject as per the strength and remarks. Due to this issue most of the mentor only gave 20% remarks of the problems and rest of the student work graded only on finishing point of the project.

For web based media project, for the first time used mentor spent more time in ranking and recording. Because project initially coded in different format and then to convert it into the Web software required more time around 60 minutes spent on each project. But after the continuous usage of web software mentor spent around 5 minutes for grading each project of the student. The total time consume 40 minutes in rating eight projects. (Messing 1990) In comparison of both media, excluding the first time usage of web software the significant amount of time save by using web based media. (40 minutes in web based media and 5 hours in paper based media). (Collis, 1991) said that this ratio of time saving enhances in order to increase the size of the class. Nowadays mentor are more rely on web based resources it also remove the requirement of return the project. And the student point of view most of the student likes to rely on web-based resources in order to save time and resources because time is very significant factor in every field.

#### 1.1.2 Readability:

Readability is considered to be a determining factor than any of the others. Faculties and students preferred reading from print material such as books and other material because of the tendency of use the paper based media, on the contrary some of the users like screen reading

because of large amount of information available of different courses. (Messing, 1995) It also depend upon the age bracket of the users, young generation mostly rely on screen reading and perceive that its faster than paper base reading, while the older people prefer paper reading than screen reading because of their positive experience and lack of computer skills.

### **1.1.3 Easy access:**

Messing (1990) indicate that the assessment of web based media efficacy in higher educational institution increases because it makes users life easier in this sense of that from everywhere faculties, students and other users reach to the web based resources no bounding of place and time whether the users in the train, and during breaks at office. It's an age of technology users use web based resources in order enhance their knowledge and performance in shortest possible time.

### **1.1.4 Integration of Resources:**

According to Catenazzi (1993) explain that student uses multi sources while making the project, web based media open another advantage to faculties and student, easily extract resource from different places and convert them with the help of compiler in to the desired format. Mostly faculties assimilate the resources in making exam paper and routine lectures. On the contrary in paper based media integration of resources is very difficult and time consuming.

### **1.1.5 Conventional Learning method:**

Another key factor in media selection explain by (Messing, 1990) that student, faculties and other users spent their complete lives in using the conventional mode of learning and it is not very easy to switch the medium of teaching and learning, although web based media saves time and provides easy access, a single point of information but in number of studies shows that student complete potential is not being used in web based medium, mostly students prefer paper based media in order to their previous experience and association to the learning form.

### **1.1.6 Cost Saving:**

Cost is one the significant factor while selecting the media. (De Diana, 1991) Comparatively with the paper based media, web based media is cost effective because web based resource are only required storage space cost but on the other hand paper based resources involved huge cost in printing the resources like books, carrying and other cost are involved. Students project, assignments and quizzes annual printing cost is also an additional cost which is waste after

passing the course. One of the research shows that Students discouraged routine printing assignments and other material. In summary paper based resources are not re-usable. (p. 349)

#### **1.1.7 Editing Option:**

According to De Diana (1990 p. 241) Other point of difference is editing option, in the web-based media it is easy to edit or delete the material but on the contrary paper-based media this option is not apply.

#### **1.1.8 Space Saving:**

Other dominating factor of media selection highlighted by (DeZee, Durning & Denton, 2005) that web based media store millions of resources in a single place and theses resources are very reliable any time researcher and other users reach to those resources. And web based resources easily transfer to different folders or storage devices but the other medium paper based media required large space for storing and maintain the data as compare to web based data. In contrast of media, web based media saves a lot of space which is further useful for other purposes. (p. 350-353)

#### **1.1.9 Accessed Faster:**

Web-based media (De Diana, 1991) is quicker than paper-based media, in web-based integration of the resources is very easy and student faculties can easily explore the relevant material without wasting the time.

### **1.2. Research Problem**

The paper-based and web-based media has its own importance in academic environment of teaching and learning. The purpose of this study is to differentiate the usage of these media as per the perception in terms of selection criteria of both faculties and students in higher education. To find the factors dependable for media selection for Students and faculties and to judge the differences between the usage of both the media. The edge any media perceive over the other in terms of its cost, time consumption, easy access, readability, space saving, convenience to carry, storage of information mainly. (Kress, 1998, pp. 56)

### **1.3 Objectives**

These are the objectives of the study:

- To explain the factors responsible for media selection and preference in higher education teaching and learning environment.
- To compare the performance of web-based and paper-based usage among higher education students and faculties.

## 2. LITRATURE REVIEW

### 2.1 Digital Literacy and Reading Digital Resources:

Gilster (1997) explains, in the current knowledge based academic society play a vital role in order to understand and evaluate the integration of information into different formats which computer can convey. The electronic books and other reading material is a good demonstration of digital literacy. (Gilster, 1997) The ratio of the usage of web-based material immensely increases and it attracts the universities for number of reasons but at least two of them are very significant. I) web-based material are convenient in the idea of that the student and faculty have quick access to web-based material and ii) save space because web-based material or electronic books saves huge as compare to physical material or books engage.

### 2.2. SURVEYS:

Some other surveys reports show the literacy rate of digital libraries in the academic setup, the usage of web based media increases tremendously. On the research conducted by university of Texas at Austin in 1991. The total 788 respondent, out of which 627 (80% ratio) prefer electronic journal, hyperlink and other web based material and rest 162 (20%) prefer print material because of their prior positive experience and association. (McKnight, 1989, pp.172-174). The applicant who chose the web based media such because of saving the resources and easy access to the resources and there are other number of reasons which are highlighted later for the preference of electronic resources, additionally the key word search option is a crucial reason for the inclination of the academic users mainly student and faculty. On the contrary the respondent who shows their likeness in print media because of the perception of readability factor, users are used

to in reading from book rather than web based media and the speed of reading is more in print base media rather than web base media. (Maloney, 1994, pp.559). One of the similar natures of survey also voted at California state university. The research question was asked about the digital library system and their usage. 211 library users said that, 57 % print based media or books for teaching and learning purpose, if they had used both the paper and web based media or books, although no reasons were found specifically of the preference of any of the media. (Pool, 1997)

### 2.3 Measuring Student Use

In one of the survey Woolf and Vining (2000) highlighted that the usage of web based material is tremendously increases universities gathered collection of different digital format journal and electronic books for users reading and downloading. Some of the applicant have a view that electronic based journal or book have more features than print material like multimedia option, change text size and easily covert it into any of the format as to fulfill the need of the users also make presentation but printed material finish many of the intrinsic qualities or features of digital format resources.

### 2.4 Learning Efficacy and Cost-Effectiveness:

Another study's larger evaluations were conducted in the independent study on web based media and electronic books versus the print based media. This review consists of three parts. In the first review the incremental cost of producing the electronic books and other material were estimated and compared to the print based material teaching and learning cost. The idea of determining it is to address the comparative analysis of both the media usage and preference by (Lam, 2003). Clark said that the extra cost of making the media resources are rarely calculated or incorporated for comparative mode of studies. (Lam, 2003) If these were planned and the same amount of resources spent in order to progress a traditional method of learning in the class room or print based material for teaching and learning media, even lesser medium consequences dissimilarities would be practical.

### 2.5 Learning Outcomes:

One of the study conducted by (Bartlett & Alexander, 2000) university, the basic of the study was to identify the basic teaching and learning outcomes from the web based media and paper based media. Applicant feel any difference in two medias, secondly university conduct a

telephonic interview to the students and faculties at the completion of the semester and to gather the effective use of web based media and print based media material during academic session.(pp. 23). Research applicant responded to all questions and initially paper based questions were asked to the students to know the learning outcome of this medium. Than web based question were asked to the same applicants. Half of the respondent view was paper based material habit motivate towards their use and one third applicant said that print based media positive experience and long history of use enforced to continue use the same medium. On the other hand three one fourth participant asked that web based media increase the efficiency of their work and download required material form different locations and easily installed and save in different devices like CD Rome and other portable devices that were very easy to carry everywhere in the world and quiet easy to share with other users and students. (pp. 24)

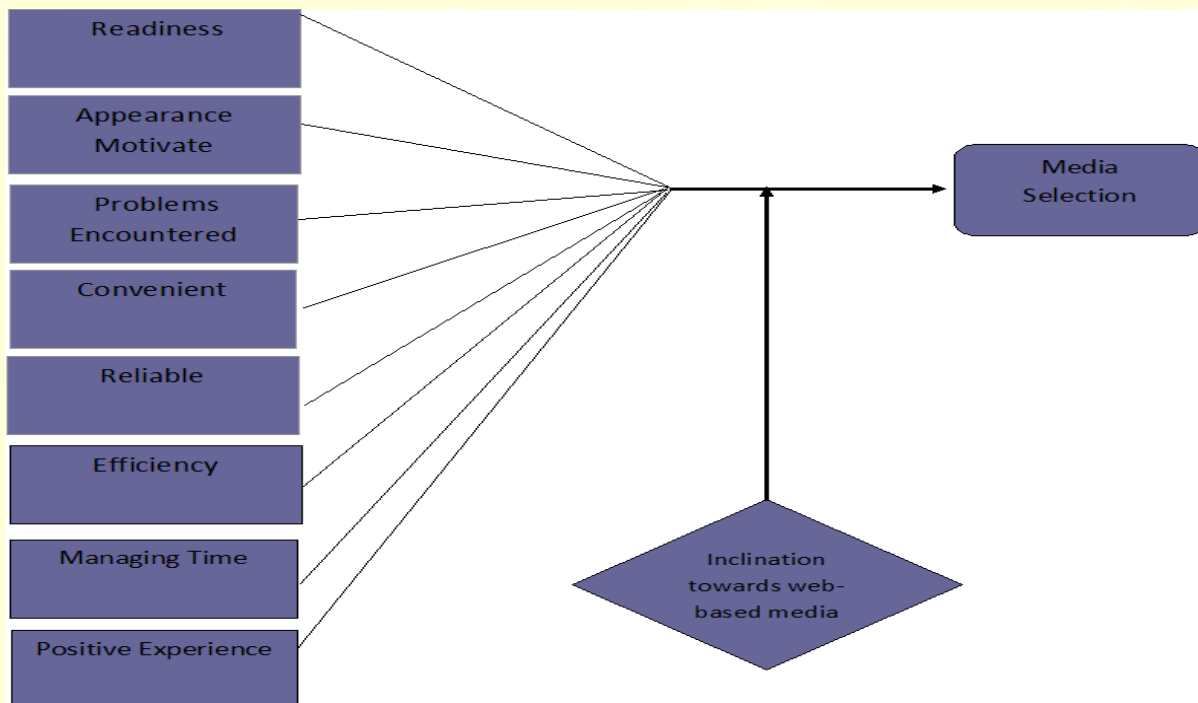
## 2.6 Cost-benefit Analysis

According to the Hardwicke & Kapes (1997, pp. 60) web based media mainly sustain storage cost of resources which was increases rapidly with the increases in the number of users because web based media provide easy access a single point of contact to all students faculties and users moreover the other benefits were amalgamation of resources from different published papers and digital libraries to a particular location as well as these properties enhance the users efficiency in their work. Hardwicke & Kapes (1997, pp. 62) said that paper based media also had different advantages mostly studies reflect that a huge number of respondent prefer print based material for readability option, participant view was the paper material reading was more clear and speed as compare to screen reading and its physical appearance gave internal satisfaction to the users. Simultaneously the cost of the paper based media was more than the web based media because it required large space or record room for maintain the data physically and printing and distribution cost also a part of paper based media and many other type of costs are associated with print media which are comparatively more than the other medium. (pp. 64)

## 2.7 Theoretical Frameworks:



According to Denton (2005) conceptual framework is the base of overall study. In theoretical framework four variables are identified from different research papers that were used in the literature review segment and also all the variables must possess the relationship among them. In this study seventeen research papers are used and the variables: easy access, time saving, efficiency, readability are the independent variables, media selection is the dependent variable and inclination towards web based media is the intervening variable of the research in fact no moderating variable was found.



### 3. RESEARCH METHODOLOGY

According to Haas (1988). The type of study is descriptive in nature because the hypotheses of the research are stated clearly on the basis of which further research will be carried out. In this research the structured questionnaire is being used for primary data was collected and analyses. It is assume that the University students and faculties of different programs and departments of SZABIST, Bahria, and PAF-KIET Universities are around 5000. No university is providing the sampling frame, therefore the study reliance to the convenient sampling technique for gathering the data form different private sector universities. (Davidson, 1994). In addition to that, sampling size is taken 350 from three private sector universities of Karachi in order to know the perception of web-based and print based media usage for teaching and learning requirements of higher

education institutes. The data is collected through a questionnaire administered personally by the research in on three universities. It is consist of 32 items, adopted from Alexander & Bartlett (2001) The items are based on 5 points liker scale whereas 1) = strongly agree, 2) Agree, 3) no option, 4) disagree and 5) strongly disagree. The data was gathered from thirty eight published research papers, Descriptive analysis, correlational analysis and one sample T-test were performed through special package of social science.

#### 4. DATA ANALYSIS & FINDINGS (FACULTY PERSPECTIVE)

##### 4.1 Overall Descriptive Analysis (Table 1)

	Minimum	Maximum	Mean	Std. Deviation	Rank
Readiness	1.00	4.00	2.2700	.62933	4
Appearance motivates	1.00	3.50	2.3500	.57075	7
Problems Encountered	1.00	4.50	2.4400	.66393	8
Positive Experience	1.00	4.50	2.2450	.70530	3
Convenient	1.00	3.50	2.2400	.58810	2
Reliable	1.00	3.50	2.1750	.62107	1
Efficiency	1.00	3.50	2.3050	.60258	5
Managing Time	1.00	4.00	2.3150	.68775	6

The data is collected from 100 faculty members.

(Scale: 1=Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)

##### Interpretation:

The table 1 shows the descriptive analysis of 100 faculty members' responses for different variables. The scores variable values range from 1 to 5 based on the scale. The factors also ranked on the basis of mean (lowest mean is ranked 1 and highest mean ranked 8). The mean score of the respondent for the readiness variable as 2.27 it means that the respondents rarely agree that readiness is preferable factor for media selection as ranking also indicate the preference of the users rank 4. The mean score of the respondent for the appearance motivate variable as 2.35 it means that the respondents seldom agree that appearance motivate is preferable factor for media selection as ranking shows less preferred variable for media selection. Problem encountered variable mean score 2.44 shows that respondent slightly agree or neutral as ranking also indicate the less preference of the users. Positive experience variable mean score 2.24 shows that applicant hardly agree as ranking also point out the more preference of the users rank 3. Convenient variable mean score 2.24 similar preferences to positive experience rank 2. Reliable variable mean score 2.17 shows that candidate strongly agree as ranking also spot out

the higher preference of the users rank 1. Efficiency variable mean score 2.30 demonstrate that interviewee barely agree as ranking also identify the less preference of the users rank 5. lastly the managing time variable mean score 2.31 shows that applicant hardly agree as ranking also highlighted the less preference of the users rank 6 in media selection.

4.2 Inferential Analysis Table 2

One-Sample Test

				Mean
Readiness	100	2.2700	.62933	.06293
appearance motivated	100	2.3500	.57075	.05708
problems encountered	100	2.4400	.66393	.06639
positive experience	100	2.2450	.70530	.07053
convenient	100	2.2400	.58810	.05881
reliable	100	2.1750	.62107	.06211
efficiency	100	2.3050	.60258	.06026
managing time	100	2.3150	.68775	.06878

Test Value = 2						
	t	Df.	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Readiness	4.290	99	.000	.27000	.1451	.3949
appearance motivated	6.132	99	.000	.35000	.2368	.4632
problems encountered	6.627	99	.000	.44000	.3083	.5717
positive experience	3.474	99	.001	.24500	.1051	.3849
convenient	4.081	99	.000	.24000	.1233	.3567
reliable	2.818	99	.006	.17500	.0518	.2982
efficiency	5.062	99	.000	.30500	.1854	.4246
managing time	4.580	99	.000	.31500	.1785	.4515

Interpretation:

The above test is carried out through by T-test one sample variable analysis. All the variables are significant at 5% level of significance. Therefore the study concludes that all variable are highly preferable for media selection.

ANALYSIS (STUDENT PERSPECTIVE)

4.3 Overall Descriptive Analysis Table 3

Variables	Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation	Rank
Readiness	250	1.00	4.50	2.4140	.68076	7
Appearance motivates	250	1.00	11.50	2.3800	.87100	6
Problems Encountered	250	1.00	4.00	2.4560	.62741	8
Positive Experience	250	1.00	4.50	2.3440	.64290	5
Convenient	250	1.00	4.00	2.3240	.58857	2
Reliable	250	1.00	4.00	2.3380	.67273	3
Efficiency	250	1.00	4.00	2.2580	.68726	1
Managing Time	250	1.00	4.50	2.3380	.70480	4
Valid N (list wise)	250					

The data is collected from 250 faculty members.

(Scale: 1=Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Disagree)

**Interpretation:**

The above table shows the descriptive analysis of 250 students' responses for different variables. The scores variable values range from 1 to 5 based on the scale. The factors also ranked on the basis of mean (lowest mean is ranked 1 and highest mean ranked 8). The mean score of the respondent for the readiness variable as 2.414 it means that the respondents slightly agree or neutral in media selection as ranking also indicate the less preference of the user's rank 7. The mean score of the respondent for the appearance motivate variable as 2.38 it means that the respondents seldom agree that appearance motivate is preferable factor for media selection as ranking shows less preferred variable for media selection. Problem encountered variable mean score 2.45 shows that respondent slightly agree or neutral as ranking also indicate the less preference of the users. Positive experience variable mean score 2.34 shows that applicant hardly agree as ranking also point out the more preference of the users rank 5. Convenient variable mean score 2.32 similar preferences to positive experience rank 2. Reliable variable mean score 2.33 shows that candidate strongly agree as ranking also spot out the higher preference of the users rank 1. Efficiency variable mean score 2.25 demonstrate that interviewee agree as ranking also identify the less preference of the users rank 1. lastly the managing time variable mean score 2.33 shows that applicant hardly agree as ranking also highlighted the less preference of the users rank 4 in media selection.

*4.4 Inferential Analysis: Table 4*

**One-Sample Test**

Variable	N	Mean	Std. Deviation	Std. Error Mean
Readiness	250	2.4140	.68078	.04306
Appearance motivate	250	2.3800	.87100	.05509
Problems encountered	250	2.4560	.62741	.03968
positive experience	250	2.3440	.64290	.04066
convenient	250	2.3240	.58857	.03722
reliable	250	2.3380	.67273	.04255
efficiency	250	2.2580	.68726	.04347
managing time	250	2.3380	.70480	.04458

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Readiness	9.615	249	.000	.41400	.3292	.4988
Appearance motivate	6.898	249	.000	.38000	.2715	.4885
<b>Interpretation:</b>	11.492	249	.000	.46600	.3778	.5342
positive experience	8.450	249	.000	.34400	.2639	.4241
convenient	8.704	249	.000	.32400	.2507	.3973
reliable	7.944	249	.000	.33800	.2542	.4218
efficiency	5.936	249	.000	.25800	.1724	.3436
managing time	7.583	249	.000	.33800	.2502	.4258

All the variables are significant at 5% level of significance. Therefore the study concludes that all variables are highly preferable for media selection.

### CONCLUSION

This study is conducted through survey of 350 students and faculty members of three private sector universities, Bahria, Szabist and Paf Kiet. The users already had their inclination based on different factors and attributes of media as one literature also reflect that some of the users gave more preference to the readiness variable because of the faster reading from hard copy and slower reading from screen. Secondly most of the students and faculty members prefer accessibility of web based media over print based media. Thirdly some literature indicated that significant cost saving and other advantages could be recognized by eliminating paper based material or supply this only to students who are not willing to use the web based materials. Therefore it is quite possible the estimates of variables are affected the higher education students and faculty members perception. Readiness, appearance motivates, problem encountered, positive experience, convenient, reliable, efficiency and managing time are major variables in selecting the preferred media and the usage of preferred media among the higher education students and faculty members. Both the users have their own perception regarding the significance and usefulness of web based and paper based media for teaching and learning environment.

### FUTURE RESEARCH

Firstly, this study should be further conducted to check students and faculty members perception towards web based and paper based media where the computer is not a main part of their

teaching and learning profession such as humanities department, that would provide the awareness of how students and faculty members distinguish both the media. Secondly the research should be expanded geographically to include entire higher educational institutes of the country to better generalize the results of the research. Thirdly, a study should also be conducted to know the perception of web based and paper based usage with other factors for instance, comparison of undergraduate and graduate students, face to face and distance education students. Finally, another suggested area of further research would be the results of the current study should usefully inform a more comprehensive institutional analysis with the increased the interest in virtual learning style.

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