

Internet Usage by Faculty in Saudi Higher Education

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Abstract

In this study, we examine the level of Internet utilization by faculty members from across disciplines in four Saudi higher education institutions: King Saud University, Imam Muhammad Bin Saud University, Prince Sultan University, and Al-Yamamah College. Results indicate that utilizing Internet technologies by faculty was primarily for teaching purposes, followed by communication, and then research. Moreover, faculty's computer skills were found to be a strong predictor of their Internet use. Barriers that inhibit efficient utilization of the internet were identified. Implications for technology integration planning and faculty development programs are discussed.

Keywords: *Internet usage, higher education, faculty, technology adoption, Internet diffusion.*

1. Introduction

The wide spread adoption of Internet applications in Saudi Arabia started in the late 1990s. Universities were among the first adopters of the technology and years later the Internet witnessed an unparalleled spread across campuses. Despite increased Internet connectivity in Saudi Arabian higher education institutions, there is little empirical research investigating the factors associated with the use of the Internet by faculty in teaching, research, and communication. Large portions of higher education budgets are allocated to provide new technology [1]. These funds are typically spent on providing hardware, setting up computer labs, and improving infrastructure to guarantee high-speed Internet access. Considering the size of these investments and the demonstrated effectiveness of utilizing Internet technologies in studies conducted in other countries [2, 3], the need arises to understand Internet usage patterns of faculty members in our local context.

2. Internet Adoption in Higher Education in Saudi Arabia

There has been considerable interest in the influence of the Internet on the Saudi social, economic, and education systems [4]. Although some universities in the kingdom had limited Internet access before 1998, it was not until December of that year that Internet diffusion began across campuses in the country [5]. Following the advent of the Internet in 1999, a number of studies have emerged investigating the adoption of Internet technologies in educational contexts.

Early investigations of Internet adoption and diffusion in academia, specifically higher education, have demonstrated that faculty members are in the early stages of adoption [5, 6, 7, 8, 9]. More recent studies have reported similar patterns and consistently reported low adoption rates [10].

Al-Abdulmenem investigated the effect of using the Internet as an educational tool in the colleges of technology in Saudi Arabia. Participants included faculty members, students, and administrators at three main colleges in Riyadh, Jeddah, and Dammam [5]. In a survey of more than four hundred faculty members in Saudi universities, Al-Fulih examined attributes of the Internet as perceived by faculty members and how their perception can be used to predict Internet adoption for instructional purposes [7]. Similarly, Allehaibi conducted a study on patterns of Internet use among faculty members in Saudi universities in an attempt to identify attributes associated with Internet diffusion in the region [6]. These studies were conducted in a period when the Internet was considered a new innovation in the education setting and not fully adopted at universities in the Kingdom.

Al-Asmari investigated the use of the Internet by EFL teachers at the colleges of technology in four cities in the Kingdom: Riyadh, Abha, Jeddah, and Dammam. Results of his study, conducted in 2004, indicated a low level of Internet adoption by faculty members for instructional purposes. Barriers to the adoption were identified, mainly limited access to the Internet and lack of computer skills [10]. Sait et. al examined the use and effect of the Internet on both students and teachers in education levels ranging from primary schools to universities in Saudi Arabia. Results of the survey revealed trends in Internet effects, perceived usage patterns and effects on students and faculty [4].

As Internet connectivity increased across institutions, studies examining Internet usage by faculty and students provided an insight into the usage patterns and difficulties early adopters faced in higher education. While some of these studies examined Internet adoption and use among students in higher education institutions [11, 12], the issue of Internet usage among faculty members has been examined to a wider extent [13, 14, 15, 16].

The literature shows variations in the approaches Internet usage issues were examined. Some studies have a more focused scope, either by examining Internet use in one specific discipline across several universities [13], or examining all disciplines in one university [16], or investigating Internet usage for a specific purpose such as research [15], or focusing on the use of Internet technologies by one gender such as those studies that examined issues relevant to Saudi female faculty [13, 17].

The scarcity and limited scope of such studies does not permit the creation of any firm conclusions or generalizations about Internet utilization in Saudi Arabia, particularly in the higher education context. Research in the 2000-2005 period indicated that the diffusion of the Internet among faculty members in Saudi universities was in its early stages. However, considering increased Internet availability, the need arises for investigations into the extent these faculty members utilize the Internet services currently available to them for instructional, research and communication purposes.

The issues surrounding Internet usage by faculty members in Saudi Arabian higher education have been inadequately examined in light of the rapid developments in Internet connectivity. The goal of this study was to investigate faculty members' Internet use for educational activities and identify key factors that influence their utilization of Internet technologies. This research is designed to answer the questions of:

- How do faculty utilize the Internet in their teaching, research, and communication?
- Is there a correlation between faculty Internet usage and (1) available university resources (2)

academic discipline (3) age, (4) gender and (5) level of computer usage?

- What are the major problems facing faculty members in their Internet use?

In this paper, we report and discuss the results of a survey of faculty members conducted in 2010. The following sections describe the methodology and results of the survey. We conclude with recommendations to consider in information technology planning and faculty development in higher education.

3. Method

The study was implemented using a survey research method which involves gathering information for scientific purposes from a sample of a population using standardized instruments or protocols [18]. The research design of this study is a cross-sectional investigation of faculty from selected higher education institutions in Saudi Arabia using a quantitative approach of self reported practices of Internet usage. A number of hypotheses were developed to investigate factors affecting Internet adoption and usage.

H₁ Faculty members use the Internet for communication more than in research and teaching.

H₂ There is a positive relationship between faculty use of the Internet and available university resources.

H₃ Faculty in technology-based disciplines use the Internet more than those in professional and academic disciplines.

H₄ Younger faculty have higher usage of the Internet than older faculty.

H₅ There is a positive relationship between faculty use of the Internet and their general computer skills.

H₆ There is no relationship between faculty gender and level of Internet use.

The target population is full-time teaching faculty; part-time, visiting faculty, and teaching assistants were excluded from the sample. The methodology itself employed a survey instrument developed and tested for a similar study that was completed in the United States [19]. The survey was adapted to the local context and validated in an exploratory study with a selected sample of faculty members in Saudi universities. Measures were employed to ensure the validity of the adapted version in terms of language, terminology and suitability for the study sample. Reliability of the measurement scales that were used in testing the research hypotheses was ensured; Chronbach alpha coefficient ranged from $r = 0.50$ to $r = 0.81$, with a median alpha coefficient of $r = 0.67$. The survey was distributed to faculty members of the participating institutions, totaling 3247. Data was obtained from 504 valid surveys from faculty members across disciplines in the sample (253 from KSU, 127 from Imam

University, 118 from PSU, and 6 from Al-Yamamah College).

Respondents' profiles

Complete data was obtained from 504 faculty members (53% male, 47% female). Table 1 presents the demographic characteristics of the sample of faculty. Respondents had a median age between 31-40 years (45% of respondents) and hold various academic ranks within their institution (11.3% professors, 14.1% associate professors, 33.7% assistant professors, 40.7% lecturers and instructors).

Table 1. Respondents' Demographics

Variable	Category	n	Percent
Gender	Male	270	53.66
	Female	234	46.43
Age group	<30 years	62	12.30
	31-40	204	40.48
	41-50	157	31.15
	51-60	69	13.69
	60+	12	2.38
Teaching experience	<10 years	229	45.8
	10-20	158	31.6
	21-30	97	19.4
	31-40	16	3.2
	40+	0	0.0
Variable	Category	n	Percent
Academic rank	Professor	56	11.3
	Associate Professor	70	14.1
	Assistant Professor	167	33.7
	Instructor / Lecturer	202	40.7
Academic discipline	Technology-based	175	34.73
	Other	329	65.27
Respondents' Institution	King Saud University	253	50.20
	Imam University	127	25.20
	Prince Sultan University	118	23.41
	Al-Yamamah College	6	1.19

Computer and Internet usage characteristics for respondents

Table 2 displays descriptive data pertaining to computer use by faculty. For the daily hours spent using the computer, approximately half of the respondents (50.5%) reported three or more hours in use per day. The most frequent computer application was Office Applications such as Word, Excel, PowerPoint and Access (92.1%), followed by the use of special software related to the academic discipline (40.2%), then the use of programming software (11.9%). Only 10.9% of

responding faculty members were familiar with web development software.

Table 2. Descriptive Data Pertaining to Computer Use by Faculty

	n	%
Daily Hours Spent Using Computer		
Less than 1 hour	64	12.7
1 – 2 hours	185	36.8
3 – 5 hours	176	35.0
More than 5 hours	78	15.5
Types of Computer Applications Utilized (Multiple Responses)		
Office	465	92.1
Programming	60	11.9
Web development	53	10.9
Special software	203	40.2
Level of General Computer Proficiency		
Low	13	2.6
Low to moderate	65	13.1
Moderate	201	40.4
Moderate to high	140	28.1
High	79	15.9

Demographic data related to Internet usage is presented in Table 3. The majority of faculty respondents (71%) believe that the Internet plays an increasingly important role in the way they do their work. Regarding the number of years they had used the Internet, most respondents (81.9%) had been using the Internet for more than four years. The number of emails received during the day varied, with the majority of respondents (83.1%) receiving 20 or less per day. More than 85% of faculty reported Internet proficiency levels of moderate to high levels. 16.9% spent more than three hours per day, on average, on the Internet.

Table 3. Descriptive Data Pertaining to Internet Use by Faculty

	n	%
Number of Years Experience Using Internet		
Do not use Internet	6	1.2
Less than 4 years	85	16.9
4 – 8 years	175	34.9
More than 8 years	236	47.0
Amount of email Received Daily		
Less than 10	239	48.1
10 – 20	174	35.0
21 – 30	49	9.9
31 or more	35	7.0

Amount of email Sent Daily		
Less than 5	275	55.3
5 – 10	163	32.8
11 – 15	45	9.1
16 or more	14	2.8
Amount of Time Spent on Internet Daily		
Less than 30 minutes	50	10.1
30 – 60 minutes	141	28.4
1 – 3 hours	221	44.6
3 hours or more	84	16.9
Extent Internet Helps Work		
No help	10	2.0
A little help	24	4.8
Some help	111	22.1
Major help	356	70.9
Level of General Internet Proficiency		
Low	17	3.4
Low to moderate	53	10.6
Moderate	138	27.5
Moderate to high	179	35.7
High	114	22.8

4. Results

Internet usage for teaching, research, and communication

The first hypothesis was that faculty members use the Internet for communication more than in research and teaching. This was examined using Spearman's correlation between Internet usage and the three scales for teaching, research and communication. Results in Table 4 show a significant correlation between Internet usage and teaching, followed by communication and then research. Thus, this hypothesis was not supported as faculty in this sample demonstrated higher utilization of Internet in teaching more than communication or research.

Table 4. Spearman Correlations for Internet Usage in Teaching, Research, and Communication

Internet usage and other scales	Spearman Correlation	Std. Error	Sig
Research	0.35	0.04	0.00
Communication	0.36	0.04	0.00
Teaching	0.39	0.04	0.00

Factors affecting Internet usage

Available University Resources: The hypothesis of having a positive relationship between Internet usage and available resources was examined using Spearman's correlations. Although a positive correlation was observed in this sample (Spearman's correlation = 0.2 , approx sig level = 0.65), it was not found to be significant at the $p < .05$ level. Thus, this hypothesis was not supported.

Table 5. Correlations between Available University Resources and Internet Use

	Available University Resources	Approx Sig. Level
Internet Use	0.02	0.65
Daily Internet Use	-0.03	0.47

Academic Discipline: Spearman's test showed a significant correlation between the discipline and Internet use ($P < 0.001$). Faculty in technology-based disciplines (i.e. engineering, computer science, physical and medical science) use the internet more than other disciplines (Spearman's correlation =0.17, Standard error 0.04). Thus, Research Hypothesis Three was supported.

Age: This hypothesis was examined using Somer's d test (correlation 0.10, Asympt Standard Error = 0.04, Approx significance = 0.01). This test revealed that age was negatively correlated with the level of Internet Use. Thus, Research hypothesis four was supported at $p < 0.05$. The significant correlation demonstrates that younger faculty has higher usage of the Internet than older faculty.

Computer usage level: The correlation was significant, Spearman's correlation $p < .05$ between (a) Internet usage and computer usage was -0.47 and (b) between internet usage and the respondent's perception of their computer proficiency was -0.49. Thus, Research Hypothesis Five was supported. Findings indicate that there was a positive relationship between faculty use of the Internet and their general computing usage level.

Gender: The male and female faculty members were compared for their computer use and Internet use, utilizing Somer's d test for ordinals. None of the usage variables was significant at the $p < .05$ level. Thus, research hypothesis six was supported. Our findings demonstrate that there was no relationship between faculty gender and their level of Internet use.

Problems related to Internet usage

Table 6 presents the problems reported in using the Internet by faculty respondents. Ratings use a four-point scale: “1” = “Strongly Disagree” to “4” = “Strongly Agree”. Items are rank-ordered by highest mean rating.

Table 6. Descriptive Statistics for Problems with Internet Use

	<i>M</i>	<i>SD</i>
Information inaccuracy	2.43	0.762
Too much information	2.42	0.873
Out of use websites	2.14	0.761
Loss of privacy when disclosing information	2.04	0.789
Losing intellectual property /copyright	2.00	0.876
Lack of speed/slow response	1.57	0.726

Highest rated Internet problems were for “Information inaccuracy” ($M = 2.43$, $SD = 0.762$), “Too much information” ($M = 2.42$, $SD = 0.873$), and “Out of use websites” ($M = 2.14$, $SD = 0.761$). Lowest rated problems were “too lack of speed/ low response” ($M = 1.57$, $SD = 0.726$) and “Losing intellectual property/copyright” ($M = 2.00$, $SD = 0.876$).

5. Discussion

Our findings indicate that Internet is utilized by faculty for teaching purposes more than for communication and research. Previous studies examining faculty Internet usage in the local context have consistently reported email and communication as the major purpose for their online activities e.g [15] when compared to teaching or research purposes. Integrating Internet technologies in the teaching process generally indicates higher utilization. This may be an indication that in contrast to studies conducted in the past that showed that Internet adoption is in its early stages [5, 6, 7]. Internet is being utilized to a wider extent as the resources become more accessible to faculty in higher education institutions.

In our examination of the hypotheses, the study showed that there is no correlation between available university resources and Internet use. This finding is in line with findings of studies that reported that organizational factors have minimal effect of faculty use of the Internet [16]. Perhaps, this may be viewed in light of the fact that a large number of respondents reported moderate to high levels of Internet proficiency and other characteristics of early adopters. As previous studies in the local context reported that early adopters of the Internet did not rely fully on their institution’s resources and sought their own Internet access at home or in

alternative settings, this may be true of this sample as well. In line with findings from earlier studies, this study confirmed that faculty in technology-based disciplines use the Internet more than other disciplines [20]. Regarding age of faculty members, the study confirmed the findings of previous studies which stated that younger faculty members tend to use the Internet more in their academic activities. In terms of gender differences in Internet usage, findings of this study demonstrated that gender does not significantly predict the level of Internet adoption and use. In terms of computer skills of faculty, there was a strong correlation between faculty Internet use and level of computer usage. Adequate computer skills have been consistently reported as strong predictors of Internet usage in general, and in our local context in particular [16]. This finding points to the need for considering training and support for faculty in technology integration planning.

With regards to problems in utilizing Internet technologies in academic activities, faculty’s responses varied. Respondents indicated that the main obstacles preventing them from using the internet more are: information inaccuracy, information overload, and out of use websites. In considering earlier studies, a noticeable shift is observed in the reported barriers by faculty; from problems in availability and connectivity [7, 21] towards barriers of interaction with web content such as concerns of the quality of the information and skills required to efficiently integrate Internet technologies in academic activities. Although this may not have been prevalent in our sample, variations in connectivity still exist and barriers of limited access to computer and Internet technologies continue to be reported in recent studies [10, 13, 17]. This shift could be attributed to the increased availability of Internet resources, as budgets are allocated by higher education institutions for improving technology infrastructures and internet connectivity.

The overall results of the study and the insights obtained on patterns of faculty Internet use are important to consider by stakeholders and policymakers for Saudi higher education. Much of previous research in Internet diffusion in higher education, conducted across the world, provides explanation for low adoption rates by putting the blame on faculty; either they are stuck in traditional methods of teaching, labeled as resistors and charged with negative attitudes towards technology. These unfair explanations are based on a poor understanding of different faculty with different needs. The challenge of increasing the benefits gained from the Internet technology should focus on understanding individual faculty needs. Stake-holders are advised to include faculty members in every step of the planning and implementation of up-to-date technologies. If they are involved from the early stages, then their requirements would be met and they are expected to have higher levels of efficient integration of Internet technologies that meet their particular needs.

This study offers an in-depth understanding of problems in utilizing the Internet and faculty perceptions towards the Internet. Technology solutions are not expected to be the quick fix to all educational problems and issues. It is generally known that technology solutions do not improve inadequate teaching methods. Therefore, the focus should be on adopting the right technology solution that fits the education context and the faculty involved. The human factor should always be considered as the starting point on making the decision on how technology, and more specifically the Internet, could be employed to improve teaching and research efforts. Faculty should be given the chance to participate in decision making with regard to the appropriate use of technology in their specific academic discipline.

6. Limitations

An inherent limitation of the study was the self-selection of the four local universities. There is no assumption that the selected sample is representative of all faculty members around the country. Moreover, findings of this study should be subject to cautions generally exercised with subjective reporting by respondents. Internet usage patterns were perceived by faculty respondents, not measured by objective tests. In addition, it is probably inevitable that most respondents were positive about the benefits of the Internet; otherwise, they would not have adopted it in their academic activities or even considered responding to the survey. Nevertheless, findings of this study remain significant in providing an understanding of faculty perceptions and needs for successful utilization of Internet technologies in the context of higher education.

7. Conclusion

This investigation was successful in obtaining insights on faculty member's perceptions and attitudes about integrating Internet technologies in institutions of higher education in Saudi Arabia. Factors influencing efficient usage of Internet technologies were found to be academic discipline, age, and computer skills and usage level. Increased understanding of the factors affecting usage can aid higher education policy-makers involved in the provision of educational technologies, especially those who need to overcome a divide between early adopters of technology and mainstream faculty who are yet to utilize technology in their teaching and research. A clearer perception of the differences between these two groups is needed in order to achieve broader adoption of new technologies. Internet usage patterns of faculty and barriers that inhibit efficient utilization in academic activities can aid in identifying the most effective methods of integrating the Internet in teaching and research and motivating faculty to use it. Moreover, faculty should be made aware of the potential of various Internet technologies

for enhancing the teaching and learning process. Clarification of the incentives and elimination of obstacles to fully integrate the new technology is needed. On a final note, this study demonstrated significant changes in higher education as Internet adoption increases; efforts of early adopters (both faculty and administrators) involved in promoting efforts to raise awareness have facilitated and encouraged widespread acceptance of the Internet across college campuses. This study will hopefully motivate educators to expand their own knowledge and proficiency in Internet technologies and lead to more efficient utilization.

Acknowledgments

This work was supported by grant 60-27-100 from King Abdulaziz City for Science and Technology. We wish to thank the groups of students from the participating institutions that assisted us in survey distribution and collection in both female and male campuses.

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