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An Investigation into the contribution of Web Technology to University Academics' increased pursuit of Research

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ABSTRACT
This study set out to assess how web technologies can encourage university instructors to pursue research, look into how teachers use web technologies for research, and pinpoint the issues facing higher education when it comes to employing web technologies for research. The study's scope was restricted to social science faculty in Pakistan's Punjab Province universities. Two groups of people were included in the study: academic leaders such as department heads and deans, as well as university instructors. Using a random selection technique, 200 university teachers and 25 academic heads made up the study's subjects. For the purpose of gathering data, two 5-point Likert scale questionnaires were created. Pilot testing was used to validate the study instruments.

Keywords: *Web Technology, Research Pursuance, University Academia, Academic Heads, Research Skills***.**

I. INTRODUCTION

Research and development are considered to be the fundamental activities of a university and ladders to socioeconomic development of a country. The dawn of the 21 century has witnessed technological innovations and inventions based on the results of research conducted in universities & research institutes. Universities now have become hubs of research-based knowledge. Research and development have brought about world-wide technological revolution. The revolution of information & communication technologies and knowledge explosion are confirmatory evidence of research. Research is a dynamic activity and it is being conducted for advancement & innovation in the nature and capabilities of technologies particularly information & communication technologies for dissemination of information and knowledge. It seems obligatory for developing countries to take research initiatives by involving university academia to move with the shifting world. Pakistan is a developing country where participation rate in tertiary education is estimated to be up to 5% only (Government of Pakistan, 2009). Universities like other institutions are recognized by their professionals and academic & research output/productivity. Academia is considered to be important in smooth functioning of university and raising its status. In Pakistan, during the first decade of 21 century some transformational steps were taken by shifting the focus of universities more on research for development. Among others, training of academia, use of Information and Communication Technologies (ICTs), research incentives to university teachers are important steps worth mentioning. Currently, university teachers are working as intellectuals of society and academic leaders of the 21 century generation. Apparently, the overall situation of universities in Pakistan reflects that academia is keen on conducting research in their respective disciplines for knowledge creation and its dissemination. Seemingly they are working to make Pakistan a knowledge society. A teacher particularly, a university teacher is considered to be the intellectual and reformer of the society. S/he is desired to enlighten the society with the light of intellect and the blend of vision with wisdom. Therefore, university academia need to acquire certain professional and research skills and/ or competencies for meeting the above goals and social desires. These skills alongside others consist of pedagogical -classroom instruction and academic management, research skills -conducting, supervising and evaluating research studies and competency in using ICTs properly. Therefore, possessing such skills would be reflecting research pursuance among university academia.

II. Review of Related Literature

Apparently, the research pursuance among university academia allows them to contribute to knowledge creation. However, there are various factors which contribute towards its development and augmentation among university academia. The more prevalent factors consist of evaluation of performance, incentives & promotion, recognition of productivity, working environment, knowledge explosion and emerging technologies. Such factors persuade them develop research attitude to enhance their productivity in competitive environment. All these factors are important to affect more or less the research attitude but emerging technologies have a greater impact on developing and promoting research pursuance among varsity academia. Emerging technologies include a wider range of technologies like virtual reality, robotics, videoconferencing, social media and other internet-based technologies. Along with other technologies, the usage of web technologies has enhanced research output and

academic performance (Hussain, 2005) of university academia. Web technologies have promoted digital literacy, social networking & interaction, access to latest research and information for enhancing research pursuit and academic performance of university teachers. Use of web technologies (Bhattacharya & Sharma, 2007) enables academicians to share the results of their research, exchange research experiences, initiatives and/or projects with their contemporaries by developing collaboration and linkages. Web technology is a modern technology and allows university academia learn to adopt innovative techniques of research as practiced by the international community. It is a computer-related technology and the University of Sheffield (1996) acknowledged its significant effects on quality of education and training. Similarly, Chickering & Ehrmann (1997) described that web-based technologies have promoted access to higher education by enhancing its quality, accessibility and cost effectiveness in terms of research and teaching in universities. Web technologies include social networking websites and tools, e-mail and video-conferencing and seemingly are used to promote linkages and facilitate communication among university academia. These technologies appear to enable them conduct joint research studies and solve problems mutually by creating face-to-face like situations. Various researchers, educational practitioners and educationists (Sanyal, 2001; Mooij, 2007; Cross and Adam, 2007; UNESCO, 2002; Bhattacharya and Sharma, 2007; Plomp, Pelgrum, & Law, 2007; Hussain, 2005; Chandra and Patkar, 2007) have put forward sufficient reasons to support the use of Internet and web technologies in research and other academic activities at universities. Web technologies are used to eliminating the time and space barriers, promoting and facilitating synchronous and asynchronous communication and interaction by developing virtual community of university academia. The academia learns modern research techniques and conduct studies accordingly. Web technologies have promoted competitive environments and facilitated active involvement of academia in activities such as writing research papers for publishing in journals & presenting in conferences, sharing their academic experiences & research findings and working together for better future. It would develop a mind set to solve problems through research and development (Hussain, 2011) cooperatively as well as collaboratively. Internet and World Wide Web (WWW) are basic technologies used to share research experiences & findings and educational practices. Different tools like eport folios, cyber infrastructures, digital libraries and online learning object repositories are used for the purpose (Chandra and Patkar, 2007). However, motivation plays a crucial role in using web technologies and Plomp, et.al (2007) affirmed that these technologies create and sustain motivation among academia to enhance their performance. Similarly, Bottino (2003) and Sharma (2003) assert that use of web technologies can enhance pedagogical and research performance and management ski ls of users [particularly, university academia]. According to Yuen, Law, & Wong (2003) it facilitates synchronous and asynchronous communication, reflective practice and the ability to retrieve and analyse information. This was supported by Casal (2007) who articulated that it provided platform of information sharing. Likewise, Mooij (2007) indicated that it helped in promoting greater reliability, validity and efficiency of data collection for analysis, evaluation and interpretation at any educational level by getting help of the professionals. Currently, university academia uses web technologies for instructional purposes, sharing of educational practices and developing social academic networks. Academicians and researchers use them for accessing information through social networks, online academic journals, digital libraries and databases. Their social networking potential and synchronous interaction holds greater promise for the future of higher education (Mason, 2000). University academia is using them widely to persuading their research attitude.

III. Objectives of the Study

The purpose of this study was to evaluate the role of web technologies in promoting research attitude among university teachers, examine the use of web technologies by university teachers in conducting research and identify the problems of university academia in using web technologies for research purpose.

IV. Research Methodology

The study was conducted with the main focus of evaluating the role of web technologies in enhancing research pursuance among university academia in Pakistan. This study was descriptive in nature and therefore, survey approach of data collection was adopted by the researchers. It was delimited to academia of social sciences of the universities located in Punjab Province of Pakistan. The study consisted of two types of population: university teachers and their academic heads -deans and chairpersons/or heads of departments. Two research tools -questionnaires on five points rating (likert) scales were developed to elicit the opinions of the respective respondents after review of the related literature. The research tools were developed according to the scope and objectives of the study. The tools were validated through their pilot testing on 10 university teachers and 05 academic heads. The finalized research tools were administered on the respective subjects. Random sampling technique was used and research tools were administered on 200 academicians/ university teachers and 25 academic heads. The response rate was 75% and 72% respectively for teachers and their academic heads (as 150 and 18 responses complete in all respects were received back from teachers and their academic heads respectively). The data were coded and analysed through MS-Excel in terms of percentage. The scale values assigned were highest i.e. (05) Strongly Agreed (SA) to lowest (01) Strongly Disagreed (SDA). Data Analysis

and Results of the Study and Discussion The data collected through the questionnaires of the university academia and academic heads were analysed in terms of percentage by using MS-Excel programme. The results of the data analysis of both of the categories are given below

Results of the Data Analysis of the Questionnaire for University Academia The results drawn from the data analysis of the questionnaire for the university teachers and discussion on them are given below Apparently, web technology has become an effective tool to be used in education & training, research, administration and services sector. The data given in the Table 1 revealed that web technology facilitates academicians in having access to academic resources. They (81%) were of the opinion that it played a crucial role in promoting their access to academic materials & information and that's why it was extensively used by their community. The academia in the higher education institutions needed different kind of information according to their academic need. Therefore, they classified its role according to nature of information they accessed through it. They (74%) affirmed its role in getting information about research journals in different disciplines and retrieving their contents and/ or research papers to use for academic purpose. Similarly, it made it possible to launching repositories of academic work including theses and dissertations and 78.6% of the academia apprised the role of web technology in accessing to such resources which otherwise were very difficult to have. Conferences and seminars are considered part and parcel for academic excellence of university teachers. These events provide a platform to the researchers and educationists for sharing their experiences and results of researches. Accordingly, 88.7% of the academicians acknowledged the role of web technology in disseminating information about conferences & seminars to present their research papers, experiences and views.

Academic information	74(49.3)	48(32)	3(2)	11 (7.3)	14 (9.3)
Research Journals	68 (45.3)	43 (28.7)	6 (4)	12 (8)	21 (14)
Repositories	71(47.3)	47 (31.3)	4 (2.7)	9 (6)	19 (12.7)
Conferences	82 (54.7)	51 (34)	2 (1.3)	7 (4.7)	8 (5.3)
Academic Websites	78 (52)	54 (36)	3 (2)	9 (6)	6 (4)
Professional Training Website	77 (51.3)	59 (39.3)	4 (2.7)	7 (4.7)	3 (2)
Databases	77 (51.3)	59 (39.3)	3 (2)	6 (4)	5 (3.3)
Publishing Houses/ Companies	59 (39.3)	76 (50.7)	3 (2)	6 (4)	6 (4)
Research Organizations	47 (31.3)	83 (55.3)	4 (2.7)	7 (4.7)	9 (6)
Average	70 (46.9)	58 (38.5)	4 (2.4)	4 (5.5)	10 (6.7)

Continuous professional training is regarded as one of the basic components of professional life and university teachers are not exempted rather they need specialized orientation on research and pedagogy. For the purpose they needed information about such training events and logged on to different web sites for its retrieval. They (88% and 90.6%) visited different academic and professional training websites respectively; and affirmed the role of the technology in providing information about opportunities of professional development at national and transnational level. Similarly, 90.6% were of the opinion that this technology helped them in accessing to the various databases for getting latest researches like research papers/articles, theses and dissertations. They (86.6% and (90%) also confirmed the role of web technology in facilitating them develop and maintain academic linkage and collaboration with research organizations and publishing houses/ companies respectively for sharing results of the researches by getting published their papers and/ or articles. In overall (85.4% of) the university academia commended the role of web technology in promoting open access to educational resources and developing urge for conducting research to meeting the prime aim of the university in 21 centuries. Universities have been recognized as hubs of research and centre of excellence the world over. In 21 centuries, the universities are expected to (and they are) generating new knowledge through research for which academia needs to have open access to latest researches by using appropriate technology. Web technology is one which is playing such a key role. According to the Table 2, the data of 84% of the university academia affirmed this role of web technology by asserting that they had open access to the educational resources on their own ease round the clock as and when they desired and/ or needed these. For knowledge generation a researcher has to identify and use different types of materials for augmenting their research for knowledge building. Nonetheless, 88.7% of the university teachers were of the view that the use of web technology had lessened their travelling for research purpose in locating the materials. They (86.7%) valued the role of search engines as they (86%) used these tools for retrieving educational materials from different websites. In overall the data indicated that 86.3% of the university academia acknowledged the time saving role of web technology as they used it twenty hours a day and seven days a week at places where live and work.

	SA	A	UNC	DA	SDA
Time Saving					
Anytime time (7/24)	49 (32.7)	77 (51.3)	6 (4)	8 (5.3)	10 (6.7)
Maximum downloading	56 (37.3)	73 (48.7)	2 (1.3)	8 (5.3)	11 (7.3)
Limits travelling	57 (38)	76 (50.7)	2 (1.3)	5 (3.3)	10 (6.7)
Help of Search Engines	61 (40.7)	69 (46)	4 (2.7)	4 (2.7)	12 (8)
Average	55 (37.17)	74 (49.17)	4 (2.3)	6 (4.1)	11 (7.1)

Table 2. Opinion of University Academia About Time Saving Role of Web Technology

Research always demands cost in terms of time and material resources; but university teachers have to complete a number of academic activities for their professional pursuit. They need cost effective resources of diversified nature for substantiating knowledge and its deliverance at right time to the right people. They also need some technological facilitation to maintain quality in research and pedagogy and web technology emerges as one of the technological resources to fulfill such academic demands. Keeping in view the scenario, the university academia (overall 79.7%) affirmed the cost-effective role of web technology in accessing academic resources and using them to conduct research for development Table 3. They (80.7%, 74% and 84.6%) acclaimed that it saved their travel cost, minimized photocopying expenditures and reduced purchasing of books respectively.

SA		A	UNC	DA	SDA
Cost Effectiveness Saves travel cost	52 (34.7)	69 (46)	6 (4)	11(7.3)	12 (8)
Minimizes photocopying cost	62 (41.3)	49 (32.7)	7 (4.7)	14 (9.3)	18 (12)
Reduces purchasing of books	68 (45.3)	59 (39.3)	2 (1.3)	9 (6)	12 (8)

Table 3. Opinion of University Academia about Cost Effective Role of Web Technology

Accurate and authentic information is one of the basic substances for genuineness of knowledge. A researcher has to cross verify different kinds of information through established methods and procedures. However, the present time is an information era and there is a bombardment of information which is multiplying day by day. University academia is desired to have latest information for which they need some reliable sources and web technology works as one of these. However, they (79.3% and 77.3%) were of the opinion that web technology helps them in getting accurate and authentic information respectively relating with their area of research and pedagogy. Likewise, they (80%) commended its role in providing up-to-date and right information at the right time for right deductions and/ or inductions in research. Generally speaking they (78.8%) affirmed precision, reliability and newness of the data retrieved through the web technology (Table 4).

Accurate	56 (37.3)	63 (42)	6 (4)	11 (7.3)	14 (9.3)
Authentic	47 (31.3)	69 (46)	4 (2.7)	13 (8.7)	17 (11.3)
Up to date	66 (44)	54 (36)	5 (3.3)	6 (4)	19 (12.7)
Average	56 (37.5)	62 (41.3)	5 (3.3)	10 (6.6)	17 (11.2)

Table 4. Opinion of University Academia about Nature of Information and Data Accessed through Web Technology

Results of the Data Analysis of the Questionnaire for Academic Heads

This section describes the results of the data analysis of the questionnaire for academic heads and their interpretation. It is observed that the web technology has been infused almost in all fields of human life including education & training, research, administration and services sector. The data given in Table 5 consisting on opinions of the academic heads of teacher education institutions revealed the use of web technology supports research & academic activities of university teachers. They (94.4%) affirmed that university teachers use web technology for getting access to information of all kinds -textual, pictorials and/or videos. They affirmed that the academia searched out different information according to their academic needs.

Statement	SA	A	UNC	DA	SDA
Access to Academic Resources					
Information of all kinds	08 (44.4)	9 (50)	00	00	00
Research Journals	7 (38.9)	8 (44.4)	1 (5.6)	1 (5.6)	1 (5.6)
Repositories	10 (55.6)	8 (44.4)	00	00	00
Conferences	8 (44.4)	9 (50)	1 (5.6)	00	00
Academic Websites	6 (33.3)	11 (61.1)	1 (5.6)	00	00
Professional Training Website	11 (61.1)	5 (27.8)	1 (5.6)	1 (5.6)	00
Databases	13(72.2)	4 (22.2)	1 (5.6)	00	00
Publishing Houses/ Companies	11 (61.1)	7 (38.9)	00	00	00
Research Organizations	10 (55.6)	6 (33.3)	1 (5.6)	1 (5.6)	00
Average	9.3 (52)	7.4 (41)	1 (5.6)	.3 (1.8)	00

Table 5. Opinion of Academic Heads about the Role of Web Technology in Promoting Access to Academic Resources

Knowledge creation and its dissemination is not a simple task rather is a complex phenomenon which depends on research, infrastructure and the experience of researcher. The more the researcher is experienced and competent the more reliable knowledge in produced through research. Therefore, sharing of experiences and practices is necessary for university teachers. The data of the Table 8 supported this description as academic heads (77.7%, 100% and 88.9%) acknowledged the role of web technology in helping their academia sharing their research and instructional experiences and best practices respectively of the both. They (100% and 88.9%) also asserted that besides it set a stage for the sage of sharing findings of researches and information respectively among community of the educationists, academicians and researchers creating a professional passion among them. However, the overall data revealed that 91% of the academic heads commended the role of web technology in enabling university academia sharing their research, pedagogical practices and findings of their researches throughout the world.

V. Findings of the Study

Findings from the results, their interpretations and discussion are presented below ·University academia appreciated the role and use of web technologies in conducting research. They also revealed some of the problems which they faced in using web technologies. According to the data analysis university academia (85%) were of the view that the use of web technologies have promoted research attitude among them by providing access to academic resources such as databases, research journals and research repositories, information and packages of professional trainings, instructional materials developed by research organizations, and information about conferences & other academic websites. The use of web technologies allowed them to become aware of the publishing institutions and the process of developing and publishing a quality research paper in well-known abstracted journals and/ or books. They have access to accurate, up to date and authentic information (79%) by using web technologies. ·Web technologies play a crucial role in promoting opportunities of sharing academic experiences and exchanging findings of research including latest instructional and research models needed to be disseminated for the good of academic community (83%) throughout the world. They were able to use the web technologies round the clock (7/24) for accessing research and other relevant instructional materials of their interest (86%) and field/area. Similarly, they (86%) affirmed the use of the technologies -as it saved their travel, cost on purchasing of books and photocopying expenses. However, they reported facing some problems (80%) including electricity failure, low bandwidth of internet and software viruses.

The academic heads also affirmed that web technologies play an important role for academic excellence. They provide platform to share findings of their research and pedagogical experiences in their virtual academic community. They promote a research oriented mind set. They share information on innovations and advancements relating to their respective areas/ fields; exchanging best instructional practices for the benefit of researchers and educational practitioners (91%). However, they (all 100% of the academic heads) indicate some problems of university academia including intermittent electricity failure and disconnection of internet, its low bandwidth and virus activation.

VI. Conclusion

The study revealed that web technology plays a significant role in the promotion open access to databases and other educational resources; and developing urge among university academia for conducting research to meeting st the prime aim of a university in 21 century. This technology facilitates them in getting information about opportunities for their professional development, conferences & seminars, publishing

research papers, and developing academic linkages & collaborations with national as well as transnational organizations; which otherwise were difficult for them. The use of web technology enabled university academia to exchange their research and instructional experiences for enhancing their academic performance and research productivity. However, the university teachers reported some problems in using web technologies. Along with others, they reported low bandwidth of internet and intermittent electricity breakdown and/ or failure to be the intensive problems causing academic stress and aggression among them.

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