

Socio-Demographic Effects on Digital Libraries Preference and Use: A Case Study at Higher Learning Institutions

A. K. Razilan, A. B. Amzari, B. Ap-azli, A. R. Safawi

Abstract—Explosion in information management and information system technology has brought dramatic changes in learning and library system environments. The use of academic digital libraries does witness the spectacular impact on academic societies' way of performing their study in Malaysia, a country with a multi-racial people. This paper highlights a research on examining the socio-demographic differences on the preference and use of academic digital libraries as compared to physical libraries at higher learning institutions. Findings indicate that preference towards digital libraries differed between ethnicity, gender and university. However none of the socio-demographic factors is statistically significant in terms of the use of digital libraries.

Keywords—Socio-demographic, academic digital library, preference, use.

I. INTRODUCTION

THE practice of the e-learning, digitization of library's material and the use of modern technologies at learning centers and higher learning institutions are prominent. Explosion in information management (IM) and information system (IS) technology has brought dramatic changes in learning and library system environments. Through the passage from physical library to digital library era, the use of academic digital library systems does witness the spectacular impact on academic societies' way of performing their study/research. Malaysia is a multi-racial and multi-cultural country where different races have their own traditions and customs which gives Malaysia a colorful heritage.

Despite of this fact, this paper highlights an exploratory research on examining the socio-demographic differences on the preference and intention of using academic digital libraries as compared to physical libraries among multi-racial undergraduate students at higher learning institutions. In this study, the term for academic digital libraries represents the online library resources, consisting of e-journals, e-book and e-media that maintained by the institutions' libraries. Due to the advanced of the information and communication technology (ICT), traditional libraries adopt the technology to migrate from physical to digital. According to [2], the

transition has made the library to be inevitably digital where in his study the Thailand academic libraries started preparing for the in-house digital collections like theses, archives and research papers serve for this purpose. In addition, the digital library concept has introduced digital resources such as e-journals, e-books and online databases. Academic libraries in Malaysia are also heading in the same direction. In recent years, besides maintaining the physical libraries, the academic libraries are also equipped with such digital resources.

Despite the on-going issues such as on the intellectual copyright and network connection, the implementation of academic digital libraries is inevitable at higher learning institutions in Malaysia. Apart from the varsities' in-house digital collections and resources, the digital repositories are also included part of the digital libraries. Maintaining digital repositories (for academic libraries) is analogous to maintaining physical library materials and is often a necessary aspect of building local digital [4]. He also emphasized that "even before the Web was introduced, academic libraries had started to create digital libraries of trustworthy information". Owing to the Internet and Web technologies that has brought a myriad of advances to academic libraries, [4] once said; "The reason that the (physical academic) library is losing its supremacy in carrying out this fundamental role is due, of course, to the impact of digital technology". Using his premises, as quoted, the authors emphasize the use of the term digital libraries to represent the academic online library resources at higher learning institutions in Malaysia.

II. PROBLEM STATEMENT

Many existing studies focusing on information-seeking behavior however very little research investigating socio-demographic factors such as age, ethnicity and gender, in the preference and use of digital libraries as compared to physical libraries at higher learning institutions. Such socio-demographic factors play important roles to provide knowledge of socio-demographics gap that could lead to differences in digital libraries acceptance.

A. Research Hypotheses

This study aims at investigating the socio-demographic differences in the preferences towards using digital libraries and usage of digital libraries for academic reason. The null hypotheses generated are as follows:

1. H_0 : There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on

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preference towards *visiting* digital libraries as opposed to physical libraries.

2. H_0 : There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on *using* digital libraries.
3. H_0 : There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on *being frequent users* of digital libraries.
4. H_0 : There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on using digital libraries *more* than physical libraries.

B. Rationale of Study

This study proposed to investigate the relationship of students' socio-demographics in digital libraries preference and use at higher learning institutions. The age, ethnic, gender and which universities they are engaging with are likely to affect their preference and use of the system to accommodate their study needs. Any demographics barrier can be identified and monitored as to allow students to take advantage of the current digital technologies in their learning activities at the universities.

III. RELATED WORKS

According to [5], the *use* of technology has an effect on all aspects of teaching and learning. Hence, as stressed by [12], it is important to understand what technology is and how to use it and, most importantly, is comfortable using it. The success of a system relies on the acceptance and use by its targeted users. Reference [11] claimed that the continuity of digital libraries usage should be taken using user-based measure, particularly to evaluate such system. *Usage* defined in the context of IS is the *use* of a digital libraries [7]. Moreover, digital libraries usage and usability aspects are seen as key proximate determinants that drive the success of digital libraries [10].

Findings from [15] indicated that even though awareness of and experience with repositories (online library resources) is low, respondents are willing to investigate further and recognize a variety of benefits of a centralized system. Reference [1] pointed out that scholars, students, teachers and researchers actively seek current information through the various media available in the libraries. They emphasized that if users were aware of one helpful resource, it would usually lead to greater use of that resource.

A case study conducted by [13] in Italy on users perceptions of digital library services indicate that users have different perceptions with regard to digital libraries and that they tend to use the services of more than one cultural institution. The study also revealed that users often do not know how to use the libraries and are unaware of all of the services offered. Moreover, students' ability to find and retrieve information effectively is a transferable skill useful for their future life as well as enabling the positive and successful use of the electronic resources when they are at school [14].

Reference [9] established that there were socio-demographic differences in access and use of Information and

Communication Technology (ICT) facilities in Nigeria. His study revealed the existence of digital gap of gender, [3] discovered that there exists gender gap in the Internet (on intensive Web use) among postgraduate students at Fuzhou University, Fujian, People's Republic of China.

In another study, demographic influence was found to be significant with concerned to inclusion of digital library on e-learning in higher learning institution in Malaysia [6]. The research revealed that demographic factors such as level of education and gender are the major factors in understanding and appreciating e-learning. From a study conducted by [8], age was found to be correlated with computers and use of electronic resources.

IV. METHODS

The study focuses on the usage of end users towards using academic digital libraries used throughout their learning process at the university. In order to capture the essence of the study, a survey design approach was adopted. It was done at four Research Universities (RUs) in Malaysia, namely University of Malaya (UM), National University of Malaysia (UKM), Putra University of Malaysia (UPM) and Science University of Malaysia (USM).

In achieving the objective of the study, self-administered structured questionnaires were distributed to 600 to the four universities. The item instruments were composed by majority of close-ended and a five-point scale items questions. The Likert scale items are ranging from "1=strongly disagree" to "5=strongly agree". SPSS was used to carry out statistical analyses of the study data.

The study focuses on the preference and use of digital libraries with respects to the following variables:

1. *Preference*: Prefer to visit digital libraries as compared to physical libraries.
2. *Use*:
 - Intention of using digital libraries for academic purposes.
 - Being frequent users of digital libraries.
 - Use digital libraries more than physical libraries.

The socio-demographic variables of the study are as follows:

1. Ethnic: Malay, Chinese, Indian and Others (e.g. Kadazan, Iban, Dusun and etc.)
2. Age: ≤ 24 years, 25-29, 30-34, 35-39, ≥ 40 years.
3. Gender: Male and Female.
4. University: UKM, UM, UPM and USM.

V. RESULTS

A. Respondents Profiles

Sample of study consists of 60% female and 40% male students with rate of return of 86.2%. Fig. 1 shows the respondents' ethnic distribution where the dominant ethnic comes from Malay (62%) and Chinese (28%) and Indian (2%). In terms of age distribution, more than 90% are in the group of ≤ 24 years. This is in line with the common age of first degree program throughout Malaysia.

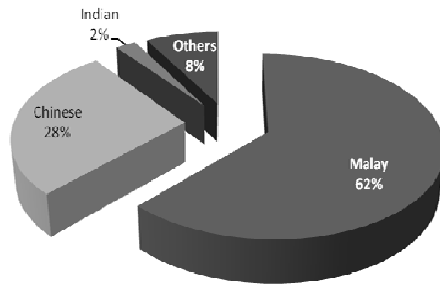


Fig. 1 Ethnic distributions

Most of the universities provide wireless network surrounds their faculty and hostel areas. In Fig. 2, finding from this study reveals that the majority of the respondents got access to the internet at hostel (40%), followed by home (27%) and faculty (20%). Internet access from home might due to students who are staying near the university areas and who are living with their parents.

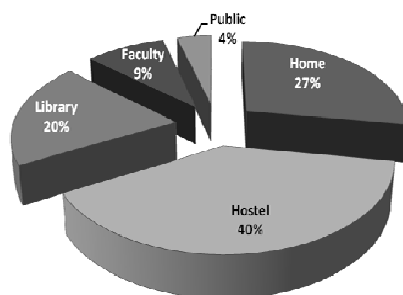


Fig. 2 Location of access to digital libraries

The highest portions of respondents were from the faculty of Social Science and Humanities (16.3%), followed by Computer Science & IT (15.0%) and Business/Finance/Banking (11.1%). Further breakdown is as shown in Table I.

A. Preferences

The term preference is referring to the preference towards visiting digital libraries as opposed to physical libraries. The results are based from question: "I prefer to visit university's digital library than physical library resources". Table II displays the ANOVA test and t-test table of race, age, gender and university versus preference towards digital libraries.

From ANOVA and *t* test results shown in Table II, they clearly indicate that students' preference towards using digital libraries as compared to physical libraries are differed by the factors of race, age and university. However, only the age factor is not statistically significant at 5% level. This could be due to reason that the undergraduate students' ages are majority below 25 years old.

TABLE I

DISCIPLINE OF EDUCATION/FACULTY	
Disciplines of Education	Total
Architecture	11
Agriculture	23
Business/Finance/Banking	57
Computer Science & IT	30
Dentistry	4
Education	55
Economic	26
Engineering	42
Food science	3
Health science	5
Islamic studies	1
Linguistic	24
Law	2
Library & Information Science	1
Medicine/Pharmacy	9
Science	77
Science & Technology	55
Social Science & Humanities	84
Veterinary Science	2
Others	3
Missing	3
Total	517

TABLE II

ANOVA TEST AND T-TEST OF RACE, AGE, GENDER AND UNIVERSITY VERSUS DIGITAL LIBRARIES VISIT PREFERENCE

	ANOVA test	t-test
Ethnic	$F_{3,513} = 3.084$ $p = 0.027^*$	-
Age	$F_{4,512} = 1.710$ $p = 0.146$	-
Gender	-	$t_{515} = -0.267$ $p = 0.008^*$
University	$F_{3,513} = 3.778$ $p = 0.011^*$	-

Note: * $p < 0.05$

As a whole, gender, ethnic and university factors are significantly different in preferences, at 5% level of significance. In order to identify which groups are differed from each other, Tukey HSD post-hoc tests are then performed. This test is only applicable for groups ≥ 3 , hence gender is excluded.

- Ethnic:** Only Malay students showed higher preference towards using digital libraries as compared to *Others* ethnic groups (mean difference = +0.397, $p = 0.038$). However, there is no significant different between other ethnic groups at 5% significance level.
- University:** Students studying at the UM showed a higher preference in using digital library as compared to the rests of the universities (mean difference = +0.367, $p = 0.007$). Nevertheless, there is no significant different of preferences among other universities.

B. Use

Use of universities' digital libraries refers to the use of the system throughout students' learning process at the university for academic purposes. The results are taken from question of "I am aware and use university's digital library for my study

activities". The following ANOVA test results are shown in Table III.

TABLE III
ANOVA TEST AND T-TEST OF RACE, AGE, GENDER AND UNIVERSITY VERSUS DIGITAL LIBRARIES USAGE

	ANOVA test	t-test
Ethnic	$F_{3,513} = 0.234$ $p = 0.873$	-
Age	$F_{4,512} = 0.010$ $p = 0.999$	-
Gender	-	$t_{515} = -0.723$ $p = 0.396$
University	$F_{3,513} = 0.927$ $p = 0.427$	-

Surprisingly, none of the socio-demographic factors related to the usage of digital libraries in the four universities. All of the ANOVA test and t-test show non-significant results at 5% level.

C. Frequent Use

The definition of frequent user of digital libraries is not measured in number of access per week or per months. It is rather based from Likert scale items answering the question of: "I am a frequent user of university's digital library". Table IV of ANOVA test results show all of the socio-demographic factors chosen are not significant at 5% level. It indicates that being frequent digital libraries users is not related to students' race, gender, age and university.

TABLE IV
ANOVA TEST AND T-TEST OF RACE, AGE, GENDER AND UNIVERSITY VERSUS BEING FREQUENT DIGITAL LIBRARIES USERS

	ANOVA test	t-test
Ethnic	$F_{3,513} = 0.820$ $p = 0.483$	-
Age	$F_{4,512} = 0.009$ $p = 0.999$	-
Gender	-	$t_{515} = -0.852$ $p = 0.395$
University	$F_{3,513} = 0.926$ $p = 0.428$	-

D. Digital Libraries Use (as compared to physical libraries)

We further investigate the use of academic digital libraries as compared to university's physical libraries. The respective variable responding to question of "I use university's digital library more than physical library resources".

Results showed that all of the selected socio-demographic factors are not statistically significant at 5% level (refer to Table V). This finding indicates the higher usage of digital libraries as compared to physical libraries are not differed among ethnic types, age of students, their gender and as well as which university they are studying.

TABLE V
ANOVA TEST AND T-TEST OF RACE, AGE, GENDER AND UNIVERSITY VERSUS DIGITAL LIBRARIES USAGE MORE THAN PHYSICAL LIBRARIES

	ANOVA test	t-test
Ethnic	$F_{3,513} = 0.239$ $p = 0.869$	-
Age	$F_{4,512} = 0.005$ $p = 0.999$	-
Gender	-	$t_{515} = -0.854$ $p = 0.394$
University	$F_{3,513} = 1.117$ $p = 0.342$	-

VI. DISCUSSION

Findings from this study show the results based on the hypotheses:

1. There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on preference towards visiting digital libraries as opposed to physical libraries.

The results showed that preference towards visiting digital libraries is differed between groups of race, gender and university. Moreover, the *Malay* ethnic students are likely to have more preference as compared to *Others* ethnic (minority ethnics in). However, preference of using digital libraries is not differed between groups of students' age.

2. There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on using digital libraries.

Findings of the study lead to the result of non-statistically significant difference of the socio-demographic factors versus the digital library usage. This is an indication of students of differing age, ethnicity, gender and university did not differ with respect to use of digital libraries.

3. There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on being frequent users of digital libraries.

Similar results are obtained where none of the socio-demographics statistically significant difference in terms of being frequent users of digital libraries. This finding demonstrates that difference in socio-demographic factors did not differ with respect to being frequent user of their university's academic digital libraries.

4. There is no significant influence of socio-demographic factors (age, ethnic, gender or university) on using digital libraries more than physical libraries.

The results show that socio-demographic factors did not have significant influence in terms of using digital libraries more than physical libraries.

VII. CONCLUSION

A case study on the digital libraries preference and use by investigating socio-demographics differences among multi-racial students at higher learning institutions in Malaysia is presented. This study contributes to a field of knowledge on the digital libraries preference and intention of use as opposed to traditional libraries.

Socio-demographic factors of ethnic, age, gender and university are examined with respect to undergraduates'

preference on digital libraries. The study provides ample evidence that ethnic, gender and university differences exist but not for age factor.

We also conclude that use, being frequent user and use digital libraries more than physical libraries did not differ between the groups defined in the study. The study provides the evidence of no major gap in the use of digital libraries in terms of socio-demographic factors among multi-racial students at higher learning institutions.

Based on the study findings, we need a further research on considering postgraduate students in the study sample with age group distribution that are not skewed only to below 24 years old. In addition, other socio-demographic factors such as family income, marital status and location of residence could pose interesting findings on their effects on the preference and use of academic digital libraries at higher learning institutions.

REFERENCES

- [1] A. Asemi, and N. Riyahiniya, "Awareness and use of digital resources in the libraries of Isfahan University of Medical Sciences, Iran", *The Electronic Library*, vol. 25, no. 3, 2007, pp. 316-327.
- [2] S. Butdisuwan, "Digital Library: A Transition for Academic Libraries in Thailand", *American Library Association Annual Conference*, June 23-29, Chicago, IL, USA, 2005.
- [3] B. Bimber, "Measuring the gender gap on the Internet", *Social Science Quarterly*, vol. 81, no. 3, 2000, pp. 868-876.
- [4] J.D. Campbell, "Changing a Cultural Icon: The academic library as a virtual destination", *EDUCAUSE Review*, Jan/Feb, vol. 41, no. 1, 2006, pp. 16-31.
- [5] V.L. Cohen, "Learning Styles in a Ninth-Grade High school Population", *Journal of research on Computing in Education*, vol. 33, no. 4, 2011, pp. 355.
- [6] M.A. Islam, N.A. Abdul Rahim, T.C. Liang and H. Momtaz, "Effect of demographic factors on e-learning effectiveness in a higher learning Institution in Malaysia", *International Education Studies*, vol. 4, no. 1, February 2011, pp. 112-121.
- [7] A. Koohang, "Development and Validation of an Instrument for Assessing Users' Views about the Usability of Digital Libraries", *Issues in Informing Science and Information Technology Education*, vol. 1, 2004, pp. 55-63.
- [8] O.C. Okiki and S.M. Asiru, "Use of Electronic Information Sources by Postgraduate Students in Nigeria: Influencing Factors", *Library Philosophy and Practice*, 2011, pp. 4-6.
- [9] W.E. Olatokun, "Analysing Socio-Demographic Differences in Access and Use of ICTs in Nigeria Using the Capability Approach", *Issues in Informing Science and Information Technology*, vol. 6, 2009, pp. 479-496.
- [10] A.K. Razilan, W.D. Wan Ab. Kadir, A.S. Fatimah and S. Diljit, "Academic Digital Library's Evaluation Criteria: User-Centered Approach", In *Proceedings of the World Academy of Science, Engineering and Technology (WASET)*, June 24-26, Paris, 2009a, pp. 172-177.
- [11] A.K. Razilan, W.D. Wan Ab. Kadir, A.S. Fatimah and S. Diljit, "A user-based measure in evaluating academic digital library", *International Conference on Academic Libraries (ICAL-2009)*, October 5-8, University of Delhi (North Campus), Delhi, 2009b.
- [12] L.L. Smolin and K.A. Lawless, "Becoming literate in the technology age: New responsibilities and tools for teachers", *The Reading Teacher*, vol. 56, no. 6, 2003, pp. 570-577.
- [13] A.M. Tamarro, "User perceptions of digital libraries: a case study in Italy", *Performance Measurement and Metrics*, vol. 9, no. 2, 2008, pp. 130-137.
- [14] A. Tella, A. Tella, C.O. Ayeni and R.O. Omoba, "Self-Efficacy and Use of Electronic Information as Predictors of Academic Performance", *Electronic Journal of Academic and Special Librarianship*, vol. 8, no.2, 2007, http://southernlibrarianship.icaap.org/content/v08n02/tella_a01.html.
- [15] University of Rhode Island, "Survey of Interest in Creating a Repository of Digital Information at the University of Rhode Island", Available at <http://www.uri.edu/ir/>, 2006.

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