Assessing Malaysian Students Readiness to Become Authors of Learning Materials in a Collaborative Digital Library of School Projects

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This study investigates students ICT readiness, usage of online resources and information seeking behaviour of secondary school students with the specific goal of applying the results to the design of a collaborative digital library for school projects. The digital library has been conceived to support resource needs of these students as well provide the space for them to publish their school projects, which are currently submitted handwritten. The study uses the case study approach and an urban secondary school in Malaysia is chosen as the case school. This paper reports the findings from a survey and focus group interviews which indicate that the students are ready to collaboratively build the digital library as evidenced by students digital library readiness score of 69%.

Introduction

There are a number of emerging models of how Internet-based technologies may come to be used in the school curriculum. One way is to use the Internet to create a portal or virtual library site that features an extensive catalogue of web sites and other Internet resources, and a search engine. Another popular way, which is not common in Malaysian educational setting, is using databases to experiment with in-classroom learning communities and sharing data with students. Bos (1998 p. 2) felt that the World Wide Web (WWW) "may be in danger of evolving to support mainly data access by students, rather than continuing to support more interactive models of usage". The last few years have seen the increase of professional use of educational portals, and construction of technologically advance digital libraries for the K-12 community, which results in the possibility of K-12 students being contributors to the growing Web collections. Loertscher (2002) sees that missing in web portals and tools is a workspace designed for students where both process and content learning can be developed and delivered to teachers. He emphasized that students should be given numerous opportunities to use the resources and tools in autonomous, creative, and collaborative ways.

This study adds to the continuing development of the WWW as a research tool by exploring the educational and technological possibilities of using the digital library as a medium for Malaysian secondary school students to publish their project work, search and share the collections when conducting their school-based project. Research shows that Internet technologies such as digital libraries have been of tremendous use to students' project works. Blumenfeld et al. (1991), Grant (2002), and Sidman-Taveau and Milner-Bolotin (2004) found that project-based learning (PBL) is especially effective in enhancing student motivation and fostering higher order thinking skills, especially when supported by computer and Internet technology. Durrance and Fisher (2003) indicate that the ability to use technology as a tool is very significant in helping students to support their project work. Lynch (2003) contends that the resource-based learning movement has given rise to considerable interest in the use of information resources as the basis for student-centered learning. Bos (1998) indicates that the World Wide Web has the affordances to support students in PBL activities as students have the opportunity and potential to become authors or content providers and also contribute to the distributed organization of the Web.

In this research, the affordances of digital libraries to give the students the opportunity to become Web authors, and also to contribute to the distributed organization of the Web takes place within the framework of PBL. In this sense, the digital library represents a special workspace for the students community, not only for search and access but also for the process or workflow management, information creation, sharing and exchange, and distributed workgroup communication.

Context of Inquiry

Collaborative digital libraries are constructed, collected and organized by a community of users and their functionalities support the information needs and uses of that community. Renda and Straccia (2004) viewed a digital library as a collaborative working and meeting space of people sharing common interests. However, many digital library initiatives adopt the "build it and they will come" approach, and focus on the technological aspects, instead of involving potential users or participants in the digital library design and development (Giersch et al., 2004). The risk here is that the intended users might not come or if they do they may leave unsatisfied The question of how users may have satisfying and productive experiences working with digital libraries should be the focus for digital library research as digital library will only realise their potential when they are usable, useful and used by a broad cross-section of users. In this sense, the cliché of the print library still applies, that is if the library is not used or satisfying to users, its quality then becomes questionable. While many resources have been devoted to developing digital libraries, library researchers have observed that these systems remain underutilized. If digital libraries are not used widely, it will therefore be difficult to defend their considerable investments and the potential benefits they offer will not accrue to users.

Blanford and Buchanan (2002) opined that if digital libraries are to achieve their potential, they need to be useful, usable and used by people for whom information retrieval is not generally the main goal. Users' involvement in digital library design has been a continuing topic of interest in the digital library community and a focus on user needs is central in many studies. There is a general acknowledgement that incorporating user input into the design and development of digital libraries will result in the construction of better systems (Twidale et al., 1997; Nardi and O'Day, 1999; Theng et al., 2001; McMartin and

Terada, 2002; Bishop et al., 2003; and Giersch et al., 2004). All efforts to design, implement and evaluate digital libraries must be rooted in the information needs, characteristics and contexts of the people who will or may use those libraries (Marchionini et al., 2002). Therefore, to make effective users adaptations, a researcher must have some conception of what the potential users already know, what their misconception and problems might be and what they should be interested in learning. In order to increase the acceptance and relevance of a digital library's contents to users' needs, researchers should concentrate on user requirement analysis to discover expectations and content demands to incorporate into a digital library (Thong et al., 2004).

Digital libraries for education are faced with several challenges, among them, wide adoption and meaningful contribution to educational improvements (Giersch et al., 2004). Various ICT initiatives have indicated the need for commitment and willingness to collaborate across agencies, which calls for openness to change, greater involvement and sense of ownership (OECD, 2003). Successful collaboration depends on social readiness such as willingness to collaborate and willingness to change as well as technical readiness such as adequate technology experience and adequate infrastructure (ITR/SOC + IM, 2000). The introduction of collaborative projects and technologies has often failed because there was a lack of willingness to collaborate and lack of openness to change. Studies on use and usability of digital libraries also explore users' receptivity in order to determine usage for a long time to come. While it is clear that there is a growing receptivity to digital libraries in developed countries, there have been no studies in the Malaysian educational context to ascertain that. Therefore, there is a necessity to identify the factors that can increase user acceptance of digital libraries and not much has been researched on this in the digital library literature. As the digital library will depend heavily on the direct contributions of materials from the students and teachers as authors or creators of the contents, it is important that this study initiate an examination of the needs of these very important potential members of the digital library community, and how the collaborative digital library might be designed to meet their needs. This study examines the existing stakeholder's readiness that would ensure the reception of a collaborative digital library for schools use. This approach is a focal point for the creation, use and investigation of digital library sources and services, developed from a user's perspective, in order to ensure usage for a long time.

The Study

The objective of the study is to conduct a needs assessment by understanding the existing stake holder's needs, conditions and environment that would ensure the reception of a collaborative digital library for school projects and this would include:

(a) Ascertaining students' readiness to participate in the building of the digital library as content providers and developers. This would include finding out their ICT skills, their knowledge and use of the Internet.
(b) Carrying out a needs analysis for digital resources among students undertaking their school-based projects. This would include finding out their perceived and actual needs for digital resources.
(c) Ascertaining the types of information that students require and would use when undertaking their school projects. This would include studying their current behaviour of information use and their perceived level of satisfaction with the available information.

(d) Finding out students motivation and willingness to collaborate and share digital resources. This would include students understanding of their role in the collaborative digital library environment.

The study uses the case study approach and an urban secondary school in Malaysia is chosen as the case school. The study adopts a multiple data collection techniques which includes (a) survey questionnaire involving 397 secondary 2 and 3 students; (b) focus group interview with 30 students who voluntarily participate in the digital library project; (c) interview with six history subject teachers; (d) site observation of the school's resource room and school's computer laboratories and ICT infrastructures to gauge possible support for the collaborative digital library implementation; (e) document analysis of students project and other official documents related to the implementation of the school-based projects; (f) user testing and evaluation of the digital library prototype; and (g) literature review of digital library projects. Together these data gathering techniques provide quantitative and qualitative data that illustrate the needs and expectations of the stakeholders involved in the collaborative digital library initiative. This paper reports the findings from the survey and focus group interviews which help ascertain whether the students are ready to collaboratively build the digital library.

The Sample

The 397 Secondary 2 and 3 students participated in the survey consisted of 53.9% (214) boys and 46.1% (183) girls. Respondents identified their race as: 67.8% Malay, 16.6% Chinese, 12.3% Indian, and 3.3% others. They come from various academic backgrounds, in terms of academic performance. From the 397 samples, 30 students become the focus group who will be interviewed and who are willing to participate in the digital library project. The focus group comprises five (5) smaller focus groups of six (6) in each – four groups of Internet Users (24 students), and a group of Non-Users (6 students). All users reported having either Advance or Intermediate Internet skills

Findings

ICT Readiness

The findings indicated that students are ready to utilize digital libraries as computer ownership is high (89.2%, 354) and all respondents in the sample indicate having used computers. A high majority (95.0%, 377) has access to the Internet and 75.3% (299) respondents indicated having Internet home account. The students in this survey can be described as "Internet-savvy"; many of these students have been online for more than five years and they are technologically literate. A total of 32.7% (130) have an online usage experience of 3-4 years, whereas 18.4% (73) have more than 5 years. The students sampled are also frequent users of the Internet with 30.2% (120) logging on everyday, 8.8% (35) at least every alternate day and 24.9% (99) at least once a week. Students report that their primary access to the Internet access is at home, and that is the place they most frequently go online. This equated to about 84% of the total respondents having access to the Internet from

home. Students in the sample are also versatile in their downloading skills of resources from the web. Most (218; 54.9%) reported having experience downloading plug-ins (e.g. Adobe Acrobat, RealPlayer, etc) and installing them on a computer.

Digital Readiness

Digital readiness is reflected by students' awareness and usage of digital resources, and strong preference for digital resource: The survey indicates that high proportions of students feel comfortable with digital resources, use them substantially, and are relatively well equipped in terms of searching for and sharing the resources. The preference for digital resources is reinforced by the ease of access to these resources, as indicated by a few students who wrote that Web resources are the best option for obtaining fast information. However, students' usage of Malaysian educational websites is limited to only specific sites as many students are not aware of the websites as well as the services and resources they have.

Information sources – use, familiarity and favourability: We asked questions about the students' familiarity and use of libraries and information, as well as the information sources that are most frequently selected and used by the survey respondents. The students reported using the following information sources to gather information for their project work in ranked order: the Internet (79.3%), chapters from books (74.3%), friends (71.1%), articles (68%) and parents (66.5%). About 61.2% indicate going to actual sites such as the personalities' house, historical buildings, museums, national archive and relevant municipal council offices to obtain information. Other sources are pamphlets and brochures (27.7%), data from interviews (34.8%), and questionnaires (15.4%). However, not even half of the respondents reported using the public library (46.9%) and school library (27%) as a source of information for their project work. Eight students (2%) reported getting information from previous years students' projects

It seems that the characteristics of electronic resources such as its convenience access and ease of searching are the chief factors contributing the selection of Internet as frequently cited choice. Students in general preferred this source due to the following reasons in ranked order: a) the information is easy to access; b) the information is reliable; c) they can get the information at any time; and d) the information is free and not expensive. This shows that the students tend to choose the information gathering method with little regard to the reliability of the information, since only 38 (9.6%) students ranked this first (Table 1).

Table 1: Reasons for Choosing the Methods Mentioned (n = 397)

Reasons	***Easy to access***		***Can get information at any time***		***Free and not expensive***		***The information is reliable***	
	Count	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
Ranked First	*292*	*73.6*	*35*	*8.8*	*25*	*6.3*	*38*	*9.6*
Ranked Second	*59*	*14.9*	*96*	*24.2*	*51*	*12.8*	*162*	*40.8*
Ranked Third	*17*	*4.3*	*143*	*36.0*	*88*	*22.2*	*59*	*14.9*
Ranked Fourth	*3*	*0.8*	*30*	*7.6*	*106*	*26.7*	*52*	*13.1*
Not chosen	*26*	*6.5*	*93*	*23.4*	*127*	*32.0*	*86*	*21.7*

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Respondents who use Internet resources were asked to indicate the type of online resources they are familiar with and use to get information. The most popular resources are web pages, search engines, e-mails, blogs, instant messaging, online news, electronic books, and audiobooks (downloadable). However, when asked to list websites or educational portals that

they frequent or use for their project work, they were not able to relate specific examples. The majority of the survey participants indicated web directories such as Google (174, 43.8%), Yahoo! (167, 42.1%) and MSN (275, 69.3%), however many left this open-ended question unanswered. The students in the focus group were asked what types of web resources they used to find facts. This is a question that gives many of the students a pause. Over half of the students said they use search engines to find sites with facts. Again, Google, Yahoo! and MSN were mentioned the most often. The second most common answer was web sites of "Institution like places". Websites of libraries, museums and government agencies were considered acceptable for many students for facts. One student said, "*In History, we had to do this project on Tokoh [prominent personality]. Teacher said like maybe you should go to the Internet and find out and see if there's more things you can learn about. When I went to the Internet – and it had more things, like biography, like more pictures, certificates and awards – that kind of stuff. So it made it like easier to write and I got good grade on my assignment*". Another student remarked: "*If you want to write on historical places, it's easy – go to www.tourism.gov, you can go just click to many places of interest from there and choose any historical sites*". This result indicates that the more discriminate students have become "street wise", somehow knowing the appropriate websites to look for certain information. This also clearly indicates that the students use the browsing mode to obtain information and find directories of specific subjects useful for searching.

Web searching and information sharing: Most students in this study have never had formal instruction in Web searching (182; 45.8%). Those who have had some form of formal instructions in Web searching learn in a subject class (18; 4.5%), in a computer class (78; 19.6) and in a library class (12; 3.0%). Half of the respondents indicated that they first learn searching the Web on their own (104; 26.1%), and another 103 (25.9%) learned from their parents. A total of 79 (19.9%) students noted that they had learned from their friends, 77 (19.4%) from siblings and relatives, while only 14 (3.5%) learned from their teachers. In terms of Internet searching skills, most reported having intermediate skills (56.2%, 223), while 31.7% (126) and 5.8% (23) rated themselves as a beginner and advance respectively. This may be because Malaysian students exhibit modesty when self-evaluating their ICT competency.

Many indicated that training is not required to use the Internet, as plainly put by a male user during the focus group interview: "it is easy, anyone can use it, even little kids". Although not directly stated, the assumption that training to use the Internet is not required is implied by the evidence that about only one-third of the respondents having undertaken training of any sort. It is also implied by the lack of Internet training opportunities offered by the school for students to gain expertise in an activity of such academic significance. The array of negative personal experiences of frustration recorded by the students in their response to their inability to locate information justifies a need for skills development through training of some type.

Students reported that they get information about which websites to visit from various sources. Friends are the main source of information about which sites to visit (341, 85.9%), followed by printed materials (180, 45.3%) and television (168, 42.3%). The students like to share the resources they create or found with others, and the common method to do so is by e-mailing the URL of websites. They generally find a particular website by using a default

search engine that appears when they click the search button of the browser. Other methods of sharing or exchanging and finding information they found are presented in Table 2.

Table 2: Methods of Sharing/Exchanging and Finding Information on the Internet (n=377)*

Sharing / exchanging information	*f*	Finding information	*f*
E-mailing the URL of websites	109	Use search engine that appears when I click the search button of my browser	143
Inform other via chat room	95	Use my favourite search engine	168
Create links to the websites	10	Links from the home page I usually use	47
Click to the "send to a friend" button of the website	42	Browsing from Internet directory such as Yahoo! and MSN	19
Others: Communicate with friends via other means : the telephone, SMS and word-of-mouth	63	Others: Not indicated by students	0

***** Excluding 20 Internet Non-users

When using Web search engines, the students generally preferred using Google (174; 43.8%), followed by Yahoo! (167; 42.1%) and MSN (17; 4.3%). The majority of the respondents carried out very basic searches. They search using one search engine only and employed single keyword searches. The next most popular method of searching was browsing web sites and following hyperlinks. Two most common search strategies that they used were by keywords (194; 48.9%) and by title (169; 42.6%); there were also students who searched by images (65; 16.4%) and by combination of the search strategies (52; 13.1%).

The 24 Internet users in the focus group interview recalled their searches as fairly straightforward and simple; they made fairly few moves, preferring to enter a search and browse the results with only occasional refinements. In general, they know what a search engine is and the difference between browsing and searching, as indicated by the following answers: "*I know. Search engine has all these (features), you can browse, you can also type a search (phrase)"*. When asked the difference between the two features, another respondent added, "*Using a search function is much faster, if we know what (phrases or keywords) we want to search (use). We use browse if we are not sure what (phrases or keywords) we want to find (use)"*. In general students are not fussy users and are not aware of "other" ways of searching for information. The lack of expertise as recorded by many of the participants in the focus group may be reflected in the quality of the web instruction they have received, as none of these respondents had obtained formal instruction in Web searching.

Web publishing experience*:* Beyond the traditional activity of using the Internet to find information and to communicate with friends and other individuals, some students in this survey are using the Internet for Web publishing. A number of students reported having either their own personal web page (25; 6.3%) or a group web page (59; 14.9%), or have had the experience in creating web page as a service to others (7; 1.8%), indicating that these students have had experience in creating digital resource web development over the Internet. These students either use web-page creator tools or Hypertext Markup Language (HTML) to develop their sites. Most of the personal websites identified are www.myspace.com and www.friendster.com, indicating that students who publish their information in these online communities perceive their information space, where they share photos, journals and interests with a network of mutual friends, as a website of their own. The researcher made an attempt to visit the group websites reported by the students and found that the websites do exist,

however they only display static information. A few students reported that their websites are still under construction.

School-related use of the Internet

A few questions in the survey instrument asked students how they use the Internet for school purposes. A high majority of the students report using the Internet for schoolwork (338, 85.1%) and as the major source for their most recent school project (337, 84.9%). This data may suggest that the students believe that Internet helps them with their schoolwork, and that the Internet's potential role as an educational tool is often the primary reason why families or parents get Internet access.

One question asked students to indicate which subjects they use the Internet for. Students sampled mainly use Internet resources to get information for the following subjects: History (299; 75.3%), Science (225; 56.7%) and Geography (158; 39.8%). A total of 144 students reported using the Internet to search information for English Language. This clearly indicates that students use Internet resources for project-based school subjects only as pointed out by a student: "*I use the Internet to help me write English essays, write papers or do school projects especially for History* ". The samples also use the Internet for the following subjects: Mathematics (70; 17.6%), Living Skills (50; 12.6%), Malay Language (45; 11.3%) and Religious Education (22; 5.5%). When asked what type of assignments they used the World Wide Web for, the students in the focus group gave a variety of responses. Again, History and current events were the most common responses. Other topics that were cited as being good to look up on the Web included English essays and science experiments. One student told the authors that the Web was a good source of information on computers and for finding maps. While more than half of the students reported that their teachers encourage them to use the Web, a total of 12.8% (51) indicated the opposite.

Utilization of Online Information in Project Work: Students in the focus group were asked how they handle and utilize the information obtained from the Internet in their project work. Specifically they were asked what types of websites they would use to find facts, what types of websites they would not use and how they know if the information on a website is reliable and accurate. Although all students from the focus group are fully aware that they need to list the resources they use in their school projects as references, many think that the references apply to only print resources. When asked if they cite people's work when they use their information, only one student indicated her knowledge on the need to cite, expressed by the following response: "*oh, it is, like you quote? I know that we need to quote people's work if we use their information in our project. But teachers don't ask us to do this. I know about it, ….that you need to quote people if you borrow their words or sentences. In our school project, we just need to list the references we use – there's marks for it.*" The students also had difficulties with the question of how the information on a website was reliable and accurate. The most common answer was that the students do not know. There are a few students who use the source of the information or copyright statements to determine accuracy and reliability of websites.

In general, the Internet users in the focus group are satisfied with the information on the topic that they found on the Internet. In fact they express preferences to use web resources over the print. The preference of use is situational and due to convenience; for example students prefer using web resources for their school projects, when they need to get

information immediately, or when they cannot afford to travel to get information. A few respondents indicated that they use web resources when "they want to copy and paste quotations directly into their essays". These students felt copying and pasting text from a website and into a paper is effortless, as pointed out by a male student: *"Everything is there - you just need to make a good search. It's a shortcut if teachers allow you to type out your homework, because you can copy and paste."*

Awareness and Usage of Digital Libraries

Educational studies consistently report how important awareness, usage and motivation are in the educational use of information technology (Genoni et al., 2000). A key aspect in the awareness and usage of digital resources relates to how the technology is implemented and accessed by the users. Adams and Blandford (2003) have identified how social and organisational structures can impact upon users' awareness and acceptability of digital library resources.

This study found that that although students sampled have been using the Internet, they have not however been exposed to the usage of digital libraries. During the focus group sessions, many admitted not having heard of the term before, however a few of them equated the term "digital libraries" with "Internet, the Web, Google and search engines". Giving a list of web portals, respondents were asked to indicate "Yes" or "No" if they have had experience using the portals. A total of 96 and 32 students reported that they are familiar with and have used *Portal Pendidikan Utusan* (www.tutor.com.my) and *CikguNet* (www.cikgu.net.my) respectively before, two popular educational portals hosted by the Ministry of Education Malaysia. A hundred students have used at least one of Malaysia's leading online newspaper. Students who reported having experience of using any government website is quite encouraging (112), however usage of library websites is very low (22). The number of those using entertainment websites, especially online games, is high, that is 239. A total of 275 students indicated having used any web directory such as the MSN portal (www.msn.com) and Yahoo! (www.yahoo.com). Other educational web portals used by the students are *KakakTua* (www.kakaktua.com.my), *Epelajar* (www.epelajar.com.my), *Student.com.my* (www.student.com.my), *GetCyberEd* (www.cybered.com.my) and *MySchoolNet* (www.myschoolnet.com.my).

This survey provides evidence that students' usage of Malaysian educational websites is limited to only specific sites and that many participants are not aware of the full potential of these web portals to gain access to valuable services and information. Efforts were made to ask the focus group on why they have not accessed the two Malaysian educational portals, and common reasons given were that they do not know that the portals exist. A student who had used the two portals said that the portals are very useful for examination purpose, however most of the information there can be obtained from books and newspapers. Another student feels that these portals only contain resources for examination purposes, indicated by this response: "*I don't use these CikguNet or Portal Pendidikan Utusan. Maybe when I go to Form 5, I will use to access the examination questions there. I know there are a whole lot of materials for exam classes there"*. The results indicate that the respondents have little understanding of the concept of digital library even though they have used such libraries as Cikgu.Net and online newspapers and have indicated benefiting from the services and resources.

Willingness to Collaborate and Receptivity to use Digital Libraries

Students were unified in their responses about the usefulness of a digital library and the need to create portals for school project works. None of the respondents perceive digital libraries as not useful. The survey indicated students' need for a digital library and they are willing to participate in the development of the prototype. Over 90% of students feel that there is a need for digital libraries of local history information and this would definitely benefit them, however only a small majority is very willing to be the content provider to the portal of historical projects. There was less unanimity within the respondents about the willingness to participate in the project; only 65% students are willing to participate and 64.7% are willing to produce and submit their project work to the digital library. An open-ended question asked the reasons why if they answer "Not Willing" or "Not Willing At All" to these two questions and two most popular responses are "*shy to let people see my work*" and "*not ready to let others see my work"*. These responses indicated the need to have students' work reviewed and approved before the digital objects are incorporated into the collection. Similar agreement was reported for "willing to be a content provider to a portal of historical projects", somehow less agreement was reported for "willing to be trained on how to publish projects in the portals" Table 3 presents these findings.

Correlation coefficients between perception of digital library usefulness and each of the 4 willingness variables, and each of the six Internet experience independent variables (Internet use, Internet home access, Internet length, Internet frequency, Internet user type and Internet skills) were analyzed and shown in Table 4. The results reveal that students willingness to participate in the digital library project were significantly correlated ($p < 0.01$) with their Internet length of use, frequency of use, user type and their Internet skills. Willingness to produce and submit project work to the digital library also showed significant correlations ($p < 0.01$) with these four independent variables. Internet frequency, user type and Internet skills were also found to be significantly correlated ($p < 0.01$) with the students' willingness to be a content provider to the digital library of school projects. These results indicate that strong relationship existed between each of these "willingness to collaborate" statements and each of these three Internet experience variables. That is, students who have higher-order experience and abilities using the Internet would tend to be more willing to collaborate in the digital library project.

Table 3:
Usefulness of a Digital Library and Willingness to Participate in Such Project (n = 397)

Digital Library Usefulness Statement	**VU**	**U**	**SU**	**NU**	**TNU**	**Mean**
A digital library of history projects submitted by students, which contains resources on personalities, historical buildings, places and events be useful for project work	38 9.6	222 55.9	137 34.5	0 0.0	0 0.0	3.75 0.616
Digital Library Willingness Statement	**VW**	**W**	**SW**	**UW**	**TU**	**Mean**
I am willing to participate in such a project if given the chance	18 4.5	240 60.5	31 7.8	108 27.2	0 0.0	3.42 0.939
I am willing to produce and submit my project work to such a portals.	16 4.0	241 60.7	44 11.1	96 24.2	0 0.0	3.45 0.902
I am willing to be a content provider to a portal of historical projects.	20 5.0	238 59.9	46 11.6	93 23.4	0 0.0	3.47 0.906
I am willing to be trained on how to publish my project in the portals.	0 0.0	191 48.1	114 28.7	92 23.2	0 0.0	3.25 0.808

Very useful (VU) – 5; Useful (U) – 4; Somewhat Useful (SU) – 3; Not useful – 2; Totally Not Useful (TNU) – 1
Very willing (VW) – 5; Willing (W) – 4; Somewhat Willing (SW) – 3; Unwilling (UW)– 2; Totally Unwilling (TU) – 1

Table 4
Correlation Coefficients between Perception of Digital Library Usefulness and Willingness to Collaborate, and Internet Experience

Variable	Internet Use	Access (Home)	Internet Length	Internet Frequency	User Type	Internet Skills
Perception that digital library of students project is useful	-0.150**	-0.319**	0.277**	0.363**	0.326**	0.383**
Willingness to participate in such a project given the chance to so	-0.141**	-0.321**	0.217**	0.349**	0.305**	0.248**
Willingness to produce and submit project work to such a portals.	-0.114*	-0.303**	0.162**	0.280**	0.247**	0.271**
Willingness to be a content provider to a portal of school projects.	-0.030	-0.256**	0.103*	0.246**	0.254**	0.263**
Willingness to be trained on how to publish my project in the portals.	-0.028	-0.054	0.029	-0.016	-0.016	0.036

- $p < 0.05$; ** $p < 0.01$

Collaborative Digital Library Readiness Score

With a view to setting typologies of students and the collaborative digital library readiness profiles of the different typological groups, the researcher collapsed the Internet Usage and Experience, Digital Library Usefulness and Willingness to Collaborate questions into a condensed score, as this study has found that students who have higher-order experience and abilities using the Internet would tend to be more willing to collaborate in the digital library project. Totaling responses each student made to the 11 items assessing his or her personal Internet usage, receptivity to use and willingness to collaborate resulted in the Students Collaborative Digital Library Readiness Score. The details of the scoring method used are provided in Table 5.

Table 5:Summary Chart of Student Digital Library Readiness Scoring

No	Question	Range of Scores	Value
1	Do you use the Internet at home?	0 or 1	0 = No, 1 = Yes
2	How often do you use the Internet to find information about a topic taught?	0 to 4	0 = Never 1 = Seldom 2 = Sometimes 3 = Frequent 4 = Very frequent
3	How long have you been using the Internet	0 to 5	0 = Never 1 = Less than 6 months 2 = About 1 year 3 = About 2 years 4 = 3-4 About a year 5 = More than 5 years
4	How do you rate your skill as an Internet user?	0 to 3	0 = Non-user 1 = Beginner 2 = Intermediate 3 = Advance
5	How often do you use the Internet?	0 to 6	0 = Never use

			1 = Less than every 3 month 2 = At least every 3 months 3 = At least once a month 4 = At least once a week 5 = At least every 2 days 6 = Everyday
6	How would you describe yourself in terms of an Internet user?	0 to 6	0 = Never 3 = Moderate user 1 = Very infrequent user 4 = Regular user 2 = Infrequent user
7	Is a digital library of history projects submitted by students, which contains resources on personalities, historical buildings, places and events useful for project work?	0 to 4	0 = Totally not useful 3 = Useful 1 = Not useful 4 = Totally useful 2 = Somewhat useful
8	Are you willing to participate in such a project if given the chance?	0 to 4	0 = Totally unwilling 3 = Willing 1 = Unwilling 4 = Totally willing 2 = Somewhat willing
9	Are you willing to produce and submit your project work to such a portals.	0 to 4	0 = Totally unwilling 3 = Willing 1 = Unwilling 4 = Totally willing 2 = Somewhat willing
10	Are you willing to be a content provider to a portal of historical projects?	0 to 4	0 = Totally unwilling 3 = Willing 1 = Unwilling 4 = Totally willing 2 = Somewhat willing
11	Are you willing to be trained on how to publish your project in the portals?	0 to 4	0 = Totally unwilling 3 = Willing 1 = Unwilling 4 = Totally willing 2 = Somewhat willing
	Total Score =	45	

Of the total sample of 397 students, 20 respondents tallied a 0.0 score because they have never used the Internet at the time of the survey. These respondents are categorized as "Not ready" although many of them did indicate willingness to participate in building the digital library resources. The mean Collaborative Digital Library Readiness Score for the entire sample is 31.4, with a maximum score of 44. It shows that the majority of the students are ready (61.1%) to collaboratively build the digital library, as reflected by their readiness index. Based on these findings, it is possible to briefly describe the characteristics or profiles of the samples categorized into four groups ordered from smaller to greater digital library readiness index as indicated below.

a) Profile 1 (26, 7.0%): Not ready students due to non-use of Internet or unwillingness to collaborate as content providers.
b) Profile 2 (127, 31.9%): Partly ready students with initial Internet use. This group of students is initial users of the Internet, essentially circumscribed to personal environment and at home. They have basic ICT services at home but seldom use the Internet. They find the digital library somewhat useful and are somewhat willing to participate in the digital library as content providers.
c) Profile 3 (223, 56.2%): Ready students with medium Internet use. These students use the Internet to communicate and to gather information for school assignments and projects. They use Internet at home and other locations for game and out-of-school activities. They see the usefulness of the digital library and are willing to participate in collaboratively building the digital library resources.
d) Profile 4 (19, 4.9%): Very ready students with advanced Internet use. It is a group of students who use heavily use the Internet and are multi-taskers. The use of Internet in subjects is a special characteristic of this group. They find digital libraries very useful

and are eager to produce and submit their project works and contribute to develop resources for the digital library.

Based on these considerations, it is assumed that the students are ready to use digital libraries and they are willing to act as potential collaborators to develop content. This motivating indicator supports the plan for realization of the digital library and provides a context for the digital library to be used to support students information needs in conducting research projects.

Summary and Conclusion

Are Malaysian students ready to collaboratively build a digital library of learning materials? The answer is "Yes", as reflected by their ICT readiness, digital readiness and willingness to collaborate in the digital library. The students in this study share their views on the information that could be made available on the digital library and the potential features that they would like the digital library to have. Students' familiarity with the concept of a digital library differs, however most of those interviewed have a good understanding of what a digital library could feature.

The study concludes that the factors that facilitate students to utilize digital libraries are as follow:

(a) ***Computer ownership and home Internet penetration***. Findings show that students are savvy with Internet use at home and they love using the Internet for multiple purposes.

(b) ***Frequent usage of the Internet.*** Home use accounts for a high percentage of Internet time. The heavy usage at home highlights the importance of family and parents in monitoring young people's access to the Internet. In contrast, the students reported the Internet use at school is limited.

(c) ***Internet access from various places and for various purposes***. Students also access the Internet from other places, such as their friends' house, cyber cafes and public libraries. Students' favourite Internet activities are information search for personal reasons, online discussions/chats, entertainment and information search for schoolwork. Retrieving online news and online transactions are not popular. Setting up a web page, however, is not a widespread skill.

(d) ***Positive view towards the Internet.*** Students think that the Internet is important, useful, interesting, easy to use and convenient.

(e) ***Comfortable and well equipped to use digital resources***. The survey indicates that high proportions of students feel comfortable with digital resources, use them substantially, and are relatively well equipped in terms of searching for the resources.

(f) ***Strong preference for and awareness of digital sources.*** This preference is reinforced by the ease of access to these resources, as indicated by a few students who said that Web resources are the best option for obtaining fast information. Students understand that experts and information on any topic are conveniently available online. However, students' usage of Malaysian educational websites is limited to only specific sites as many students are not aware of the websites as well as the services and resources the sites have.

The students were unanimous in their response about the usefulness of a digital library and the need to create portals for history project works. The survey revealed that

students not only desired a digital library where they could find resources for school projects but also were willing to be design partners and part of the community within which they could contribute contents and communicate with others. Student partner's participation has resulted in 777 resources collated in the digital library, comprising 126 documents, 35 projects, 437 images, 23 audio files, 34 videos and 90 hyperlinks. The study shows the digital library could be expanded to include digital history lesson plans, teaching tools and history examination question bank for schools. The content can include other subject domains such as science and geography project reports. A focus outreach programme in the form of exhibition and workshops is necessary to create wider awareness and use.

Assessing user needs through survey and interviews provide invaluable information about users' needs and the community's perception of digital libraries, as well as provide the researcher with a blueprint for moving forward in a way that corresponds with user-defined needs. This is the strength of the digital library system as it encourages active participation, which would in the long run produce the desired outcome in terms of ICT literate teachers and students and the experience of creation or publishing in digital libraries. Both teachers and students must accept the reality that the richness in content of the digital library is dependent upon their active participation as partners. The success of this collaborative resource development initiative depends on the willingness of schools to participate and changing the mindset concerning the delivery or submission of history projects.

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