Article

JoLiS

Journal of Librarianship and Information Science
1–13

DOI: 10.1177/0961000611418811
lis.sagepub.com
SAGE

Digital libraries in the classroom: Secondary school teachers' conception

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Abstract
This paper presents findings from a case study investigating secondary school teachers' understanding of the term digital libraries and their relationship with learning. The study addresses two research questions: (1) How do teachers conceptualize digital libraries, their relevance and issues relating to their integration into the curriculum? and (2) What are the teachers' perceptions of the initiative to develop a collaborative digital library for school projects? A series of interviews were carried out on six History subject teachers which provide a detail and succinct information on their understanding of digital libraries, their knowledge and use of the Internet and digital resources, their perception of the possible impact of digital resources on teaching and learning, the benefits teachers seen in digital resources and the problems they have in using them. It also offers important insights on History subject teachers' perceptions of the initiative to develop a collaborative digital library for History projects, perception of its potential use, pointing out the conditions that facilitate its use in the classrooms. The paper also points out the relevance of digital libraries to the History curriculum which will make readers understand that using the technology is relevant to the teaching of all subjects.

Keywords
collaborative resource development, digital libraries, digital readiness, History instruction, Malaysia, secondary school teachers

Background and context of inquiry

Applying digital libraries in K-12 education has the potential to change fundamental aspects of the classroom in ways that could have an enormous impact on teaching and learning. Digital libraries providing educational resources are widespread in the World Wide Web. The K-12 is a group of people that are generally open to and familiar with web-based technology and it seems ideal to provide this 'Net Generation' (Caywood, 1998) with web-based reference services such as digital libraries. Researchers and educators have the following reasons why it is important to study and plan the provision of digital library service for students: (a) it helps provide the means to collect, store and organize digital information; (b) it is able to provide information whenever and wherever it is needed; (c) it revolutionizes the traditional pedagogy of providing learning resources and the way these resources can be accessed; (d) it helps students to practise self-accessed and self-directed reference learning at their own pace; and (e) it changes the conventional process of seeking information, as well as the speed and spread of information obtained. Massulo and Mack (1996) succinctly summarize the three roles the digital library can play in K-12 education: as a resource for teaching in curriculum development; as a resource for learning to enrich students' experience; and as an authoring space in support of students learning. Zainab et al. (2003) wrote that not only do digital libraries offer innovative strategies for learning opportunities, but they can also make a significant impact on enhancing and improving ICT skills among students and teachers because hosting of information, retrieving and handling information from the Internet requires a fair amount of computer skills and Internet literacy.

A key question pertinent to be discussed is: how are digital libraries perceived to contribute to learning? Research demonstrates that many issues influence the implementation of digital libraries in the classroom (UNESCO ITTE, 2003). Previous models of digital libraries have attempted

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to describe effective information use within a learning context from the perspective of students (Abbas et al., 2002; Theng et al., 2001), and a significant amount of research has been done on children's use of digital libraries in recreational and instructional settings (Hutchinson et al., 2006; Massey et al., 2005; Reuter, 2007). However, little is known from the teacher's perspective. What conditions within a school or group of teachers will tend to support successful digital library adoption? Only few studies document how K-12 teachers find, access and use digital libraries. Recker (2006) examined the technical aspects of teachers' use of digital libraries, where she attempted to understand how teachers find and use this technology for their instructional purposes. There are a few studies which adopt teachers' needs and perspectives in digital library design. Marlino et al. (2001) reported on teachers' desire for resources that are pedagogically relevant to their current teaching context, as opposed to generic digital resources. Sumner et al. (2003) reported on teachers' expectations and requirements for the design of educational digital collections for classroom use. Teachers in the study were primarily interested in finding quality resources, which they defined as 'age-appropriate, current and accurate'. Carlson and Reidy (2004) conducted focus group interviews to delve into teachers' use of digital resources, the technical and educational support they need, and the ideal design features and services of a digital library for STEM (science, technology, mathematics) resources. Recker et al.'s (2004) study also focused on understanding the teacher's perspective regarding the prospects and uses of educational digital repositories.

While it is clear that there is a growing receptivity to digital libraries in developed countries, no known studies in the Malaysian educational context to ascertain that could be located thus far. However, various studies in Malaysia have revealed that there is a strong preference for digital resources among teachers, and this might lead to digital libraries being accepted favourably by this educational community. Although research provided empirical evidence that Malaysian teachers have high positive attitudes towards web technology and have moderate levels of ICT competence (Bee Theng and Chia Hua, 2008), teachers are relatively slow to use digital resources in the teaching-learning process and not ready to adopt online tools such as blogs and discussion forums into the classrooms (Thang et al., 2010). The actual usage of computer (AUC) and Internet for classroom purposes remains moderate although training has been given (Kumar et al., 2008). Koo's (2008) study also found that many teachers were not prepared to utilize the Internet and that they were undecided on their own readiness as well as their perceived readiness of their students to use online collaborative learning. Secondary school students doing their school-based research papers received almost no instruction in the use of web resources (Zakiah, 2002). The teachers, however, permit students' use of the Internet to do their research with little guidance from them and they are often surprised at the sophistication the students reveal in conducting searches.

Missing from such studies in Malaysia is a deep characterization and understanding of how digital learning resources may fit into the learning environment. Developing this perspective requires adopting teacher perspectives, rather than simply focusing on technological concerns. This lack of research limits our understanding of how educators use digital information resources and of the factors they consider important for their use in instructional settings. As such, this paper which aims to investigate secondary school teachers' understanding of the term digital libraries and its relationship with learning, sought to answer the following research questions:

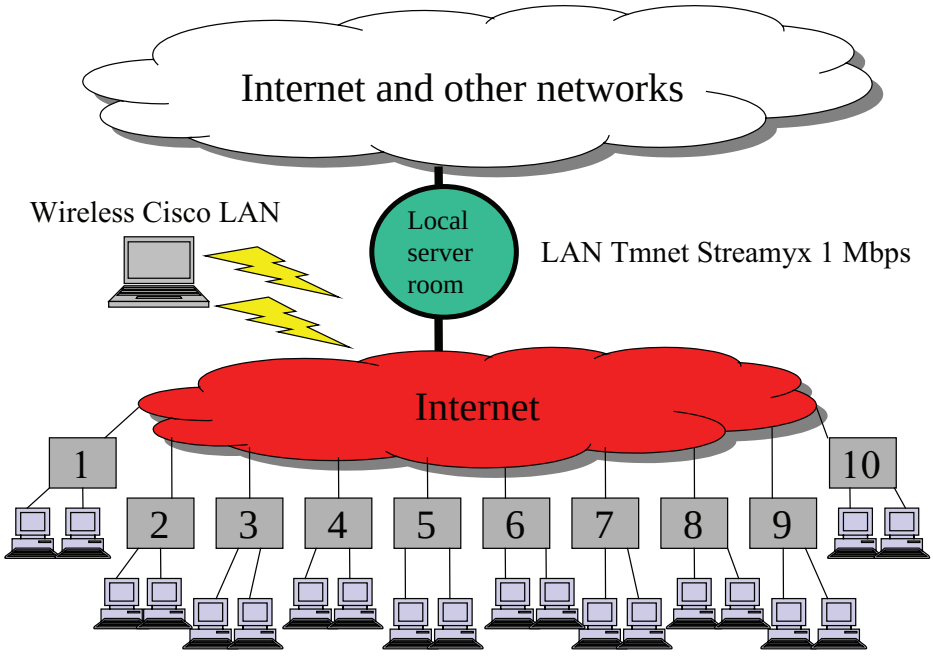
1. How do teachers conceptualize digital libraries, their relevance and issues relating to the integration into the curriculum? and
2. What are the teachers' perceptions of the initiative to develop a collaborative digital library for school projects?

Research design

The study used the case study approach which was open-ended and exploratory (Yin, 2003). As such, the intent was not to answer experimental hypotheses, but rather to understand how teachers perceive the prospects and uses of digital libraries.

The case school

A single selected urban co-educational secondary school (equivalent to Grade 7–12) in Shah Alam, Selangor Malaysia was chosen as the case for the following reasons: (a) the school is willing to participate in the study; (b) the school provides Internet connections and is situated near numerous cyber cafes, putting the stakeholders in an ICT rich environment; (c) the school has an open and friendly atmosphere, encouraging community involvement and extracurricular students' activities. Figure 1 graphically illustrates the school ICT infrastructure expressed in terms of location of access, computing facilities and network, which would facilitate the implementation of a collaborative digital library for school projects. The school has subscribed to TMNet Streamyx Enterprise ADSL 1.0 M since 1 March 2006 to replace its earlier 512 Kbps broadband Internet access. Students may access the Internet from three primary locations: the self-access learning centre (SALC), the school resource centre (or the school library) and the computer laboratory. The SALC is accessible anytime during school hours with or without teachers' supervision whereas the school resource centre and the computer laboratory are accessible only during operating hours or with permission of the teacher in charge. The wireless Cisco



1	Self-Access Learning Centre	10	**6**	Staff room 1	4
2	School Resource Centre	5	**7**	Staff room 2	4
3	Computer Laboratory	40	**8**	Department Heads' Office	4
4	Information Technology Laboratory	40	**9**	Subject Panels' Room	4
5	Language Laboratory	20	**10**	Main Office	10

Figure 1. The case school's ICT infrastructure

LAN operated at the end of 2007 facilitates students' access and teacher-based usage for teaching from various locations within the school, especially in classrooms. Teachers, on the other hand, may access the Internet from any of 10 locations in the school.

The research sample

The case study focuses on the perspectives of History subject teachers on a digital library initiative for school projects. History teachers were sampled because they implement project-based learning and engage students in formulating meaningful questions, planning tasks, gathering resources, evaluating information, collaborating with others and reporting findings. Project-based teaching methods are increasingly used in Malaysian secondary school classrooms with the expectations that students will be engaged by the chance to use different information sources creatively and will especially benefit from the use of various presentation types to improve learning (Malaysia, Ministry of Education, 2006). Literature has shown that digital libraries can make it possible for students to have access to information and data which interests them, a fundamental requirement for authentic inquiry in project-based learning (Abdullah and Zainab, 2007; Raven et al., 1996). As such, it is assumed that a digital library collection scope on History would benefit the students in conducting their school projects.

Because of the nature of the research design, the study sample was relatively small and not randomly selected, and therefore could not be generalized to the entire secondary school History teaching population. This study used criterion-based purposive sampling (Yin, 2003) to identify participants from the group of 14 History subject teachers in the case school and teachers having the following criteria were chosen:

1. at least 5 years of teaching experience in History;
2. at least 2 years' experience of supervising History school projects at the lower secondary level (Grade 7–9);
3. use ICT such as computer applications, Internet and electronic resources in their lessons;
4. willing to dedicate at least six hours to the study for interviews and informal discussions;
5. would permit the researchers access to their teaching and technology integration related materials.

A special effort was made to seek out at least one male teacher (because of the predominance of females in the

Table 1. Demographic Information of teachers sampled

Gender (Age)	Teacher (Group)	History classes taught	Years of teaching experience	Highest academic degree	Years of Internet use	Computer access & usage
F (35)	Participant A (1)	Secondary 3	8	Master	2	Home
F (34)	Participant B (1)	Secondary 3	5	Bachelor	1	Home; School library
F (32)	Participant C (1)	Secondary 1 & 2	6	Bachelor	None	Home
F (38)	Participant D (2)	Secondary 3, 4 & 5	13	Bachelor	3	Home (Internet); SALC;[a] own laptop
M (42)	Participant E (2)	Secondary 3 & 4	16	Master	3	Home (Internet); office
M (28)	Participant F (2)	Secondary 1 & 2	5	Bachelor	8	Home (Internet); computer lab; SALC; own laptop

F = Female; M = Male
[a]SALC = Self-Access Learning Centre which provides Internet facilities for the school community

Malaysian teaching profession). The Assistant Principal suggested six names, whom she considered to 'fit your participant criteria and will be able to assist you in your digital library research'. After receiving the nomination list, a letter explaining the nature of the study and extending an invitation to participate was sent to each potential participant. As a result six teachers were interviewed and their demographic information is presented in Table 1.

The participants

Each participant has been a classroom teacher for at least five years, and owns a computer or has one at his/her disposal at home. The teachers reported using the computer for professional work and all have used it for word processing, creating spreadsheet and slide presentations. However, the level of readiness for Internet use by the teachers is limited. Based on the wide range of computer experience, the teachers were grouped into two distinct categories. Group 1 consisted of three teachers (A1, B1 and C1), who are either non-Internet users or Internet dropouts, since they had abandoned their use of the Internet. Group 2 consisted of three teachers (D2, E2 and F2) who are Internet users, and have used the Internet for at least three years. Participant F2 considered himself skilled in 'using the Internet, email and complex software such as hypertexts'. In terms of ICT training, Group 2 teachers claimed that they were self-taught. They indicated that they had gone through an Internet use workshop but could not recall how recent, in depth or complex the training was. None of the teachers indicated that they 'can train students or teachers in the use of the Internet'. When probed further on why they have not been sent for computer and Internet training, Group 1 teachers were consistent in their responses – that 'teachers sent for training are those teaching languages, mathematics, sciences and technology subjects'. The researchers have reasons to believe that senior teachers such as Participants D2 and E2 who have administrative positions in the school, are more likely to have higher ICT skills than the other teachers because they need to use ICT tools for administrative purposes and they have been given the opportunity to attend ICT training courses. Academic qualification reveals little in the way of patterns that can be attributed to ICT skills. However, the level of classes taught would seem to contribute to teachers Internet experience as both Participants D2 and E2 have years of experience teaching History for the upper secondary classes.

Data collection

Since the study involved teachers as participants, the research had to undergo human subject review and was approved by the Educational, Planning and Research Division (EPRD), Ministry of Education Malaysia. As required in the EPRD's approval process, the objectives of the research were clearly communicated both orally and in writing to each participant. Data were collected through a series of individual discussions and interviews with the participants. Each teacher was interviewed at least three times; and each interview lasted approximately two hours. Interview sessions were audio-taped and additional written notes during each session acted as a general aide memoir for the researchers.

The study was designed to be practitioner centred, with participants focusing on and describing curriculum and technology-based information activities and the learning process from their own perspective as subject teachers. The first round of discussions, lasting approximately one hour each, gathered teachers' initial conceptions of the term 'digital libraries'. A further round of group discussions with the same teachers gathered additional views on the issues relating to its integration into the History curriculum; how digital libraries are interpreted by teachers in relation to the learning tasks they design, monitor and assess; as well as

Table 2. Participants' description of digital libraries

Digital libraries are conceived and described as:
Documents on the Internet, (using) OPAC, you can access them through without going to the library (Participant E2)
Online access to books in electronic form (Participant D2).
digital library is like the Internet (Participant C1),
educational websites (Participant A1)
like Google, and contains resources that you can find in a library but of course in electronic form (Participant B1)
some kind of a directory to search for certain subjects (Participant F2).

the teachers' perceptions of the initiative to develop a collaborative digital library for school projects.

The interview sessions took place in either the teacher's classroom environment or an available department office. Although a series of questions guided the discussion, each interview took on a life of its own, and the conversation was a fluid, friendly exchange between peers. Written notes from each interview were reviewed after the interview as the researchers started to look for general themes amidst the wide range of responses. Short summaries of these interviews were sent to each of the six participants to verify what had transpired. All teachers returned the summaries with clarifying information that has proven to be extremely helpful. The researchers took steps to safeguard the credibility, transferability, dependability and confirmability of the study (Lincoln and Guba, 1985) using peer review, thick description, creation of an audit trail and a search for disconfirming evidence (Denzin and Lincoln, 1994; Lincoln and Guba, 1985).

Data analysis

Verbatim transcripts were prepared with each participant and phase coded to ensure anonymity. Analyses took place throughout data collection and writing, and were coded through an iterative process of identification. Constant-comparative methodology (Bogdan and Bilken, 1998) was used in an attempt to create categories that captured the nature of the participants' stories. In the preliminary coding scheme, the interviews were coded line-by-line to identify recurring themes and sub-themes. Findings were structured around the following four final themes that emerged from the interviews, and the sub-themes, presented as issues and strategies to overcome the issues, along with the data demonstrating them in more depth.

Findings

Theme 1: Teachers' conceptions of digital libraries

The teachers in this study said that they did not know what a digital library was and none of the teachers indicated familiarity with digital libraries. Only one teacher indicated having heard about digital libraries, saying, 'I don't know much but I hear our teacher-librarian talk about it'. (Participant D2). One conjecture is that the term itself is not a familiar one and has not entered into the lexicon of educators in Malaysia. When asked, 'What are the Web resources on local history that you would recommend to students or other teachers?' most teachers mentioned the sites listed in the KlikNet section of the History textbooks. None of the teachers named Malaysian web portals of educational resources such as Portal Pendidikan Utusan (www.tutor.com.my) and CikguNet (www.cikgu.net.my) in their list of sites used, nor did they name any other educational sites in any way. One possible explanation is that, as most of them are either non-users or not using the Internet for teaching, these educational sites have not reached a visible level to them. Participant E2 named a few sites that he had compiled, and he indicated that 'there is no one-stop centre students and teachers can access to find resources on local history'.

Although they were not aware of digital libraries, the teachers interviewed tended to transfer the sense of a conventional library to the concept of a virtual library when asked to describe what the term 'digital libraries' suggested (Table 2) They often also assumed that it would be a primarily text-based resource, with variations including as broad a definition as 'the Internet' and 'Google'. Although their conception of digital libraries is too general, their description tend to focus on the digital library content and systems which fits with the first part of Borgman's (2000) definition which states that content and the information storage and retrieval systems comprise part of the digital library.

During the interviews, those who reported using the Internet (Group 2 teachers) were asked to express opinions on what a digital library would have that could aid them in their teaching. Again, their answers were mainly on contents as reflected in the following verbatim statements:

> contents with appropriate amount of texts for my students because a lot of resources on the Internet are designed with understanding of university teaching. (E2)

> I would like them to have diagrams and pictures with the text to make it more visual, I like it to be easy for students to find information, [digital library] need to be easy to see and read. (F2)

> related contents for all forms [secondary levels], and content like photos and images, as well as ways to interact with other people including question submission and on-line help. (D2)

What Group 2 teachers said they wanted for their teaching is, in many ways, the very definition of a digital library. This was summarized by Participant F2 in this way:

> There is so much information out there. We need websites approved by teachers for students to go to. Students are accessing information they have no clue about and can't do anything with. Teacher approved sites would help them narrow their searches and find more useful information.

This clearly indicates that while most participants noted that digital libraries comprise content and systems, only Participant F2's definition reflects Borgman's (2000) second part definition of digital libraries i.e. digital libraries are constructed by and for a community of users.

Theme 2: Internet integration into the curriculum

In order to identify how digital libraries can be integrated into the curriculum the general expectations that the participants have for the Internet in education are examined. When asked how the Internet and web resources have changed their curriculum planning or instruction, none of the teachers indicated that web resources have impacted their teaching. This is an anticipated answer since none of the teachers have used the Internet in their teaching or have used it in a major way. The interview also asked how the teachers see the Internet's potential value for them in the near future. Do the teachers see the Internet as a valuable or an essential resource in their teaching, as something of limited value, or perhaps something that is not even needed? When the question: 'What would you want to do in your classroom with respect to Internet technology?' was posed, the researchers were struck by how none of them answered 'Internet integration'. It was thought that the teachers did not see any pedagogical value in the Internet and thus did not want to integrate it in their teaching, or perhaps they already had enough Internet connections at schools. To explore this explanation, the researchers asked the teachers about the benefits of having Internet access in their classroom. These questions provide a clearer representation of the extent to which teachers may want to use the Internet and how they may want to integrate this type of technology in their teaching.

a) Teachers value Internet resources. Although they did not actually weave the Internet into classroom activities, the teachers easily defined the benefits of using digital resources and technology in the classroom for their students and for their own professional development. They indicated that the Internet could be used effectively within their subject area. They in general find that Internet

> can do what they have to do without my assistance.

Participant F2 thought that teachers felt their students were bombarded with Internet technology outside school, and he remarked that:

> the students aren't going to be behind if they don't have Internet at school.

In particular, he thinks that some teachers feel that many students have Internet access at home or will get it somewhere else so

> the little bit they do get here in school is okay. (Participant F2)

That is why, in his opinion, not many teachers are using the Internet for educational purpose or 'Maybe they just don't see the value', he said.

b) Teachers have problems integrating the Internet in their classroom instructions. Although the Internet-using teachers felt it was important to know how to use the Internet, they were not very confident in their current Internet skills and how to use it to support teaching and learning, apart from integrating Internet-based activities through teacher-directed student use in the form of having the students use the Internet for information-gathering.

> I don't know how best to use the Internet with students. (Participant D2)

In spite of having attended workshops, she felt that she needed more resources to assist her with the process of teaching with the Internet. She said:

> I think you have to work very hard to make it practical,

and she believed that having an aide would be very helpful. She also looked forward to the day when there would be people to help teachers 'facilitate' Internet projects and curriculum. Participant E2 felt that he needed more training specific to his curriculum needs, and said that:

> there are a lot of things I probably could do [with Internet] that I don't know how to do.

Like most of the other teachers, Participant E2 has never gone to a workshop that focuses on how to use the Internet with students; his training opportunities have mostly focused on his personal Internet skills.

Both Participants E2 and F2 stated that they had managed to integrate the use of the Internet in their teaching, however much of that use did not carry over into student-based activities. Participant F2 said in an interview response:

> I don't use the Internet with my students. But I have them used out-of-class context.

He admitted that he was trying to find ways of incorporating the World Wide Web in his teachings and run a 'more student-centred classroom' which according to him would allow him to be more of a facilitator than a teacher as

> web lessons are more interactive and give real-life examples that are engaging to students.

He planned to use the Internet in his History class and have his students post short essays and get the essays reviewed or graded so they can eventually do an entire History essay class-project using the Web. Participant E2 admitted using web resources in his History lesson and he compiled a list of URLs of the resources.

> Yes, I use but not in class with my students. I go to these addresses [URLs], to get additional information for my students.

When the researchers asked: *'*What should the focus be today to help history teachers to effectively use the Internet technology for teaching and learning*?'* Participant A1 quickly said:

> Training! Teach us! Many of us do not know, do not have the chance to learn.

The teachers in general felt that professional development is critical to the successful integration of digital resources and they expressed frustration about the lack of training opportunities. Participant D2 felt that school should emphasize Internet use within the classroom, through 'meaningful teacher-directed student use'. Therefore, he urged that:

> the wireless network and computer labs should be fully utilized by all teachers, regardless of subjects because Internet has various disciplines, we have to encourage students to use Internet resources the right way, students evaluate resources, present what they found. Make sure that they have skills and use quality resources.

The interviews revealed that the level of readiness for Internet use by the teachers is limited because they lack experience in using ICT for instruction or integrate it in the student curricular activities. Only Group 1 teachers reported making use of the Internet, which is confined to three types of use: (a) personal and professional communication; (b) lesson preparation; and (c) teacher-directed student use. None of the participants have used it for professional collaboration among peers. At present the teacher participants have no clear direction on integrating technology or the Internet into their History curriculum. The main reasons for lack of classroom Internet use are broken down into three categories: staff development,

Table 3. Teachers' issues relating to usage of web resources in support of their teaching

Staff development	School support	Teachers' attitude
No skills using the Web No experience to use for instruction and students-based activities Teachers do not know how to integrate Need training	Difficulties in getting access to use the lab Requires advance planning and signing up to use the lab No standards exist to require its use Takes too long to locate resources Lack of contents that are appropriate Lack of time because of other curriculum needs	Using the Internet with students is a low priority Not comfortable using the Internet Reluctant to use

school support and teachers' attitude. The most common issue raised relates to staff development such as teachers' lack of familiarity with the use of technology in general and digital resources in particular, and their need for training and professional development. Table 3 summarizes the teachers' responses as revealed throughout the series of interviews.

c) Teachers direct students to use digital resources. The teachers in this study do not teach their students how to use the Internet. They were either unable or reluctant to teach students how to use the Internet and there is a common belief among them that it is too complicated and not within their job to do so. This also indicates that the level of readiness for Internet use in the classroom is very low. As expected, Group 1 teachers confessed to being unable to teach others how to use the Internet. Teachers in Group 2 unanimously felt that they do not have to shoulder the responsibility to teach their students to use the Internet. Participant E2 strongly felt that teaching students to use computer resources such as the Internet remains a specialized province of the computer teacher or the 'ICT coordinator' rather than having been integrated into the instructional repertoire of teachers across all subjects. This was echoed by Participant D2 who indicated:

> computer teachers should be expected to teach this [Internet use] since they have greater access and they use it a lot.

This indicates that the academic subject teacher does not appear to be an important agent of transmission of competence and knowledge of ICT to students.

However, all teachers in the case study indicated that they encouraged their students to use the Internet especially to find information on Malaysian history. Thus, even though there were teachers who stated that they did not use it for either personal or professional activities, this apparently does not imply that they discourage their students from using the Internet.

Participant D2 specifically had her Secondary 3 students use the Internet to find digital resources for their History project. Participant B1 required her Secondary 2 students gather to information from multiple sources and verify the information they found from these various sources. She said:

> I always require my students to use more than one resource, at least three. I prefer at least one to be an Internet resource.

When asked why she emphasized the need for at least one web resource when she herself has never used the Internet, her reply was:

> We have to encourage them. The Ministry [of Education] wants them to use. Make them search [use the Internet] although we do not use it (laugh). We have this section called KlikNet in the History textbook, I tell them to go to the related website and read additional information, and share what they have read with the whole class. (Participant B1)

Similarly, Participants A1 and C1 encourage their students to use digital information sources to search for additional information to supplement their readings and have the students present the information they found as depicted by the following responses:

> Yes. I encourage them to use. I have to be confident to ask them to search for detailed information especially on prominent [historical] figures. [They] cannot rely solely on textbooks. I am not that good [in using Internet], but just tell them the students to go to the Internet, find this and that ... have them present [the information] in class. (Participant A1)

> Yes, I sometimes ask my students to find additional information on the Internet. Just tell them to do it, they do not ask much. They know how to find. I have one student who keeps the information he found in a laptop. He wants to present, so I just let him present. (Participant C1)

However, beyond the traditional activity of searching for and using information sources to write project reports, none of the teachers mentioned having students use the Internet to contact other individuals, to collaborate with classes in other schools in joint projects, and to become content creators and publish their work on the World Wide Web. Two teachers felt that the activities were not necessary and not required of the curriculum as pointed out by Participants A1 and B1:

> Not needed, at least at this point. (A1)

> What we are doing now is sufficient. (B1)

This indicates that most teachers fail to see that this activity would enhance students' ICT awareness and use.

A positive aspect in the study is that teachers stated it was important that students learn how to select and use information on the Internet. Participant E2 believes that his students have to learn to find and use digital resources, as it is a skill that is required in learning History. He said in an interview response:

> My students are exposed to these skills, it is important in [learning] history, being able to recognize various resources, authoritative sources, primary sources, old and new. Any work must have resources, reference list.

Participant F2 felt that digital resources increased his students' interest, making his classes less teacher-directed and offering them more student-directed learning so that:

> My students are actually reading. I sometimes give them questions and tell them to use other sources because they cannot get the answers from their textbook. My goal is to get them to search and find the answers.

From the responses, it is clear that Internet integration is confined to a level where teachers encourage their students to channel Internet use into their academic work by searching and using digital resources in their school projects and assignments. The teachers however have not reached a level where they ask students to find and use digital resources through independent or collaborative Internet-supported or Internet-based assignments, or even submit their school work or projects electronically.

Theme 3: The relevance of digital libraries in project-based learning

Teachers were asked how a digital library can contribute to students' learning outcome in their school-based History project. Participant E2 sees the 'relevance' of the digital library project to the current requirement of the History coursework, which he quoted as to obtain:

> information-seeking skills, resource study skills, experience conducting research through History Thinking Skills and presentation of research findings.

Students may know about 'real events' published in the form of various formats such as videos, images, as well as text in the form of memoirs and diaries. He also felt that digital libraries would help solve the problems of students who cannot get certain information due to logistical problems. Again, what Participant E2 described, in many ways, aligns with the objectives and roles of digital libraries.

The teachers, equating digital libraries to the Internet, expressed the opinion that the technology could enable students to become more efficient and effective learners and the way they described the impact on learning tended to fall into two distinct facets of learning: (a) efficiency in the way information was handled, and (b) achievements in terms of results.

a) Digital libraries facilitate information handling. The teachers were requested to give specific examples on how a digital library of historical resources could be used in the classrooms. Participant A1 indicated that she would ask students to locate and read relevant materials from the digital library in class and then provided the opportunity for discussion about what they had learned, encouraging them to consider the difference in their learning between being told the facts and reading about the subject. Participants B1 and C1 indicated that they would introduce changes in their approach to teaching where

> students will have to do a lot of information seeking as a while-reading activity. (B1)

> more class discussions and presentations will take place. (C1)

Participant D2 felt that she has to concentrate on helping students recognize and develop the strategies they use to select relevant information from a text. Participant E2 felt that the digital library can be utilized to teach information skills and she felt students would be better prepared for locating information 'if being taught to do so' (E2). Participant E2 agreed that students should be given the chance to use Internet technology to do their schoolwork, even at an early age. He pointed this out in an interview response:

> Internet technology is a facility; the government encourages its usage. Since we have it, use it. We can even let the Year One [elementary school] students do their school work on a computer.

He felt that given the time, students should be given the opportunities to publish their work online because students have the interest and potential to be local content providers. He said:

> I see potential in these students, their deep interests when writing. They tend to write more than what we have in our textbooks. That is what happening in America and England, when students write on local history, they get a lot of information, some of which is not written in books. The same thing is what we want in our students, to be able to provide local content on the Internet. (Participant E2)

Participant F2 felt over the past year he had trained his students to fact-find efficiently and the digital library can be used for 'enrichment activities such as Information-Hunt'.

F2 felt that students have no obstacles publishing their work online as they have experience as content creators – they are sharing self-authored content and working on webpages for others.

> I know many of my students share their own creations online, things such as photos, stories, poetry, some even create or work on web pages or blogs.

However, the majority of discussion about digital libraries' contributions to learning was speculative rather than actual and this is due in part to teachers not having used the technology in the classrooms.

b) Digital libraries facilitate quality work. According to some teachers in this study, students' motivation to produce quality written work increased when they knew that they could word process their reports and publish them online. Participant D2 noticed a difference in her students' projects once she allowed them to use the computer to produce their reports:

> My students seemed more motivated to complete their reports and displayed a greater interest in creating quality work when I told them the possibility that they would be published online, in Scribd [a social publishing site].

She also said that her students would have no difficulties publishing their work on the Internet as most of them live in technologically rich households and engage in various online activities such as getting news, downloading files and blogging, and they have experience with content creating and sharing activities.

Participant F2 felt that the students would invest more time in their project work when they knew it would be published on the Internet and available to a wide audience. F2 explained in an interview response:

> The Internet provides an audience. All these while, students wrote for the teacher and for a grade. Now when they [students] publish it [report] on the Internet, they are writing for a larger audience. This makes them more aware of the quality of their work.

Participant A1 too felt that students would put more effort into the quality of their work if the work would be published on the Internet. They were more amenable to making revisions because composing and editing on the computer were much easier than hand-writing assignments. A1, a non-Internet user remarked:

> I believe the students will be more careful in their work. Errors are pretty easy to see on the Web, they can easily change them. If hand-written, it is difficult to get them change what they have written.

Although these teachers felt that more students would be motivated by online publishing, Participants E2 and F2 pointed out that some students might not be affected by it. E2 commented:

> I hope online publishing will also motivate our students who are reluctant writers. I hope they will be more engaged in writing their report.

F2 supported his colleague's point. He said:

> If students are comfortable with keyboarding and the length of what they are writing is manageable, online publishing will be motivational to them.

Theme 4: Teachers' willingness to participate in a digital library of history projects

What are the teachers' perceptions of the initiative to develop a digital library for school projects? The teachers' replies were rather brief when they were asked if they were willing to work with their students to carry out the digital library of students' History projects. All 'seemed' to be willing to collaborate but were quite concerned about their roles in the digital library project as reflected by the following questions posed to the researchers: 'What am I supposed to do [in this project]' (Participant D2) and 'What is my role in this project?' (Participant F2).

When the roles were communicated to the teachers – that of a 'facilitator' and 'content manager' – it 'seemed' intimidating to the teachers to facilitate the digital library project when they have minimal technical knowledge of the specific tools used to carry it out. Participants B1 and C1 were rather concerned about not having specific technical skills. Participant A1 said:

> I am okay with this, maybe, even though I have no experience as an Internet user.

Participant E2 indicated readiness for an ICT programme that would begin to use teacher collaboration for instruction and staff development, but was not ready for advanced use or monitoring of student collaboration. He indicated having been compiling URLs of web resources on Malaysian history which he would ask his students to use to access the websites at their convenience from home. He would like to contribute the list to the digital library project and remarked:

> I have a list of resources on History, yes I write them in an exercise book. I can give you, [you can] put in your digital library project and you can provide link [so that] it is easy to go. (Participant E2)

In general the teachers expressed willingness to play the role of facilitator, making sure that their students have the resources and scaffolding that they need to carry out the project, as depicted by the following responses in Table 4. The responses reflected that the Group 2 teachers 'seemed'

Table 4. Teachers' willingness to participate in the digital library project

[I want, I have told you before that I wanted to join]* (Participant A1)
[I will give my cooperation, whatever I can afford]* (Participant B1)
I agree. However it depends on the school's instruction and the (History) panel (Participant C1)
[I agree and I give my support. I think this project is beneficial to teachers and students. I see there is a need for this project]* (Participant D2)
[I like it and I strongly agree to join]* (Participant E2)
Yes! I would love to participate and engage in some of the more technical aspects of the project (Participant F2)

*Statements in [ ] have been translated from the Malay language

not to hesitate to participate in the digital library of History projects.

a) Teachers are willing to learn. Although the teachers lack skills and do not have time to learn, the teachers sampled said that they would be willing to devote between one and three hours per week to learning to use a new web-based resource. Participant E2 felt that practical ICT projects were feasible in the school since the school is very supportive of 'anyone who wants to integrate ICT into practice' and has the ICT structure in place.

> The school spends money not only on ICT stuff but also on training. (E2)

D2 thought that she could learn more about Internet technology and how it could be used in her own teaching practice. With a smile, D2 remarked:

> I think [I have] no problem, this is good, I can learn if I do not know, I can also know more about Internet resources and use [them] in my teaching.

Motivated to learn more on technology by this project, participant F2 said:

> I am teaching myself website design and hope to spend more time doing it in this project when I don't have so many other works.

b) Teachers think they should work with students to integrate technology. The teachers in this case study foresee that it would be possible for the students to work in a practical ICT project such as the digital library project as many of the students have ICT skills. 'No problem, the kids are more IT savvy that most of us here,' pointed out Participant E2. 'If we don't have IT literate students, the digital library doesn't work', Participant F2 remarked. F2 further said that 'teachers do not have to worry about not having technical skills' as they can still facilitate students' learning and make other important contributions to the process by 'making sure that students have the resources that they need to do their project' such as access to computers and the Internet, as well as technical support when they encounter obstacles that they could not resolve. F2's view was supported by the school's ICT teacher coordinator who thought 'teachers can facilitate an ICT project if they do not know how to implement the technology'. The latter believes that teachers should work with their students to widen the students' participation and encourage their learning. 'They [teachers] don't need technical skills'. She added, 'Our students also are able to do it [Internet project]'. The ICT teacher coordinator shared her following interesting story about how she and her students worked together in developing a website, linking and organizing various web resources by subjects to encourage using and learning about Internet resources.

> In our Internet project, students learned the technology by doing, I just facilitate the process, I get technical experts involved when students have technical problems. That's what I have been doing with them (pointing to a group of students in the SALC room), it may be just a simple project, linking various web resources to our portal, but this is a possible solution for teachers who are not IT expert. Get them to do it! I learn a lot from my students.

F2 would like to provide his students with the opportunities to submit their work to websites designated to publishing students writing, or allow students to create their own classroom web pages and publish their work, however he 'has not got the chance and time to do so' and 'the students have not developed a site yet'. He felt online publishing opportunities were invaluable and greatly motivated most students to write and complete their best work. Being an English Language teacher as well, he would like to encourage his students to submit their essays to online children's journals for publication. He stated in an interview response:

> On the Net, there are possibilities to publish on commercial sites, as well as school web pages and personal home pages. We should encourage and expose our students to this kind of publishing, something like what you are doing now, publish their school projects online. (Participant F2)

Participant D2 also expressed interest in allowing her students to create and submit their History projects online, since the students have been given the opportunity to 'use a computer to do their project report'.

> What you are doing is very good, I am very sure the ICT coordinator likes this project. She needs contents for her digital resource centre. This project can contribute in History [subject]. (D2)

Conclusion

This study produced three main results. First, it offers important insights on History subject teachers' conception of digital libraries, perceptions of the initiative to develop a collaborative digital library for History projects, perception of its potential use and how it fits within the general curricular goals in general, and history education in particular. Research findings have proven that using technology in education facilitates teaching and learning irrespective of subjects. Second, the results indicate that the teachers are taking an interest in the Internet and digital resources, and they are not exclusively negative in their judgments of the possibilities of digital libraries. The findings revealed the application of digital libraries even to the teaching of History, which is believed to be very rare. Third, the general impressions on assessment of teachers' readiness indicate that the History subject teachers in this sample are not fully ready to collaboratively build the digital library. The interviews indicated that teachers take two possible opinions on how to spearhead the digital library project; either

1. train them how to integrate Internet use in their History instructions, or
2. let students loose to use their own initiative by instructing them to use Internet resources in digital libraries and contribute to the initiative by publishing their project reports in the digital library system.

This case study has also shown that access to Internet technology in schools does not always result in use and may not guarantee enhanced instructional practices if teachers' ICT competencies are limited and their comfort level in using the Internet is low. The extent to which teachers embrace ICT innovation and change is limited as they have no clear direction on how to integrate the Internet into their History curriculum. Their ideas on integrating Internet into the classroom activities are limited to searching and using web resources for school projects and students assignments. This lack of progress with ICT integration will affect sustained use of all technology in the classroom, including digital libraries.

For teachers in this study, willingness to use digital libraries is related to their perceived personal competence using the Internet technology. The teachers are not aware of and have not used digital libraries before, although they 'seemed' to have an idea what digital libraries are. However, they were willing to be trained to integrate the Internet into classroom teaching. They see the value of digital resources and online publishing for their students. Teachers foresee that it is possible for their students to work in the digital library project as many of the students are ICT literate. The teachers in this study were either unable to teach students how to use the Internet, or felt that that they did not have to shoulder the responsibility for doing so. As their ICT skills are rather limited, they will play the role of a facilitator, making sure that their students have the resources and scaffolding that they need to carry out the project. The findings of this study also emphasize the need for digital library tools to be easy to use, save users time, have demonstrable value, and fit into existing contexts, while not adding complications to teachers' heavy workload, otherwise they risk not being adopted by the majority of users.

Acknowledgements

The researchers would like to express their thanks to the teachers who found the time to participate in this study and to the school management for supporting their involvement. We would also like to thank the Ministry of Education Malaysia for enabling the research to be undertaken and the Ministry of Science, Technology and Innovation for granting a research grant No 04-02-03-0208 EA209, as well as the anonymous referees who made constructive suggestions for changes that have improved this paper.

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