INDONESIAN TEACHERS' USE OF THE INTERNET FOR LEARNING

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Abstract

The increasing permeation of the Internet into daily lives gives cause to study the role of the Internet in classrooms. The beliefs of teachers about the Internet are a twenty-first century phenomenon that impacts the teaching and learning process of Indonesian students in the classroom. Consequently, it is necessary to know the views of teachers about, and practices with, the Internet. Though Indonesian teachers view the Internet as useful for both personal and professional uses, pedagogical awareness for uses by and with students in the classroom appear limited. There is evidence that an increased understanding of the potential of the Internet for students to construct knowledge and benefit from the capabilities of the Web 2.0 environment is needed.

Introduction

An increased diversity of students in primary classrooms has resulted from widened access to and use of the Internet (Thrupp, 2008). Digitisation has changed the nature of time and space, resulting in deterriorialisation and disintermediation of learning (Brabazon, 2016). Learning is no longer limited to the territory that is the school, and teachers are no longer the sole source that mediates learning. Students come to school knowing that information is readily accessible if they have access to the Internet and the World Wide Web (WWW) and that they can control the process of accessing information and self regulate their learning. This process has seen teaching described as a chaotic and messy business (Mishra & Koehler, 2008). Contemporary teachers work with this chaos and mess to support students in making sense of that which needs to be learned. One way to support students is to use digital practices including the Internet, meeting students in a learning space with which they are familiar and they see as modern (Mojica-Casey, 2014). However, where there are gaps between student and teacher use of and knowledge of the Internet, pedagogical conflict may arise.

Much use is made of the Internet socially in Indonesia (Asosiasi Penyelenggara Jasa Internet Indonesia [APJII], 2015). Predominantly, Internet use by children occurs away from the school. Indonesian students reported

that their teachers use a range of information communication technologies (ICT) at school, but student use at school is limited, particularly in elementary and junior secondary schooling (Palekahelu, Hunt, & Thrupp, 2016). In this context, this study examines the knowledge of and views of Indonesian elementary teachers about the Internet and the uses made of the Internet in the classroom, enabling answers to these questions to be formed:

1. How do Indonesian elementary teachers view the Internet?
2. What use do Indonesian elementary teachers make of the Internet?

Conclusions from this study can inform school managers, education systems and teacher educators about ways to implement and manage the Internet for learning and directions for professional development for teachers, Indonesian education system policy and programs, preservice teacher programs and teacher practices.

Literature Review

Diversity in contemporary classrooms originates in differences between students and differences between students and teachers. Digitisation of our lives as one source of this diversity has its roots in beliefs about, access to and use of the Internet. There are differences between students based on access and more importantly, use of and the nature of Internet use. The diverse nature of students in our classrooms is partially determined by the size of the gap between students of the amount of use of the Internet at school and at home (Thrupp, 2008). The complexity of this diversity is deepened by the difference between knowledge of and use of the Internet between teachers and students. Misalignment between teacher and teacher knowledge of the Internet can create pedagogical conflict, resulting in the needs of students not being met. This study is interested in the extent of and nature of alignment between student and teacher knowledge of and use of the Internet as demonstrated by teacher use in the classroom with students in Indonesia.

Important to research related to education in Indonesia is acknowledgement that Indonesia is a highly populated country (in excess of 250 million people) with highly diverse communities across 17,500 islands. Given this, research on education is generally limited in its potential to describe Indonesia as a whole. For example, there is a considerable gap between education and Internet access between Java and the provinces of eastern Indonesia. With respect to the research, it is necessary to have this in mind when viewing the connectivity of Indonesian schools, Indonesian teachers and Indonesian students. This provides the context for investigating the degree of transition to ICT and the Internet by teachers in learning and teaching in Indonesia. Further, there are two aspects to teachers and the learning and teaching process: teacher knowledge and teacher pedagogical practices.

Internet Access in Indonesia

Indonesia is a connected country with the nature of connection being mobile and social in nature. This is evident in a report by APJII (2015), stating that the vast majority of Internet users (85%) conducted online activities using their mobile phones. Fewer than one in three respondents went online using a

laptop computer, desktop or tablet. Use of these devices with the Internet is synonymous with social media use.

Children of elementary and secondary age access the Internet to connect with others and to access a wide range of information. Internet usage in Indonesia represents the third highest number of Facebook users in the world (Marketer, 2015): 50-80% of users in 2011 were between the ages of 15 years and 30 years (Waizly, 2012); 88.1 % of users access Facebook using mobile phones. School use of the Internet is less than home use, suggesting the home environment to be a richer ICT environment than the school. A study by Palekahelu, Hunt and Thrupp (2016) in Central Java indicated that 50% of students in elementary, secondary and vocational schools have Internet access at home. However, use at school is considerably less with 50.1% of students using computers at school either one or more times a day or two to three times a week, and only 37.3% of students in primary school using the Internet either one or more times a day or two to three times a week. Despite less use of the Internet at school, students exhibit a positive attitude to the use of ICT in learning. High mobile phone access and hence Internet access provides an alternate lens with which to view this usage data. Connectivity is a socio-cultural artifact of students currently attending school in Indonesia. As such, contemporary students view use of the Internet as modern (Mojica-Casey, 2014) and therefore, an appropriate element of their learning, even though this may not occur at school. This assumption goes some way to supporting Brabazon's (2016) claims that learning for Indonesian students is deterritorialized and disintermediated in that they learn independently of school in a mobile environment.

The differences between student and teacher beliefs is the focus of this study, investigating teachers and Internet use in the classroom. The other partner in the classroom environment, the teacher, experiences a different connectivity: 25% of Indonesian teachers in a study by Son, Robb, and Charismiadji (2011) claimed to have a computer connected to the Internet at home. In viewing the competencies of Indonesian teachers with ICT, the list includes use of word processing, email, and Web and multimedia programs (Palekahelu et al., 2016; Son et al., 2011). While some use is evident, the World Wide Web was rarely or never used by 52% of teachers. This lack of usage increased for other uses of the Internet.

ICT and Teachers in Learning

The use made of the Internet and its capacity is at the heart of understanding teachers and their use of the Internet for learning in the classroom. The benefits of incorporating technologies into teaching and learning in Indonesian schools has been recognised for some time. In 2002, Yuhetty argued for the integration of technologies into school education in order to build the international competitiveness of the nation. However, it is the pedagogical framework around the use of ICT that creates the advantage for learners (Harendita, 2013; Mishra & Koehler, 2008).

The SEAMEO Regional Open Learning Centre (SEAMOLEC) report of 2010 suggested Indonesian schools are in the emerging or applying stage of access

to ICT infrastructure, and resources in schools are at a low level. Supporting this, Oncu, Delialioglue, and Brown (2008) observed that ICT were not integrated in the learning process. This continued to be the case in the work by Cahyono and Mutiaraningrum in 2016 where they suggested that the use of ICT in teaching is not evident in many places in Indonesia. However, Baubeng-Andoh (2012) stated that there are factors at many levels that discourage Indonesian teachers from the use of ICT in schools while Maknun (2013) highlighted that skills for using the Internet for learning are different from those for social purposes. Disparity in some reports is in the definition of use for learning and teaching. In 2011, data showed that while 80% of Indonesian schools had access to the Internet, only 39% of teachers used ICT during the teaching and learning process (Harendita, 2013). On the other hand, 49% of teachers claimed to use a computer for teaching purposes, and 38 % claimed to use Web sites to supplement learning/teaching (Son et al., 2011). Students in Salatiga reported a wide use of ICT by their teachers (Pakehalu et al., 2016). What remained unclear about teacher use of the Internet is the nature of use; the Internet as a resource for teachers in preparing for learning in the classroom as compared with an interactive use between teacher and students during the learning process.

Further reasons have been suggested for the limited use of ICT by Indonesian teachers with students. These include teacher resistance (Harendita, 2013) and lack of skills (Son et al., 2011). In their research, Son et al. found that teachers indicated factors such as limited access to facilities (77%), limited time (49%), limited access to the Internet (45%) and lack of computer skills by teachers (37%). The Education Sector Analytical and Capacity Development Program (ACDP) (2015) study of ICT in Papua reported lack of access to computers and the Internet as a major barrier to ICT integration and use. Maknun (2013) suggested that the preparation of teachers was another issue.

Pedagogical Issues

Effective use of the Internet has been demonstrated to provide new approaches to the teaching and learning process. Given recent research, the pedagogical issues of teachers and the Internet are twofold. Harendita (2013) suggested that the complexities around teacher resistance relate to pedagogical issues, specifically pedagogical conflict. This conflict can be subdivided into two issues. Firstly, there is teacher identity, as it is required to transform into new cultural contexts such as the digital environment. Secondly, alternative pedagogies related to the use of ICT in the classroom conflict with past classroom approaches (Harendita). Teachers cling to approaches that they assume have always worked for them. The implication here is that the pedagogical shift enabled by the Internet is too extensive for some teachers. Organising the learning processes that use the Internet requires teachers to think differently and manage unlimited content (Maknun, 2013). This requires a pedagogical shift, the heart of disjuncture of teachers and disadvantage for students.

In summary, the use of connectivity evident generally in the community is not reflected in classrooms. Further, the use of the Internet in Indonesian classrooms is highly inconsistent in extent and nature. This study investigates

the context of this inconsistency in use for learning and emphasizes differences between social uses of the Internet and educational. The study of possible pedagogical conflict for Indonesian teachers has a worthwhile role to play in informing the way forward.

Research Approach

The Internet is a social and technological phenomenon, and the use thereof for learning is an educational phenomenon. Consequently, studies that investigate teacher use of the Internet and, in particular, teacher use in the classroom, serve to reveal aspects of that phenomenon. This study developed from earlier research with Indonesian elementary students on their beliefs about the Internet (Relmasira, Hunt & Thrupp, 2016); a keen interest in the alignment of student and teacher beliefs developed. From this, an interest in the views of and uses of the Internet by teachers developed into this study, examining the phenomenon of Internet in the classroom. Harendita (2013) suggested that teacher's voices are often not heard and that the issue of Indonesian teachers and ICT, in this case the Internet, are often seen from the perspectives of policy makers or administrators. Subsequently, the design of this study aimed to hear 50 elementary teachers from one district in Central Java set in urban and peri-urban settings around Kota Salatiga talking about their use of the Internet. An element of the survey used a Y chart graphic organizer, previously used with Year 6 students. The Y chart format (Hunt, 2015; Relmasira et al., 2016) enabled participants to reflect upon the look, feel and sound of the Internet. The accompanying survey questions elaborated upon the use of the Internet in a range of settings and a range of purposes and finally, the use made of the Internet in the teaching and learning process. The survey was presented in the national language, and teachers responded using their national language. Data had both quantitative and qualitative elements.

Results

The quantity of data collected from each question varied greatly as participants answered only questions of relevance to them.

Demographic Data

Participants were teachers with varying years of teaching experience from local schools in Salatiga, Central Java. They have a range of experiences with the Internet with an average of less than eight years experience.

Beliefs About the Internet

Data providing views on the Internet were drawn from the Y chart and cross-referenced with items from the survey. There were 34 responses to the Y chart that asked, what does the Internet look like, sound like, and feel like. Dominant beliefs were grouped as follows: knowledge and information, use in problem-solving, and balancing negative and positive aspects of the Internet. The first of these three beliefs, relating the Internet to knowledge and information, was the strongest. Twenty responses focused on the Internet being information or *full of data*. The words information and knowledge were used interchangeably throughout. Comparisons with books were frequent, being able *to dig up information*. An emphasis of the capacity of the Internet

was expressed, *Internet helps us to know everything.* Further responses posited the richness of the Internet and its providing a *window to the world*. *Because of various knowledge we can easily read the world. Very wide; very complete; like a window to the world* but a wind*ow that defeats books.* The second concept of the Internet as being of use in problem-solving was evident in some responses. This was elaborated by, *where there is the Internet, there is a solution.* Further elaboration of jobs being easier related to the ability to access the Internet *wherever and whenever.* The third belief related to the negative/positive aspects of the Internet. Awe and astoundment were balanced by negativity. This was evident elsewhere in the survey where responses expressed fears related to *pornography*, *children seeing pictures they shouldn't* and the need to *use the Internet wisely*. The benefits were well enunciated in expressing *usability* and *making life complete*. See Table 1.

Table 1

Beliefs About the Internet: Y Chart Data

The Internet Is	Of Use in Problem-Solving	Negative/Positive Aspects
access new information, broaden our knowledge, find information, variety of information, negative information, helps us know everything, can get answers, Internet feels like knowledge, the abbreviation for Internet, sounds like knowledge Internet = knowledge	making jobs easier, feels easier the Internet is able to facilitate/expedite jobs	sweet, spicy, Nano-nano candy that has a variety of taste, fun, goosebump, awesome, scar, sometimes bitter

Beliefs expressed also integrated some misconceptions in defining the Internet. Some responses suggested it to be a box or an object rather than a network of networks. No responses showed an understanding of this concept of the Internet. Despite this, there was strong agreement about the usability and usefulness of the Internet.

Usefulness

A Likert scale was used with participants to elaborate upon the usefulness of the Internet for learning. Participants used a 5 point scale from *Not very useful* to *Very useful* with regard to their view of the Internet at home and at school. This corroborated their beliefs of the Internet *being of use in problem-solving* and *making jobs easier* as shown by the Y chart.

While specific responses regarding usefulness for learning were rare in the Y chart, the data from the second item demonstrated a strong positive response in contexts, both home and school: 38 out of 39 responses stated the Internet is useful to very useful for learning at home with a similar figure for usefulness for learning at school. This was strongly supported by open-ended responses in a later item where 11 out of 24 participants used words like *useful,*

necessity, helpful, learn to add information about the Internet. Despite this, data related to use for preparing learning for classes showed a clear balance between rare use and regular use and was not consistent for all teachers.

Further questioning about the use of the Internet provided useful insights. Use at home or school dominates, with little use evident in other locations. Even those teachers who identified the Internet at home to be very useful made limited use of it for their role as teachers. Personal use dominated the time spent on the Internet. Use at school appeared less than that at home, but maximum use in this context was directed at preparing for the teaching and learning role.

Barriers to Use of the Internet for Teaching and Learning

One question specifically asked about the extent to which professional development, access to the Internet, cost of the Internet, Internet safety, access to computer/tablet or mobile phone and teacher ability/competencies would be a problem for using the Internet for teaching and learning. Generally, it was evident that all of these ideas would be *a slight problem sometimes* or *sometimes a problem*. Very few participants identified any of these issues as a *large problem*. The responses about access to computers were consistent with data from other questions. Of 50 participants, 41 indicated that computer equipment in the classroom was useful to very useful for access to the Internet. A similar number indicated that computer equipment in the classroom was useful to very useful for children accessing the Internet for learning. However, responses related to Internet safety are not consistent with open-ended responses about the Internet that clearly identify concern about the extent of dangers the Internet posed for children. These responses are demonstrated in specific concerns with *pornography* and *violence* and the need to *guide children* and *block negative sites*.

Among participants, 38 indicated that their ability/competencies could be problematic on a continuum from slight to large. Participants identified themselves as users of the Internet, but only one response outlined lack of competency. This data, however, has to be compared with other data that suggest a limited knowledge of the capability of the Internet, its scope of facility, and its potential for learning. Thus, a holistic view of the data posits concern. Participants appear not to know what they do not know about the Internet, especially its more recent developments. Consequently, ability/competencies is revealed as a barrier to the use of the Internet in the teaching and learning process. Further, this suggests that Indonesian teachers are unable to identify the professional development programs they need.

Further Issues with the Internet

Open-ended responses asked participants to *add other information you want us to know about you and the Internet*. Responses to this item strongly reiterated the negative aspects of the Internet and the need for care when children are using the Internet. This was strongly balanced by the usefulness of the Internet in relation to information, knowledge and learning resources. Two new themes became evident in this data: communication and

building/broadening networks. Participants indicated that the Internet presented the ability to *communicate faster* and *easily*. Related to this is the ability to *make friends/build a network* and *as a bridge to broaden my netw*ork.

Discussion

Misconceptions about the Internet, its structure and purpose, result in ineffectual engagement with the Internet, especially so, when discussing and implementing the teaching and learning process. The key outcome of this study shows little evidence of Technological Knowledge (TK) (Mishra & Koehler, 2008), this being knowledge of technologies and how they work and work together. Further, but to a lesser extent, there is little evidence of Technological Pedagogical Knowledge (TPK) and Technological Content Knowledge (TCK). The first, TPK, is the use of technology to implement different teaching strategies. The second, TCK, is knowledge of subject matter and how technology is used to engage with information. The use of TPACK (Mishra & Koehler), that is the integration of TK, PK and CK is a succinct means of summarizing the findings of this study. While this study did not begin with the intent of investigating Technological Pedagogical Content Knowledge (TPACK), the findings suggest the lack of TPACK at the heart of the use of the Internet by Indonesian teachers. Teachers in the study demonstrate little evidence of current technological knowledge about the Internet, and little knowledge of how to use the Internet for learning.

This study identified strongly held teacher beliefs that the Internet is useful, predominantly providing information readily. There was reasonable evidence that use of the information from the Internet is thought to provide a global perspective, well beyond that provided by books. This has strong correlation with the study by Maknun (2013). Searching for and locating information is the main purpose of the Internet at home and at school. There was evidence that the teachers generally valued the Internet for their personal learning and the contribution to information for lessons and materials for use in the classroom as in the study by Son et al. (2011). Alternate uses of the Internet and the WWW were not identified; once again, this was consistent with the work of Son, Robb and Charismiadji.

The focus of participants in this study with the Internet as a source of information appears aligned to the ideas embedded in Web 1.0. This would be considered a limited capability with the Internet and WWW. The Internet since Web 2.0 has provided considerable opportunities for creating and constructing knowledge with information (Johnson, Adams, Becker, Estrada, & Freeman, 2015), visual and graphical interfacing, apps and free programs for CAD work and differentiated means of communication. In many spheres of education, this has been recognized as having great potential to connect students with people, places and processes for learning (Hunt, 2015). Web 2.0 has provided the facility to use multiple Web resources to locate, manipulate and create products, providing teachers and students with a process for thinking with information to create knowledge as opposed to searching for information. These aspects of the Internet were not evident as themes in the data from this study.

Pedagogical practices were not evident even though the teachers identified sufficient equipment was available. It could be assumed that, if use with children were to occur, it would focus upon searching for and locating information, this being the dominant use made by teachers and their acknowledged belief of the purpose of the Internet. This study supports the finding by Cahyono and Mutiaraningrum (2016) that the use of ICT in teaching is not evident in many places in Indonesia. This requires further investigation, and it can be concluded that there is some misalignment between student and teacher capability with the Internet and the WWW.

Indonesian teachers suggest that classroom ICT facilities provide little barrier to the use of the Internet for learning; this needs further investigation. While teacher judgment of adequacy of ICT facilities aligns with their beliefs about the Internet and pedagogical approaches to connectivity in the classroom, this may need to be reviewed as Indonesian teachers build knowledge and capacity of how Web 2.0 and Web 3.0 technologies can impact on learning and use by students in classrooms. Once this learning is established, teachers may change their judgment as to future requirements for ICT in the classroom.

Conclusions

In answering the research questions, it can be concluded that Indonesian teachers view the Internet as a highly useful source of information and that use of the Internet is to locate information for personal use and for presentation by the teacher in the classroom.

This study raises concerns for the professional competencies and capabilities of Indonesian teachers with the Internet. Teachers identified minimal problems with this as a barrier to use of the Internet for teaching and learning purposes. In contrast, however, responses across the survey indicated limited knowledge of the capacity of the Internet generally. This knowledge of the Internet combined with limited pedagogical knowledge in relation to use of the Internet by students for learning in the classroom was evident in this study.

Further investigation is required to evaluate the capability and competency of Indonesian teachers and the Internet. This study indicates a Web 1.0 mindset, limiting the effectiveness of connectivity in the learning and teaching process. The evident weakness in Technological Knowledge (Mishra & Koehler, 2008) as shown in this study results in issues with Technological Content Knowledge and Technological Pedagogical Knowledge. Consequently, it provides direction for professional programs for teachers and the content of programs for future teachers in contesting currently held beliefs about the Internet and its contribution to the learning and teaching process. Beliefs and values guide the professional practices of teachers.

Shaping beliefs and values for currency in a new cultural context is essential to national development (Harendita, 2013; Yuhetty, 2002). Teachers have clarified their role as presenters of information and the font of knowledge for students. When this is compared with a TPACK view of the teacher's role with the Internet, there is a strong possibility of pedagogical conflict. This

could well be the challenge for school and system leaders as they move toward ICT strategies in education for the nation.

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