Establishing a community of learners: the use of Information Technology (IT) as an effective learning tool in rural primary or elementary schools

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The computer is, in some ways, my hands and feet. It even gives me wings to fly to other countries and far away places. (Moraitis 1999, p.44)

This paper is not meant as a treatise on the use of IT in education, in particular rural primary/elementary schools. However, as the title suggests, the paper does want to open up for discussion some of the following issues.

1. How is IT being used or might be used as an effective learning tool in school education, and rural primary/elementary schools specifically?
2. What are the barriers, if any, to this effective use in schools?
3. Is it possible for one or two knowledgeable IT users in a school to make a difference or should schools examine the prospect of creating communities of learners in IT, and finally,
4. Is it a worthwhile exercise using IT as a learning tool, considering the cost, in an attempt to break down the hypothetical isolation and lack of access to aspects of education that supposedly their urban counterparts take for granted?

This paper will touch on some of these themes but no attempt will be made to fully explain or cover all the literature on any of the issues. Comment from both practicing teachers and academics are welcomed.

Academics and politicians such as Hatton & Elliott (1998) and Sidoti (2000) respectively, have raised the issue of the inequities faced by students and teachers in rural Australia. A similar picture occurs in many countries overseas to a greater or lesser extent. Admittedly there is some contention about whether rural students are disadvantaged versus their urban counterparts. Whatever the reality, it is often argued that many students suffer the dual problems of ineffective teaching/learning and isolation from real life learning experiences. The question of equity may be seen to be significant if it is discovered that the use of appropriate technologies and strategies to assist student learning in fact do assist the learning chances of these rural children. The tyranny of distance from large centres can often be a negative factor in a child’s education.

I was reminded of the possible use of IT to overcome some of the problems of isolation on a research visit to a small one-teacher school in North Western NSW [Australia]. This school was two hundred kilometres from the nearest rural centre of any consequence. This small rural centre was in turn nearly a thousand kilometres from the state capital. The students at this small isolated school, with the aid of a brilliant young teacher, were using new technologies to give them ‘wings’ to fly to other places and to use Information Technology (IT) as a tool to improve their learning. This visit started me thinking. Could IT be used as an effective tool in rural primary or elementary schools [and other schools for that matter] to enhance the learning of the students and the professional development of their teachers? I apologise for the rhetorical question but it is one that I, and from the literature, many others, have been trying to answer for some time. Following visits to twenty other rural schools of varying size, from 1997 to 1999, I believed that there might be great possibilities to enhance student learning, but that many challenges had yet to be overcome.
Background

Since 1997 we have seen thousands of computers ‘rolled out’ to schools throughout much of the more technologically advanced nations. Some Singapore schools are reported to have two computers to every child (Houston 1999). The Apple Classrooms Of Tomorrow (ACOT) schools and those such as ‘River Oaks’ in Canada (Smith 1999a & b) have made major changes to teaching methods, curriculum and obtained huge resources to implement IT. The reality is that the use of Information Technology is increasing exponentially and that schools are just part of that incredible growth. The current position in many schools is posed by Roblyer, Edwards and Havriluk (1997, p.v) who contend:

Everything has changed so quickly, in fact, in education and in society at large, that it is often difficult to determine just what is happening and what response is required of us. We teachers stand before technology as we would a mirror. What we see is determined largely by what we are and what we consider important. (...) We may see something else, something novel and original, capable of making possible the unimagined and undreamt-of - an agent of reform, change and progress.

The question posed by Roblyer et al (1997) is relatively simple. Given the proliferation of new technologies into schools, and the enormous expenditure of resources on the implementation of IT, how do school communities ensure the most effective use of Information Technology (IT) as a learning tool for their students? For the purpose of this discussion I have taken the position that IT involves all computer-assisted learning, including the use of multimedia, the Internet, digital cameras and other new technologies that are emerging in schools. To assist in narrowing the focus I am mainly concerned with this issue as it affects rural primary or elementary schools. Additionally, I don’t wish to dwell unduly on the argument of the relative merits of the use of IT in education (Rosen 1993; Sava 1993; Newhouse 1998). No doubt much of what comes out of this discussion will have relevance to a broader educational field.

According to May (1999) very few school communities and managements appreciated the problems associated with the introduction and use of IT. Whilst she was speaking mainly from an Australian secondary or high school perspective, her views are supported by many others (Sandholtz, Ringstaff & Dwyer 1997; Smith 1999a & b; Wilsmore 1998 & 1999). What became apparent to myself at least, from a reading of the research and literature, was that whereas individuals could make an impact on the introduction and use of IT, it required support from all community members for the vision to become reality. As Sergiovanni (1994, p.202) so clearly put it:

No one person can pull it off. Community building asks a great deal from everyone. It asks, for example, that principals, teachers, and students care for each other, learn together, inquire together, and share together….

My investigations over the past few years into the use of IT in NSW schools and the leadership role of the principal support his view, not just on leadership but on the whole process of introducing and supporting the use of IT in schools.

The context

While the implementation of IT in schools has been going on, schools have been dealing with shifts and changes in management, staffing, professional development and curriculum. Of significance is devolution in the area of curriculum. Hackbarth (1997) argues that curriculum must change to support the new technologies. Smith (1999a & b) also contends that without the ability to radically change curriculum structures at ‘River Oaks’ [Smith’s old school in Canada] that very little real use could have been made of the emerging technologies. The strict curriculum controls at a state level in many Australian states make any radical change problematical.

The development and use of IT in the wider community has also arguably had a significant influence on the timing and importance of the implementation of IT in schools. This development and use, coupled with changes in education policy surrounding the introduction of IT have all influenced schools to a greater or lesser degree, depending on individual circumstances. According to Jones (1996) technology on the one hand might ensure better economic equity, freedom of choice and an active democracy. On the other hand, he contends that it might increase the prospect of widening the gap between the rich and poor, the institution of a technocracy and the chance of democratic goals becoming irrelevant.
An Australian Bureau of Statistics media release [No. 152/99, December 20 1999] on ’Internet and Internet Purchases Continues to Grow’ showed that 48% of all Australian households had a home computer in August 1999 and nearly 23% of all households had home Internet access. In the previous twelve months 5.6 million Australian adults accessed the Internet. Adult Internet access was nearly evenly divided between work and home with slightly more access at work then at home. Finally the greatest users were the 18-24 year age group. More recent statistics both in Australia and overseas would paint an even more startling picture of the use of computers and the Internet.

Certainly, there is little question that technology has changed many of the ways we live our lives. The media report that automatic tellers are fast replacing the face to face banking system and Internet banking, although in its infancy, seems set to gather an increasing market. Computerised robotic arms and machines have replaced thousands of workers in the motor industry. Even our motorcars are now filled with complicated electronic wizardry to automatically open and lock doors, open windows and almost tell the car how to operate. We have been ‘seduced by the force’ of technology. Education, however, appears to have lagged behind. A visit to many classrooms would show they are little different from the sixties, with computer technologies often restricted to computer laboratories and specific sections of the libraries (This was obvious from my visits to many other schools in rural NSW).

There is little doubt that the current Australian state governments and the NSW government in particular have poured enormous financial resources into computers in education both in the field of hardware, Internet access and training for almost one third of all teaching staff in NSW government schools (Mawson 1998). According to Mawson (1998) other states have also followed suit. And so the picture continues similarly in other states and territories. Overseas the trend is similar as McKenzie (1999, p.1) argues:

Schools across North America are rushing to network. Governments and corporations hasten forward with grant support, advice, encouragement, pressure, and products. The Internet is sold as the bridge to the future, and the ‘wired’ school is all the rage. Access to the Information Superhighway becomes a priority. For some it becomes an obsession. Bill Gates has compared the rapid development of the Internet to the Californian Goldrush of 1849.

Despite these advances, many teachers and academics believe that IT is not being used effectively in schools and in particular, rural primary/elementary schools. One reason offered for this lack of effective use of IT is teacher orientated.

Teacher professional development

The technophobia of teachers and principals is well documented. Pagram (1996, p.6) goes further noting that teachers are to some extent one of the major problems behind the successful introduction of the technology revolution in schools. He argues that:

Having the students more technologically literate is a situation that many technologically illiterate teachers find hard to deal with and it is a situation which will occur more and more...they (the govt.) are acknowledging the biggest stumbling block to the use of technology in education, teachers.

Parker (1997, p.15) is just as explicit.

Unless teachers have integrated technology into their classroom practices children learn little more than how to play educational games and work a simple word processing game...meanwhile the TILT (Technology in Teaching and Learning) will only get to 15,000 out of 54,000 teachers.

Parker further argues (1997) that what is needed is effective professional development of all teachers. Sandholtz et al (1997) also contend that principals need to give teachers time to continue professional development in the area of IT and that little is accomplished in one-shot workshops. The 1999 MACQT report (The Ministerial Advisory Council on the Quality of Teaching Report, NSWGAC, Australia) of the NSW government still regarded adequate professional development as an issue and many contend that in 2001 it is still a major issue. Bill Gates (1999, p.3) puts this into perspective. He suggests that the winners and losers in the business and wider community of the future will depend on: ‘... How you gather, manage, and use information’. Gates (1999)
further argues that education is vital to this process of gathering, managing and using information. This view is reinforced in an even more dramatic fashion by Parker (1999, p.26) who contends:

Unless we get it right for the future we will see, increasingly, people who are banished to the ‘new techno-coated Dark Ages’.

A community of learners

Boyle (2000) argues that for real learning to take place in schools the establishment of effective learning communities is crucial. This view is supported by many leading educators, for example, Hill (1999), Caldwell (1997) and Sergiovanni (1996). According to Retallick (1999) educators should be building communities to challenge bureaucratic structures and thinking. He further argues one of the most effective ways to do this is the idea of a learning community.

First, Retallick (1999) argues that if teachers accept that their everyday work experiences offer a chance to learn then they are on the way to establishing a leaning community. Second, he contends that because the learning is informal it is not always perceived by teachers to be professional development. He concludes this argument by suggesting that professional development can encompass many forms of learning, including workplace learning. When examining workplace learning as a means of professional development he suggests the following are of great importance (1999, p.117-119):

1. The context in which schools and teachers are situated was found to have greater significance than any other single factor
2. The nature of the innovation/change. For present purposes an innovation is defined as a ‘product’ and change as a ‘process’. (…) The nature of the product and/or process is an important factor in what and how teachers learn, as is the question of who initiates the learning, i.e. teachers themselves or others.
3. The teacher as a person and learner
4. The situation of teaching
5. Learning resources and support
6. System recognition and reward
7. The culture of the school.

Cocklin (1999, p.267) furthers the idea of learning community by suggesting that:

The notion of community adopted here is one of working together, wherein difference and even contestation are valued, and which places particular emphasis upon the everyday lived reality of the school context.

Cocklin cites Kleine-Kracht (1993, p.392) to add weight to his argument, who contends that the old concept of educational hierarchy and bottom down learning are replaced in a learning community by the following concepts, that is:

Our traditional concept that teachers teach, pupils learn, and administrators manage is completely altered. In a community of learners, everyone is about the business of learning, questioning, investigating, and seeking solutions. The basis for human interaction is no longer a hierarchy of who knows more than someone else, but rather the need for everyone to contribute to the process of asking questions and investigating solutions.

It is my contention that the technophobia (Hoare 1998) of an aging teaching profession exacerbates the issue of the effective use of IT as a learning tool in schools. Maddux et al (1997) suggests, however, that fears that computers or other technologies will replace teachers is unfounded and that rejection on these grounds by teachers is misplaced. They further contend that many teachers are either unwilling or unconvinced that the use of technology will improve student outcomes. The establishment of an effective learning community might be one way to counter this technophobia.
Rural Education

Sidoti (2000, p.3) suggested that, on the available evidence, ‘rural and remote children are generally disadvantaged in comparison with their urban counterparts’. He went on to argue that this was often reflected in poorer performance by many students. Piller (1992) contends that despite great advances in technology rural schools are still in trouble. The rural schools lack the skills or funds to maintain the technology. They also lack access to training so that IT might be used successfully to bridge the gap. Collins (1999) suggests that a way of overcoming some of these problems is by community development.

According to Gibbs (2000) schools that can identify and teach the skills to interpret the mass of information available through technology that can improve learning will provide learning that prepares them for life and a future of change. Newhouse (2000) argues that many teachers lack knowledge and expertise in implementing the use of computer technologies and suggests that one possible way is by utilising a roster or group work. He further contends (1999) that through proper use they might extend cognitive abilities and are a flexible resource. In my opinion this could well compliment a constructivist and collaborative approach to learning. Ewing et al concluded that the STARS (Superhighway Teams across Rural Schools) project in 1996 illustrated that the use of technologies supported by adequate human resourcing could make a difference in rural schools. Allen et al (1995) also argued that their report illustrated that IT can reduce the tyranny of distance and disadvantage in rural areas. It is time to grasp the nettle. Finally, Bork (2000, p.74) might give us food for thought on this issue when he suggests:

Better learning for all emphasises learning, not teaching or educating. Learning can be much more effective, both cognitively and affectively, than it has been in the past and is now. It can occur everywhere and at any place.

Conclusion

This paper has opened a discussion on the possibility of creating better educational outcomes for students in rural primary or elementary schools by effectively utilising Information Technology (IT) as a learning tool in these schools. A preliminary argument has been advanced that one of the best ways forward to accomplish IT’s effective use is by the creation of a community of learners. This community of learners may overcome problems of teacher professional development and the technophobia felt by some teaching staff and principals. Below are the summaries to the on-line discussion. These summaries will be followed by some concluding remarks on the subject by myself.

Summaries - Leslie Henrickson

No 1.

IFETS Discussion Digests 212-215. The responses below include both the challenges to this assumption and variations on how best to present a positive use of IT in education.

Overview This paper has opened a discussion on the possibility of creating better educational outcomes for students in rural primary or elementary schools by effectively utilising Information Technology (IT) as a learning tool in these schools. A preliminary argument has been advanced that one of the best ways forward to accomplish IT’s effective use is by the creation of a community of learners. This community of learners may overcome problems of teacher professional development and the technophobia felt by some teaching staff and principals. Q1. How is IT being used or might be used as an effective learning tool in school education, and rural primary/elementary schools specifically? Dennis Nelson commented on the use in the classroom: IT’s current use is too narrow and this reduces its most positive. He suggests that IT has potential from day one to promote an alternative way of looking at the world that is more holistic, integrated and reflects interdependence between humans and our world. For example, the use of GIS software can connect students to worldwide problems and relate that to policy issues, as well as, relate this down to the personal level of students to see how and what impact they can have.. Mike Zenanko commented on the use by teachers: A recent study in Alabama, USA showed that 94% of teachers have a computer on their desktop, 92% are connected to the Internet. Teachers use computers for record keeping, research and class presentations. PowerPoint (87%) and hyperstudio (13%) are being used to make classroom presentations. Most schools (54%) are using Accelerated Reader and some CBI software (Plato, A+LS, Writing to Read, Cornerstone, Pathways, etc.). Gary Miller commented on one particular application of IT to expand learning beyond the classroom: The use of this on-line mentoring tool expands the walls of the classroom into the real world. http://www.telementor.org. Q2. What are the barriers, if any, to this effective use in schools? Marshal Anderson comments on the perceived view of teachers as barriers to effective
use: He believes that teachers cannot be isolated out as barriers because they do not have much input into the development of IT in education. He suggests that the politicians and corporations have not included teachers in the development of IT enough. This exclusion has been profit motivated. The barriers are not the teachers per se but that there is no agreement on fundamental issues like what are the aims of the community, what methods might be used to achieve them etc. A second barrier issue was the impact of consistent curricular practices. The view on this varies from country to country. Des Wilsmore of Australia notes the devolution in the area of curriculum may stand as barrier to effective implementation. Anderson Of UK notes that there the curriculum has become more centralized over the last 15 years. Whereas, Des would argue that the curriculum should change to meet the new technologies, Marshal believes it to be the other way around. Michael De Nola and Peter Hill were in agreement with Marshall. De Nola presents a cautious view toward unreflective change for change sake. He raises concerns about losing site of fundamental ability to distinguish actual reality and virtual reality. This is all the more relevant due to the scale and rate of exponential change that is unsettling and leaves one with a feeling of inadequacy. Hill agrees, commenting that the original quote from Des referred to the workplace and not schools. He note particularly for HE that those developing interactive and online systems often seem to place those systems at the centre and fit the teaching and learning stuff around the outside. The curricular consistency barrier is compounded by poor IT software design and, therefore, awkward incorporation into the curriculum. It goes both ways. Poor software that doesn't capitalize on the power of the electronic medium. Poor implementation because of using a traditional format with a new technology. For example, Gary Miller notes the new e-book devices that are glorified page turners. None of them take advantage of the new features that a book can have if it is electronic, such as non-linear progression, branching stories (like "choose-your-own-adventure" books), or recorded progress and certification. He observed similar trends with instructors using video cameras for classroom training rather than short, well-scripted pieces. A third barrier is general human nature. Dennis Nelson makes the general comment about human nature that change is unlikely unless people see their unwillingness to change as more dangerous than changing their current living patterns. A fourth barrier is the need for more money and more training. Software is a continual cost, upgrading or hardware acquisition and maintenance. Q3. Is it possible for one or two knowledgeable IT users in a school to make a difference or should schools examine the prospect of creating communities of learners in IT, and finally, Des posed the question about having one or two local IT experts who may make a difference. There seems to be agreement that experts can and do make a difference. Though, most responses focused on how the Internet provides local users expertise and expert networks, and on that this does not seem to be a problem that will persist into the future. Dennis Nelson promotes the idea that schools should create a worldwide community of learning mentors, if nothing more than an elaborate network of these kinds of lists, white boards, etc. Muhammad Betz illustrated this point with an outline of the MERLOT resource that is on-line, free and open for faculty and students. (see http://taste.merlot.org/). This is a project that establishes learning communities on the WWW focused on higher education. These comments were primarily about creating a community and expert network on line that facilitates creating a community in the classroom where resources and expertise are shared electronically. The refinement of this project over time typifies what the Web can be for educators: instead of an information landfill, an accessible library of high quality curricular and instructional resources created by a community of educators from all over the world. Mike Zananko suggests that the need for one or two local experts may be a non-issue in coming times as a recent survey shows that 70% of the pre-service teachers have their own or have use of their family's PC. The number of teachers that have trouble with computers are declining. Q4. Is it a worthwhile exercise using IT as a learning tool, considering the cost, in an attempt to break down the hypothetical isolation and lack of access to aspects of education that supposedly their urban counterparts take for granted? The most direct response to this question came from Dennis Nelson. He focused on the social costs of implementation, not the hardware/training costs. There are three social costs: conformance, non-conformance and lost opportunity. While business oriented, the costs have a social dimension. The social value of conformance is the means of learning how to work together on new visions, value of non-conformance as the loss of networks and connections that keep a system in place and the value of lost opportunity is immeasurable, assuming a positive outcome. These interpretations are from the perspective of someone promoting IT in education. But, Nelson cautions that these social costs may have a negative side, i.e. workaholics, accumulation of things not relationships. One way to counter-balance the IT network costs is through community building through the network and not one or two local individuals.

No. 2
IFETS Discussion Digests 216-219. The format I'll follow is to summarize some main points under the four originating questions posed by Des. I will follow up with some guiding questions. Des's intention was to take the positive position that IT in education is beneficial. Several responses challenge this initial assumption. The responses below include both the challenges to this assumption and variations on how best to present a positive use of IT in education.
Overview

This paper has opened a discussion on the possibility of creating better educational outcomes for students in rural primary or elementary schools by effectively utilising Information Technology (IT) as a learning tool in these schools. A preliminary argument has been advanced that one of the best ways forward to accomplish IT’s effective use is by the creation of a community of learners. This community of learners may overcome problems of teacher professional development and the technophobia felt by some teaching staff and principals.

Q1. How is IT being used or might be used as an effective learning tool in school education, and rural primary/elementary schools specifically? Muhammad Betz noted that there was a learning community in the US called Marco Polo that had a corporate sponsor. The MarcoPolo program provides no-cost, standards-based Internet content for the K-12 teacher and classroom, developed by the nation's content experts. Online resources include panel-reviewed links to top sites in many disciplines, professionally developed lesson plans, classroom activities, materials to help with daily classroom planning, and powerful search engines. This community has a strong teacher training component as well. (see http://marcopolo.worldcom.com/index.shtml) Betz notes that often in the US it's the rural schools with more technology and that internet programs such as this help to foster true learning communities. Mike Zenanko responded that many teacher education programs in general are making thoughtful, but slow changes in teaching advanced technology to students in their methods courses. Overall, the change is positive and he sees the teachers in the Colleges of Education as pushing the envelope on this front. John Laurie raised the issue that we require new pedagogical practices. His comment is a call for and reminder to bring imagination into the process of developing the new communities. "In the context of education and technology and gives some clue that creating effective learning communities is not just about applying what we already know, but enabling the imaginative process to thrive, in both student and instructor. Not only do we have to develop a new pedagogy for IT, but also an understanding that the language of on-line learning and the enabler of imagination on-line is context rather than content. Q2. What are the barriers, if any, to this effective use in schools? Stephen Downes picked up on Laurie's idea noting that too often the use of new technologies to do old things and don't think about pushing the envelope of what the technology can do, not just pushing the envelope of what the teacher can do. "A new technology opens the door to new methodology, and that a development approach which does not take into account the enhanced capacity that technology brings is one which is doomed to failure, because new technology is almost never able to do old things as efficiently or effectively as old technology." Similarly, Nettleton emphasized that the environment and the subject are changed simultaneously. He drew on a biological metaphor of complex adaptation in higher education if HE is to survive. "The implementation of new technology methods cannot take place without the system around it adjusting to the intrusion of this new organism Bill Ellis reiterates the theme that we do need to accommodate our practices to our technologies. Historically, the educational system was used to transform society from one form of production to another, e.g. agrarian to industrial. We are in the midst of a new transformation and our technologies should fit the age not the other way around. Q3. Is it possible for one or two knowledgeable IT users in a school to make a difference or should schools examine the prospect of creating communities of learners in IT, and finally, No responses seemed to directly address this question. Q4. Is it a worthwhile exercise using IT as a learning tool, considering the cost, in an attempt to break down the hypothetical isolation and lack of access to aspects of education that supposedly their urban counterparts take for granted? No responses seemed to directly address this question.

No. 3

IFETS Discussion Digests 220-223. The responses below include both the challenges to this assumption and variations on how best to present a positive use of IT in education.

Overview
This paper has opened a discussion on the possibility of creating better educational outcomes for students in rural primary or elementary schools by effectively utilising Information Technology (IT) as a learning tool in these schools. A preliminary argument has been advanced that one of the best ways forward to accomplish IT’s effective use is by the creation of a community of learners. This community of learners may overcome problems of teacher professional development and the technophobia felt by some teaching staff and principals.

Q1. How is IT being used or might be used as an effective learning tool in school education, and rural primary/elementary schools specifically? Danilo M. Baylen addressed the modified question: Is it necessary to establish a community of learners to ensure the effective use of IT in rural schools? He offered three reasons why a community is essential. First, because humans are social beings and community provides connection to what is meaningful. Second, communities for support for learning. Third, a community opens up the individual to a wider worldview. He did not go into IT or rural schools specifically. Q2. What are the barriers, if any, to this effective use in schools? Brent Muirhead comments that the main barrier to effective use in the US is lack of teacher training. The administrative structure fails to adequately prepare teachers to use the equipment. The hardware is all in place but there is the absence of consistent technology instruction for teachers has created an unnecessary barrier to creating relevant technology applications. He notes the inconsistency between demands on teachers and the training supplied. The American public has high expectations for their teachers. Yet, they are often not willing to provide the basic resources for them to effectively do their jobs. Richard Daddio makes a
similar observation that the having the hardware is not enough. While Brent suggests that teacher training is the
problem, Richard steps back further into the philosophy of education claiming that we need to rethink our whole
philosophy of education, learning and teaching. For example, at a K-6 public school in New York that is wired to
the hilt and all teachers given new equipment. Yet, he notes that all the equipment in the world will not engage
students in higher level thinking skills without first examining our state standards, district instructional goals, our
the teaching and learning model now employed in the district and what role technology plays in the educational
process. We are convinced without a fundamental change in the way teachers provide daily instruction, our
technology expenditures will not be justified. The outcome here was the staff development time and curriculum
development went hand in hand and some real changes began to happen on this campus with this learning
community. Marshal Anderson commented on the difference between provision and use in the UK and probably
as bigger gap between 'use' and 'good use'. He cites three reasons why this is so. ICT needs to have media
exposure, to get in the news, to get on the map for it to gain legitimacy. ICT needs to be integrated into student's
learning experience. Software development is not well understood and seems to be at the whim of changing
policy winds. Bill Ellis emphasized the philosophy of learning, education and teaching, like Richard. It seems to
me that the whole concept of "integrating technology into curricula" is wrong headed. It assumes that curricula
thinking is right and technology has to be fitted. Not only the technology but the whole philosophy of education,
new social needs, current brain research on how we learn, as well as the new technology suggest that it is time to
think deeper and go to the roots of WHY we learn, HOW we learn, and WHAT we learn. He notes that the role
of school is to transform society from one stage of production to another. But, we are in uncharted territory now
with the information age and this forces us to have to rethink our philosophies. Before we try to make our
teacher "computer literate" we need to take the time to explore more deeply the many ways computers could be
used to fashion a learning system for the Information Age. We have to think outside of the school/teach/educate
box and envision the worlds that could be in a cyberage. Q3. Is it possible for one or two knowledgeable IT users
in a school to make a difference or should schools examine the prospect of creating communities of learners in
IT, and finally, Danilo M. Baylen addressed the modified question: What form should this community take and
who should lead, monitor, mediate it? He posed a series of guiding questions: What's the purpose? Who are the
stakeholders? What are the expected outcomes? How do we get there from here? Maybe these are the questions
that we need to ask ourselves before we decide on the form of the community and roles that community
members need to take to make it happen. Q4. Is it a worthwhile exercise using IT as a learning tool, considering
the cost, in an attempt to break down the hypothetical isolation and lack of access to aspects of education that
supposedly their urban counterparts take for granted? No one really addressed this question.

Concluding remarks

Despite a divergence of views on some issues there was consensus on the problematical implementation of IT in
many rural schools. The idea of establishing effective learning communities gained widespread support with a
variety of options offered. There was, as expected, some disagreement on whether rural schools are more
disadvantaged than their urban counterparts but there was enough support to suggest it is just not an Australian
phenomenon. Finally it is my belief that by establishing effective learning communities in rural schools that ICT
can play a big part in improving educational outcomes for rural students. Much more research needs to be done
in this area to clarify all the issues.

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