

A Review of *Permissible Computing in Education, values, assumptions, and needs*

***Permissible Computing in Education: Values, Assumptions, and Needs*, Ragsdale, R.G. (1988), New York, Westport, Connecticut, London: PRAEGER P 285.**

**Seitebaleng Susan Dintoe
Memorial University of Newfoundland, Canada**

Research has shown that there are challenges associated with the various uses of computers in education from an educational technology perspective (Dintoe, 2018; Lockhard & Abrams, 2004). Ragsdale (1988) showed that the successful use of computers depends on the willingness of education institutions (schools, colleges, universities, or other organizations), faculty, students/learners and parents to work collaboratively to meet common goals. Although Ragsdale wrote *Permissible Computing in Education: Values, Assumptions, and Needs* in 1988, this book review discusses its value and relevance in terms of current educational technology use for pedagogies. Ragsdale's purpose in this book was to "make explicit some of the value bases that support the various uses of computers in education" (p. vii). He argues that the assumptions that science and technology should be seen as 'value-free pragmatism' in terms of using tools and procedures for work are partly true. He further notes that values and needs are influenced by the use of science, emphasizing permissible things, such as computers in education, might not be beneficial or constructive. Therefore, the purpose of this book review is to discuss how the ideas in Ragsdale's book relate to the current literature on the use of computers in pedagogies and the strengths, weaknesses and/or areas not identified, or those that are identified but not discussed in detail in the ten chapters.

In this book review, I will start by providing brief background information about the author. Then, I will summarize the main ideas in the ten chapters, alongside evaluations, critical analyses supported by other sources, and conclusions. Although Ragsdale's book was published in 1988, it is valuable and relevant to the current use of technology such as computers in pedagogies.

BACKGROUND INFORMATION ABOUT THE AUTHOR

Dr. Ronald G. Ragsdale was an Associate Professor at the Ontario Institute of Studies in Education (OISE), University of Toronto, Department of Measurement, Evaluation, and Computer Applications. He was active in computers and education for 25 years. Ragsdale's main interest was in evaluating the impact of computers on the educational process. He wrote two books in 1982 and 1983 on computers and taught courses on the research and development of educational technologies. One of the books he wrote in 1988 was "Permissible Computing in Education: Values, Assumptions and Needs", which will be reviewed here. Ragsdale was the editor-in-chief for the Canadian Journal of Education and was pre-eminent in his developing field of study, but, unfortunately, he passed away on April 18, 2011.

SUMMARY OF THE MAIN IDEAS IN EACH OF THE TEN CHAPTERS

In the first chapter, the author discusses computer applications and education: measurement and evaluation. He defines and investigates the relationship between computer applications and the current consequences of values and assumptions regarding computers. In addition, he analyzes the relationships to make recommendations for future computer applications in educational

settings. He argues that the prevailing values regarding computers support the use of computers in education. Thus, computers are value-free, where the available structure and/or resources are used to complete a job. He further noted that assumptions such as the absence of moral absolutes or absolute moral values that guide scientific thinking and research are partly true.

The focus in the second chapter relates closely with chapter 10. "It focuses on determining what is to be done and deciding if it has in fact been done" (p. 25). The author notes the process involved in developing a needs assessment and conducting formative and summative evaluations. His views concur with the literature on the importance of understanding learners and their environment before designing instructional materials for pedagogies (Smith & Ragan, 2005). On page 32, the author discusses the evaluation of the use of computers through the cause and effect model and states that the introduction of computers in schools has had certain results. He suggests replacing causality with 'mutual simultaneous shaping', meaning that "everything influences everything else". According to Ragsdale (1988), needs, candidates as stakeholders, and critical competitors, are steps in assessing computer needs in education to determine influential factors. Critical competitors are competing needs, and refers to searching alternatives in using computers, ideas that are discussed further in chapter 10, pages 240-243.

Chapter three is interesting because it focuses on identifying the benefits of computer use and human needs. Ragsdale (1988) links this to the issue of "equity" and "equity to concepts such as fairness, impartiality, and injustice" (p. 47). Ragsdale states that computers can be used for teaching and learning if they are of benefit to the user. The user could be an individual teacher, learner, organization or parent at home. In this regard, Ragsdale argues that the strengths or benefits of computers and human needs or weaknesses are not likely to be satisfactory. In this regard, computers are influenced by technology; the software, hardware and tools change all the time and these influence the need of humans to use the technology. Therefore, "the successful search for 'equity' and the determination of its attainment depends on the careful use of needs assessment and evaluation techniques" (p.69). An interesting question he asks is "how does equity affect the evaluation of computer applications in education?" (p.69).

A question that should be asked is: Are computers or educational technology beneficial or harmful to society? Ragsdale (1988) in chapter four defines computers from an 'Artificial Intelligence' (AI) context, as "computer processes and techniques that stimulate human intelligence, to learn more about human intelligence itself and to improve the operation and increase the independence of computers" (p. 72). Research can inform the answer to the question of whether the use of AI in education is beneficial to current technology use for pedagogies.

Ragsdale (1988) in chapter five focuses on courseware development, definitions, and needs in relation to discovery learning. He describes the difference between formative and summative evaluations and touches on areas of research on courseware that are discussed in more detail in chapter ten. O'Shea & Self (1983) note that he defines courseware as "the set of programs and associated materials for a computer-assisted learning course" (p. 269, in Ragsdale, 1988). Ragsdale (1988) further notes that computer programs are used for instructional purposes.

According to Ragsdale (1988) the process of courseware development is often referred to as Computer-Assisted Instruction/Learning (CAI or CAL) or Computer-Based Instruction/Learning (CBI or CBL). Computer-Managed Instruction (CMI) is used for supporting the teacher. Ragsdale acknowledges various key authors in his book such as Skinner (1984), who argued that courseware for discovery learning delays the acquisition of learning. On the other hand, Salomon (1984) argued that it involves a lack of mindfulness. However, Dreyfus & Dreyfus (1984) identified five stage models of skill acquisition as a process from novice to expert. The novice first has to learn rules and recognize features, then advanced beginners begin to add some situational knowledge to the rules and features, develop competence marks, which leads to development of proficiency and

finally, expertise. The views on the process of moving from a novice to an expert, especially in the use of computers, align well with Rogers' (2003) concept of the 'normal linear process'. Rogers argues that the adoption and diffusion of technology progresses in a linear stage from innovator to laggard and the adoption and diffusion of technology innovation is a step-by-step process where the expert as an innovator will collaboratively teach or work with the beginners as laggards. Reid (2006) supports this view in a study that used Rogers' Diffusion of Innovation theory and concluded that the rate of adoption differed due to demographic experiences. Similarly, Dintoe (2018) notes that some faculty are experienced, while others are learners in the use of technology for pedagogies.

Ragsdale described courseware and needs through seven potentials and limitations. For example, he notes that learning is active, and varied sensory and conceptual modes are developed. Thus, learning involves less mental drudgery and more independent learning. The limitations, noted by Ragsdale include: computers can only supplement conventional learning, not replace it; it is hard for teachers to use (complex) tools; courseware development is becoming more sophisticated; and nobody as of yet understands how computers should be used in education. Luehrmann (1980) claimed that due to continual technological changes, computer use was becoming complicated and sophisticated for users such as teachers and students. Further evidence cited by Newhouse, (2001) who conducted a study using the Concerns-Based Adoption Model (CBAM) as a framework, concluded that staff were unaware and lacked interest.

Ragsdale noted that, "courseware development is not an appropriate task for an individual but for a team of people" (1988, p. 109). He further states that this development occurs through theories based on models or instructional design such as Gagne's Instructional Design. This development goes through a process from needs assessment through communication of the team approach for the same goal.

The purpose of formative evaluation is to attain set goals and identify side effects. This is done during product development to give feedback on problems, gaps or side effects to make improvements where necessary. However, Scriven (1981a, p.145) described side effects as "unintended good or bad effects of the program or product being evaluated, at times ...not part of the goals". Side effects are like simulations that are determined by assumptions, and influences the study outcome. The discussion also looked at arguments on micro-worlds' negative effects on novice learners, as they encourage discovery learning.

Furthermore, Ragsdale noted that a summative evaluation is performed after a formative evaluation as a form of product evaluation. It describes the ideal model composed of checkpoints: benchmarks, needs assessment, product assessment, and identifying critical competitors (see Ragsdale, 1988, chap. 2, p. 42; Mann, 1998). In addition, these lead to performance testing, locating features, the estimation of operational costs, setting standards and proving overall synthesis. There is need for research on CAI. On this note, factors that impact the adoption and diffusion of technology use in teaching and learning in the current literature are noted such as students not accessing materials posted online, faculty's fears about using technology, technology users being different (as experts and beginners), and a lack of infrastructure (Dintoe, 2018).

In chapter six, the author cites different authors and describes the relationships between programming and writing. For example, Kerniham & Plauger (1974) note that the failures associated with computers are the fault of those who teach programming and writing. Although there are common elements, Schneider (1984) argues that programming has errors that cause faults in written documentation. Furthermore, English & Edwards (1984) note that the teacher should know the audience through the program, to organize ideas into an outline or design and revise it well until it flows. Ragsdale argues that computer literacy is a term that must be specifically defined based on needs and critical competitors. Here, Ragsdale means that computer literacy will

influence why, how and when people are using computers. Computer literacy is a topic that has been researched by several authors (Mehran, Bahman, Mohamadredza, & Mohsen, 2015; Simona, 2016).

It was noted that literacy in linguistics and in computers involves the communication of ideas, and while writing is flexible, programming is explicit. The understanding of linguistic literacy was meant to enhance teaching of computer literacy in the area of programming. Ragsdale's definition of programming was taken from *The New Webster's Computer Dictionary* (1984), which states that, "it is the process of converting a problem specification into a sequence of instructions to be executed by a computer" (p. 253). He further noted that computer literacy involves coding, storing, and planning to schedule. Writing also involves communication, planning, feedback and/or debugging. According to Ragsdale, "Programming was said to be a specialized writing called school writing" (p. 253). Olson (1988) argues that school learning changed the cultural values of learning from a focus on oral knowledge to computer explicit knowledge. He further notes that students are expected to write explicitly; for example, an essay sentence must have one idea, and the student should use explicit rather than implicit language. Therefore, four major aspects of writing and programming processes were identified: style, planning, writing, and revising/debugging (Ragsdale, 1988, pp. 134-143): Weinberg (1971) also mentioned egoless programming, a goal-free approach, and summation and/or formative approaches for feedback.

The purpose of chapter seven is to consider aspects related to students; what they are, what they should or might become, ways in which they might move from one condition to another, and how these aspects of students affect and are affected by various types of computer applications. The author noted that the explicit and implicit benefits of computers are less clear for students to acquire. He further emphasized that students differ in their strengths and needs, and thus educational philosophy needs to make clear whether computers should be used in schools at all. Lockhard & Abrams (2004), through a study conducted from 1983 to 1995, found that failures in computer use by students occurred because specific goals and objectives were not set. When stating that 'education caught the tiger by its tail', Luehrmann (1980) meant that the teacher's authority over students to guide them was very important to avoiding the ineffective use of computers in classrooms.

Therefore, based on the above emphasis, Ragsdale (1988) identified four different types of students for whom computers might be beneficially applied:

-) First, the 'empty students' who will need more assistance on certain skills. This means that computer tutoring with teachers is best for these students to meet their information needs.
-) The 'searching students' who are in need of less direction. They need a proper environment for learning as they employ "discovery learning" to use the computer as a tutor; for example, the LOGO environment (pp. 103, 146 & 165). The logo environment is where students use computers to do things on their own through a discovery learning process. The author notes that, "there is a world of difference between what computers can do and what society will choose to do with them" (p 166).
-) The 'creative students' who need tools to facilitate creative work. They use the computer as a tool; for example, they use word processing to write an essay or graphics to create artwork.
-) Finally, there are 'social students', a term which applies to all types of students. They need peers and the world to solidify their learning. For example, they benefit from likes through Facebook and chartroom interactions with friends or teachers.

The author argued that from the university and business viewpoints, computer literacy should be encouraged to avoid the misapplication of computers. Use should be based on evaluated needs

with critical competitors and the environment in which the work is to be done (Ragsdale, 1988, p. 185).

The author in chapter eight noted that the influence of parents and the church over school-age students is declining. Students spend most of their time watching TV alone or interacting with one of their parents. This has increased expectations around the teachers' role in schools. The expectations for the teachers' role has also increased their workload through computer use as noted by Mann (2006) who applied the 'Phase Theory'. In this regard, Ragsdale (1988) identified the following types of teachers based on their expectations, which are influenced by their computer use and/or by students' use of computers (p 188).

-) The first type of teacher is the 'theoretical teacher', whose main goals are setting high expectations for teachers. For example, teachers are expected to discipline and get students engaged in various school activities. On this aspect, the author noted the heavy workloads and job satisfaction of teachers.
-) The second type is the 'dispensing teacher', who uses Programmed Instruction (PI) such as CAI to dispense information to students. The author argued that this practice still increases the teacher's workload. However, Papert (1980) earlier counter-argued that the workload of the teacher would be reduced because students learn on their own through 'discovery learning'.
-) The third type is 'the guiding teacher', who uses Computer-Managed Instruction (CMI) to manage course work, class grading and/or record keeping (Ragsdale, 1988, p. 195). It was noted that classroom and curriculum control are activity centered. For example, one-to-one student computer use allows them to concentrate more on the computers and experiment with them. Therefore, the teacher's guidance will be needed as noted by Luehrmann (1980).
-) The 'collaborating teacher' assigns students work they do not know how to learn from, and teaching takes place through joint learning (collaborative) and/or peer tutoring.
-) The 'professional teachers' value changes and are involved in innovation processes, thus the teacher's workload is affected by many factors in the school system. These factors include commercial organizations, specifically in computer production and sales, administration such as principals in schools, and the students' level and need for use of computers. This is an area for evaluation based on previous and current technology use for teaching and learning.

Chapter nine focuses on the parents' role. The author argues that, computers add another level of confusion to parents' role in their children's development at school and in other parts of the society (Ragsdale, 1988). Children learn language and values from their parents, which they then implicitly apply in their learning (Bowers, 1988). Ragsdale's point here is that parents at home are expected to assist their children with school activities. He further noted that computers are a solution for parents in assisting in their complex roles. Therefore, he identified four roles for parents: 'parents as a value source', as values are threatened by technological change; 'parents and classroom' involving them with school activities; 'computers at home', which isolates parents from their children with some health hazards; and, finally, 'parents, students, teachers and computers' to build a possible beneficial relationship.

Ragsdale in chapter 10 argues that the differences between teachers and students make it difficult to analyze computer use in normal classrooms. This concurs with the literature; for example, university teachers were not able to use technology as expected because students were not using it to access materials posted online for their learning (Dintoe, 2018). In addition, teachers have different experiences in educational technology use (Dintoe, 2018). According to Rogers (2003), the adoption and diffusion of technology in the social system is more effective when adopters are

different. Ragsdale further noted that, “teacher development on computers is still unknown” (p. 226). Faculty and teacher professional development and training is an issue noted in several studies (Dintoe, 2018; Dlamini & Mbatha, 2018; Thomas, 2008; Totolo, 2007). Therefore, the purpose of this chapter was to consider some of the implications for “teacher development and the teacher’s role in research” (page 225). The most informative section in this chapter is the plan for teacher development. The author discussed the process of determining goals, assessing needs, changing curriculum objectives and implementing strategies by identifying needs and critical competitors for effective computer adoption in institutions of learning. However, current research has noted that teachers (university faculty and schoolteachers) have acknowledged challenges in educational technology use, although education systems offered them professional development and training (Dintoe, 2018; Muianga, Barbutiu, & Hansson, 2019; Singhavi, & Basargekar, 2019). For instance, faculty felt that despite support through professional development and training they were not given enough time to practice what they have been taught at workshops and seminars (Dintoe, 2018).

EVALUATION

Ragsdale published this book in 1988 with a specific focus stated in each chapter that relates to the overall goal. The overall goal was to make explicit some of the value bases that support various uses of computers in education. This goal is clearly achieved as is evidenced through the studies conducted before and after 1988. Ragsdale applied the key adoption and diffusion of technology supported by research that are still relevant in the current period. For example, the author argues that the interaction among students, teachers and parents is decreasing, as computers are increasingly used at home and at schools. In schools, students are motivated by the methods used and applied in schools, not in media (Clark, 1983/1994). This was evidenced and supported by Bernard, et al., (2004) through a meta-analysis study that found conventional and distance learners do not perform differently. Kozma (1994) counter-argued that media motivates learners, meaning that instruction is the method, which influences learning rather than technology as a media. It was further argued that as media and methods influence students’ learning, there is a high possibility that learning will be individualized through Computer-Aided Instruction (CAI) (Noble, 1998, Bork, 1980). However, Bates (2000) noted that technology is used in universities for mass production. Ragsdale’s argument concurs with the views in current studies through a student-centered concept, where learning is individualized, and the teacher becomes a facilitator.

The author discusses some possibilities, particularly with regard to the issue of computer literacy. Ragsdale (1988) notes that for computer literacy to be effective, relationships between students, teachers and parents should be established to meet the same goal. According to Rogers (2003), a social system does not operate in isolation, as it meets the overall goal based on the individuals and resources used, while operating within the system to work collaboratively with people and technology. Generally, Ragsdale’s (1988) view is that children should be educated together with teachers and parents, with the computer used as the tool for the collaborative work in this relationship. However, the author argues that there is a need for students, teachers and/or parents to be computer-literate. He argues that needs and critical competitors determine computer literacy. What he means here was that needs and critical competitors should be identified for the effective and efficient use of computers. Authors like Paper (1980), support the idea of computer literacy, but Ragsdale’s argument is on the importance of needs and critical competitors. Computer literacy is important in pedagogies, and if this is lacking, it means that teachers and learners will have some challenges in using technology for teaching and learning (Dintoe, 2018).

The most interesting fact about this book is the methodology and empirical studies cited in it. The author uses empirical studies to support his arguments in chapters one to ten. For example, on page 190, a study conducted by Goodlad (1984) with over 27,000 participants concluded that, “although teachers are capable of effective teaching, they often do not use these practices regularly

in the classroom” (p.190). The author has used multiple methods in collecting data including qualitative and quantitative approaches with critical, feminist concepts, and he discusses the statistical significance on page 255 under the appendix section. Although the methodology, literature review with key authors and analysis are well discussed, the author mentions copyrights, but does not discuss in detail. Copyright is one of the most important concepts in educational technology when it comes to determining who owns what and how material should be shared for example, when developing teaching and learning materials (Mann, 2008).

The book is well written from chapter one to ten. In chapters one to six, the identified facts on the effectiveness of computers in education are stated. Then, the ideas in these six chapters are elaborated in chapters seven to ten. The application of ideas in these chapters relate very well compared to others on the same subject. For instance, one of the arguments, by Salomon & Gardner (1986) cited in Ragsdale’s (1988) book, is that computer researchers “should avoid asking which technology teaches better: TV or computer?” Salomon and Gardner noted that computers and TV are different in their usage, and this concurs with Ragsdale’s views that the needs and strengths of users are different as a computer can be a tutor, tool or tutee. For example, on page 237, in showing the differences, he discusses assessing the needs of teachers who are teaching about computers, teaching through computers and/or teaching with computers. Ragsdale (1988) refers to the same concept of tutor, tool and tutee discussed by Taylor (1980). The other example is the notion of complexity and isolation and/or the health hazards of computer use by students. This refers to teachers’ workload in classrooms when computers are in use, as was argued by Mann (2006) through the application of ‘phase theory’. According to Bork (1980), students are isolated from their parents and/or teachers and do not attend to them when interacting with the computer. The studies based on the Concerns-Based Adoption Model (CBAM), for example, by Newhouse (2001) showed that there was high concern by teachers around computer adoption. The other study that used Rogers’ Diffusion of Innovation theory as a framework, Soffer, Nachmais and Ram (2010), concluded that Learning Management Systems (LMS) tools were used and adopted by faculty at a higher rate due to the training offered to them. The most relevant and interesting study was a survey conducted by Glenn, D’Agostino & Johnson (2008). The participants of the survey were 289 executives, out of which 189 were from higher education and 100 were from corporate settings. The survey respondents were from the U.S. (154), Europe (69), Asia-Pacific (43) and from the rest of the world (23). The results showed that “online-collaboration tools, software that supports individually paced learning, and Learning-Management Systems (LMSs) are among the communications technologies most expected to improve academics over the next five years” (p. 3).

In the book review, I discussed how well Ragsdale’s book relates with previous and current studies. The arguments and claims made by the author in this book are convincing. However, while Ragsdale mentions the concept of copyright on page 223, he notes that ‘the use of tool programs such as word processing and consideration of the ethical questions relate to computer use, including software copyright by parents’. He does not present detailed arguments and views about the concept of copyright in computer use in education. Mann (2008) argues that ‘Players is the Thing’, meaning that whoever uses materials must acknowledge or have the authors’ agreement. Furthermore, Ragsdale’s (1988) arguments on teacher-student-parent use of computers as a tutor, tool or tutee influenced the authors of computer programs, but he does not discuss this issue further in relation to educational technology in the context of copyright on ownership.

My personal experiences and expertise in educational technology use are from a research, teaching and learning context. I have studied and worked in this field. My work experiences were through research, teaching using learning management systems (LMSs) with an expectation for teachers (university and schools) and students to use technology. The context in which I was teaching was a university in a developing country, and educational technology use was a challenge due to a lack of infrastructure, policy development, professional development and training for

teachers (Dintoe, 2018). In addition, I worked as a program coordinator, where educational technology and computers were compulsory and important for use by faculty, staff, and students. For example, distance learners were not able to use technology due to the factors described above. Similarly, and surprisingly, although computers were available on campus, the traditional students did not use them for the purposes they were meant. Similarly, the technology used in education was changing frequently (new tools and software were developed), which was even more challenging. I also taught in a Canadian university context. I taught a graduate course that was offered fully online. It was through these experiences that I developed my interest in the field of educational technology, conducted research, and published in peer-reviewed journals. In this regard, permissible computing from an educational technology perspective, values, assumptions and needs by Ragsdale (1988) are in line with my personal experiences and relevant to the current studies in this field.

CRITICAL ANALYSIS

Direct comments on how relevant and reliable this book is, compared with previous and current studies are discussed below. The main ideas in all ten chapters were summarized and organized based on Ragsdale's (1988) views on students, parents and teachers' use of computers for pedagogies, and forms the basis for the analysis that follows. Social systems like learning institutions cannot use technology in isolation without collaborating with the community at large, including students, parents and instructors, to meet the same goal.

Students and Computers

The use of computers in learning institutions has increased since their introduction in the 1900s (Taylor, 1980). Although this book was published in 1988, it concurs with the current literature because computers are used in schools, colleges, universities, homes, (personal use), and companies (such as hospitals medical records, employee salaries). However, students' use of computers in education, as noted by the author, shows less clear explicit and implicit benefits acquired by students. Ragsdale notes that students differ in their strengths and needs. Therefore, a question raised was whether there is a need for computers in schools due to these differences. This question concurs with the current literature on the importance and need for technology use in teaching and learning (Dintoe, 2018; Mfaume, 2019).

Ragsdale identified different types of students:

Empty students

Ragsdale's (1988) argument was that empty students are those who need close monitoring and help. For example, studies have been conducted to support his argument (Dintoe, 2018). Bork (1980) argued that students interact with computers without teachers through computer-aided instruction (CAI). On page 160, Bork's argument is cited and it is noted that this type of student need is like small vessels to be filled with information by the big vessel, which is the teacher and/or the computer. This point concurs with the literature (Dintoe, 2018). This emphasized the argument claimed by other authors that this type of student using CAI does not exercise their cognitive thinking, for example, as noted by Taylor (1980), in Ragsdale (1988). Clark (1994) argued in support of the idea that *'computers are like delivery van carrying groceries'*. What he meant here is that computers do not have any effect on learning; rather, it is the method used. Salmon (1984), who is quoted in Ragsdale's book, states that the students applied mindfulness when there was no thinking involved. Kozma (1994) counter argued that method and media had effects on students' learning. The meta-analysis studies conducted, for example, by Bernard, et al. (2004), in support of Clark's (1994) claim, concluded that there is no difference between conventional and online

learning. On this note, students need to be allowed to use the computer as a tool for discovery learning.

Searching Students

The author argues that discovery learning is part of a designed environment for learners, for example, to primarily discover the aspects of the LOGO environment. Papert, in 1980 argued that students teach the computer, and this allows them to use their cognitive thinking. This view was counter argued by Salomon (1986) that students are not applying their critical thinking but rather applying their analytical senses of mindfulness. Sardello (1984) noted that in the process of students discovering learning, their behaviors and values change (Ragsdale, 1988, p. 167). Noble (1984), argued that the computer is not empowering students but rather imposing constraints on them. However, studies conducted using Rogers' Theory of Diffusion such as, Soffer, Nachmais, & Ram (2010) concluded that the faculty's adoption and use of Learning Management System (LMS) tools increased due to support from the university. Ragsdale (1988) argued that there are fears of TV replacing children's imagination, so computers have the potential to replace all their mental functions.

Creative students

Taylor (1980) concluded that students could interact with the computer without the teacher's assistance. This was referring to students using computers to find more information. The view was counter argued by Luehrman (1980) who indicated that you could teach the computer and learn from it at the same time. He emphasized the importance of the teacher to guide the students, as they can simply play on the computer and not learn anything at the end of the day. It is therefore important to clearly state the specific use and type of educational technology to be used for pedagogies to facilitate student-centered learning.

Social Students

Ragsdale (1988) argues that all students learn by socially interacting with their environment because they have varied social needs. What he means was that some students prefer group work or peer tutoring. For instance, group and peer tutoring refers to students as programmers or as individuals working alone. Bork (1980) described Computer Aided Instruction (CAI) as the individual contact or interaction of the student with the computer. For example, the student can use word processing as a tool to complete assignments. It was argued from a historical point of view by Olson (1980) that students' implicit knowledge is explicitly beneficial to them through a transformation process, where oral material is transmitted into writing, which then is transformed into explicit information by the computer.

Parents and Computers

Ragsdale (1988) identified types of parents' roles in relation to computers. He argued that the parents' role is complex when it comes to the use of computers. The parents, for example, are threatened by the fact that their values change based on the use of computers in schools and at home. The author meant that the contact between parents and students decreases, as students now tend to focus more on interacting with media such as TV and computers. Bork (1980) and Mann (2009) noted that computer aided instruction (CAI) is used as a form of direct interaction for student-computer use. The other point raised was that when parents are helping students with their work, should parents be computer literate or not? Is there a need for parents to have access to computers and/or own computers at home? Noble (1998) and Bates (2000, 2011) noted that the culture of learning is changing to put a greater emphasis on virtual learning and mass production respectively. They mean that physical classrooms will become empty, and homes will be used as

classrooms. Bowers (1988) argued that implicit knowledge is transformed into explicit knowledge for computer use and noted the argument on cultural change due to computers' effects on learning. The author further noted that the student-parent-teacher-computer relationship should be based on achieving the same goals, supported through government plans, parents' involvement in educational policy development or courseware development, and/or computer training. The author noted teacher development and research as a vital point as far as this relationship is concerned.

Developing Teachers

This section discusses the types of teachers identified by the author in relation to developing teachers and teachers as researchers. He identified teachers as theoretical, dispensing, guiding, collaborating and professional. As all teachers are different, he argues that there are problems in developing them. For example, he states that there are "threats on teachers as there are computers on teachers" (Ragsdale, 1988, p. 228). Noble (1998) argued that technology is imposed in the system from the top down. Administrators force faculty and students to use media. This concurs with the literature (Dintoe, 2018). Administrators enter the business of computer use in education with inadequate preparation, buy computers and they compel the faculty and students to use them. Bates (2000) supported this in chapter 2 of his book, stating that universities are now being run like factories to produce mass products. Further, Ragsdale (1988) notes that teachers are generally fearful of technology use, and are troubled, but love computers. The concept of faculty fearing the use of educational technology for pedagogies has also been noted in a study conducted by Dintoe (2018). The author noted that there are teachers who are experienced in the use of computers and others who are not. Those without experience feel a sense of pressure or imposition. In this regard, training should be based on these facts, as computers can be used for multiple roles such as tutor, tool and/or tutee. He further noted that the lack of formal training could be addressed through 'in-service education', 'graduate instruction' or through research.

Ragsdale (1988) makes a good argument on planning for teacher development. He notes and discusses specific factors in detail from pages 234 to 243. The most important factor is the view on implementation strategies. He notes that needs and critical competitors are the most important factors to be identified in implementation strategies. Mann (1998) notes that critical competitors are evaluators of competing needs. Ragsdale states that "technology (computers), parent involvement, peer tutoring and or typewriters with word-processing be compared to choose the best media to use" (p. 240). One question to ask is what is the best way to teach mathematics, critical writing or physical fitness? The author notes that the most important step is first to identify needs and critical competitors. For example, a study conducted by Lockard & Abrams (2004) states that use of computers among students failed because the goals, objectives and needs were not specified. The students were all equipped with computers, but they played games and did some trial and error not related to the course learning. In this regard, as evidenced by the US 'No Child Left Behind' policy (2002), students' learning decreased. Clark (1994) counter argues, saying that 'a computer is like a delivery truck to deliver groceries'. This analogy supports the view that students are not learning anything rather there is mindfulness as noted by Salmon and Gardner (1986). Students pay attention to their thoughts and feelings without judging them. Professional development and training for teachers was noted by several studies from the developed and developing world education systems. The findings indicate found that teachers are developed and continuously trained, for example, through in-house activities, but teachers do not find this effective. This concurs with the current literature on professional development and training (Dintoe, 2018).

CONCLUSIONS

Permissible computing in education reinforces the factors encountered by teaching and learning institutions, teachers (schools, colleges or universities), students, and parents. Ragsdale (1988) has clearly described the use of technology as having utilized the diffusion and innovation of

technology experts in the field. The list of literature he has used is extensive and thorough. He raises interesting points about computer use and the role of teachers, students and parents as collaborators for successful teaching and learning. Other good points were on evaluating and assessing needs through formative (continuously during learning process) and summative means (at the end/completion of learning), courseware development, programming and writing. The book relates well with both previous and current situations on the use of educational technology such as computers for pedagogies. For those who seek to understand permissible computing in education, values, assumptions, and needs from a perspective of schools, colleges, universities, teachers, students and parents, this book is especially helpful. In addition, this book is useful for readers and experts in this field who are interested in identifying factors that impede the use of technology in pedagogies in current practice.

Ragsdale's (1988) book "Permissible Computing in Education: Values, Assumptions and Needs" is relevant to the current use of technology in education and is well written. The arguments he makes concur with the current literature. Ragsdale noted that there is a need for the collaboration of teachers, students, and parents to work together on the use of educational technology for common goals. Similarly, Rogers (2003) stated that the adoption and diffusion of technology cannot be done in isolation but can work if done through the social system, technology and individual adopters. However, studies have noted several factors that influence the use of technology for teaching and learning (Singhavi & Basargekar, 2019; Dintoe, 2019; Muianga, Barbutiu and Hansson, 2019; Skoumpopoulou, Wong, Ng & Lo, 2018). The arguments and views raised by Ragsdale (1988) concur and the bibliography (literature) he used have direct relevance to the current educational technology and information and communication technology (ICT) used in teaching and learning institutions (universities, colleges, trade colleges, schools, K-12) in the developed and developing world.

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