Teaching Safe and Secure usage of ICTs in South African Schools

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Abstract:

This paper posits that the safety and security concerns while interacting with information communication technology (ICT) devices should be considered as a social skill for school learners. Teaching these concerns specifically to information technology learners marginalises the balance of learners, whom are exposed to same risks regardless. We contend that given the widespread usage of ICT devices, it may be necessary for all learners to be aware of the usage risks of ICTs in general on society. Currently the life orientation program offered by primary schools in South Africa intends to equip learners with the skills and values and attitudes for successful living and learning. The aim of this paper is to primarily survey the learning outcomes within the current life orientation programme and to reflect on how these outcomes may be extended include the safe and secure usage of ICT devices.

1. Introduction

The number of internet users in South Africa grew to 3 million in 2002 and is serviced by over 200 competing Internet Service Providers (Lewis, 2005). In 2005, 10.75 out of every hundred South Africans had internet access and approximately 10 per 100 had a fixed land lines. In South Africa, 37.5 million users, accounting for 75% of active users, perform about 90 million SMS transmissions per day (Longe et al., 2009). With options such as 3G (Third Generation) and GPRS (General Packet Radio Service) which offer access to the internet, it implies that more than 70% of the population have the potential to access the internet. Unlike fixed line internet access, these wireless mobile devices are ubiquitous, affordable and portable. As the growth of the internet users surges so does the profile grow to include children. In an isolated study conducted on mobile phone usage in a lower income area amongst school children, it was found that 97% of the respondents own a mobile phone (Kreutzer, 2009). Given the statistics cited, it can be extrapolated that a large proportion of South African children are interacting with some form information communication technology (ICT) device or at the very least will so in the future. Given the susceptibility of children, it is of paramount importance that their safety and security is ensured whilst they interact with ICT devices. According to McQuade (2007) technological, legislative, and law-enforcement solutions are inadequate towards this end as it is largely an educational problem.

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In general, using technology amongst school children is strongly encouraged as it greatly enhances the learning experience specifically within the South African context. The potential positive effects of computer use by children include enhanced cognitive development, reduced barriers to social interaction, enhanced fine motor skills and visual processing (Straker et al., 2009). However the use of the internet and mobile phones is not only limited to scholastic activities. For example, Kreutzer (2009) found in the school survey that most important uses on mobile phones, were personal communication (91%), entertainment use (82%, including music, photos, videos), websites (71%), and instant messaging (47%). This magnitude of usage exposes children to variety of information security risks. It has been shown that the use of the internet and mobile phones can be exploited as tools for identity theft, e-mail scam, trafficking, sexual exploitation and prostitution (Longe, et.al,2009). It is imperative that children are taught at an early age how to counteract these types of exploitation. In additional to cybercrime, there is another issue of e-safety. Children need to be aware of the health risks involved in prolonged usage of mobile phones and computers. In this paper, we explore the possibility of introducing information security and e-safety to children at primary school level (specifically Grades 4-7) as to protect them from these types of risks.

Currently in South Africa, children, are taught about Life Orientation which was introduced as one of eight learning areas that would be compulsory for all learners from Grade R to Grade 12. Life Orientation is intended to contribute towards the 'holistic development' of South African children (Ferguson, 2007). The authors of this paper promote the notion that learning how to be safe and secure whilst using ICT devices is a life skill and contributes to the 'holistic development' of children. In turn prepares children for real-world challenges posed by ubiquitous usage of technology.

2. Security and Safety Issues

Children are affected by both security and safety issues. The security issues are related to information security risks such as identity theft and computer viruses. The e-safety issues includes information security risks as well as the concerns related to both the physical and mental well being of children whilst interacting with ICT devices, such as carpal tunnel syndrome or cyber-bulling. Cyber-bullying is any bullying behaviour delivered through technology (Atkinson et al., 2009).

The e-safety concerns (Straker et al., 2009, Atkinson et al., 2009) include:
- **physical effects** – such as musculoskeletal discomfort, visual problems and sedentariness
- **content and online interaction concerns** – such as inappropriate content, cyber-bullying, financial security and internet predation
- **personal social impact** – such as withdrawal, and addictive use of computers
- **Identity frauds** – where individuals find their details used for fraudulent purposes.
- **Internet attacks** – encompassing malware, spam, and other types of problems arising from surfing the internet.

- **Social networking attacks** – problems that arise through the general use of social network applications.

In general, the four basic safety and security concerns identified for children as extracted from list provided above using ICT (information communication technology) devices are:
- **Information Security Risks**: These include malware, space, identity theft, etc.
- **Physical Risks**: Musculoskeletal discomfort, visual problems etc.
- **Personal Social Impact Risks**: Withdrawal, Internet Addiction,
- **Interaction Threats:** Internet Predation, Cyber-bulling etc.

Figure 1: ICT Safety and Security Risks for Children

The next elaboration involves inserting these risks (as shown in Figure 1) into the Life Orientation Program that is currently taught at Primary School Level. It is contended that the children need to be made of aware these risks at a younger age to counteract these negative aspects of using computers and mobile phones. According to Berson and Berson (2004), learning about what it means to be a citizen in a digital world where technology has facilitated global connections is of vital importance as increasing numbers of students go online, they require skills to securely and responsibly take full advantage of computers and the Internet.

3.   Reshaping the Life Orientation Programme to include e-safety
The 'unique situation of South Africa as a new democracy and the social problems resulting from years of suppression and exploitation under the previous government (such as poverty, lack of infrastructure and basic needs, as well as urgent health problems), coupled with the necessity of competing in the global market and equipping learners with the skills, knowledge, values and attitudes for successful living and learning, contributed to the creation of this learning area' (Rooth, 2005) named life orienation. The Department of Education in South Africa has been highly responsive in terms of incorporating real-world skills into the school curriculum as there is value in teaching children how to navigate in the real world.

According to the Revised National Curriculum Statement Grades R-9(Schools) by the South African Department of Education (2002) Life Orientation involves:

> "Issues such as poverty, inequality, race, gender, age, disability and challenges such as HIV/AIDS all influence the degree and way in which learners can participate in schooling. The Revised National Curriculum Statement Grades R-9 (Schools) adopts an inclusive approach by specifying the minimum requirements for all learners. All the Learning Area Statements try to create an awareness of the relationship between social justice, human rights, a healthy environment and inclusivity. Learners are also encouraged to develop knowledge and understanding of the rich diversity of this country, including the cultural, religious and ethnic components of this diversity."

According to the Revised National Curriculum Statement Grades R-9(Schools) by the South African Department of   Education (2002) Life Orientation outcomes are at the intermediate phase (Grades 4-6) as described in Table 1 below.

Table 1: Learning Outcomes for Life Orientation in the Intermediate Phase (Grades 4-6)

Learning Outcome 1: Health Promotion
The learner will be able to make informed decisions regarding personal, community and environmental health.
The Intermediate Phase learner further develops investigative skills. Health and safety aspects are, therefore, expanded to include substance abuse. The learner at this age is becoming increasingly aware of his or her own sexuality. Hence, the learner should be nurtured in a sensitive and caring manner, while at the same time alerted to the associated risks.

Learning Outcome 2: Social Development
The learner will be able to demonstrate an understanding of and commitment to constitutional rights and responsibilities, and to show an understanding of diverse cultures and religions.
In the Intermediate Phase, the learner broadens social relationships. It becomes necessary for the learner to understand rights and responsibilities as stipulated in the South African Constitution. The learner should develop a positive attitude and understanding of diverse cultures and religions. The learner should be able to apply knowledge and skills to respond to discrimination.

Learning Outcome 3: Personal Development
The learner will be able to use acquired life skills to achieve and extend personal potential to respond effectively to challenges in his or her world.
The learner is still in the process of self-concept formation, and requires opportunities to develop positive self esteem. The learner relies on feedback, acceptance and positive input from others. The learner needs experiences of success as well as opportunities to develop interests and potential. Peer relations are increasingly important as the learner compares self to others. As the development from pubescence to puberty occurs, the learner needs to be assisted to develop a broader range of life skills.

Learning Outcome 4: Physical Development and Movement
The learner will be able to demonstrate an understanding of, and participate in, activities that promote movement and physical development.
The Intermediate Phase learner is developing greater body awareness and improved body control with confidence and competence. The mastery of movement skills and body control serves as a basis for participation in general movement activities and sport. Social skills become more important as the learner's interest in team activities develops and expands to include co-operation and leadership skills.

Including these real world skills is highly relevant; however as online communities grow recently the concept of real world has become interlaced with one that is, virtual, as well. It would stand to reason that there needs to be additional outcome added to the learning outcomes in the Life Orientation Programming. This outcome should include a learning unit that addresses cybercrime and safe conduct in terms of mobile phones and the internet. However the authors of this paper would like to propose an alternative to this solution, as the aforementioned route will involve retraining and radical curriculum

changes. This will severely impact on the education budget and overburden teachers. It is proposed that the range of existing social learning outcomes be extended to include e-safety and cybercrime. By definition the range statement of a learning outcome 'captures essential related and relevant contextual information for the demonstration of reflexive and repetitive competence' (Gunthrop, 1998). According to the Whole Sale and Retail SETA (2010) the 'range statement/s specify in what context, what situation, what environment, with what equipment and within what parameters learning outcomes are to be achieved. A well-designed learning programme will therefore provide for learning opportunities that will enable learners to achieve the learning outcomes as specified by the range statements.' It is posited that the range of each outcome with the learning orientation curriculum can be extended to include technology context, from social perspective (as shown in Figure 2). We believe that including the technological perspective in the range can provide a holistic viewpoint of the interconnected world that we live in. Indeed, integrating topics such cybercitizenship can, and should, be a natural extension of the social studies and hence does not require teachers to be technological experts (Berson and Berson, 2004).
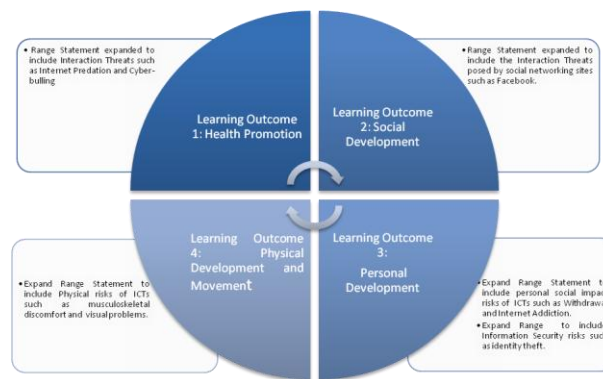

Figure 2: Expanding the Range of each Learning Outcome to account for ICT risks to Children

4. Conclusion

This paper investigated the possibility of including e-safety and information security into the school curriculum. The next step would involve performing a Delphi technique amongst school teachers to gain their expert opinion on how these issues should be addressed and the ideal grades at which these issues should be taught.

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