

Educational Acquisition of Adolescents: Impact of Modern Technology

Mwenda K. Wainaina
Educational Foundations
Great Zimbabwe University Education

Abstract

Today's youth have unprecedented access to modern technology and use them in expected and unexpected ways. Youth spend many hours a day using the technology, and the vast majority of them have access to Internet, cell phones, smart phone, video games and many more. Recent evidence raises concern about effects on academic performance. This chapter provides an overview of the impact of modern technology on the educational attainment of adolescents. The purpose was to examine the relationship between adolescent usage of computers and academic performance. Within the qualitative research the case study design was adopted. Interviews and focus group discussions were the primary tools used to gather data. The study found out that modern technology impacts learning both positively and negatively. Recommendations were made for parents, educationists, the media, and policy makers among others, for ways to increase the benefits and reduce the harm that technology can have for adolescents.

Key words: adolescents, educational achievement, modern technology, media

Introduction

Modern technology has experienced vast expansion in recent years, leading to its extensive use by people from all generations. For a generation of young people, technology has assumed a substantial stake in their social and educational lives. The vast majority of adolescents have access to computers, the Internet, cell phones, video games, and many other forms of modern technology. With the increased role of modern technology in the adolescents' lives has come the increased concern about how children might be affected. Technology is changing process and content to the extent that children today are immersed in a world that abounds with information. The increasing amount of time children spend on modern technology has raised questions about the use of the technology. This chapter provides an assessment of the impact of modern technology on the educational achievement of adolescents.

Background

The evolution of technology has dramatically changed society. An endless number of people all over the world use modern technology. Of the most profound changes in the past decade has been the widespread proliferation of information and communications technologies (UNICEF, 2011). The growth of technology has changed the world, which in turn has changed the daily lives of adolescents.

Dehmler (2009) asserts that children today are growing up in an interconnected, networked world. The youth have unprecedented access to modern technologies and use them in expected and unexpected ways. Teens all over the world are growing up in a world in which the Internet, cellphones, text messaging, television and video games, and other technologies dominate their communication and are an integral part of everyday life. Children are immersed in a world abounding with information (Livazovic, 2011).

While technology is often described as the most important influence upon society, it remains a subject which has undergone little study. Recognizing that technology lies at the very heart of society, this study wishes to investigate its impact on adolescents. Technological advancement is one of the most essential factors for teenagers in many societies. Due to the enormous development of technologies, this era can also be called the Age of Technology. With the purpose of serving in the social, educational, and employment world, technology is becoming the most essential tool. Social network sites, online games, video-sharing sites and gadgets, such as iPods and mobile phones are now fixtures of youth culture (UNICEF, 2011). They have so permeated youth lives that it is hard to believe that less than a decade ago, these technologies barely existed. Modern technologies have altered how youth socialize and learn and that raises a new set of issues that educators, parents, and policy makers should consider. An important question which this paper tries to address is how modern technologies affect academic performance of these adolescents. Technology is an integral part of most adolescents' lives, hence it is important to understand the impact it has on academic achievement.

According to Honey (2005), Pew Internet and American Life Project carried out a survey that explored technology use among 802 youth ages 12 through 17. The survey was conducted between 26 July and 30 September 2012. The study found out that

- 78% of the teens have a cellphone and almost half of them, 47%, own smart phones;
- 23% of the teens have a tablet computer, a level comparable to a general adult population;
- 95% of teens use the internet, and 93% of teens have a computer or have access to one at home.

Methodology

The study was undertaken to present a deep understanding of the impact of modern technology on academic performance of adolescents. The qualitative research methodology was used to guide the study. According to Babbie (1990) qualitative research is sensitive to contexts and lived experiences, and aims for in-depth and holistic understanding in an attempt to do justice to

the complexity of social life. Within the qualitative research, the case study design was employed. The case study is an in-depth examination of a unit of interest such as an individual, and a company (Muranda, 2004:54). A case study selects a small geographical area or a very limited number of individuals as subjects of study. Purpose of case study is to probe deeply, to analyze intensively so as to establish generalization about the wider population to which unit belongs. The population of this study consisted of adolescents, teachers and parents.

Purposive sampling was adopted for this study. Durrheim (2006) purports that purposive sampling ensures that a small number of people participate in the study. Qualitative research focuses on the richness of data where a relatively small sample is selected. The participants include 24 adolescents, 4 teachers and 4 parents. The researcher, as alluded to by Saunders (2009) was able to identify the participants as able to provide significant data.

The research largely drew information from interviews and focus group discussions. Interviews are ways for participants to get involved and talk about their views. There is room for immediate feedback, probing and clarification. Leedy and Ormrod (2005) observe that in some cases, a researcher may want to interview several participants in a focus group to discuss a particular issue. Researcher can obtain a variety of opinions on a certain issue when time is limited.

Discussion

The study set out to investigate the impact of modern technology on the academic performance of adolescents. It emerged from the study that modern technology refers to many forms of electronic communications, which include the Internet, which is accessible through both computers and mobile phones, and instant messaging services, such as Whatsapp. Dehlmer (2009) also asserts that modern technology refers to the types of devices most commonly used for communication and entertainment purposes, including:

- Computers (including Internet Access, Online Games, and other computer games);
- Cellphones (including phone calls and text messages);
- Console Video Games, and Television (including TV shows and movies shown on television and played on VCRs or DVD players).

Thus, as also echoed by MacArthur (2008), the term Modern Technology is used to describe media ecology where more traditional media, such as books, TV, and radio are converging with digital media, specifically interactive media and media for social communication. All participants agreed that for adolescents, the modern technologies have assumed a substantial stake in their social and educational lives. The majority of the adolescents are increasingly connected in a virtual world using different technologies on a daily basis. These technologies popular among teens, as also alluded to by Mikulec, Goni and Moreno (2013) include cellphones, television, text messaging and video gaming. Of these Internet-using teens, approximately half use online social networking websites (SMS) such as MySpace

(<http://www.myspace.com>) and face book (<http://www.facebook.com>). Thus adolescents are avid users of modern technologies. Social network sites, mobile phone operators, and other private actors are implementing savvy methods designed to appeal to youth in developed countries (UNICEF, 2011). Face book Zero was launched in May 2012 as a mobile site free of data charges and available in 45 countries, 10 in Africa. These developments are exciting and offer possibilities for transforming learning, innovation and much more. However, they also pose risk.

Although research on the effects of children's use of modern technology is still sketchy and ambiguous, some initial indications of positive and negative effects are beginning to emerge (Subrahmanyam, Kraut, Greenfield & Gross (2000)). According to the findings, adolescents' use of modern technologies has implications for educational practice because it is now a prevalent environmental factor in their lives. In the same vein, Watt (2010) posits that there is need for professionals working with young people to have a fully informed evidence-base as to the possible benefits and drawbacks of modern technology. A growing concern for parents, educators and others involved with the welfare of adolescents is related to young people's ability to use these tools safely and effectively.

Findings of this study indicate that modern technology has both positive and negative effects in the area of education. According to the study findings, teenagers frequently use the computer and Internet for their schoolwork; they use them to complete school assignments. Students can learn from computers to become independent learners. In line with this finding, Marshal (2002) cited in Honey, Culp and Spielvogel (2005), found strong evidence that modern technology complements what a great teacher does naturally, extending their reach and broadening their students' experiences beyond the classroom.

Honey et al (2005) go further to say young people are taking advantage of the new powerful technology. Three quarters of online teens use instant messaging, representing close to 16 million youth. Of these 16 million, 78% say they use instant messaging to talk about homework, tests or schoolwork. Subrahmanyam et al (2000) posits that cognitive researchers suggest that for example, playing computer games can be an important building block in enhancing children's ability to read and visualize images. Playing specific computer and video games have been found to have immediate positive effects on specific cognitive skills. They may improve problem solving skills.

Modern technology also motivates and engages the learner when students have a choice in their assignments, see the relevance or can self-assess with teacher-feedback intertwined, student motivation increases (C. O'Hara and Pritchard, 2010). The study also is in agreement with these findings. The rapid evolution of modern technology has indeed broadened society's vision of the technologies as tools for developing children's skills and motivating in academic areas such as Mathematics, Science, Language arts and writing. Even parents generally believe that modern technologies are an important educational resource. Among teens, schoolwork has surpassed games as the most frequent online activity.

It was noted that in the classrooms, computer software applications, along with word processing software, are the most widely available applications of educational technology. Database and spreadsheet programs promote organizational skills and modelling software promotes the understanding of science and Mathematics concepts (Honey et al, 2005). The primary form of student learning is described by the above authors as discrete educational software (DES) programs such as integrated learning systems (ILS), computer-based instruction (CBI). Teachers use DES to supplement instruction, introduce new topics and provide means for self study. Similarly, Centre for Children and Technology (2005) note that various technologies deliver different kinds of content and serve different purposes in the classroom. Word processing and e-mail promote communication skills, database and spreadsheet programs promote organizational skills, and modelling software promotes understanding of science and Mathematics skills. Even the cellphones many students carry with them can be used to learn.

Bruce and Lewin (1997) cited in Centre for Children and Technology look at ways in which applications can support integrated enquiry-based learning to engage students in exploring, thinking, reading, writing, researching, inventing, problem solving and experience of the world. They develop the idea of technology as media with four different focuses:

- Media for *inquiry* such as data modeling and spreadsheets;
- Media for *communication* such as word processing, e-mail, simulations, tutorials and synchronous conferencing;
- Media for *construction* such as robotics, computer aided design and controlsystems;
- Media for *Expression* such as interactive video, animation software, and music composition.

No longer limited to school laboratory, school hours and specific devices, technology access is increasingly centered on the learner experience. Learning with technology enhances students' reasoning and problem solving abilities.

Although there seems to be a great deal of research indicating the positive aspects of modern technology on academic achievement, some research as has also been found by this study indicate that modern technology (especially when used in excess) has detrimental effects on adolescents (Dehmler, 2009). Excessive use of technology has its drawbacks on educational achievement.

The number of hours as noted by the study, adolescents spend using technology, is increasing. Adolescents spending many hours surfing social websites. They engage in constant interaction and socialization. Their attraction to and involvement in activities on social platform likely means greater concentration. Although teen users experience delight and enjoyment when interacting with others on social networks, they may lose control over other tasks they are expected to perform. (Roois, Limayem & Salehi – Sangari, 2011).

Similarly, Strasburger, Jordan and Donnerstein (2010) allude to the fact that modern

technology can affect adolescents by not only displacing time they do their homework, but also influence behaviors. Teens can download violent videos, send sexual text messages, buy cigarettes and beer on the Internet, and post enticing profiles on myspace.com. According to the social learning theory, adolescents learn by observing and imitating what they see on the screen. The super-peer theory states that the media are like powerful best friends in sometimes making risky behavior seem like normal behavior. All this interferes with learning. Time flies while they are absorbed in the joy and curiosity produced by these websites and no time is left to conduct school tasks. This significant use of technology decreases students' academic achievement. Absorption distracts from the main task of studying or homework preparation and impedes students' concentration on assignments. Another problem of excessive usage of electronic gadgets is that they can weaken people's memory. Students of the new generation seem to have problems with writing complete sentences or spelling words because of frequent use of text messages.

This study also found that when adolescents are exposed to computer games, television or other technological device, this detracts from the quality of sleep adolescents experience and will lead to poor academic performance as day functioning will be affected. These findings seem to be congruent with Zavodyny (2006) who asserts adolescents' increased use of modern technology has been accompanied by a decrease in amount of sleep and increase in attention difficulties and poorer academic achievement. Delmher cites a study by Wolfson and Carskadon (1998) who examined the effects of high school students regarding their sleeping habits. The results indicated that students who earned C's, D's and F's reported less sleep on school nights than students who earned A's and B's. Thus, heavy use of modern technology has been linked to reduced time in bed and in increased sleep disturbances in adolescents.

Implications

The findings have implications for schools using or planning to use modern technology.

- Modern educational technology is less effective when learning objectives are unclear and the focus of the technology use is diffused. The schools need to convene a technology planning team comprising administrators, teachers, technology coordinators, students, parents and representatives of the community (community-wide involvement) to determine the educational goals for students and types of technology that will support efforts to meet the goals. The team should also develop a vision of how technology can improve teaching and learning.
- Students cannot be expected to benefit from technology if their teachers are neither familiar nor comfortable with it. Many teachers fall behind their students when it comes to modern technology skills and competences, thus making it difficult to interest, motivate and engage children in conventional lessons. They need to have experience with the technology. Hence it is important to provide professional development to teachers to help them not only to learn how to use new technology, but also how to provide meaningful instruction and activities using technology in the

classroom.

- Longer class periods and more allowance for team teaching should be built in the daily schedule. Students may need more than a daily 30- or 40-minute period to find, explore and synthesize material. Thus more time should be built into daily schedule allowing teachers time to collaborate and work with their students.
- Ongoing evaluation of technology applications and student achievement, based on the overall education goals, helps ensure that the technology is appropriate, adaptable and useful. With a variety of theories suggesting a potentially powerful effect of media and the growing empirical evidence for negative impact, parents should take care to limit exposure to detrimental technology.
- With the amount of sexual suggestiveness in for example, movies, schools should provide comprehensive school-based sex education programs for adolescents. Also drug and media education programs are crucial.

Conclusion

Modern technology is transforming the experience of growing up of adolescents. It brings the good and bad to the adolescents. At its best as conclusively remarked by Honey (2005), technology can facilitate deep exploration and integration of information, high-level thinking and profound engagement by allowing students to design, explore, experiment, access information and model complex phenomenon. High level engagement in social networking causes students to lose focus on academic tasks and negatively affects their academic results. Using media as both a source of information and a means of communication are an integral part of curricula in many developing countries. Competence in technology usage is therefore key to adolescents' academic achievement in schools. With ever-expanding technology, there is an unprecedented need to understand the recipe for success, which involves the learner, the teacher, the content and the environment in which technology is used.

REFERENCES

- Babbie, E. (1990) *Survey Research Methods, Second Edition*, Belmont: Wadsworth.
- Centre for Children and Technology (2005) *Critical Issue: Using Technology to Improve Student Achievement* Available at (<http://www.info.ncrel.org>) Retrieved 21/08/13.
- Dehmler, K.M., (2009) *Adolescent Technology Usage, Sleep, Attention and Academics*
- Honey, M., Culp, K.M., & Spiehogel, R. (2005). *Critical Issue: Using Technology to Improve Student Achievement*. New York: North Central Regional Educational Laboratory.
- Koivusilta, L.K., Lintonen, T.P., & Rimpela, A.H. (2007). *The orientations in adolescent use of information and communication technology: A digital divide by socio demographic background, educational career, and health*. Scandinavian Journal of Public Health, 35(1), 95-103.
- Leedy, P.D. & Ormrod, J.E. (2005) *Practical Design, 8th Edition*. New Jersey: Pearson Merrill Prentice Hall
- MacArthur (2008). *Living and Learning New Media*. Summary of Findings from the Digital Youth Project Available at www.macfound.org. Retrieved 21/08/13.
- Muranda, Z. (2004) *Dissertation writing: Concepts and Practice*. University of Zimbabwe Publications: Harare.
- Mikulec, E, Goniu, N & Moreno, M (2013) *Urban, Suburban, and Rural: Adolescents' use of preferences for fitness promotion technologies communication*. University of Wisconsin school of Medicine: Madison.
- Roois, Limayem, M. and Salehi – Sangari, E. (2011) *Impact of face book usage on student achievement rules off self-regulation and trust*. Electronic Journal of Research in Education Psychology, 9 (3)961-994.
- Saunders M, Lewis, P. and Thornhill, A. (2009) *Research Methods for Business Students Fifth Edition* Strasburger, V.C., Jordan, A.B. and Donnerstein, E. (2010) *American Academy of Paediatrics, Health Effects of Media on Children and Adolescents Volume 1 (4)756-767 Edition* Pearson Education Limited : England.
- Subrahmanyam, K., Kraut, R.E, Greenfield, P.M and Gross, F (2000) *The Impact of Home Computer use on children's activities and Development*. Available on <http://www.futureofchildren.org> Accessed 22/07/13.
- UNICEF (2011) *The States of the World's Children*. Available at: <http://www.unicef.org>. Accessed 22/07/13.
- Watt, H.J (2010) *How does use of the modern technology influence language and literacy development: A review; Contemporary issues in communication science and Disorders*. Volume 37, 141- 147. Available at: <http://www.asha.com>. Accessed 01/08/2013.
- Zavadny, M. (2006). *Does watching television rot your mind? Estimates of the effect on test scores*. *Economics of Education Review*, 25 (5), 565-573.