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FEATURE

The Influence of Teen Computer Usage on Academics and Spirituality

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Abstract. *The study investigated the influence of technology usage on students' academic performance and spirituality. A total of 166 respondents participated in this study from three different schools in the Philippines. Respondents answered a spirituality questionnaire and detailed the time they spent on technology usage. Results showed that there was no direct significant relation between technology usage and academic performance; however, computer ownership did have a significant negative impact on student grades. In identifying the relation between technology usage, spirituality and academic performance, the results show that 22% of variance in academic performance is explained by spirituality which is negative. It was found that technology usage had an indirect influence on academic performance through spirituality.*

The beginning of the twentieth century brought many developments that have changed people's lives in regard to academics, relationships, and their social and spiritual lives. As the years have passed after the inception of the Internet, computers have become a common household necessity. Children in this increasingly technological age are becoming more and more dependent on computers, due to their offer of sophisticated information at the touch of a button, and instantaneous worldwide communication (Robbins, 2010; Wellman, 2001). Parents buy personal computers and subscribe to Internet service providers to advance educational opportunities for their children and to prepare them for a balanced life (physical, mental, spiritual and emotional) in this information age (Torr, 2004). But children are quite able to deviate from the main objectives of their parents, and get attracted to games, instant messaging and Internet browsing. These practices are not wrong in themselves, but often, as in matters of food, taste or preference is not always the best guide.

Computers may affect people's lives in some way or another in the world today; whatever they read, listen to, or look at, has an effect on them and by beholding, they become changed (White, 1911). Being consumers and users of information may be reflected in people's spiritual life. Today many children are becoming addicted to social networks. The amount of time that youth, and even adults, are spending on social networking is causing a wave of concern about the safety and content of these sites, and it is also having some impact on face-to-face social relationships (Nyland & Near, 2007). In short, computer usage can significantly affect our relationship with God and with other humans.

Many people today are beginning to pay attention to how computers affect us, and especially how they affect our children. In a recent study, 6,000 Australian parents indicated that they have "a deep concern about the impact of media and technology on the wellbeing of their children" (Hinds, 2011, para. 1). Children are not only very active in the usage of computers, but they are also more affected by their surroundings than adults, who are already more set in their ways (Subrahmanyam, Greenfield, Kraut, & Gross, 2001). This should concern us greatly as Christian parents and teachers. What are children actually doing with the time they spend on the computer? How does their computer use influence their spiritual wellbeing? How does it affect their academic achievement? Should parents and teachers be concerned? This study analyzes the influence of computer use on both the academics and the spirituality of teenagers.

Review of the Literature

In this study, *technology* includes personal electronic devices such as laptops, handheld computers, cell phones, televisions and institutional devices such as computers, and associated devices. During the past decades, the world has undergone the most significant period of technological innovation since the first decades of the 20th century (Eldemery, 2009). Technological progress influences the way people relate, communicate, socialize, and educate, and every aspect of their lives (Juniu, 2006). Rapid changes in technological advancements have resulted in competing views about the impact of emerging technologies on social interaction, academic development, and leisure behavior.

After the introduction of personal computers in the early 1980s, the percentage of computer use in United States rose to 15%. By the early 1990s, it had reached more than 30%, and by the end of 2000 it had hit nearly 50% (Carr, 2003). According to Internet World Stats (2011), Internet usage statistics, there were 114,304,000 Internet users in Asia in the year 2000, while in March, 2011, there were 922,329,554 Internet users; an increase of over 700 %. Compare this to the Internet usage statistics of 2006, which had risen only about 250% above the 2000 figure. Clearly, there has been tremendous growth in Internet usage in recent years.

According to Munro (2009), "today's technologies seem dedicated to a pursuit higher than happiness" (para. 2). Technology helps people find information that is needed and connect to people within a fraction of a second—technology is actually transforming the face of the earth. In this changing world, children are adapting more to technology than anything else in their lives because of the entertainment and information that is promised. Due to their access to technology from childhood, teenagers and young adults today have a significant technological competence (Prenksy, 2001). The advent of technological devices, especially with computer technology, has many benefits and also some potential problems. Addressing these concerns about the personal and social effects of technology is even more important today, when there is less adult supervision than in the past (Hunley et al., 2005).

Thinking of the factors influencing academic performance, often people think of intelligence quotient (IQ) as one of the factors that most strongly influences academic performance. But according to one study (Duckworth & Seligman, 2005), self-discipline predicts academic performance more robustly than IQ. This study found that "the correlation between self-discipline and final GPA (r = .67) was twice the size of the correlation between IQ and final GPA (r = .32)" (p. 941). In these postmodern days, many children have trouble making choices that require them to sacrifice short-term pleasure for long-term gain. Programs that build self-discipline may be the best way to build academic achievement (Subrahmanyam et al., 2001).

Computer Usage: Adults vs. Children

The Internet has become the universal source of information for millions of people−at home, at school, and at work (Internet Word Statics, 2008). However, children's computer use patterns are radically different from those of their predecessors (Kirschner & Karpinski, 2010). Oblinger (2003) found that the younger the age group, the higher the percentage of computer use for schoolwork and leisure purposes, because the computer helps the individuals according to their interests: working, playing, talking to friends, doing research, or even ordering food! Pierro (2005) states, "A person could live his or her entire life curled up in a room with a computer, and would have access to everything they need! It is insane" (para. 2).

Americans are spending about 20 percent more time with radio, television, and the Internet than they were a decade ago (Mindlin, 2011). People seem to squeeze media into almost every free moment of their life (Shields, 2011). In recent years, the number of hours spent watching TV has actually declined, however, people are spending even more time online (Murno, 2009).

Technology and Academics

Instructors who believe in student-centered, collaborative learning have made use of computers to facilitate learning in schools because the Internet provides a constant, rich, ever-changing source of information (Beltran, Das, & Fairlie, 2010; Rune, 2010; Sandholtz, Ringstaff, & Dwyer, 1997; Warschauer, 1999). Many educators have found that technology gives them the opportunity to make the teaching process more interesting. This helps increase student motivation, especially when the variety of activities increases (Marcheggiani, Davis, & Sanders, 1999; Warschauer, 1999).

When the quality and quantity of technology use are not closely monitored or ensured, computer use may do more harm than good to student achievement in school (Kirschner & Karpinski, 2010). Having calculators in schools certainly allows children to calculate more quickly, but if they do not have an understanding of the equation; if they do not have the capacity to comprehend the answer; then they are at the mercy of technology. If they type a wrong number, they will never know that their answer is wrong (Murno, 2009). Computers and the Internet also facilitate cheating and plagiarism, and make it easier to find information from non-credible sources (Rainie & Hitlin, 2005). With the aid of the Internet, computers often absorb too much time, causing children to neglect reading, recreation, exercise, and relationships (Subrahmanyam et al., 2001).

Technology overuse by children may be associated with attention difficulties, poor academic achievement, and sleep impairment (Cris, 2010). Home computers are used extensively for games, networking, downloading music and videos, communicating with friends, and other entertainment among youth, potentially crowding out schoolwork time (Jones, 2002; Lenhart, 2009; U.S. Department of Commerce, 2004). Children might become so accustomed to immediate, on-screen information that they fail to probe for deeper levels of insight, imagination and knowledge (Murno, 2009). Children in households with computer games installed have been found to have significantly lower school grades (Malamud & Eleches, 2010).

Having a computer at home can be very useful for completing school assignments and may facilitate learning through research and educational software (Beltran, Das, & Fairlie, 2010). Parents are encouraged to promote the educational use of technology in order to improve academic achievement (Kirschner & Karpinski, 2010). Technology and media can support learning and relationships especially if used wisely. Enjoyable and engaging shared experiences that optimize the potential for children's learning and development can support children's relationships both with adults and their peers.

Technology and Spirituality

Spirituality is one of most significant aspects of human life. Spirituality is one's relationship with God that deepens values within a person that helps them to find the meaning of life (Ashmos & Duchon, 2000; Kilcher, 1998). In this 21st century, technology has increased the pace of life, and it has tailored some of our goals and ambitions, shaping and influencing our identity, and filtering our view of the divine (Hilton, 2008).

People live in an upside-down world where relationship with God and spiritual things often take a back seat to daily concerns with secular things. Many Christians are concerned about the young adults who have grown up in the church, and about the influence of secularism and the media on the young people's commitment to Christ and their involvement in the church (Thayer, 2008). The realities of fast food, electronic media, and the pace of living in a capitalist society can be toxic to children's holistic development, and especially to their spirituality (Palmer, 2007).

Looking into the present generation, children are increasingly more apt in using technology. In Christian families, God should be given higher preference than anything else, but there is a real danger that technology is negatively affecting our spiritually, just as it has affected the rest of our lives. How do Christian teens use technology? Is there a relationship between their technology use and theirs spirituality? Does their technology use affect their academic performance? These are the questions that this study addresses.

Method

The purpose of this study was to identify teenager computer usage patterns and to study the influence of technology on their academic performance and their spirituality. This is a correlational study, employing two research instruments: the Four Dimensions of Spirituality Inventory (adapted from Vyhmeister, 2006), and a self-constructed Technology Usage Questionnaire. The variables used in this study were technology usage, spirituality, and self-reported academic performance. Academic performance and spirituality are the endogenous variables. Technology usage is the exogenous variable. The demographic variables considered in this study are age, gender, school, type of technology that is used for. Using above variables, a conceptual framework was developed as shown in the Figure 1. Data was gathered from three selected Adventist schools: one in Metro-Manila, one was in a rural area, though not far from the city, and one was a suburban international school located on the outskirts of Manila. The respondents in this study were students whose ages were between 12 and 16. Data was analyzed to see if technology usage had any influence on spirituality or academic performance.

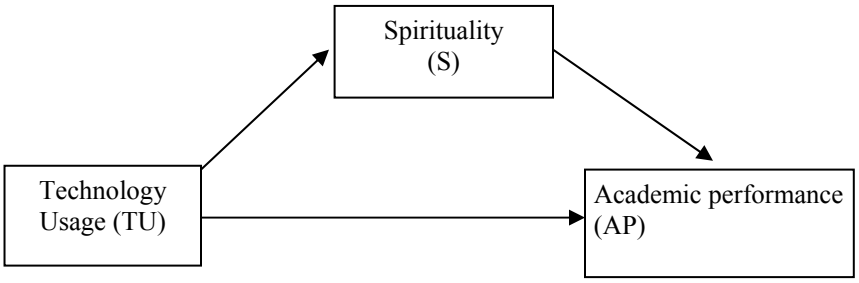

Figure 1. Conceptual framework: Influence of technology usage and spirituality.

The Four Dimensions of Spirituality Inventory, a questionnaire with a reliability alpha of .93, was used as a part of data collection. This questionnaire was divided into 4 components (attitude towards God, knowledge about God, values, and life choices). For the spirituality inventory questionnaire, the students were asked to choose the best option on six point scale, where 1 meant closest to the left side (negative) statement, while 6 meant closest to the right side (positive) statement, and the in-between numbers show the progressive continuum from left to right. The students were given a chance to identify their own spiritual strengths and weaknesses among the 4 components (attitude towards God, knowledge about God, values, and life choices) by adding their scores for each component.

The researcher developed the Technology Usage Questionnaire, with a reliability alpha .683. The instrument contains a demographics section in order to know the profile of respondents in regard to their age, number of hours spent using technology, the purposes of technology usage and academic performance. The students were asked to fill out all the sections of the questionnaire by documenting demographic information, preferences, time spent on other non-school-based activities, and other relevant information and the total time of technology usage and the type of technology they used. The students were also asked to report on their grades and this was divided into a 5-point scale (straight A's, mostly A's, A's and B's, mostly B's and C's, and other).

Data Analysis

The data was analyzed in two ways. First, a descriptive analysis of computer usage, spirituality and academic performance was calculated. A descriptive analysis of time spent on other non-school-related activities was also calculated. The second group of analyses included calculations of path analyses to determine whether there were any correlations between computer usage, spirituality, and academic performance.

The total of 184 questionnaires were distributed in 3 different schools and collected. After evaluating the questionnaires, 12 were deleted due to incomplete data and 6 were deleted after performing consistency checking. So the total questionnaires considered in this study correspond to 166 respondents. In all, 77% reported having a computer at home.

ANOVA results showed that there were no statistically significant differences in computer usage based on which school students attended. This is despite the fact that one school was within Metro-Manila, one was in the country, though not far from the city, and one was an international school on the outskirts of Manila. All the schools are fairly close to urban areas, and all these schools are under one religious denomination.

An independent-samples t-test was conducted to compare the spirituality of students who owned a computer and those who did not. It was found that there was no significant difference between the spirituality scores of those who do not own a computer (M = 143.81, SD = 22.63) and those who do (M = 145.93, SD = 18.68); t(164) = .588, p = .557. This means that computer ownership is not directly correlated with spirituality (p = .557). Most of these students live in dormitories, however, or have free access to computer laboratories. This might minimize the effect of computer ownership for this population.

An independent-samples t-test was conducted to compare the academic performance of students who own a computer with that of those who do not. It was found that there was a significant difference in the scores between those who did not own a computer (M = 3.18, SD = .942) and those who owned a computer (M = 2.80, SD = .876); t(164) = 2.353, p = .020. This result shows that those who do not have computers reported significantly higher academic performance (mostly A's) than those who owned one (mostly A's and B's). Maybe technological gadgets distract teenagers. As suggested earlier, academic success may be more closely linked with persistence and self-discipline (Subrahmanyam et al., 2001), which computer usage may not promote. Subrahmanyam et al. (2001), however, still conclude that home computers have been linked to mildly positive effects on academic performance. In the current study, there was no significant difference between boys' (M= 3.13; SD = .84) and girls' (M= 3.05; SD = 1.037) academic performance. More and more research shows results that the gap is closing between boys' and girls' academic performance (Li-Chun & Ming-Puu, 2010) or that there is no statistically significant gender difference in average grades (McDowell, Werner, Bullock & Fernald, 2003).

Vyhmeister's (2006) Four Dimensions of Spirituality Inventory yielded a total possible score of 180 points, with higher number meaning higher spirituality. It was found that student spirituality ranged from 77 to 180, with a mean of 145.42 (SD = 19.63). On average, girls' spirituality was higher than that of boys. The average spirituality for girls was 149.54 (SD = 16.61); the boy's

average was 141.86 (SD = 21.37). This result is similar to most of the research on spirituality and gender (Miller, Davies, & Greenwald, 2000; Smith, 2005). Of the four dimensions of spirituality (attitude towards God, knowledge about God, values, and life choices), students scored higher in attitude towards God (32 out of 36) and the least in life choices and knowledge about God (28 out of 36).

The conceptual framework shown in Figure 1 was tested for significance using multiple regressions. The significance of the independent variables was tested using the regression model at a significance level of 0.05. The output of this test is shown in Table 1. Table 1 shows that only spirituality was significantly related to Academic Performance ($\beta = 0.221$, $P = .005$). Technology usage was not significantly related to the Academic Performance ($\beta = 0.006$, $P = 0.935$).

According to the regression model test, this study reveals that there is no direct significant relation of technology usage time with academic performance ($\beta = 0.006$, $P = 0.935$), however there is an indirect effect of technology usage on academic performance through spirituality (4%), though this is very weak.

There is an inverse relationship of technology usage and spirituality ($\beta = -0.200$, $P = 0.01$). This means that if technology uses increases, spirituality decreases. The strength of the relationship between technology usage and spirituality, however, is only $R2 = 0.04$ (4%). With spirituality and academic performance ($\beta = 0.220$, $P = 0.004$), there is a positive relationship, which means if spirituality increases, then academic performance increases. The strength of the relationship between spirituality and academic performance is also only $R2 = 0.048$ (5%).

Table 1

Multiple Regression Test Computer Usage, Academics and Spirituality

Variable	B	Sig
Spirituality	0.221	0.005*
Technology usage	-0.006	0.935
Constant	1.056	0.015*

*significant at α=0.05

Technology Usage and Related Issues

The average usage of technology per week was 17.3 hrs. In response to the question, "Do you use technology more or less than your friends?" the majority (41%) of the students' response did not differ much from their friends. However, 19% of students identified themselves as heavier users than their friends. Most teens in this study (77.1%) said that their parents limit their technology use. Most teens (96.4%) said that they use technology for activities like email, school work, religious reason, while only a few (3.6%) admitted to visiting sexual sites. The fact that this study was done in Adventist schools, students might have under-reported using technology for questionable purposes. In any case, it is clear that some are admitting to using technology for things they should not. Therefore, parents and teachers need to constantly monitor teenager computer usage and teach them to make good choices.

Looking into the data, it was found that 33.5% of respondents are spending on an average a half hour to one hour a day on technology. When asked how long they spend on physical activities, students reported that they are spending half an hour a day for physical activities. This means that Adventist teens in the Philippines are spending appropriate time on physical activities. In asking the respondents what are the most three common activities that teenagers like to do with technology, most teens answered that their favorite activity in using technology is playing games and chatting with friends through social networking. However these favorite activities may lead the teenagers to misuse the technology instead.

Conclusion

This study reveals that there is no direct significant correlation between reported time spent using technology and academic performance; however, there is an indirect effect of technology usage on academic performance through spirituality. There is also a grave concern about the negative correlation between spirituality and technology use. The amount is small for now, but if this represents a trend, it is a problem. Technology use is necessary for survival in today's society. But it comes with some level of risk for spirituality.

Spirituality is shown here as an essential component for academic performance. If spirituality is weak, or low, academic performance may also be low. One implication is that, since technology is increasing in schools, spirituality should increase in order to maintain strong academic performance. This study brings an attempt to understand children's activities with technology at home, in school and other various places. It has identified that help is needed in improving the spirituality at home and at school, which may help to overcome the tendency of misusing technology. At school, teachers should emphasize more spirituality

and should have a strong biblical foundation to prepare the students to face this technological world.

This study uses the sample from Adventist denomination schools. In order to test the feasibility and generalizing the findings, further study should be conducted in other religious denomination schools to identifying the four dimensions of spirituality and its influence.

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