Avondale College

ResearchOnline@Avondale

Education Conference Papers   School of Education

10-2014

Can the Use of Web 2.0 Tools Help Deliver 21st Century Learning?

Peter Beamish
Avondale College of Higher Education, peter.beamish@avondale.edu.au

Bobby McLeod
Sahmyook University

Follow this and additional works at: https://research.avondale.edu.au/edu_conferences

Part of the Other Education Commons

Recommended Citation

CAN THE USE OF WEB 2.0 TOOLS HELP DELIVER 21ST CENTURY LEARNING?

Peter Beamish
Avondale College of Higher Education, Australia

Bobby McLeod
Sahmyook University, South Korea

Abstract

It has long been recognized that people need to be literate to function optimally within society. The 21st century has seen technology increase the complexity of environments, so that a literate person must now possess a wide range of abilities, competencies, and literacies. These have often been referred to as "21st-century skills" and while many of them are not new, the extent to which individual success depends on having such skills is new.

The current study seeks to explore ways in which technology can be used to increase literacy and enhance 21st century skills in students. 1193 students attending Sahmyook University in Seoul, South Korea were placed in small groups and asked to make a movie in English. This constructivist, real-world, group-based project required students to collaboratively negotiated their way through a variety of language, technical and social challenges using a wiki.

We can conclude from this study that collaborative projects, supported by web 2.0 tools, can deliver worthwhile learning. Students reported that the project; was interesting and rewarding, improved their relationships with classmates, encouraged teamwork, improved English skills, facilitated positive attitudes and the development of ICT skills. Students experienced improved technical, collaborative, leadership, critical thinking and problem solving skills that enhanced knowledge and contributed to their personal 21st century skill set.

Introduction

Society has been transformed by the 'democratization' and 'consumerization' of information and communication technologies (ICTs) and these are reshaping how we work and play (Grajec, 2014). To function optimally within this society, students need to be equipped with a contemporary set of skills and competencies. These so-called 21st century skills are not new, but they have become 'newly important' and they can no longer be considered ad-ons or optional (Silva, 2009, p.631).

Ubiquitous access to ICTs both on and off school campuses is also opening doors to a multitude of pedagogical opportunities for teachers and students. Teachers can create classroom environments that are authentic, engaging, technically opportunistic, meaningful, creative, and student-minded (Kaufman, 2013).

This study seeks to investigate the use of a combination of ICT applications in an authentic, collaborative project, and how this facilitates student learning through the use and development of 21st century skills in an English classroom. It is proposed that as students use technology as a learning tool, there will be high levels of engagement in learning, deep connections to the content, and students will develop social, technical, and communication

skills (Mehdinezhad, 2011).

The present study seeks to use a task that is authentically based, constructivist in nature and collaboratively done, to engage students in learning. The students involved in this study were placed in small groups and asked to make a movie in English. This constructivist, real-world, group-based project required students to collaboratively negotiate their way through a variety of language, technical and social challenges using web 2.0 tools, including a wiki. This movie task enabled students to develop knowledge and skills, including 21st century skills through:

- having to exercise creativity and innovation in producing a script;
- critical thinking and problem solving when it came to deciding on logistical and technical aspects;
- learning to learn through obstacles that required new skills to overcome;
- being able to communicate effectively within groups and with the teacher;
- developing social skills that enabled them to function well as part of a team;
- developing information literacy through sourcing details and knowledge on various aspects of what at times was a daunting task;
- developing ICT literacy to enable successful completion of a variety of technology dependent facets;
- becoming locally and globally aware through using web tools and resources;
- constructing personal knowledge that resulted in reflection of life and career goals;
- grasping a better understanding of personal and social responsibility through commitment to the group and its objective.

Of particular interest in this study is the use of a wiki to facilitate group work during the movie project. Stahl (2012) analyses collaborative projects on three levels (planes): individual learning, small-group cognition and community knowledge building (Figure 1.). He asserts that sequential small-group interactions bring in resources from the individual, the small group, and the community planes, involving students in procedures of shared meaning making. More often than not, the process becomes more important than the project outcome, and knowledge developed through this kind of collaborative process is retained longer and has more complex structures.
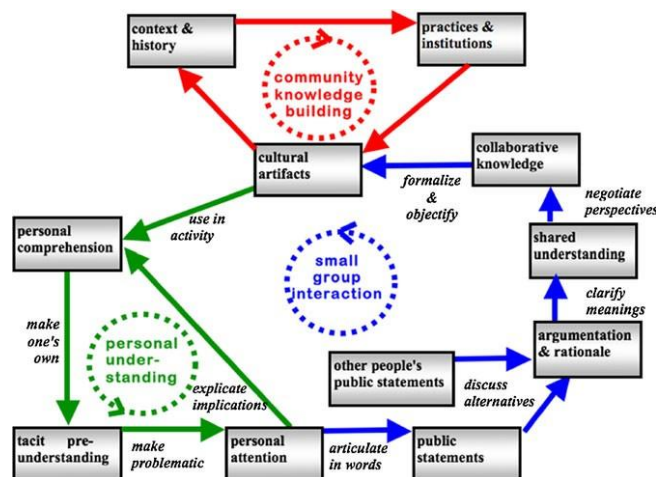

Figure 1. A model of collaborative knowledge building (Stahl, 2012, p. 470)

Within the present study, students are asked to develop individual skills, and also contribute skills to benefit the group. Within their group, students are able to question, explore and assess, use authentic data, and reflect on processes. The group scaffolds weaker members as

they navigate their way through the processes. Group knowledge is then eventually shared with the community through the products the groups generate. The outcome is a rich learning environment where students learn from each other, students learn from the group, and groups learn from other groups.

The Study

The current study makes use of a mixed method approach to investigate how web 2.0 tools may be used to increase literacy and enhance 21st century skills in students. In particular, the study sought to engage students in an authentic context as they created a movie within their English class. Online questionnaires, student reflections in blogs, and student-created artifacts in the form of storyboards, movie scripts, video files and wiki sites were used to collect data from 1193 students attending Sahmyook University in Seoul, South Korea who were placed in small groups for the task. In addition, 6 in-depth semi-structured student interviews were conducted with students from the different groups.

The students in the study were enrolled in a compulsory Practical English course, required of all first year students as English is a second language for these students. The core curriculum for this course is Smart Choice 2nd Edition Curriculum (Wilson, 2011). The course, involving 4 class sessions a week, has a digital slant through the use of a "digital" book used by teachers in fully equipped multimedia classrooms. In addition, students complete part of their course requirements through online exercises and regular blogging assignments.

The movie project encouraged students to be creative in their use of authentic language. This project required students to collaboratively negotiate their way through a variety of language, technical and social challenges and this process was facilitated through the use of a wiki. Participants were randomly grouped into groups of four or five. They were given an introduction to the project and evaluation criteria in the form of a rubric, together with links to tutorials on how to use the relevant technology. All students were provided with clear expectations for the project and access to the ICT tools to complete the task.

An emphasis was placed on the fact that movie scripts needed to be well thought out with relevant and authentic content that included an equal appearance for all students within the group. Movies needed to be between five and ten minutes in length and the entire process completed within six weeks.

Variables and Constructs in the study

A model was developed for use in the study that describes the dynamic learning system that operates in a classroom. This proposed model describes learning in terms of an interaction of background, process and outcome factors and formed the theoretical basis for this study in the tradition of the '3P' model of Biggs and Moore (1993).
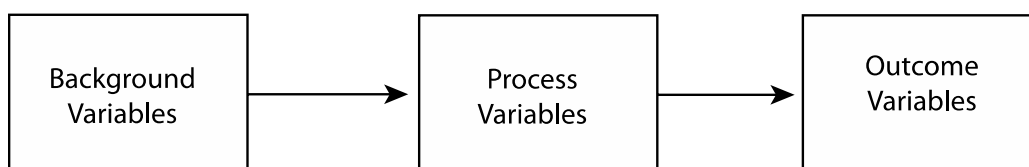

Figure 2. A General Overview of the Proposed Path Model for the Movie Project

The selection of factors to be included in the proposed model was informed by the literature and variables and scales were developed to assess the various factors. The variables and scales included in the study were:

Age – the age of the student.
Gender – the gender of the student.
English Level Background – a measure of student English ability at the start of the project.
Computer Games Experience – a measure of previous student experience playing games on computers.
Blogging Experience – a measure of previous student experience using blogs.
Wiki Experience – a measure of previous student experience using wikis.
Engagement in the Project Process – a measure of student engagement in the movie project and process.
Attitude to the Project – a measure of student attitudes to the movie project.
Movie Project Outcome – the grade that each student received for the movie project.
Attitude to Teamwork – a measure of student attitude to teamwork.
English Level Outcome - a measure of student English ability at the end of the project.

Data was gathered to test the model from student responses to an online questionnaire. Descriptive analysis, factor analysis and reliability testing were then used to investigate and develop the scales and variables used in the study. All scales had appropriate item loadings and reliabilities as measured by Cronbach's alpha of above 0.8. Analysis of variance (ANOVA) was applied to specific variables to determine their effect on the composite scale variables and multiple linear regression analysis was applied to the data to examine possible relationships.

Path analysis techniques were used in this study to test the proposed model and AMOS 7.0 was used to analyze the data. When regression analysis is carried out on large samples, the chi-square measure should be complemented with other goodness-of-fit measures (Ho, 2006). To test the overall model fit, the following indexes were applied: The chi-squared test, the comparative fit index (CFI), the normed fit index (NFI), and the root mean square error approximation (RMSEA).

Triangulation of the data occurred through the use of the qualitative techniques and this enabled a deeper and richer view of the use of web 2.0 tools to emerge. Data was gathered from a number of sources including: student reflections in blogs, student interviews, and student-created artifacts in the form of storyboards, movie scripts, video files and wiki sites.

Results

All of the groups completed the movie project on time. An English test designed as part of the Smart Choice English Curriculum (Wilson, 2011) was administered to all students at the beginning of the course to determine their English level upon entering the course, and the test was administered again at the end of the course to determine their exit score. Students averaged a score of just slightly above the midpoint on the entrance English test ($\mu=30.1$, $\sigma=11.2$, possible range 0 - 60). By the end of the course their average English ability had increased significantly ($p<0.01$) to an average score of 38.6 ($\sigma=8.5$, possible range 0 - 60), with the effect size (Cohen's d) of the course being 0.85.

Results from the path analysis indicated that the unconstrained model fitted the data well. Although the chi-squared values were significant (X^2 [44, N=1095] = 595, p<0.01) for English Level Outcome, and (X^2 [28, N=1176] = 1756, p<0.01) for Attitude to Teamwork, the incremental fit indices (Normed Fit Index, Incremental Fit Index, Comparative Fit Index), are all above the 0.90 range (range 0.94 – 0.95), and the root mean square error approximation (RMSEA) of 0.70 indicates a good fit of the model (Ho, 2006).

The path model (Figure 2) explained 38% (R^2) of the variance in the students' final English

score and 52% (R^2) of the variance in the students' Attitude to Teamwork. Significant relationships are shown within this path model and the size of the standardized regression coefficients give an indication of the strength and nature of these relationships.
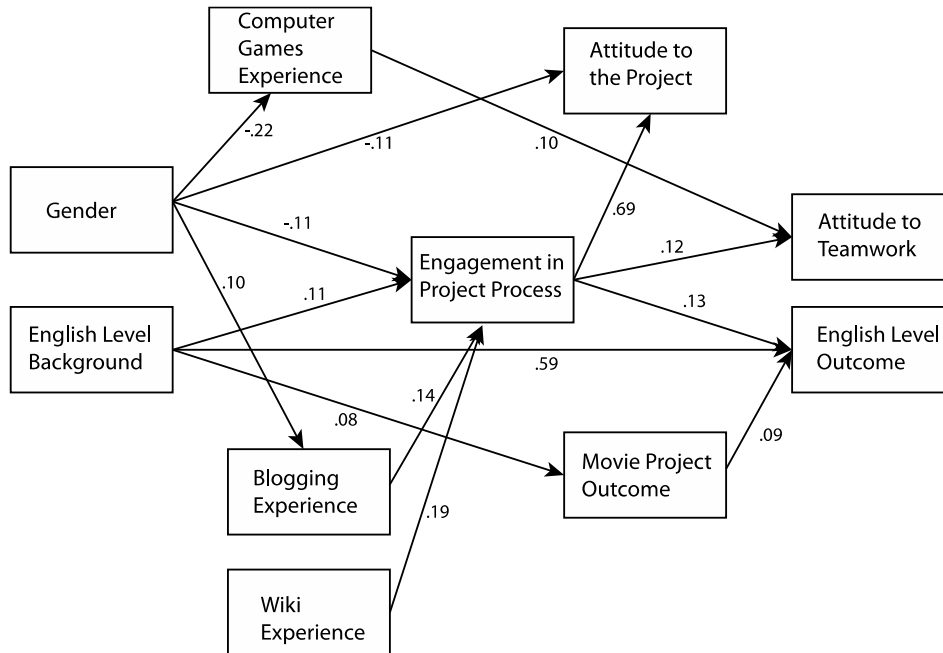

Figure 3. A Path Model for the Movie Project showing significant Paths (p<0.05)

A Closer Look at the Model

Student Background

The students involved in the project came from a low level of use of the web 2.0 tools that the project required. Only 13 per cent of the students had used a Wiki before. Some of the students mentioned that they didn't even know what a Wiki was, and on further questioning, determined that they had not yet used Wikipedia. 21% of the students had made a movie before, but the majority of students indicated a total lack of experience in this area. These two factors combined contributed largely to an initial negative reaction to the project, simply due to the fact that students, could not initially perceive what the project would entail and how the various digital tools would be used to assist them in completing their work.

A majority of students reported using various forms of social media. Facebook was the most common with 87% of students indicating that they had created a Facebook profile, and 54% indicating that they had created a profile on CyWorld. 73% of students indicated that they had used a blog and 62% indicated that they played online computer games. Overall, students' use of social media was not huge as they indicated that they averaged approximately 2 hours a week using social media.

There were gender differences in the students' use of social media. Girls had significantly (p<0.01) more experience on Facebook, Cyworld and the use of Blogs while boys had significantly (p<0.01) more experience in computer gaming than girls.

Engaging with the Project Process

There was a well-defined process for making the movie that was given to students. Student

engagement in this process was important as it had the potential to positively influence their attitudes to the project, their attitudes to teamwork and their final English level. The movie project process involved students working in groups and writing a script for a movie in Korean with the help of a wiki, translating it into English, and then acting out and filming the performance. Much of the translation from the Korean script into English was done in a group with various students taking the lead in their groups and the others observing and contributing. Students discussed slang and idioms to be used in the script and from time to time had to stop and look up words in a dictionary. Once completed, their teacher who identified grammar, spelling and punctuation errors, and discussed the use of some of the English checked this version of the script. Before filming, the group would be go over their lines and would model to each other how to pronounce some of the words more naturally. During filming all students got to handle the camera, with advice and ideas coming from the 'tech' leader of the group. The students then shared the editing of the movie.

Overall, students engaged in the project reasonably well with an average level of engagement of 2.73 (σ=0.55, scale 1-4). It is interesting to see what factors influenced the students' level of engagement in the project. Path analysis (Figure 2) found that initial student levels of English ability positively influenced levels of engagement (β=0.11), as did their previous experience in using a wiki (β=0.19), and using a blog (β=0.14). Interestingly, while there were found to be positive influences between Gender and Blog use (β=0.11), with girls reporting significantly higher levels of use of blogs than boys (p<0.01), and Blog use positively influencing engagement in the project, there was a direct negative influence from Gender to Project engagement (β= -0.11) indicating that girls were not as engaged in the movie project as boys. This may have been due to the more aggressive style of engagement with ICT projects that boys often apply (Volman, Van Eck, Heemskerk, & Kuiper, 2005).

Student engagement in the project was found to positively influence the students' final English levels (β=0.13) and their attitudes to the movie project (β=0.69), and their attitudes to collaborative learning and teamwork (β=0.12) (Figure 2). The final movies were generally of a good standard with student groups achieving an average grade of 48.99 (σ=6.52, possible range 0 - 60). Interestingly, there was no significant relationship between levels of student engagement in the movie project and the final grade they received for the project. This may have been due to the fact that the student grade for the movie project was a group score rather than an individual score.

Student Attitudes to Project

Attitudes play a very important role in education. The relationship between attitudes, engagement, and achievement is often a recursive one and has been well documented (Tarantino, McDonough, & Hua, 2013). In the current study attitudes have been considered an important outcome of student involvement in the movie project.

The initial reaction when the project was announced was a negative one, based on the fact that, in general, most students had little to no experience using a Wiki and very few had any movie editing experience. As students started working on the project and started developing their digital skills, attitudes changed, and by the end of the project students displayed a positive attitude, attesting to the fact that they felt a strong sense of accomplishment and pride and reported an average Attitude to the Project of 3.68 (σ=0.78, possible range 1 - 5). Comments from students included:

> *I can feel very proud of my movie.*

> *It was good. I feel great, we made a masterpiece.*

Students reported positive attitudes towards collaborative learning and teamwork and reported an average Attitude to the Teamwork of 4.08 (σ=0.86, possible range 1 - 5). Students

acknowledged the importance of being able to function well in a team, and as a team. They also acknowledged developing better relationships with their teammates, to the point of bridging the gender divide that often exists between members of the opposite sex within Korean culture. They recognized that functioning optimally in a team was a skill they needed for their studies and for their workplace in the future. The benefits of developing better relationships within a team, spilled over into the classroom as a whole, with students reporting a:

> better team spirit amongst all my classmates since doing the project.

The gender of the student influenced attitudes to the movie project ($\beta = -0.11$) with boys having a more positive attitude than girls. This negative influence continued between student attitudes to the movie project and their final English level ($\beta = -0.12$) indicating that boys had more positive attitudes to the project than girls, however, girls scored significantly better on the final English score than boys ($p<0.05$).

Discussion

The argument for the use of ICT in schools is two fold. Firstly, schools should prepare students for a productive life in society. Secondly, the use of technology in schools can deliver new ways of teaching and learning, improving student outcomes (Grajek, 2014). There is a substantive research base to support that successful approaches to learning incorporate challenging tasks: e.g. reasoning tasks, not just reproduction tasks, active learning with clear purpose and strong teacher direction, and feedback to the learner, and to the teacher (Hattie, 2012).

The present study sought to immerse students in an authentic, engaging, technically opportunistic, meaningful, creative, and student-minded project that was designed to increase their English knowledge and skills. Initially students were a little wary and apprehensive about the project. This apprehension came from two main areas; the first being a reluctance to participate in group work and the second was a lack of confidence due to being unfamiliar with the technical aspects the project required.

> I don't like to work in a group, because as I mentioned some people will not work
> at all. And secondly, I'm not good at computer, so I have some much stress on how
> can I edit the movie, or how can I film it, or where should I shoot it and all this
> kind of stuff.

Some of the students were positive and were particularly looking forward to the authentic nature of the learning task.

> Awesome. I really wanted it, because English is too formal, so looked forward to
> making the movie.

The students' attitude to learning projects is very important. Attitudes have been shown to influence achievement (Michelli, 2013; Tarantino, McDonough, & Hua, 2013; Wasike, 2013) and it is important for students to be positive about learning tasks in which they are asked to participate.

In the present study, despite some initial anxiety, students' attitudes were generally positive by the end of the project. Students' comments at the interviews reflected this:

> I really enjoyed it. I watched the movie like ten times.

> Really great. Proud. Because we made it. We didn't expect that we made the
> final version because we don't know about and didn't have any experience before,
> but we made it. So, we were proud about it.

These positive attitudes were found to in turn have influenced their attitudes to teamwork and their final English levels. In response to the question "What didn't you like about the movie

project?" students mentioned insufficient time and lacking in computer skills, specifically with Microsoft Moviemaker.

The authentic nature of the task motivated students to work, and be involved. During the process, the group was aware that they would have to present their movie to the class, and possibly to the whole department. With their language and technical skills being used in a public way, extra care was taken to produce high quality work, even to the point of re-filming some scenes. They reported:

> *In the group we all knew that we are going to present in front of the class,*
> *right? If it wasn't for an audience, we probably would just, you know, shoot it and*
> *put subtitles in and submit it for our grade. So, we put a little bit of creativity and*
> *art stuff because of the audience.*

The project was successful in exposing students to 21st century skills. Students developed and used learning and innovation skills, digital literacy skills, and career and life skills as described by Trilling and Fadel (2009). Triangulating the quantitative data, the interview data and the blog responses revealed that students benefitted from the project through improved relationships both within the group and the class; they had a growing recognition of the importance of teamwork; they improved their English skills; they enjoyed the experience; they learned about the importance of participation; as well as developing their technical skills.

Of particular note is the way students developed their collaboration skills. Group dynamics and challenges had to be met and dealt with, by assuming leadership roles where their skills surpassed those of the rest of the group, demonstrating concepts of leadership and project management. Challenges with group management, technology, filming locations and meeting deadlines required activation of their critical thinking and problem solving skills. At one point a student commented:

> *If a team member is not willing to do it, it's really awkward for me to have to keep*
> *telling team members "Oh, you have to work on this, and you have to work on*
> *that; Why do I have to tell you every single step?"*

Effective collaboration was demonstrated by the fact that, not only were they extremely proud of the movie, but they achieved a really good score and they remain good friends to this day as several of the students reported an ongoing social interaction with group members after the project was completed.

Within the group students helped, and were helped, by members of the team with new vocabulary, pronunciation, new idioms and colloquialisms. Members of the group did not initially appreciate the value of teamwork, but by the end of the project students had gained an added appreciation of the teamwork aspect and the level at which they could function at through the assistance of a team. In fact, this was one of the main outcomes of the project.

In the interviews, students affirmed the role of teamwork and the part that they played in their team:

> *So, and especially in Korea, you have to work in a group. You have to be in a*
> *group, like to survive, you know. It's so close to each other and you have to do*
> *things together, all the time. And, if you do something individually, they'll be like*
> *"Oh, what's wrong with her? She's like a loner, or outsider."*
>
> *I learned the editing skills from Sophie. I didn't know how to use moviemaker at*
> *all, so now if someone asked me to make a movie, it will be really awful, but I*
> *know how to make it. I can give them a product that I made.*

The project did ask both teachers and students to consider new ways of teaching and learning. The authentic, real world nature of the learning task was both challenging and a little daunting to students. Teachers needed to conceptualize their role as they became facilitators of a process rather than content transmitters. The English course did help students to improve their

English skills and the movie project made a significant contribution to that outcome.

Conclusion

The movie project described in this paper was successful in increasing students' English knowledge and led to students having a positive attitude to teamwork while facilitating the development of 21st Century skills. Schools need to continue to develop ways to maximize the effective use of ICT in the classroom to engage students in learning. The widespread use of ICTs has moved from institutions to the home (Noss, 2012). With ubiquitous access to technology, students have the tools to build knowledge and skills to set themselves up for a bright and productive future. The results of this project have contributed to the argument that teachers can use ICTs to establish learning environments that benefit students collectively and individually.

The project provided a rich environment with students learning from each other, students learning from the group, and groups learning from other groups. Students should be given opportunities to explore and develop who they are as individuals (Kaufman, 2013). In today's global learning community, ICTs have helped learning to become personal.

References

Biggs, J., & Moore, P. (1993). The process of learning 3rd. ed. Australia: Prentice Hall.

Grajek, S. (2014). Top-ten IT issues, 2014: Be the change you see. Educause Review, 49(2), 10-46. Retrieved from https://net.educause.edu/ir/library/pdf/ERM1421.pdf.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. London: Routledge.

Hoy, R. (2006) *Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS.* Sydney: Chapman and Hall/CRC

Kaufman, K. J. (2013). 21 Ways to 21st century skills: Why students need them and ideas for practical implementation. *Kappa Delta Pi Record, 49*(2), 78-83. doi: 10.1080/00228958.2013.786594

Mehdinezhad, V. (2011). First year students' engagement at the university. *International Online Journal of Educational Sciences, 3*(1), 47-66.

Michelli, M. (2013). The relationship between attitudes and achievement in mathematics among fifth grade students. The University of Southern Mississippi Honors Thesis, Paper 126.

Noss, R. (2012). 21st century learning for 21st century skills: What does it mean, and how do we do it? In *21st century learning for 21st century skills* (7th European Conference on Technology Enhanced Learning). Saarbrucken, Germany.

Silva, E. (2009). Measuring skills for 21st-century learning. *Phi Delta Kappan*, 90(9) 630-634.

Stahl, G. (2012) Traversing planes of learning. International Journal of Computer-Supported Collaborative Learning 7 (4), pp. 467-473. doi: 10.1007/s11412-012-9159-7

Tarantino, K., McDonough, J., & Hua, M. (2013). Effects of student engagement with social media on student learning: A review of literature. *The Journal of Technology in Student Affairs,* summer. Retrieved from http://studentaffairs.com/ejournal/Summer 2013/ EffectsOf StudentEngagementWithSocialMedia.html

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. San Francisco, CA: Jossey-Bass.

Volman, M., Van Eck, E., Heemskerk, I., & Kuiper, E. (2005). New technologies, new differences. Gender and ethnic differences in pupils' use of ICT in primary and secondary education. *Computers & Education, 45(1)*, 35-55.

Wasike, A. (2013). Effects of attitudes of female students on the performance in mathematics in various types of secondary schools in Teso district, Kenya. *Journal of Education and Practice, 4*(5).

Wilson, K. (2011). *Smart choice* (2nd ed.). Oxford: Oxford University Press.