39th annual Proceedings

Selected Papers on the Practice of Educational Communications and Technology - Volume 2

Presented at The Annual Convention of the Association for Educational Communications and Technology

AECT Sponsored by the Research and Theory Division
And
The Division of Instructional Design
Las Vegas, NV

Editor: Michael Simonson

Nova Southeastern University
Fischler College of Education
North Miami Beach, Florida

2016 Annual Proceedings – Las Vegas: Volumes 1 & 2

Volume 1: Selected Research and Development Papers
And
Volume 2: Selected Papers
On the Practice of Educational Communications and Technology

Presented at
The Annual Convention of the Association for Educational Communications and Technology
Sponsored by the Research and Theory Division
And
The Division of Instructional Design
Las Vegas, NV
2016

Editor
Michael Simonson, Ph.D.
Chair, Instructional Design and Technology Department
Fischler College of Education
Nova Southeastern University
North Miami Beach, FL

Preface

For the thirty-eighth time, the Research and Theory Division of the Association for Educational Communications and Technology (AECT) is sponsoring the publication of these Proceedings. Papers published in this volume were presented at the annual AECT Convention in Las Vegas, NV. A limited quantity of these Proceedings were printed and sold in both hardcopy and electronic versions. Volumes 1 and 2 are available through the Educational Resources Clearinghouse (ERIC) System. Proceedings volumes are available to members at AECT.ORG. Proceedings copies are also available at:

http://www.tresystems.com/proceedings/

The Proceedings of AECT's Convention are published in two volumes. Volume #1 contains papers dealing primarily with research and development topics. Papers dealing with the practice of instructional technology including instruction and training issues are contained in Volume #2. This year, both volumes are included in one document.

REFEREEING PROCESS: Papers selected for presentation at the AECT Convention and included in these Proceedings were subjected to a reviewing process. All references to authorship were removed from proposals before they were submitted to referees for review. Approximately sixty percent of the manuscripts submitted for consideration were selected for presentation at the convention and for publication in these Proceedings. The papers contained in this document represent some of the most current thinking in educational communications and technology.

Michael R. Simonson
Editor

Previous Proceedings Published in ERIC

Year	Location	ED Number
1979	New Orleans	171329
1980	Denver	194061
1981	Philadelphia	207487
1982	Dallas	223191 – 223326
1983	New Orleans	231337
1984	Dallas	243411
1985	Anaheim	256301
1986	Las Vegas	267753
1987	Atlanta	285518
1988	New Orleans	295621
1989	Dallas	308805
1990	Anaheim	323912
1991	Orlando	334969
1992	Washington, D.C.	347970 – 348041
1993	New Orleans	362144
1994	Nashville	373774
1995	Anaheim	383284
1996	Indianapolis	397772
1997	Albuquerque	409832
1998	St. Louis	423819
1999	Houston	436128
1999	Long Beach	444595
2000	Denver	455756
2001	Atlanta	470066
2002	Dallas	496300
2003	Anaheim	496305 & 496303
2004	Chicago	499961 & 499962
2005	Orlando	499958 & 499963
2006	Dallas	499964 & 499959
2007	Anaheim	499889 & 499896
2008	Orlando	504371
2009	Louisville	511355 & 511356
2010	Anaheim	514647
2011	Jacksonville	514646 & 514647
2012	Louisville	546875 & 546876
2013	Anaheim	546877 & 546878
2014	Jacksonville	TBD
2015	Indianapolis	TBD

Proceedings copies are also posted at:

http://aect.site-ym.com/?page=ConvProceedings (for AECT Members)

and

http://www.tresystems.com/proceedings/

2016 AECT Conference RTD Reviewers

M. J. Bishop
Marcie Bober
Jonathan Brinkerhoff
Abbie Brown
Shirley Campbell
Susan Colaric
Marcy Driscoll
Jared Danielson
Peg Ertmer
Deniz Eseryl
Branda Friedan
Xun Ge
Andrew Gibbons
Krista Glazewski
Michael Grant
Janette Hill
Brad Hokansen
Ann Igoe
Kethleeen Ingram
Paul Kirschner
James Klein
Dave Knowlton
Theodore Kopcha
Tiffany Koszalka
Kathryn Ley
Nancy Maushak
Trey Martindale
Joan Mazur
Al P. Mizell
Gary Morrison
Zane Olina
Gamze Ogozul
Andrea Peach
Robert Reiser
Willi Savenye
Rebecca Scheckler
Michael Simonson
Andrew Smith
Michael Spector
Howard Sullivan
Ellen Taricani
Lucinda Willis

VOLUME 2 - SELECTED PAPERS ON THE PRACTICE OF EDUCATIONAL COMMUNICATIONS AND TECHNOLOGY

Teaching Strategy for the Development of Creative Thinking of Future Educators of Mexico, Through ICT

Clotilde Lomeli Agruel

Aidee Espinosa Pulido

Julieta López Zamora

Francisco Javier Arriaga Reynaga

Descriptors: Teaching strategy. Creative thinking.

Abstract

The formation of creative students is an explicit objective of the new educational model proposed by the recent educational reform in Mexico. How do educators develop creative thinking in their students? What measures can be taken to support the formation of new educators able to develop the competencies required by the educational reform? In response to these questions, a teaching strategy was designed to stimulate creative thinking in future educators enrolled at a teacher training institution and taking the course Educational Innovation.

The teaching strategy consisted in organizing the class into eight triads in line with the pedagogy of cooperative learning. Each triad designed, produced and evaluated a reusable digital learning object aimed at stimulating creative thinking in middle and high school students. The prior knowledge of the students taking the course was identified, with the students undertaking self-evaluation on completion of the first unit, with both this data and the results of the evaluation of the learning objects used to discuss the pertinence of the teaching strategy. To conclude, with a more rigorously planned teaching strategy that includes a research design that systematically approaches an understanding of how to develop creative thinking across the diverse spectrum of classrooms in the Mexican education system, the results obtained in the exercise do stimulate to advance on this line of research.

How to Develop Creative Thinking?

The need to form creative students and teachers who stimulate creativity in their students is common in all educational disciplines and levels around the world. Both Guilford (1950) and Torrance (1972) stated that they were convinced of the possibility of teaching students to think creatively. The various theoretical perspectives coincide in their conceptions of one aspect, namely that creativity both can and should be developed in both formal and non-formal educational environments (Garaigordobil, 2006; Gregerson, Snyder & Kaufman, 2013).

The standard definition of creativity (Runco & Jaeger, 2012), accredited to Stein (1953) and Barron (1955), identifies the criteria of *original* and *useful* for judging an idea or product as creative. Stein (1953) describes creative work, in terms of being useful for a group at a specific time, beginning with the reintegration of existing material and knowledge in order to produce something that contains original elements.

Significant advances along various lines have been found in the field of research into creativity, with open debates and continuing to propose new definitions of creativity (Runco & Jaeger, 2012).

Hennessey and Amabile (2010) identify a growing interest in the study of creativity accompanied by the fragmentation of the research field, arguing for the overriding need to undertake interdisciplinary research from the perspective of systems that recognize the complexity of studying the psychology of creativity. The foregoing impacts on teaching practice for the development of student creativity in the classroom, in that the educator is nourished by both empirical research and theory in designing their teaching strategies.

The development of student creativity in school is fundamental for the progress of human beings across all spheres, be they social, economic, scientific, cultural, familial or personal. Not all countries explicitly include the development of creativity in their educational policy and study programs (Lucas, Claxton & Spencer, 2013). For example, Singapore has, for more than 20 years, maintained the development of creativity in its schools as a priority (Tan & Law, 2000). In 2006, Sawyer described the need to restructure the educational system of the United States of America, the country neighboring Mexico, an essential element of which being the planning and development of

empirical research in the field of education to help educators identify those innovations that promote creativity in students.

Creativity in the Mexican Educational System

The Mexican educational system is currently undergoing a process of profound reform. The third article of the Mexican constitution was modified with the mandatory requirement for the State to offer high quality education, to which end educational policies and various programs have been established to provide the framework for moving towards the required educational quality.

A new educational model and the corresponding curricular proposals for compulsory education are found within the national discussion (Secretaria de Educación Pública, 2016), both of which are intended to be implemented in 2018 at preschool, primary, middle and high school level across the whole country. It is here where creativity explicitly appears in the Mexican educational system.

The new educational model for compulsory education in Mexico comprises three curricular components that, by means of their interaction, would offer students an integrated formation. One of the curricular components, personal and social development, includes the development of student creativity. Who will develop creativity in students? Their teachers. How will teachers develop creativity in their students?

For educational quality to improve, it is indispensable that teachers are prepared to make the pedagogic practices proposed by the new educational model their own and also to implement them in the classroom. Thus, serving teachers will be periodically evaluated as a condition of their entry into, retention and progress in the profession. Creativity, the use of information and communication technology (ICT) and collaborative work are central planks of the current legislation introducing educational reform in Mexico. The Secretariat of Public Education produces profiles, parameters and indicators for teacher evaluation (Secretaria de Educación Pública, 2015), in which predominate the collaboration of teachers amongst themselves, innovation in the quality of their teaching practice, and their incorporation of ICTs.

Teacher training institutions play an important role in the context of educational reform. Their educational programs must form new teachers with the competencies required for delivering high quality education in harmony with the country's new educational model. The teaching strategy described here is an exercise in joint responsibility. Those students that participated in the strategy were enrolled in one of the teacher training institutions. The teaching strategy intends to attend to the need for trainee teachers to identify that the development of student creativity should form part of their teaching practice and that, due to its complexity, this requires collaboration amongst themselves. It also requires trainee teachers to recognize that the use of ICT, and in particular the use of learning objects (LO), given their reusable nature, can help to improve teacher efficacy.

The production and use of LOs, as well as research in this area, are recent phenomena in Mexico. Established in 2006, the Latin American Community on Learning Objects (LACLO) is the organization that drives academic events in this area. Wiley (2002) presents an extensive review of the literature on LOs. Among the attractions of LOs are their reusable and interoperable nature, and that they make sense on their own terms and are minimal units of didactic content.

To sum up, the question of how to develop creative thinking in a scholastic environment has neither an unambiguous nor definitive answer. Although the specialized international literature provides examples of good practice (Gregerson, Snyder & Kaufman, 2013), the teaching strategies must be contextualized in the cultural, political and material environment in which they are applied (Hennessey & Amabile, 2010). An international perspective must be maintained on the advances in the field of research (Hellstén & Reid, 2008), in accordance with the challenges of the Twenty First Century and the work of researchers and practitioners in the area of creativity (Glăveanu, 2014).

In Mexico, research into creativity is an emerging field (see the States of Knowledge of the *Consejo Mexicano de Investigación Educativa*, COMIE, or the Mexican Council for Educational Research). In the face of the challenges posed by the educational reform and the proposal of a new educational model, and further to undertaking empirical research across the broad spectrum of Mexican classrooms, it is crucial to reduce the gap between the international community producing scientific knowledge on creativity and the educators charged with developing creativity in students.

Teaching Strategy

The teaching strategy described here has its roots in the above described context of Mexican educational policy, the challenges posed by the education reform currently underway, and the international field of research into

creativity. This teaching strategy for creative thinking was designed for the course *Innovación Educativa* (IE, or Educational Innovation) which is part of the formation of teachers and psycho-pedagogical counselors at a public university in Mexico.

The IE course has a double objective which, on the one hand, aims to stimulate creative abilities in the students taking it and, on the other, seeks to contribute to the formation of educators in order that they develop creative thinking in their future students through innovative teaching practice. The 120-hour course, distributed over 16 weeks on a blended learning basis, is taken by students in the last year of their undergraduate degree.

The course was divided into three units. In the first unit, which lasted two weeks, the work teams researched and discussed the contribution of a chosen author. Subsequently, each team organized a session in which they shared their work before the whole class. In order to complete the first unit of the course, each student was required to prepare a comparative table of all the approaches to creativity discussed in class. The unit finished with a self-evaluation of the knowledge the students displayed and their participation in the teamwork activities.

The second unit, which lasted two weeks, saw students undertaking activities in teams that introduced the subject of the LOs and their repositories. Examples and counter-examples of the objects, which placed emphasis on identifying the characteristics of the LOs, were analyzed.

In the third unit, which lasted 11 weeks, the work teams chose one of the theoretical perspectives on creativity analyzed in class to use in preparing their LO, which was to be designed for middle and high school students. The teams prepared the instructional design, which was presented to the class along with their arguments supporting their instructional decisions. The free application eXelearning was used for the instructional design of a total of eight LOs. A teacher from the area of educational technologies collaborated during the development phase, providing advice and assessment for the teams over the installation and operation of eXelearning.

Feedback was given for the first version of the LOs in terms of the clarity of the communication and writing for the students, coordinated by their teacher from the Language and Literature Teaching undergraduate program. Once the recommendations were received, the teams improved their LOs.

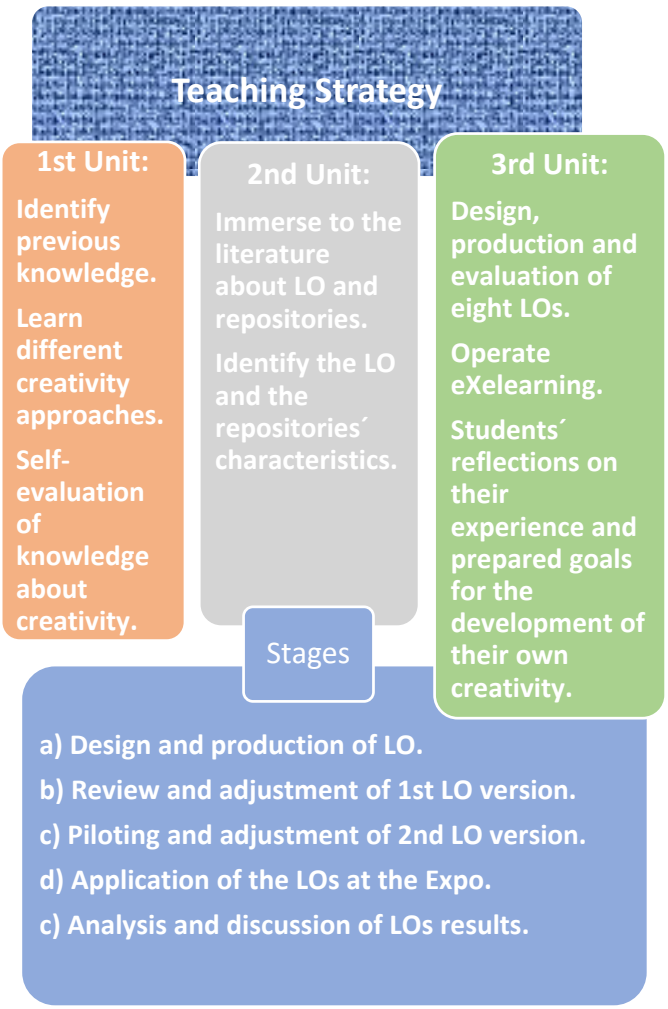
Each team put the second version of the LOs into practice, evaluating them using a checklist and open questions, with three middle and high school student volunteers participating in the evaluation of each LO, based on which, the teams improved their LOs and then devised a third version.

Finally, the LOs were presented at a Teaching Expo to groups of middle and high school students, who were invited to register their email address in order to be signed up to a free platform on which they could interact with the LOs at their own pace.

On completing the course, the students presented their reflections in an individual essay on their experience of the project, and prepared goals for the development of their own creativity.

The theoretical pillars that guided the teaching strategy presented here are the pedagogy of cooperative learning (Johnson & Johnson, 2009), instructional theory (Clark & Mayer, 2011; Reigeluth, 2012), theoretical perspectives on creativity (Gregerson, Snyder, & Kaufman, 2013; Hennessey & Amabile, 2010; Runco, 2014), and LOs (Wiley, 2002).

The pedagogy of cooperative learning provided the students with abilities for collaborating in groups, among other benefits. The blended learning format of the course and the development of the reusable learning objects trained the students to use ICT for their future teaching practice.



Results

The teaching strategy described here was applied during the 2016-1 school term to one group in their last year of the Undergraduate program in Psycho-pedagogic Counselor at a public university in the North East of Mexico. A total of twenty three students participated, of whom two were men and twenty one women, and all of whom were enrolled on the IE course. The results for the students' prior knowledge on creativity, self-evaluation and the development of LOs are presented below.

Prior Knowledge

On the first day of class, the participants were asked to respond to a questionnaire comprising open questions prepared by the teacher with the aim of identifying the students' prior knowledge as related to creativity. The twenty three students indicated that they could not recall the names of either authors or theories related to creativity, nor could they recall the digital resources required for its development. Furthermore, the significance and examples of the LOs were also an unknown subject.

The questionnaire enquired as to the participants' conceptions of creativity, by undertaking a content analysis of their responses (Kerlinger, 1986), with the following four themes standing out with greater frequency: *ability*; *idea*; *imagination*; and, *problem-solving*. Of the twenty three students, five referred to creativity as an ability to create or develop, while three described creativity as the creation or application of ideas, and eleven included two or three of the four themes identified in their answers. *Ability* was the most mentioned theme, followed by *idea* with ten mentions, *imagination* with seven and *problem-solving* with five mentions, as shown in Table 1.

Table 1. Themes from the content analysis of the students' prior knowledge on creativity

Theme	Number of mentions
Ability	17
Idea	10
Imagination	7
Problem-solving	5

Of the twenty three students, four gave varied responses on their conception of creativity without alluding to the four themes (*ability*, *idea*, *imagination* and *problem-solving*) identified in the content analysis. One of the four students conceived of creativity as "giving your style to something", while the second and third students compared creativity to "being an innovator", and, lastly, the fourth student expressed their conception of creativity as "doing something for yourself that nobody else can equal". The responses of these four students were very short, comprising nothing more than phrases.

Together, the prior knowledge of the participants before commencing the IE course demonstrates an inability to recall topics seen in previous courses during their formation, in which content from some authors and theories related to creativity were covered. Only two of the twenty three students described their conception of creativity by including three of the four themes identified in the content analysis, with their responses being the most elaborate. None of the conceptions of the students refer to the two criteria *original* and *useful* (Runco & Jaeger, 2012) taken from the standard definition of creativity.

Self-evaluation

On completing the first unit of the course, in which various activities were undertaken in cooperative teams and class sessions with the aim of self-evaluating their progress, the students responded individually to a questionnaire with open questions and four affirmations on a Lickert type scale with the answer options of *true*, *almost true*, *almost false* and *false*.

The self-evaluation required the participants to describe their concept of creativity, with all students giving open answers that made reference to the authors analyzed in class. The authors to whom most participants referred were J. P. Guilford, M. A. Runco, T. Amabile, E. de Bono, M. Csikszentmihalyi, and A. Osborne.

The results of the self-evaluation show that the responses of the students with regard to their concept of creativity were now more elaborate and include themes absent from their prior knowledge. Further to the four initial themes, the students referred to the creative potential that exists in all human beings and is manifested in various forms. They also named the themes of *process*, *change*, *original*, *divergent thinking and technique*, *social interaction and experience*, *useful*, *product*, and *innovation and invention*, all of which varied in the frequency at which they were mentioned, as shown in Table 2.

It is reasonable to identify the class and teamwork activities undertaken during the first unit of the course as the source of the variation in the themes and the frequency at which they were mentioned between the prior knowledge and self-evaluation phases of the research (tables 1 and 2). Various authors and their contributions were researched and discussed during said activities.

The self-evaluation shows that the students were more informed than before, capable of identifying relevant authors in the field of research on creativity and contributing their own conceptions with more articulate responses. However, given that they were discussed in class during various sessions, the themes of *social interaction and experience*, *problem-solving*, *useful*, *product*, *innovation* and *invention* were mentioned at a lower frequency. The foregoing could be indicative of a lack of time and activities through which the students could have widened their conception of creativity, or that, at the moment of carrying out the self-evaluation, the students were still in the process of preparing their own conceptions.

Table 2. Themes from the content analysis for the self-evaluation on the concept of creativity

Theme	Number of mentions
Ability	9
Idea	9
Creative potential, shown in many forms	8
Process, change	6
Original	6
Problem-solving	5
Divergent thinking, technique	5
Social interaction, experience	3
Useful	3
Product	3
Innovate	3
Imagination	2
Invention	1

The majority of the students found learning about creativity to be a motivation, with twenty responding *true*, two *almost true* and one student not responding. The majority responded that they found an application for that which they had learned in the course in both their personal and professional life. Furthermore, they affirmed that they participated equitably in the teamwork activities. The foregoing is shown in Table 3.

Table 3. Some opinions of the participants on both the course and teamwork.

Affirmation	Responses/students			
	True	Almost true	Almost false	False
I find learning about creativity to be a motivation	20	2	0	0
What I am learning in the course is applicable to my profession.	22	1	0	0
What I am learning in the course has implications in my personal life.	21	2	0	0
I participate equitably in the teamwork activities.	21	2	0	0

To sum up, the data from the prior knowledge and self-evaluation indicate that, on completing the first unit, the students from the IE course found themselves to be motivated by the content, to have increased their knowledge in terms of the topics, and to have participated equitably in the teamwork activities. Furthermore, in their conceptions of creativity, some students made reference to the criteria of *original* and *useful* from the standard definition of creativity.

Development of Reusable Learning Objects

The second unit from the course, which lasted two weeks, focused on familiarizing the students with the LO repositories, analyzing their characteristics, and locating objects in those Spanish language repositories which aim to develop creativity.

During the third and last unit of the course, each team of students developed an LO. The total of eight LOs that were produced are presented in Table 4. The teams were free to choose the subject as long as it did not duplicate the one chosen by another team, to agree to the learning objective, and to discuss its design. All of the LOs were produced using the free application eXelearning.

Table 4. Name of the reusable learning objects.

Name of the LO
Motivating Myself to Learn More
I Am Original
The 4'c
Fluency of Ideas
Verbal Fluency
The Hatter
Raining Ideas
Riddle Me This

The teams demonstrated their concern at the lack of experience in the management of digital applications, such as how to install and use eXelearning, for which reason the collaboration of the educational technology teacher was sought. After a short period of disquiet and thanks to the presence of the teacher, the teams were able to feel comfortable with the technology in the object production stage.

Other moments of stress for the students were the identification of the characteristics and the instructional design of the LOs. The teacher in charge of the course prepared additional materials to deal with the difficulties experienced in class and, thus, facilitate the students' understanding of the tasks. For example, based on the literature review, a check list was produced to help the students choose from the characteristics of the LOs found in the repositories consulted. Furthermore, a guide for was produced for the instructional design with help inserted in hypertext, a modification which had not been envisaged at the beginning of the course.

Another tension in the teams occurred on receiving observations in class over the first version of the LO in terms of the clarity of communication, issues related to the writing, and the copyright of the images and music taken from the internet. For this reason it was considered opportune to invite students from the Language and Literature Teaching undergraduate degree program, coordinated by their teacher, to indicate in writing the corrections required. With the above described initiative, the teams showed that they felt less pressure, as they had not been able to identify these errors themselves, due to the work dynamic and the various tasks. After receiving the recommendations, the teams went on to improve the second version of their LO.

The teams invited three middle or high school students put the second version of each object to the test, with each team managing the space and time involved and the activity itself. A total of twenty four students participated, comprising twelve middle and twelve high school students. The manner in which the students interacted with the objects was registered in these feedback sessions, with suggestions requested as to how to make the objects more attractive and useful, identifying, among other aspects, what they had liked least about the LO.

Due to the extensive nature of the data collected, partial results of the feedback from the middle and high school students on the eight LOs are presented below. To the question as to whether the objects had awoken their interest in creativity, the response was affirmative for the five objects *Motivating Myself to Learn More*, *I am Original*, *The 4'c*, *Fluency of Ideas* and *Verbal Fluency*.

For the remaining objects, *The Hatter*, *Raining Ideas* and *Riddle Me This*, the majority of the students indicated that these objects had awoken their interest in the theme of creativity a little. Discussions of the aforementioned concluded that the activities that develop creativity must be made more robust and the current emphasis on disciplinary content must be reduced. For example, the object *Riddle Me This* used information on the elements of the periodic table for the production exercises.

As can be seen in Table 5, the most recurring comments from the students for the improvement of the objects point to a reduction in the amount of reading and an increase in or the inclusion of the use of videos, movement, activities, games, exercises, music, color, feedback and interaction.

Table 5. Feedback to improve the LOs.

LO	Feedback	Comments
Motivating Myself to Learn More	What did you like the least?	Too much reading
	What would you suggest to improve it?	Less reading and more videos. Include an end of course event.
I Am Original	What did you like the least?	Few options in the activities.
	What would you suggest to improve it?	Increase the number of options in the activities, include music and video.
The 4'c	What did you like the least?	A lot of reading and the colors.
	What would you suggest to improve it?	Include images with movement, colors, games and feedback. Make it easy to download.
Fluency of Ideas	What did you like the least?	Not very clear. A lack of videos.
	What would you suggest to improve it?	More games, exercises and movement.
Verbal Fluency	What did you like the least?	Few activities.
	What would you suggest to improve it?	Include a color background and exercises.
The Hatter	What did you like the least?	Too much reading.
	What would you suggest to improve it?	Less reading.
Raining Ideas	What did you like the least?	Too much information without movement, a lack of color.
	What would you suggest to improve it?	More colors, interaction and movement.
Riddle Me This	What did you like the least?	Thought is required to create a riddle. The meaning of the chemical elements.
	What would you suggest to improve it?	None.

Furthermore, all the students affirmed in the feedback that they would recommend the LOs to their classmates. Similarly, all of them indicated that the content is useful in their lives as students.

The twenty four students coincided in their desire to be creative people. Only four students recognized their teachers as creative, while five considered them to be not very creative, and the remaining fifteen stated that their teachers were not creative. It is not known what creativity meant for the twenty four students.

In general, the students commented on their lack of knowledge on the subjects dealt with by the objects. They stated that the objects were distinct to the habitual manner in which they undertook learning activities and that they liked and had fun interacting with the LOs.

The feedback received by the students was taken into account, with the teams then making the requisite improvements to the objects. Subsequently, the LOs were presented at a Teaching-Expo for middle and high school teachers and students. The attendees were invited to provide their email addresses if they wanted access to interact with the eight LOs, with almost all attendees, including teachers and students, providing their contact information.

Image 1. Presentation at the Teaching-Expo.

Conclusions

The conclusions derived from the experience of using the teaching strategy described here are relevant solely to the environment in which it was applied. While the strategy was planned before the beginning of the course, it was necessary to make adjustments, request the collaboration of other teachers, and prepare additional materials, in order to respond to the difficulties that would present themselves during the academic term. The foregoing suggests that, given the diversity of students found in a specific class, the teaching strategy must be flexible in order for it to be adjusted effectively.

The tensions demonstrated in the work teams were attended to appropriately, a process which provided the opportunity to exemplify in practice the benefits of working in interdisciplinary teams to produce an LO. It would be recommendable for subsequent research in this area to include teams in which students from other disciplines participate in the design of the LOs, disciplines such as communication, graphic design and the production of digital educational material.

The teaching strategy for the IE course was effective in facilitating the development of competencies that will be evaluated in future educators as a requirement to enter the labor market in the Mexican educational system. Specifically, these competencies comprise collaboration and teamwork abilities, the ability to incorporate ICT in teaching practice, and strategies for the development of creativity.

The response of the middle and high school students to their interaction with the LOs was very encouraging in terms of their potential use for the development of creative thinking. It is important to continue producing LOs.

This was a greatly important life experience for the teachers involved in this teaching strategy. They specifically highlight two of the lessons learned. Firstly, with a proactive attitude and the use of asynchronous digital media, it was possible to overcome the obstacle of work scheduling, thus enabling sustained collaboration. Secondly, the educator needs to carry out their teaching practice in an empirical research space.

To conclude, the results obtained in the exercise do stimulate to advance on this line of research, with a more rigorously planned teaching strategy that includes a research design that systematically approaches an understanding of how to develop creative thinking across the diverse spectrum of classrooms in the Mexican education system.

References

Barron, F. (1955). The disposition towards originality. *Journal of Abnormal and Social Psychology*, 51, 478-485.

Hennessey, B. A., & Amabile, T. M. (2010). Creativity. *Annual Review of Psychology*, 61, 569-598.

Clark, R., & Mayer, R. (2011). *E-Learning and the Science of Instruction* (3rd ed.). USA: Pfeiffer.

Garaigordobil, M. (2006). Intervention in Creativity with Children Aged 10 and 11 Years: Impact of a Play Programo on Verbal and Graphic-Figural Creativity. *Creativity Research Journal*, 18(3), 329-345.

Glăveanu, V. P. (2014). The Psychology of Creativity: A Critical Reading. *Creativity*, 1, 10-32.

Gregerson, M. B., Snyder, H. T. & Kaufman, J. C. (Eds.). (2013). *Teaching Creatively and Teaching Creativity*. Springer-Verlag: New York.

Guilford, J. P. (1950). Creativity. *American Psychologist*, 5, 444-454.

Hellsten, M. & Reid, A. (Eds.). (2008). *Researching International Pedagogies. Sustainable Practice for Teaching and Learning in Higher Education*. Springer: Netherlands.

Johnson, D., & Johnson, R. (2009). An Educational Psychology Success Story: Social Interdependence Theory and Cooperative Learning. *Educational Researcher*, 38, 365-379.

Kerlinger, F. (1986). *Foundations of Behavioral Research* (3rd ed). New York: Holt, Rinehart and Winston.

Lucas, B., Claxton, G. & Spencer, E. (2013). Progression in Student Creativity in School: First Steps Towards New Forms of Formative Assessments. *OECD Education Working Papers*, 86, 1-45. Retrieved from https://www.**oecd**.org/edu/ceri/5k4dp59msdwk.pdf

Reigeluth, C. (2012). Teoría instruccional y tecnología para el nuevo paradigma de la educación. *RED, Revista de Educación a Distancia*, 30. Retrieved from http://www.um.es/ead/red/32

Runco, M. A. (2014). *Creativity Theories and Themes: Research, Development and Practice* (2nd ed.). AcademicPress: e-Book.

Sawyer, R. (2006). Educating for innovation. *Thinking Skills and Creativity*, 1, 41-48.

Secretaría de Educación Pública (2015). Perfiles, parámetros e indicadores para docentes y técnicos docentes. Retrieved from http://servicioprofesionaldocente.sep.gob.mx/ba/permanencia_docentes/inicio/

Secretaría de Educación Pública (2016). El Modelo Educativo 2016. Retrieved from https://www.gob.mx/modeloeducativo2016

Stein, M. I. (1953). Creativity and culture. *The Journal of Psychology: Interdisciplinary and Applied*, 36, 311-322.

Tan, A-G & Law, L-C (2000). Teaching Creativity: Singapore´s Experiences. *The Korean Journal of Thinking & Problem Solving*, 10(1), 79-96.

Torrance, E. P. (1972). Teaching for Creativity. *The Journal of Creative Behavior*, 16, 114-143.

Wiley, D. A. (Ed.). (2002). *The Instructional Use of Learning Objects*. Indiana:AIT/AECT.

Designing a Graduate Supervision MOOC for Faculty Development

Hawazen Alharbi
Werklund School of Education
University of Calgary/King Abdulaziz University
halharbi@ucalgary.ca

Michele Jacobsen
Werklund School of Education, University of Calgary
dmjacobs@ucalgary.ca

Descriptors: MOOCs, Graduate Supervision

Introduction

Massive Open Online Courses (MOOCs) offer a promising approach for faculty development in higher education. This paper reports on the analysis and the preliminary development phase of a design-based study to explore the design, implementation and evaluation of a Quality Graduate Supervision miniMOOC (QGSmM) for academic faculty ("mini" indicates a closed pilot). Supervising graduate students is an important part of a faculty member's teaching role and responsibility; thus it is an area that needs focus and support. Strong relationships between graduate supervisors and students play an important role in the success of graduate students in their coursework and research, and in the timely completion of their programs. Faculty development opportunities are an important strategy for improving and advancing faculty members' skills in research, teaching and in graduate supervision. However, given the many demands on faculty members' time, it can be a challenge to get faculty to take part in faculty development seminars and workshops. This design-based research responds to the need to design easily accessible and flexible, online faculty development opportunities that are tailored to faculty members' learning needs as graduate supervisors and can target large numbers of participants at the same time. Findings from this research are expected to increase collective understanding of the effective design and delivery of the QGSmM to engage academic faculty in an interdisciplinary learning community to enhance their graduate supervision practices. The motivation to invest in faculty development for graduate supervision is anticipated overall improvements in the experiences of both students and faculty over time.

Background

The quality of student-supervisor relationships plays an important role in the success of graduate students (Skarakis Doyle & McIntyre, 2008). Poor supervision is considered one of the factors that contribute to the dropout of doctoral students in Canada (Erichsen, Bolliger & Halupa, 2014; Skarakis Doyle & McIntyre, 2008). Rather than simply relying on their own experiences being supervised, faculty members need additional support and guidance in the development of strong graduate supervision skills. According to Dangel and Tanguay (2014), "there is conceptual and empirical literature that points to the need for quality supervision; however, there is less information on how to best support supervisors in their work" (p. 4). Enticing faculty to take part in faculty development is another challenge. While most institutions offer faculty development opportunities and programs for faculty, too few of the faculty members who need this support actually take advantage of these learning opportunities. Taylor and McQuiggan (2008) outline several reasons why faculty members choose not to participate in university-wide professional development: lack of time, volume of faculty work, logistical issues (for example, the times and locations of sessions), lack of recognition or financial awards for teaching, and lack of direction from the university. It may be that online learning is the best way to engage busy faculty members in ongoing development.

As academic work is complex and ever changing in both research and teaching, faculty members need to keep up to date with the latest research in their fields, develop their teaching and graduate supervision practices and contribute leadership and service to collegial governance at their institutions. A successful faculty development program will address limited faculty time and also take into account how and whether teaching is valued at the institution. Furthermore, faculty development programs need to be designed to enable graduate supervisors to open up their graduate supervision practices for discussion, debate and critique with graduate supervisors from across

disciplines (Manathunga, 2010). Researchers have recommended the use of MOOCs as a workable solution for faculty professional development (Bond, 2013; Fini, 2009). In the past few years, MOOCs have become integrated into higher education with faculty members designing MOOCs for students. Two studies report on the use of MOOCs for faculty professional development (Stephens & Jones, 2014; Waite et al., 2013). An assumption that guides this study is that higher education can use MOOCs to engage large communities of faculty from across fields of study in a learning community focused on the development of quality graduate supervision practices.

The conceptual framework for this design based study includes three theoretical perspectives, including connectivism theory, learning communities and constructivism. The overall design of the miniMOOC will draw upon the principles of constructivism. Huang (2002) summarizes the instructional principles of constructivism that influence the design of online learning environment: Interactive learning, collaborative learning, facilitate learning, authentic learning, learner-centered learning and high quality learning. For learning to be authentic and meaningful in this miniMOOC, learners will be involved in the design of the miniMOOC. The design of modules for the miniMOOC will be based, in part, on the input of the graduate supervisors as to what they want to enhance and learn about graduate supervision. The instructors will adopt a constructivist stance in leading and facilitation learning in the miniMOOC. Facilitators will guide, advise and facilitate learning in the miniMOOC, but will not be delivering content. This miniMOOC will also take into consideration the prior knowledge of faculty members and will encourage them to express their personal knowledge in supervising graduate students.

Research on the benefits and drawbacks of MOOCs have been considered for the design of a faculty development miniMOOC. For example, Yang, Sinha, Adamson, and Rose (2013) discovered, while studying Coursera's MOOCs, that one reason for high participant drop out is the MOOC's failure to provide the necessary social environment for participants. Building from this finding, the present study has adopted a community of learners' approach guided by connectivism. The miniMOOC will be designed to be a collaborative learning experience that emphasizes discussion, communication, and networking with other learners. Siemens' (2006) connectivism theory emphasizes the idea that "instead of knowledge residing only in the mind of an individual, knowledge resides in the distributed manner across a network" (p.8). The design of the miniMOOC will support the creation of a learning community comprised of faculty from across disciplines focused on a common role and responsibility. Forming a learning community that supports sharing and collaboration is essential to build trust, rapport and active learning in faculty development programs (Taylor & McQuiggan, 2008). The miniMOOC will be designed to support the formation of a learning community by providing rich and varied resources for review and collaborative discussion and knowledge building, and through meaningful tasks and opportunities for faculty to collaborate in different ways. The miniMOOC may encourage the division of the participants into smaller groups based on their discipline, as some aspects of graduate supervision relationships and practices have been shown to vary from one faculty to another (Golde & Walker, 2006).

The two gaps in the available literature that this design-based research aims to address are: one, how can we best support graduate supervisor development, and two, how effective are MOOCs for faculty development. This design based research study examines the potential of MOOCs as an accessible and flexible learning environment to support ongoing faculty development in the area of graduate supervision. Using a design based research approach, this study is structured to evaluate both the design and the implementation of a miniMOOC. This design based research is guided by three research questions.

1. What design elements are necessary in the development of a Quality Graduate Supervision miniMOOC?
2. What scaffolding and support is necessary to support faculty members to effectively use the Quality Graduate Supervision miniMOOC?
3. In what ways can a Quality Graduate Supervision miniMOOC support and benefit faculty members in the ongoing development of their graduate supervision practices?

This paper reports on the analysis and development phase and preliminary findings that address question one.

Methods and Design of the Study

A design-based research (DBR) approach has been chosen to guide the design, implementation and evaluation of a Quality Graduate Supervision miniMOOC. Wang and Hannafin (2005) define design-based research as "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories" (p. 6–7). DBR is increasingly popular in educational research, as it has been designed by teachers for teachers in order to bridge the gap between theory

and practice (Wang & Hannafin, 2005). Amiel and Reeves (2008) argue, "that design-based research provides an innovative proposal for research on innovation and education" (p. 30). This study follows Reeves' (2006) suggested phases for conducting Design-Based Research: a) analysis of practical problems by researchers and practitioners, b) development of solutions, c) evaluation and testing of solutions in practice, and d) reflection to produce 'design principles' (Reeves, 2006).

The Quality Graduate Supervision miniMOOC will be a hybrid or blended miniMOOC. Blended or hybrid means that the miniMOOC will be offered over six weeks with the first module offered as a face-to-face seminar and the remaining five modules offered fully online using the learning management system. This MOOC is called a miniMOOC because the first iteration will be offered as a closed pilot at one university over one DBR cycle to evaluate the design, to evaluate what scaffolding and support is required to maximize faculty learning, and to determine whether the miniMOOC impacts faculty development of graduate supervision practices. The intention is to use research findings from the pilot to iteratively refine and improve the design for subsequent offerings of the MOOC as a fully open, massive online course. The long-term goal is to continue to study the MOOC through several DBR cycles and with faculty members from many universities. Ongoing evaluation of the design will help us understand the impact and effectiveness of the MOOC and to adjust the design, change or alter it as needed. According to McKenney and Reeves (2012), conducting a pilot study can help the researcher to "begin to get a sense of how the intervention will perform in various contexts and what kind of real world realities need to be addressed for the design to have a chance of success under representative conditions" (p. 6).

Preliminary Findings of the Analysis Phase

The analysis phase refines the research problem, reviews the literature, and refines the conceptual framework. The first phase of the study has involved the analysis and exploration of the problem of faculty development for graduate supervision. The exploration phase has involved a review of the literature and a review of the institutional context to understand the nature of the problem as well as to determine the nature and type of resources and supports available for graduate supervisors. Key findings from the analysis and exploration phase have informed initial design work for the miniMOOC.

The analysis phase has drawn upon a synthesis of key findings from a cross-campus survey of faculty members and graduate program directors at one Canadian university. Two online questionnaires were administered to gather information from graduate supervisors and graduate program directors on common problems and learning needs in graduate supervision, patterns of participation in faculty development, and preferences for format. Data were collected from 60 graduate supervisors from across different faculties and from 4 graduate program directors. Key themes and a descriptive analysis of findings from the analysis of data are presented below, and are being used to inform the design of the six modules of the miniMOOC.

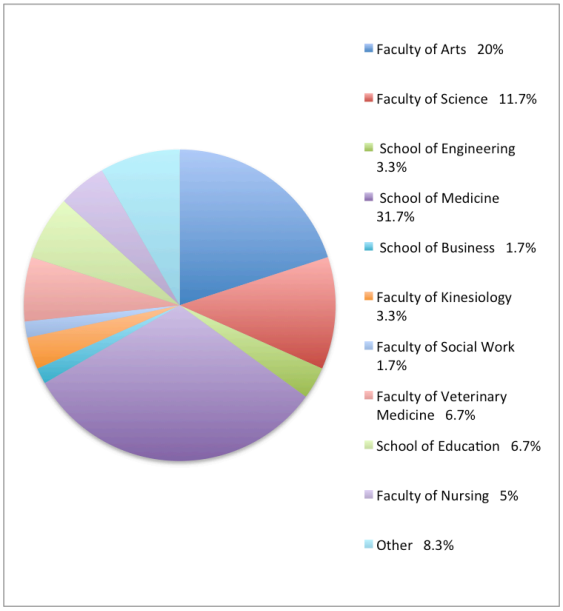


Figure 1. Percentage of Graduate Supervisors' Questionnaire

The main purpose in administering the two questionnaires was to better understand, from the faculty members and graduate program directors themselves, the types of topics that graduate supervisors want to learn more about with regards to quality graduate supervision, the kinds of support supervisors want and need, and the range of issues that supervisors face as they work closely with graduate students.

Data provided in response to questions about the topics graduate supervisors believe should be included in the Quality Graduate Supervision miniMOOC yielded several themes, which have been summarized in Table 1.

Table 1. Top Topics for Quality Graduate Supervision miniMOOC from Graduate Supervisors

Topic	Percentage
How to motivate your graduate students	15%
Strategies for Conflict resolution	13.3%
Better supervision practices/orientation	8.3%
Helping students with time management	8.3%
Preparing students to be independent researchers / preparation for candidacy	6.6%

In the Graduate Program Directors' questionnaire, the GPDs were asked to report on the types of issues and problems between students and supervisors that they usually deal with in their role. GPDs were also asked to indicate the topics that need to be considered when developing a MOOC for quality graduate supervision. The most frequently mentioned issues and problems mentioned by GPDs and the reasons behind these problems have been summarized in Table 2.

Table 2. Common Issues and Problems in Graduate Supervision from GPDs

Most Supervision Problems	Percentage	Reasons
Students fail to progress in program	**50%**	- Deficiency in students' background - Absenteeism of student or long delays - Failure of achieving program's requirements.
Student-supervisor relationship conflict	**50%**	Personality conflicts between student and supervisor
Unsupportive supervisors	**50%**	- Supervisor not available for meetings - Minimal useful feedback on student's work

A miniMOOC team has been formed in phase one, and includes an expert from the Faculty of Graduate Studies who runs a "My Supervisor Skills" program, and who has been involved in discussing the research problem. A faculty member with expertise in faculty development and a faculty member with expertise in design based research have also been recruited to participate as research members. Grant funding has been provided by the Faculty of Graduate Studies to support the development phase. To assist in the development process of the Quality Graduate Supervision miniMOOC, an instructional designer and/or educational technologist will be recruited as well as a videographer for video capture and editing. The miniMOOC team meets regularly to discuss the research plan and miniMOOC development progress, and provides critical feedback on the process. The miniMOOC team will also discuss the design of the miniMOOC and invite speakers to either moderate a module of the miniMOOC or be a guest speaker in an assigned module.

The Development Phase of the miniMOOC

The development of solutions phase is dedicated to the design and actualization of the Quality Graduate Supervision miniMOOC. Based on the findings from the literature review, institutional review and questionnaire data, the topics that will be the focus of the Quality Graduate Supervision miniMOOC and the preliminary organization of the six modules are presented in Table 3.

Table 3. Design Draft for the miniMOOC Modules

Weeks	Location	Modules' Topics
Week 1	Face-to face	Introduction
Week 2	On-line	Supervisors' Best Practices / Developing your own best practice as a supervisor
Week 3	On-line	Relationship Building / Developing strong research relationships with your graduate students
Week 4	On-line	Mentoring New Researchers
Week 5	On-line	Anticipating and Addressing Challenges
Week 6	On-line	Promoting Excellence in Graduate Education

As part of the learning experience during each module, supervisors will engage with rich and relevant resources, such as policies, best practice guides, journal articles and videos of experts. As part of each module, supervisors will have access to 3 – 6 short videos of expert supervisors who provide insights and recommendations on best practice from their own work with graduate students. Recruitment of expert supervisors will include six to eight graduate supervisors who have been recognized for excellence in graduate supervision through university and faculty awards. The expert supervisors will be videotaped as they respond to key questions in each module that align and cohere with the goals of the module. For example, for the recruitment video and for videos in module one, the following questions will be used with the expert supervisors: 1) what do you find satisfying or meaningful about working with grad students? 2) What is one strategy for graduate supervision that works well for you? 3) What is one issue about graduate supervision that is a challenge for you? And, 4) What do you still feel you need to learn about being a good supervisor?

In this miniMOOC, participants will complete tasks each week, such as creating materials for their ePortfolio, as well as engage with colleagues from across campus in discussion forums and by responding to each other's contributions. The following is an example of the discussion forum guide in module two:

Discussion question and response: Please add to the conversation on graduate supervisor's best practice based on your experience.

- Guided response: Share up to three ideas you have gained from the resources and Great Supervisors that you can apply to your practice.
- Respond to others: Review what others have posted and respond to an idea that has relevance for you. Your challenge is to "build upon" and share an example, rather than just affirming. For example, I found your idea powerful because it aligns with my experience with…

The next phase of this design-based research will involve evaluation and testing of the solution in practice. Data will be collected to answer research questions two and three. The current plan is to recruit 25 faculty members from on Canadian university to take part in the pilot and first offering of the Quality Graduate Supervision miniMOOC in Winter 2017. Multiple forms of data will be collected to document and analyze the scaffolding and supports to enable faculty members to effectively use the Quality Graduate Supervision miniMOOC, such as instructional plans and strategies, surveys, interviews, observations and discussion forum archives. Data will also be collected about how the Quality Graduate Supervision miniMOOC can support and benefit faculty members in the ongoing development of their graduate supervision practices.

Conclusion

Enhancing the skills of faculty members as graduate supervisors is very important to ensure a successful graduate supervision experience and to decrease the attrition rates among doctoral students (Erichsen, Bolliger &

Halupa, 2014; Skarakis Doyle & McIntyre, 2008). Higher education institutions are called upon to design and develop faculty development and learning opportunities that best serve and fit graduate supervisors to develop their supervision practices. Current research indicates that MOOCs offer a promising solution for faculty professional development (Bond, 2013; Fini, 2009); associated benefits of using a MOOC with faculty members may include increased awareness and understanding about online learning through first-hand experience. The outcomes and findings of this DBR study will serve a dual role in increasing awareness and understanding of the importance of supporting graduate supervisors in carrying out their roles and in the importance of providing a topic quality graduate supervisor for every student. The results of this study will be important for faculty members, institutions' administrations, faculty development providers, MOOC developers and scholars who are interested in the effective design of MOOCs as a flexible and accessible design for learning.

References

Amiel, T., & Reeves, T. C. (2008). Design-Based Research and Educational Technology: Rethinking Technology and the Research Agenda. Educational Technology & Society, 11 (4), 29–40.

Bond, P. (2013). Massive Open Online Courses (MOOCs) for Professional Development and Growth. In: Smallwood, C., Harrod, K., & Gubnitskaia, V. (2013). Continuing Education for Librarians: Essays on Career Improvement Through Classes, Workshops, Conferences and More (pp. 28-34). North Carolina: McFarland.

Dangel, J. j., & Tanguay, C. (2014). "Don't Leave Us Out There Alone": A Framework for Supporting Supervisors. *Action in Teacher Education*, 36(1), 3-19.

Erichsen, E. A., Bolliger, D. U., & Halupa, C. (2014). Student satisfaction with graduate supervision in doctoral programs primarily delivered in distance education settings. *Studies in Higher Education*, 39(2), 321-338.

Fini, A. (2009). The technological dimension of a massive open online course: The Case of the CCK08 course tools. *The International Review of Research in Open and Distance Learning*, 10(5). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/643/1410

Golde, C. & Walker, G. (Eds.). (2006). *Envisioning the future of doctoral education: Preparing stewards of the discipline.* San Francisco: Jossey-Bass/Carnegie Foundation for the Advancement of Teaching.

Huang, H. (2002). Toward constructivism for adult learners in online learning environments. *British Journal Of Educational Technology*, 33(1), 27.

Kamler, B., & Thomson, P. (2014). *Helping Doctoral Students Write: Pedagogies for Supervision* (2nd Edition). Florence, KY, USA: Routledge.

Manathunga, C. (2010) Educational development for supervisors. In Walker, M., & Thomson, P. (Eds.). *The Routledge doctoral supervisor's companion: Supporting effective research in education and the social sciences* (pp. 76-87). Routledge.

McKenney, S., & Reeves, T. (2012). Conducting educational design research. New York: Routledge.

Reeves, T.C. (2006). Design research from a technology perspective. In J. van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), Educational design research (pp. 52-66). London: Routledge.

Siemens, G. (2006). *Connectivism: Learning theory or pastime for the self-amused*? Retrieved from http://www.elearnspace.org/Articles/connectivism_self-amused.htm

Skarakis-Doyle, E., & McIntyre, G. (2008). Western guide to graduate supervision. London, Ontario: Teaching Support Centre, University of Western Ontario.

Stephens, M., & Jones, K. M. (2014). MOOCs as LIS Professional Development Platforms: Evaluating and Refining SJSU's First Not-for-Credit MOOC. *Journal of Education for Library and Information Science,* 55(4), 345-361. University of Calgary. (2009). Handbook of Supervision and Examination. Calgary, Canada: University of Calgary.

Waite, M., Mackness, J., Roberts, G., & Lovegrove, E. (2013). Liminal participants and skilled orienteers: Learner participation in a MOOC for new lecturers. *MERLOT Journal of Online Learning and Teaching*, 9(2), 200-215.

Wang, F., & Hannafin, M. (2005). Design-Based Research and Technology-Enhanced Learning Environments. *Educational Technology Research and Development,* 53(4), 5–23.

Yang, D., Sinha, T., Adamson, D., & Rosé, C. P. (2013). *Turn on, tune in, drop out: Anticipating student dropouts in massive open online courses.* In Proceedings of the 2013 NIPS Data-Driven Education Workshop, Lake Tahoe, Nevada, USA, December 9-10.

Game On: Creatively Using Gaming to Teach the Informed Consent Process to Clinical Research Professionals.

Jasmin Berrios
Morehead State University, Morehead, Kentucky

Descriptor: simulation, research

Abstract

This research focuses on the development process of gaming simulation in clinical research education at a cancer research institution/hospital. The foundation of this paper is based on the research and experience of those developing the educational gaming simulation, which is based on one of the most important procedures in clinical research - the informed consent process. Although the design is in its initial stages, the components of the gaming simulation are determined to ensure the informed consent process is adequately covered.

Introduction

There has been a growing interest in clinical trials in the United States. It is estimated that the National Institute of Health invested nearly $32.3 billion in clinical trials in fiscal year 2016 (NIH, 2016). With growing interest in clinical trials and the invested time and money, it is imperative that clinical trials are conducted with the utmost diligence.

All clinical trials are different and consist of various procedures, but a procedure that is virtually universal in all clinical trials is the informed consent process. The informed consent process was established to protect human subjects participating in clinical trials.

Informed Consent

The informed consent process is a standard procedure in the majority of clinical trials involving human subjects. Informed consent can be defined as the communication between the clinical research team and research participant. In this point of communication, the clinical research team informs the research participants of all the elements in the clinical study in an effort to provide the research participant with adequate information to make an "informed" decision. Clinical research teams can ensure adequate information is provided by including all basic elements of the informed consent set forth by the U.S. Department of Health and Human Services.

Required Components of the Informed Consent

According to the U.S. Department of Health and Human Services, there are eight basic elements that must be presented to research participants, which are:

1. Purpose and description of trial
2. Risk, side effects and discomforts of trial
3. Potential benefits of trial
4. Alternative procedures/treatment of trial
5. Confidentiality
6. Forms of compensation to research participants in trial
7. Research contacts
8. Participant's voluntary/Right to refuse (it includes the research participant's right to discontinue participation at any time without penalty or loss of benefits to which the research participant is otherwise entitled)

These elements are also required to be present in the informed consent document given to research participants. When the basic elements of the informed consent are well articulated to research participants, it allows for research participants to make a voluntary, informed decision about their participation in the clinical trial.

Implications of Improper Conduct of the Informed Consent Process

While policies, rules and regulation have helped shaped the process of the informed consent, there is a growing concern of clinical research team's communication of the informed consent and research participants' recall of information about the clinical trial. Literature shows that research participants are giving consent to participate in clinical trials without being fully aware of what is being asked of them and/or what the clinical trial protocols/procedures consist of (Bergler, Pennington, Metcalfe, & Freis, 1980; Byrne, Napier, & Cuschieri, 1988; Hoover-Regan, Becker, Williams, & Shenker, 2013). Misinformation of clinical research procedures can bring implications. A few of the implications encountered include unbudgeted remedial training, discrepancy in research data due to research participants failing to complete research procedures, and delays in recruitment/enrollment which jeopardizes time-constrained funding. These are implications that could be reduced/eliminated with proper informed consent training, such as simulations.

Simulation

Simulations take on many faces, including the use of devices, trained persons, role playing, and virtual environments that mimic various environments (Aggarwal & Darzi, 2011; Alon Farfel, Daniel Hardoff, Arnon Afek, & Amitai Ziv, 2010; Baile & Blatner, 2014; Barach, Satish, & Streufert, 2001; Brock et al., 2013; Dickinson, 2011; Hubal & Day, 2006; Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005; Kneebone et al., 2002; Lane & Rollnick, 2007; Link, Armsby, Hubal, & Guinn, 2006; McAllister et al., 2013; Sinz & Taekman, 2008; Wright et al., 2005). For this paper, simulation will require the use of a device that will mimic both the environment and the research participant. More specifically, clinical research teams will conduct the informed consent process with a virtual research participant via a computer or mobile device.

Benefits of Simulation

The general benefits of simulation in the healthcare field are to enhance learner's knowledge, provide a controlled and safe practice environment, and shape the acquisition of new clinical skills (Hubal & Day, 2006; Issenberg et al., 2005; Salas et al., 2008). Likewise, there are benefits to educators, learners and patients. Educators can use simulations to evaluate a learner's acquired knowledge by providing standardized experiences which would yield reliable outcome measures (Kneebone et al., 2002; Link et al., 2006; Peddle, 2011). Learners benefit from simulations by being emerged into various events and conditions (Brindley & Dunn, 2009; Dickinson, 2011; Peddle, 2011). Lastly, simulation increase patient safety by preparing clinical research teams (Aggarwal & Darzi, 2011; Argani, Eichelberger, Deering, & Satin, 2012; Brock et al., 2013; Green, Tariq, & Green, 2016; Kohn, Corrigan, & Donaldson, 2000; Patel, Glaiberman, & Gould, 2007; Salas et al., 2008). Another effective benefit that simulation brings to both educators and learners is the ability to give and/or receive feedback after a simulated scenario (Dayal et al., 2009; Issenberg et al., 2005; Patel et al., 2007; Salas et al., 2008; Takayesu et al., 2006). These are benefits that would help clinical research teams better conduct the informed consent process.

Informed Consent Simulation Training

Providing an interactive training in a simulated environment would give clinical research teams the opportunity to practice without placing research participants at risk or impacting the integrity of the research data. Also, including gaming mechanics to the simulation would provide immediate feedback to the research staff regarding their performance. Currently, the focus is at defining the components that must be present in the simulation to put the "informed" into the informed consent process. The interactivity is still being determined.

References

Aggarwal, R., & Darzi, A. (2011). Simulation to enhance patient safety: Why aren't we there yet? *CHEST Journal*, *140*(4), 854–858.

Alon Farfel, M., Daniel Hardoff, M., Arnon Afek, M., & Amitai Ziv, M. (2010). Effect of a simulated patient-based educational program on the quality of medical encounters at military recruitment centers. *Israel Medical Association Journal*, *12*.

Argani, C. H., Eichelberger, M., Deering, S., & Satin, A. J. (2012). The case for simulation as part of a comprehensive patient safety program. *American Journal of Obstetrics and Gynecology*, *206*(6), 451 – 455. https://doi.org/http://dx.doi.org/10.1016/j.ajog.2011.09.012

Baile, W. F., & Blatner, A. (2014). Teaching communication skills: Using action methods to enhance role-play in problem-based learning. *Simulation in Healthcare*, *9*(4), 220–227.

Barach, P., Satish, U., & Streufert, S. (2001). Healthcare assessment and performance: Using simulation. *Simulation & Gaming*, *32*(2), 147–155. https://doi.org/10.1177/104687810103200203

Bergler, J. H., Pennington, A., Metcalfe, M., & Freis, E. D. (1980). Informed consent: How much does the patient understand? *Clinical Pharmacology & Therapeutics*, *27*(4), 435–440.

Brindley, P. G., & Dunn, W. F. (2009). Simulation for clinical research trials: A theoretical outline. *Journal of Critical Care*, *24*(2), 164–167.

Brock, D., Abu-Rish, E., Chiu, C.-R., Hammer, D., Wilson, S., Vorvick, L., Zierler, B. (2013). Interprofessional education in team communication: Working together to improve patient safety. *BMJ Quality & Safety*, *22*(5), 414–423.

Byrne, D., Napier, A., & Cuschieri, A. (1988). How informed is signed consent? *British Medical Journal (Clinical Research Ed.)*, *296*(6625), 839.

Dayal, A. K., Fisher, N., Magrane, D., Goffman, D., Bernstein, P. S., & Katz, N. T. (2009). Simulation training improves medical students' learning experiences when performing real vaginal deliveries. *Simulation in Healthcare*, *4*(3), 155–159.

Dickinson, D. (2011). Human patient simulation training. *Practice Nurse*, *41*(1), 27–29 3p.

Green, M., Tariq, R., & Green, P. (2016). Improving patient safety through simulation training in anesthesiology: Where are we? *2016*. https://doi.org/http://dx.doi.org/10.1155/2016/4237523

Hoover-Regan, M., Becker, T., Williams, M. J., & Shenker, Y. (2013). Informed consent and research subject understanding of clinical trials. *WMJ*, *112*(1), 18–23.

Hubal, R. C., & Day, R. S. (2006). Informed consent procedures: An experimental test using a virtual character in a dialog systems training application. *Journal of Biomedical Informatics*, *39*(5), 532–540.

Issenberg, S. B., Mcgaghie, W. C., Petrusa, E. R., Gordon, D. L., & Scalese, R. J. (2005). Features and uses of high-fidelity medical simulations that lead to effective learning: A BEME systematic review. *Medical Teacher*, *27*(1), 10–28.

Kneebone, R., Kidd, J., Nestel, D., Asvall, S., Paraskeva, P., & Darzi, A. (2002). An innovative model for teaching and learning clinical procedures. *Medical Education*, *36*(7), 628–634. https://doi.org/10.1046/j.1365-2923.2002.01261.x

Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (2000). *To err is human: building a Safer Health System* (Vol. 6). National Academies Press.

Lane, C., & Rollnick, S. (2007). The use of simulated patients and role-play in communication skills training: A review of the literature to August 2005. *Patient Education and Counseling*, *67*(1), 13–20.

Link, M. W., Armsby, P. P., Hubal, R. C., & Guinn, C. I. (2006). Accessibility and acceptance of responsive virtual human technology as a survey interviewer training tool. *Computers in Human Behavior*, *22*(3), 412–426. https://doi.org/10.1016/j.chb.2004.09.008

McAllister, M., Levett-Jones, T., Downer, T., Harrison, P., Harvey, T., Reid-Searl, K., Calleja, P. (2013). Snapshots of simulation: Creative strategies used by Australian educators to enhance simulation learning experiences for nursing students. *Nurse Education in Practice*, *13*(6), 567–572. https://doi.org/10.1016/j.nepr.2013.04.010

NIH. (2016). *Budget*. Retrieved from National Institute of Health: https://www.nih.gov/about-nih/what-we-do/budget#note

Patel, A. A., Glaiberman, C., & Gould, D. A. (2007). Procedural simulation. *Anesthesiology Clinics*, *25*(2), 349–359.

Peddle, M. (2011). Simulation gaming in nurse education: Entertainment or learning? *Nurse Education Today*, *31*(7), 647–649.

Salas, E., Wilson, K. A., Lazzara, E. H., King, H. B., Augenstein, J. S., Robinson, D. W., & Birnbach, D. J. (2008). Simulation-based training for patient safety: 10 principles that matter. *Journal of Patient Safety*, *4*(1), 3–8.

Sinz, E. H., & Taekman, J. M. (2008). New educational technology. *International Anesthesiology Clinics*, *46*(4), 137–150.

Takayesu, J. K., Farrell, S. E., Evans, A. J., Sullivan, J. E., Pawlowski, J. B., & Gordon, J. A. (2006). How do clinical clerkship students experience simulator-based teaching? A qualitative analysis. *Simulation in Healthcare*, *1*(4), 215–219.

Wright, M. C., Taekman, J. M., Barber, L., Hobbs, G., Newman, M. F., & Stafford-Smith, M. (2005). The use of high-fidelity human patient simulation as an evaluative tool in the development of clinical research protocols and procedures. *Contemporary Clinical Trials*, *26*(6), 646 – 659. https://doi.org/http://dx.doi.org/10.1016/j.cct.2005.09.004

Inquiry Based Learning as an Instructional Strategy to Increase Student Achievement in Math and Science

Reza Chowdhury
Doctoral Student of Instructional Design and Technology
The University of Memphis
5998 Maher Valley Cove
Bartlett, TN 38135

Descriptors: Inquiry-based learning, teaching by asking

Abstract

Inquiry-based learning (IBL) is receiving a lot of attention and consideration as a modern instructional method. This paper defines IBL along with its constructivist paradigm. Inquiry-based learning could be best understood through its distinct phases, i.e., engage, explore, explain, expand, and evaluate. This survey of literature demonstrates the current trends of utilizing inquiry-based learning in the k-12 schools, influencing factors for successful implementation of IBL, and finally the benefits & challenges of inquiry-based learning. This survey of literature raised few critical questions, including: 'Is there a universally accepted definition of Inquiry-based learning?' and 'Is Inquiry-based learning working for learners?'. Finally, this paper concludes with a discussion and recommendation for future research areas in Inquiry-based learning.

Introduction of the Problem

To break through the trend of stagnation and place it among the top five performers on the international stage in school level science and math achievements, the United States needs inquiry-based learning that promotes understanding over memorization and assessments, which are intentionally designed to measure student knowledge integration abilities over standardized tests (Liu, Lee, & Linn, 2010). The United States is not among the top five performers either in math or in science. To break this trend, the students of the United States must learn complex problem-solving techniques instead of memorizing algorithms or definitions (Marshall & Horton, 2011).

15-year-old students of the United States are participating in international testing since 1960's with lackluster performance and consistently positioned on the bottom half of the participating countries (Hanushek, 2004). Two of the distinct and leading international assessment programs are: the program for International Student Assessment (PISA) under the umbrella of Organization for Economic Co-operation and Development (OECD) and the Trends in International Mathematics and Science Study (TIMSS). These assessments are the benchmark for comparing the outcome of the standardize test of math, science, and reading for 15-year-old participating students representing different countries. Though, over the last four decades, the United States has participated each of the last 15 international assessments, U.S. students failed neither to perform well nor to show any sign of improvement over the time. In 2012, among the 34 OECD countries, the United States ranked 27th in mathematics, 17th in reading, and 20th in Science (OECD, 2012). Though U.S. students demonstrated strengths in lower-order cognitive mathematical skills and abilities, U.S. students have tremendous weakness in modeling and solving higher-ordered cognitive activities related to mathematical models. U.S. has substantial economic advantage over most of the participating countries, spending the 5th highest amount of money per student and U.S. parents are better educated than the parents from most other participating countries (OECD, 2012). Considering the afore mentioned important elements of U.S. context, U.S. can and should do a much better job in preparing U.S. students to break through this stagnation and place its 15-year-olds among the top preforming nations.

These below average assessment results are the early warning sign for our nation's future economic welfare and higher-order thinking skill workers. Research indicates, if U.S. can be positioned at the average level of European achievement distribution, U.S. economy will gain a one-half of one percent boost in per capita income, i.e., about an increase of $2,000 in per capita income after 10 years (Hanushek, 2004). Schools, teachers, administrators, educators, policy makers, and legislators can and should work hand on hand to help our students to develop higher-order cognitive thinking by introducing active, participative, and higher-order thinking teaching and learning approaches instead of simply transferring passive knowledge for rote memorization. While American

teachers are failing to promote and develop higher-order thinking skills among our students, a body of research suggests and promotes inquiry-based learning as a critical approach to boost students' performance in international standard achievement tests (Marshall & Horton, 2011). The purpose of this literature review is to define IBL along with its epistemological paradigm, learn the current trends of utilizing IBL in the k-12 schools, identify the influencing factors for successful implementation of IBL, and understand the benefits & challenges of inquiry-based learning. Finally, this literature review attempts to address the eventual question, is inquiry-based learning working for our learners? The eventual goal of any successful instructional model is to help the learners accomplish new knowledge in an effective and efficient manner and promote higher order thinking. While there are challenges and limitations, analyzed data from 138 studies supports a strong and positive trend favoring inquiry-based learning practices, especially instruction that promotes student active thinking and develops decision-making capabilities based on explored data (Minner, Levy, & Century, 2010).

What is Inquiry-based Learning (IBL)?

Inquiry-based learning came into existence through a series of engaged dialogue regarding different approaches of learning and teaching, in particular from the work of Jean Piaget, Lev Vygotsky, and David Ausubel. The work of these theorists was blended into the philosophy of learning known as constructivism (Cakir, 2008), which was then used to shape instructional materials.

Inquiry-based learning is rooted in learning by discovery. Jerome S. Bruner, an American psychologist, made significant contributions in defining discovery learning. Bruner's works focused on three distinct components while dealing with cognitive learning theory. Three key tenets are: the role of culture and structure in learning, the spiral curriculum, and discovery learning (Jiang & Perkins, 2013). Bruner described culture as the toolkit for sense-making and communication (Takaya, 2008). Learners make sense of the words, images, and concepts according to their own culture, beliefs, and shared views; while cultural values are not constant rather diverse and evolving in nature. Cultural aspect of the education directs the learners to think about alternative views and encourages the learners to explore multiple perspectives before coming to a conclusion (Takaya, 2008). The structural component demands that the learners understand the new concept by liking it with existing knowledge instead of simply memorizing in the vacuum (Jiang & Perkins, 2013). The structure component emphasizes on disciplined understanding by expanding and deepening a learner's existing knowledge. The spiral curriculum concept encourages revisiting foundational concepts repeatedly until learns display mastery on those basic concepts. The third component, discovery learning, promises that learners utilize past knowledge and current experience to explore facts and relationships to develop new knowledge and understanding within themselves. The key idea here is to construct new knowledge by going beyond the presented facts and concepts. Constructivist approach of learning emphasizes the learners to go beyond something given. Vygotsky revealed a gap between a child's "actual developmental level as determined by independent problem solving" and the higher level of "potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (1978, p.86). Vygotsky coined this term as the zone of proximal development. The concept of scaffolding is grounded in the theory of zone of proximal development (ZPD) (Vygotsky, 1978).

Fundamentally, constructivist designers view instruction as "a process of supporting [knowledge] construction rather than communicating knowledge" (Cunningham & Duffy, 1996, p.171). The constructivist classroom is an environment where learners actively inquire and originate new knowledge and ideas through engaged dialogue, interaction, presentation, sharing, and negotiation. In this setup, teachers' role is to guide and moderate the discussion rather than passively passing information to the learners. Constructivist teachers provide direction to the learners by engaging them in inquiry activities and by stimulating student centered active discussion and knowledge sharing, i.e., promoting active learning in a social setup where learners construct new knowledge according to their prior knowledge, social realities, peers' perspectives, and new findings (Bruner, 1986). Piaget, one of the most famous constructivist epistemological thinkers, argued that the learners' new knowledge construction portrays the real world in which the learners lived through (Bruner, 1986). Based on the principles identified by Smith and Ragan in 2005, a new design theory has evolved with three basic principles: "Learning results from a personal interpretation of experience, Learning is an active process occurring in realistic and relevant situations, and Learning results from an exploration of multiple perspectives" (Richey, Klein, & Tracey, 2011, p.130).

According to Keller (1987), inquiry is a process of knowledge-seeking behavior. "A deeper level of curiosity may be activated by creating a problem situation which can be resolved only by knowledge-seeking behavior" (Keller, 1987, p. 2). So, the essential question is what are the key components of inquiry-based learning?

Key Components of Inquiry-based Learning Approach

Inquiry-based learning is structured around different inquiry phases, which work as an articulate group to build an inquiry cycle. However, it is evident from the literature that no single definition can include every possible phase of an inquiry cycle (Pedaste et al., 2015). Callison and Baker (2014) discovered five foundational elements of information inquiry learning that surprisingly remain constant in this evolving environment. These five foundational elements are: questioning, exploration, assimilation, inference, and reflection. Pedaste et al. (2015) reviewed 26 articles related to inquiry-based learning and suggested five distinct general inquiry phases: orientation, conceptualization, investigation, conclusion, and discussion (Pedaste et al., 2015). Marshall and Horton (2011) gathered more than 100 sets of classroom observational data of middle school science and math teachers to assess different components of inquiry-based instruction. They identified four common components of inquiry cycle: engage, explore, explain, and extend. Based on the research conducted by Luera, Killu, and O'Hagan (2003), the five key components or stages of inquiry-based learning are: engage, explore, explain, expand, and evaluate.

Table 1. Key components of IBL as identified by different researchers

Reference the researchers	Number of components	Name of the components
Pedaste et al. (2015)	Five derived phases	Orientation, conceptualization, investigation, conclusion, and discussion
Callison and Baker (2014)	Five foundational elements	Questioning, exploration, assimilation, inference, and reflection
Li, Moorman, and Dyjur (2010)	Five key steps	Ask, investigate, create, discuss, and reflect
Marshall and Horton (2011)	Four common components	Engage, explore, explain, and extend
Luera, Killu, and O'Hagan (2003)	Five key components	Engage, explore, explain, expand, and evaluate

Table 1 summarizes different key components of inquiry-based learning as identified by diverse researchers between 2003 and 2015.

Pedaste et al. (2015) did a very through and detailed literature review of 30 peer reviewed journals to identify distinct phases in an inquiry-based learning process. An analysis of the articles resulted in the identification of five distinct general inquiry phases: orientation, conceptualization, investigation, conclusion, and discussion. According to this framework, inquiry-based learning begins with orientation and flows through conceptualization to investigation, where several cycles are possible. Inquiry-based learning usually ends with the conclusion phase. The discussion phase (which includes communication and reflection) is potentially present at every point during inquiry-based learning and connects to all the other phases, discussion may potentially occur at any time during (discussion in-action) or after inquiry-based learning when looking back (discussion on-action) (Pedaste et al., 2015).

According to Callison and Baker (2014), there are five foundational elements of information inquiry learning that are surprisingly constant in this evolving environment. These five foundational elements are questioning, exploration, assimilation, inference, and reflection. Questioning triggers thinking; thinking leads to greater understanding in resolving a problem at hand. In the exploration phase, students search for answers to the questions. Exploration is a discriminating process to find and organize information in an effort to answer the question. In the inference phase, students make a conclusion based on findings which they acquired during the exploration phase and personal prior knowledge. In the reflection phase, students contemplate to answer a few questions to solidify the inquiry learning. Though the inquiry learning approach is evolving at a fast pace, the five core elements of inquiry learning remain fundamentally unchanged (Callison & Baker, 2014).

According to Li, Moorman, and Dyjur (2010), the five key steps in an inquiry-based learning model are ask, investigate, create, discuss, and reflect. Li, Moorman, and Dyjur (2010) proposed an inquiry-based learning model with videoconferencing and e-mentoring for rural areas in Canada. According to this model, inquiry begins with student-inspired, natural questions and ends with new knowledge creation. After identifying the questions, learners investigate to acquire relevant facts and data. Based on the collected data, learners devise or create a solution to the problem or question at hand. Learners discuss and share their solutions and data with the other students. Finally, learners think and reflect utilizing higher order thinking to construct new knowledge to apply in a creative way for future uses.

Based on the research conducted by Luera, Killu, and O'Hagan (2003), the five key components or stages of inquiry-based learning are: engage, explore, explain, expand, and evaluate. This section will illustrate five

different components of IBL framework as championed by Luera, Killu, and O'Hagan (2003). Students learn most once they are engaged in the learning process. In the engage stage, the role of the teacher is to generate curiosity and interest in the topic. Engage phase is completed when a student forms a question for his or her inquiry. In exploration phase, students search for the answer to the questions. Exploration is a discriminating process to find and organize information in an effort to answer the question (Callison, & Baker, 2014). In the explain stage, students share their findings and methods while explaining their hypothesis and results. At this stage, students ask relevant questions to each other to understand each other's work. Callison and Baker (2014) suggested some of the critical questions for the students to ask: Did I answer my question successfully? Did I utilize the best possible resources at my disposal? Finally, the teacher explains the student's questions and queries to link the information to the development of concepts (Luera, Killu, & O'Hagan, 2003). During the extend/expand stage, students apply the concepts and skills in the new problem to validate the knowledge (Luera, Killu, & O'Hagan, 2003). Knowledge expansion is best accomplished by associating new knowledge with real-world applications. The evaluation stage is the ongoing practice throughout the process. "At this point in a traditional lesson, students would often be asked to demonstrate their new understandings by completing an activity sheet or some other activity that would be turned in, graded, and later returned to the students." (Luera, Killu, & O'Hagan, 2003, p. 7). Evaluation in the inquiry learning process is difficult but not impossible. One possible solution is a problem solving approach, in which students are challenged with problems based on newly learned concepts. In this process, immediate feedback is essential for quick identification of learning gaps and to reteach the concept (Luera, Killu, & O'Hagan, 2003).

Current Trends of Utilizing Inquiry-based Learning

There is a common belief that few teachers are teaching science and math utilizing an inquiry learning approach. Capps and Crawford (2013), found little to no practical evidence to support this claim. AASL's (American Association of School Librarians) Standards for the 21st-Century Learner provides vision for teaching and learning by promoting inquiry framework of learning; i.e., to promote inquiry, critical thinking and eventually constructing new knowledge (Marriott, 2014). Students in the United States need to learn how to think critically in the class rooms and beyond the class room setup. To promote critical student thinking, commissions, studies, and reports continue to call for the adoption of inquiry-based learning approaches in science and math (Marshall & Horton, 2011).

There are different flavors of inquiry teaching practiced by teachers in classrooms. Banchi and Bell (2008) provided a framework for three different kinds of inquiry teaching methods—structured, guided and open. Structured inquiry method, developed and managed by the instructors, is a controlled and planned approach. In this approach, students investigate a prescribed question using a method provided by the teacher. This approach does not allow the students to come out with their own questions rather teachers provide a set of relevant and critical questions for the students to think and ponder on it. Teachers also provide a structured method of thinking through to solve the designated questions. This is the least creative and open thinking methods for inquiry learning for the students. In guided inquiry approach, teachers provide the structured inquiry questions but students come out with their own creative methods to investigate these questions. Whereas, in open inquiry, students investigate questions that they have posed using methods that they have designed (Banchi & Bell, 2008, p. 26 – p. 29). Though these three approaches offer different amount of teachers' guidance and learners' open thinking, at the center, all these approaches inspire critical think among the students to promote active learning.

Promoting "critical thinking" skills is taking center stage as a key objective in modern classrooms. Past researches have mostly examined the effectiveness of a single instructional approach in promoting critical thinking. Lately researchers began discussing mixed teaching approaches. Ku, Ho, Hau, and Lai (2014) suggested educators adopt more than one instructional approach of teaching critical thinking to optimize learning outcomes. Common Core State Standards (CCSS) requires educators to learn and teach how to ask essential questions to their students to encourage critical think and innovation (Wilhelm, 2014). On the other hand, despite the presence of a decade of rich literature promoting the need and importance of IBL, there is little evidence that it is widely used in science classrooms (Hermann & Miranda, 2010).

Table 2 summarizes Key current approaches of inquiry learning as identified by different researchers between 2008 and 2014.

Table 2. Key current approaches of inquiry learning as identified by different researchers

Name the researchers	Year of Publication	Key approaches
Banchi and Bell	2008	Teachers should provide varied degree of guidance to the students: structured, guided and open inquiry
Ku, Ho, Hau, and Lai	2014	Educators must adopt more than one instructional approach of teaching critical thinking to optimize learning outcomes
Wilhelm	2014	Teachers should learn and teach how to ask essential questions to their students to encourage critical think and innovation
Ireland, Watters, Brownlee, and Lupton	2012	Students involved in inquiry learning should be able to discover answers themselves through active engagement with new experiences
Buckner and Kim	2014	Though difficult, technologies should be incorporated to optimize inquiry learning outcome
Marriott	2014	Students are better influenced by the teachers who most frequently ask, rather than teachers who usually tell
Marshall and Horton	2011	Exploration by the students before receiving explanation from the teachers.
Brown	2012	Two important aspects of promoting inquiry teachings are asking essential questions and fostering focused conversation
Hermann and Miranda	2010	Open-inquiry question templates encourage students to actively participate in inquiry learning

Educators utilize IBL to promote active learning. In traditional learning setup, teachers actively pass the structured information to the students while students passively consume the delivered information. If teachers encourage and enforce knowledge exploration by the students before explaining new concepts and lessons, students construct better learning of the concept (Marshall & Horton, 2011). Marshall and Horton (2011) mentioned that there is a positive correlation between the amount of time spent on active learning by the learners on the new concepts and the amount of new knowledge construction in the learners.

While considering technology as a support for project-based science learning, Blumenfeld et al. (1991) identified six contributions that technology can make to the learning process: enhancing interest and motivation, providing access to information, allowing active, manipulative representations, structuring the process with tactical and strategic support, diagnosing and correcting errors, and managing complexity and aiding production. The Stanford Mobile Inquiry-based Learning Environment SMILE successfully inspired student questioning and changes student-teacher dynamics in class. Learners and learning environments influence students' initial abilities to adopt inquiry learning. SMILE, like advance technological integration in inquiry-learning, is more difficult to implement in learning environments where rote memorization is typical and deeply rooted (Buckner & Kim, 2014).

Another IBL based routine is to ask the students without giving the answer. The children in schools are better influenced by the teachers who most frequently ask, rather than teachers who usually tell (Marriott, 2014). Marshall and Horton (2011) gathered more than 100 sets of classroom observational data and separated the data set into two groups—students who explored basic concepts before receiving explanations and contributed to the explanations, and students who received explanations before exploration and did not contribute to the explanations. When teachers make students explore concepts before explanations, students construct better learning of the concept. There is a positive correlation between the amount of time spent on exploration of the concepts and the amount of new knowledge construction in the learners. A negative correlation exists between the percent of time spent explaining concepts by the teachers and the cognitive enrichment of the students. According to Brown (2012), two important aspects of promoting inquiry teachings are asking essential questions and fostering focused conversation.

Teachers should initiate and engage the students in persuasive dialogue through essential questioning to challenge the students to discover, share, link, and apply what they are learning (Wilhelm, 2014). Wilhelm (2014) explained seven characteristics of essential questions: questions should matter to students now and in the future, questions should connects to students' current lives, questions should force the students to make judgments, questions should get at the heart of the matter, questions should possess intellectual bite and challenges, questions should be open-ended in nature, questions should encourage the findings to link data, and questions should be concise and clearly stated (p. 3). Finally, carefully designed essential questions are imperative in engaging learners

in persuasive dialogue to encourage discovery of knowledge without simply delivering the answer via traditional classroom lectures.

Influencing Factors for Successful Implementation of Inquiry-based Learning

Liu, Lee, and Linn (2010) suggested an inquiry-based science unit to promote knowledge integration. They developed assessments that measure student knowledge integration abilities. This science assessment tool was consisting of both proximal items that are related to the units and distal items that are published from standardized tests (e.g., Trends in International Mathematics and Science Study). They revealed that student, class, and teacher characteristics affect student inquiry science learning. Finally, several teacher-level characteristics including professional development showed a positive impact on science performance (Liu, Lee, & Linn, 2010). Teachers' training is one of the common tools to provide professional development for the teachers to boost their confidence in inquiry-based teaching practices.

Teachers' readiness and confidence in teaching inquiry-based learning has a direct correlation with attaining effective training. Teachers who received more training in inquiry are more comfortable with inquiry methods. Open-ended learning environments are especially challenging for teachers who do not have any training or exposure to inquiry-based learning and teaching challenges (Inoue & Buczynski, 2010). Teacher preparation programs make positive contributions in developing pedagogical stances towards inquiry-based teaching among the participating preservice teachers (PSTs). This program also helps boost confidence in PSTs with some variability across different groups (Truxaw, Casa, & Adelson, 2011).

Teachers view and their teaching practices play important roles in the successful implementation of any learning approach. According to Capps and Crawford (2013), teachers skipped inquiry based learning approaches half of the allocated classroom time due to lack of pedagogical knowledge and understanding of inquiry learning approach. Ireland, Watters, Brownlee, and Lupton (2012) suggested that teachers in the elementary schools neither think nor express inquiry learning in a pedagogical way. Teachers express their inquiry teaching and curriculum in general laymen terms; this is not conducive in promoting inquiry instruction.

Corder and Slykbuis (2011) suggested teachers to take the lead in changing classroom culture of a school from a traditional cookbook lab into an inquiry driven science experience. This transformation is a difficult journey and the first attempt may fail. Teachers are encouraged to make multiple attempts to make it a success considering the enormous opportunities of learners' new knowledge construction through an inquiry learning approach.

Implementing inquiry-based learning and changing the classroom culture is not an easy task. Though teachers play a central role in this important effort, their success largely depends on administrative support. School administration is in charge of determining school curriculum, instruction period, and assessment criteria. Teachers need more instruction time than a traditional instruction period to encourage active participation of every student to promote inquiry learning approach; this not the teachers rather the school administration who have the jurisdiction on allocation instruction period for each subject area. A supportive and knowledgeable school principal can play a vital role in guiding new teachers and in transforming classroom culture from the traditional lecture approach to an inquiry-learning approach (Towers, 2012).

Teachers and school librarians should work as a team to develop assignments which encourage to ask essential questions to foster creative thinking among students in an open learning environment (Wilhelm, 2014); these questions should not have an easy and simple answer rather should have the possibility of diverse and multiple potential correct answers. School librarians can play a critical role in collaboration with the teachers in scaffolding the students in the art of inquiry learning.

Ultimately this is the job of the teachers to develop and implement inquiry learning plans (ILP). Though inquiry learning is student centered, it is the teachers who are responsible for defining all the parameters of inquiry learning classrooms for the participating students (Donhauser, Hersey, Stutzman, & Zane, 2014). Teachers' perceptions along with their professional development play a vital role in the successful implementation of inquiry-based teaching in the classroom (Ireland, Watters, Brownlee, & Lupton, 2012).

Benefits and Challenges of Inquiry-based Learning

Inquiry-based learning is gaining popularity all over the world. Traditional lecture based learning is passive and boring for learners. Teachers encourage and guide the students to develop their own questions, perform information search, develop hypothesis, test hypothesis, and share their findings in an inquiry-learning environment. This process helps learners to construct new knowledge in an actively participative classroom setup. Inquiry-based learning is essential to produce problem solvers instead of rote memorizers. The United States needs thinkers and

problem solvers to lead this great nation. Inquiry-learning has the potential to fulfil that promise. Inquiry-learning has its own challenges. The definition of inquiry-learning lacks conformity. Teachers are limited with no training in inquiry instruction. Inquiry-learning curriculums are neither easily available nor well-structured. Teachers are not supported by complimentary inquiry-learning resources. Classroom time is too short to promote inquiry-based learning. Finally, administrative support is rare to promote and support inquiry-based teaching and learning. Overall, school and classroom cultures are not conducive to inquiry learning.

Benefits

Inquiry-based teaching did not dramatically alter a student's overall achievement, as measured by North Carolina's standardized test in physical science. Nevertheless, "Inquiry-based instruction had other positive effects, such as a dramatic improvement in student participation and higher classroom grades earned by students. In additional Inquiry-based instruction resulted in more uniform achievement than did traditional instruction, both in classroom measures and in more objective standardized test measures" (Tretter & Jones, 2003, p. 350).

Inquiry-based learning is essential for math and science learning as traditional lecture based instruction is not producing the desired level of success. In addition, memorization based math and science learning failed to produce workforce ready employees (Li, Moorman, & Dyjur, 2010). In inquiry learning students develop explanations from the evidence and connect explanations to existing knowledge to construct new knowledge (Hermann & Miranda, 2010). New knowledge construction should not be the end of the inquiry learning cycle. The inquiry cycle should include knowledge sharing and learning for life (Marriott, 2014).

Teaching strategies that actively engage students in the learning process through scientific investigations are more likely to increase conceptual understanding than are strategies that rely on more passive techniques, which are often necessary in the current standardized-assessment laden educational environment (Minner, Levy, & Century, 2010). Brown (2012) suggested that teachers can provide genuine learning experiences by engaging active student discourse through inquiry learning approach. Schroeder, Scott, Tolson, Huang, & Lee (2007) discovered that alternative teaching strategies are more effective than that of traditional classroom lectures. According to Schroeder et al. (2007), eight categories of alternative teaching strategies are: questioning strategies; manipulation strategies; enhanced material strategies; assessment strategies; inquiry strategies; enhanced context strategies; instructional technology strategies; and collaborative learning strategies.

Minner, Levy, and Century (2010) concluded that there is a positive impact in the student learning outcome when an inquiry-based learning method is used instead of traditional lecture-based learning. They praised instruction that emphasizes student active thinking instead of passive consumption of traditional lectures.

Challenges

Inquiry-based learning provides boundless opportunities for students to explore, explain, construct, and utilize science and math knowledge. Nevertheless, implementing inquiry learning in a classroom is not an easy task and often encounters a good number of challenges (Edelson, Gordin, & Pea, 1999). Settlage (2007) suggested that it is unrealistic for teachers to engage in inquiry learning on a day-to-day basis, he speculates open inquiry is difficult to utilize in the classroom. Edelson, Gordin, and Pea (1999) explored five significant challenges to implementing inquiry-based learning: lack of motivation, accessibility of investigating techniques, background knowledge, management of extended activities, and practical constrain of the learning context (p. 391).

Teachers find it extremely time consuming to take preparation for unknown and boundless peripheral open-questions by the students (Hermann & Miranda, 2010). If teachers lack understanding of inquiry-based learning, they will have little to no interest in introducing inquiry learning approach in their class rooms; these incompetent teachers will eventually skip inquiry learning approach in half of the allocated classroom time (Capps & Crawford, 2013).

Open-ended learning environments are specially challenging for the teachers who do not have any training or exposure to inquiry-based learning and teaching challenges (Inoue & Buczynski, 2010). In active learning environment, students ask creative questions without having any fear. Students also come out with varied and exotic responses in open learning environment. Pre-service teachers are often challenged to successfully respond and explain the responses in a simple, coherent, and meaningful way to the students. As a result of that these teachers failed to take the advantage of teachable moments in inquiry learning to support the students' meaning-making attempts (Inoue & Buczynski, 2010). Soprano and Yang (2013) confirmed that the pre-service teachers' understanding of inquiry-based science teaching and learning along with their self-efficacy beliefs was developed and enhanced through the planning and teaching phases of the field experience. They recommended the use of

cooperative inquiry-based field experiences and pre-service teacher action research by teacher education programs to prepare the teachers who would be able to play positive roles in promoting inquiry instruction.

Fazio, Melville, and Bartley (2010) suggested that teacher development courses help improve teachers' perception related to inquiry teaching but the role of practicum was problematic. Some of the key reasons, which work as a stumbling block for creating an inquiry-based environment, are: associate teacher subjugation, availability of resources, time constraints, and the need to address curriculum standards. Finally, while inquiry-based learning and instruction is promoted for K-12 education by both administration and educators, the educational industry lacks reliable assessment tools to measure the quality and quantity of effective and efficient blending of inquiry-based instruction (Marshall, Smart, & Horton, 2010).

In summary, inquiry-based learning is facing a lot of challenges as more and more educators are trying to adopt this evolving learning approach. The successful identification of challenges is the first step in developing successful solutions. For most of the identified challenges, the researchers came out with a set of proposed and validated solution.

Conclusion

One group of students was instructed through an inquiry-based learning method (5E instructional model) whereas another group was instructed through traditional methods. The 5E instructional model is composed of five distinct components: engagement, exploration, explanation, elaboration, and evaluation. The results showed that students who were instructed through inquiry-based learning achieved higher scores than the ones instructed through the traditional method (Abdi, 2014).

Luera, Killu, and O'Hagan (2003) designed an example of an inquiry-based mini unit for students to learn the concept of volume and how to measure the volume of a rectangular prism. The concept of volume has elements of lessons from both science and math. Their study validated that a carefully designed inquiry-based learning unit is a successful tool in promoting student knowledge construction. This well designed inquiry-based unit ensured minimum teacher's intervention and promoted higher student engagement and learning achievement.

Marriott (2014) suggested that school librarians should work hand in hand with the teachers to develop complex assignment projects, which do not have a straight forward answer found in a single source or reference. This kind of project should encourage open-ended inquiry learning with many possible alternatives instead of a single right or wrong answer. This should encourage students to reach an evidence-based conclusion after exploring many diverse and relevant resources. The author also mentioned that children in schools are better influenced by teachers who most frequently ask question to promote active learners' participation, rather than teachers who usually passively pass the knowledge (Marriott, 2014). The open-inquiry question template is a structured approach to practice and promote open inquiry that typically results in a rich and satisfying research experience for students and teachers (Hermann & Miranda, 2010).

In inquiry learning, teachers ask open-ended questions to ignite active discussion and participation among the students, students' responses usually include different unexpected responses besides the usual one. Pre-service teachers are often intellectually and pedagogically challenged to successfully explaining these diverse unusual responses in an instructionally eloquent and meaningful way to the students. Instead, most of time, pre-service teachers over look and ignore these unusual responses. In this process by ignoring unfamiliar diverse responses, teachers failed to recognize and take the advantage of teachable moments in active inquiry learning approach, which enables the students to attempt and construct new meaning and knowledge (Inoue & Buczynski, 2010).

In conclusion, traditional lecture-based science instruction is not working to achieve optimal learning outcome in our schools. Traditional current textbooks are designed to teach segmented science concepts one at a time and fail to make connections for students and encourage thinking. This traditional approach promotes memorizing over understanding and open thinking. Liu, Lee, and Linn (2010) designed a science assessment consisting of both proximal items that are related to the units and distal items that are published from standardized tests (e.g., Trends in International Mathematics and Science Study). Their study compared the psychometric properties and instructional sensitivity of the proximal and distal items. The authors examined how student, class, and teacher characteristics affect student inquiry science learning. This study validated that an inquiry-based science unit is more successful in developing student knowledge integration. Teachers who have more than five years of experience teaching science have a positive impact in inquiry-based teaching. Teachers who have access to colleagues in the school implementing the same inquiry-based unit have a higher success rate in implementing inquiry-based learning. Teachers who participated in a workshop on designing inquiry-based units enjoy a higher rate of success in deploying inquiry-based learning.

Implications of the Literature

Over the past few decades, much has been written about what inquiry is and is not. Inquiry should not be considered as a singular construct, but rather a range of approaches that form a continuum (Hermann & Miranda, 2010). The National Research Council (NRC) provides one example; this continuum ranges from less to more learners' self-direction with respect to different features of inquiry: confirmation inquiry, structured inquiry, guided inquiry, and open inquiry (NRC, 2000). Teachers, who do not have any training or exposure to inquiry-based learning, are specially challenged by the open-ended inquiry learning environment (Inoue & Buczynski, 2010). Inoue and Buczynski (2010) recommended teacher preparation training in three areas to overcome teachers' hurdles in implementing inquiry teaching and learning environment. These three focus areas are: anticipating possibilities in students' diverse responses, giving pedagogically meaningful explanations that bridge mathematical content to students' thinking, and in-depth, structured reflection of teacher performance and teacher response to students' thinking.

This literature review raised few questions associated with inquiry-based learning. The first question is, what is inquiry-based learning? This literature review failed to come up with a single definition of inquiry-based learning. The reviewed literature mentioned multiple definitions of inquiry-based learning. In recent years, educators and administrators have been highly advocating the need for inquiry learning in science education. This encouragement for inquiry-based learning is based on the realization that science is eventually a question-driven, open-ended process where students need to have active participation to acquire personal experience through scientific inquiry and construct new scientific knowledge (Edelson, Gordin, & Pea, 1999). Inquiry-based learning can best be defined by describing its different phases or by asking, what are the key components of inquiry-based learning?

Pedaste et al. (2015) conducted a literature review using 32 articles from the EBSCO host Library. The articles were selected based on specific search criteria describing inquiry phases or whole inquiry cycles. This analysis of the articles resulted in the identification of five distinct general inquiry phases: orientation, conceptualization, investigation, conclusion, and discussion. No single literature proposed all of these five phases, rather each proposed a different number of phases with many different descriptions and names. The authors synthesized the collected data and proposed a framework for inquiry-based learning processes with five distinct phases. In this framework, inquiry-based learning begins with orientation and flows through conceptualization to investigation, where several cycles are possible. Inquiry-based learning usually ends with the conclusion phase (Pedaste et al., 2015).

The next question is what are the key challenges and proposed solutions of inquiry-based learning? Many challenges are identified along with proposed solutions. It is a challenging task to implement inquiry-based learning in any learning environment, especially in the classrooms. Edelson, Gordin, and Pea (1999) have been exploring these challenges through a program of research on the use of scientific visualization technologies to support inquiry-based learning in the geosciences. They identified five significant challenges to implementing inquiry-based learning and present strategies for addressing them through the design of technology and curriculum. The five challenges are: motivation, accessibility of investigation techniques, background knowledge, management of extended activities, and the practical constraints of the learning context. The proposed solutions are a having meaningful problems with implications that matter to learners, staging activities that can be used to set the stage for open-ended inquiry activities and introduce learners to investigation techniques, bridging activities introducing practices that are familiar to students as a means of introducing unfamiliar scientific practices, embedding information sources that is a knowledge base directly connected to an inquiry tool, and record-keeping tools to facilitate management and organization of inquiry activities (Edelson, Gordin, & Pea, 1999).

The final question is, is inquiry-based learning working for our learners? Almost all the articles presented some evidence directly or indirectly supporting the positive impact of inquiry-based learning. Luera, Killu, and O'Hagan (2003) claimed that a carefully designed inquiry-based learning unit is a successful tool to promote student knowledge construction. In addition, a well-designed inquiry-based unit will ensure minimum teacher intervention and will promote higher student engagement and learning achievement (Luera, Killu, & O'Hagan, 2003). Minner, Levy, and Century (2010) conducted an inquiry Synthesis Project to synthesize findings from research conducted between 1984 and 2002 to address the research question, what is the impact of inquiry science instruction on K–12 students? Fifty-one percent of the 138 studies in the synthesis showed positive impacts of some level of inquiry science instruction on student content learning and retention.

In conclusion, while there are barriers to implementing inquiry-based instruction in the k-12 classroom, educators and administrators are aware of countless benefits of inquiry-based learning. Quality and creative inquiry-

based learning instruction, reliable inquiry learning assessment protocols and tools, trained instructors, mature technology, and involved students can optimize the benefit of inquiry learning. Successful implementation of inquiry-based learning will have a huge impact on our national pride by acquiring higher rankings in math and science tests at the international level. Inquiry-based learning positively impacts our learners, which could be further enhanced by establishing a globally accepted definition and framework. Blanchard, Osborne, Wallwork, and Harris (2013) suggested that to achieve success in implementing inquiry learning in classroom, first we need to ensure that our teachers feel comfortable with teaching inquiry science. Teachers need access to quality inquiry training and other supportive resources to boost their comfort level in teaching inquiry learning. Some of the best teachers are finding it difficult to implement inquiry learning in the classroom setup to help support reformed-based Common Core State Standards. Keys and Bryan (2001) emphasized that a teacher's voice should be included when designing and implementing inquiry-based curriculum as teachers play a central role in the successful implementation of educational reform efforts. There is a tremendous opportunity to improve the teachers' understanding of inquiry-based learning. Capps and Crawford (2013) teachers skipped the inquiry learning approach in half of the allocated classroom time due to their limited understanding of inquiry-based learning. The assessment aspect of inquiry-based learning needs improvement to generate enormous interest around inquiry learning. Overall, more investment is required to develop a successful and universal model for inquiry-based learning.

Discussion and Recommendation for Future Research

Lee (2011) suggested that existing literature is limited in providing clarity while defining inquiry-guided learning. Since the publication of The Boyer Commission Report (1998), inquiry-guided learning has acquired tremendous attention as a preferred solution for a teaching and learning method to overcome any learning ills. The Boyer Commission Report (1998) defined the inquiry-guided learning only generally or chiefly by anecdote (Lee, 2011). Although many years have passed, confusion still exists about what inquiry-guided learning really is and how to do it, whether in a single course or across the curriculum (Lee, 2011). There is very little research dedicated to developing assessment tools to validate the effectiveness of inquiry learning.

Chang and Wang (2009) suggested that the emergence of computer and internet technologies will continuously influence and challenge inquiry learning. They speculate that while inquiry-based learning has many known challenges, these challenges are not static and further investigation is needed to find current and future challenges. Open-ended learning environments are specially challenging for teachers who do not have any training or exposure to inquiry-based learning and teaching challenges (Inoue & Buczynski, 2010).

While inquiry-based learning and instruction is promoted for K-12 education by administration and educators, the education industry lacks reliable assessment tools to measure the quality and quantity of the effective and efficient blending of inquiry-based instruction (Marshall, Smart, & Horton, 2010). Keys and Bryan (2001) recommended that more research is needed in the areas of teachers' beliefs, knowledge, and practices of inquiry-based science including the impact on student learning. Settlage (2007) suggested that it is unrealistic for teachers to engage in inquiry learning on a day to day basis, he speculates open inquiry is difficult to utilize in the classroom.

A final area for exploration is to master the art of asking medium questions to stimulate thinking among the learns. It is an easy task to either ask trivial questions to a learner or stimulate trivial questions in a learner's mind. It is also an easy task to ask impossibly difficult questions to a learner. The challenging task for the educator is to present challenging but medium questions to stimulate and encourage thinking in the learners' mind (Driscoll, 2005).

References

Abdi, A. (2014). The Effect of Inquiry-based Learning Method on Students' Academic Achievement in Science Course. *Universal Journal of Educational Research*, *2*(1), 37-41.

Banchi, H., and R. Bell. 2008. The many levels of inquiry. *Science and Children 46* (2): 26–29.

Baxter, J., Ruzicka, A., & Blackwell, S., (2012). Inquiry takes time. *Science & Children, 50*(1), 42-47.

Blanchard, M. R., Osborne, J. W., Wallwork, C., & Harris, E. S. (2013). Progress on implementing inquiry in North Carolina: Nearly 1,000 elementary, middle and high school science teachers weigh in. *Science Educator, 22*(1), 37-47.

Blumenfeld, P. C., Soloway, E., Marx, R., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learnin5: Sustaining the doing, supporting the learning. *Educational Psychologist, 26,* 369-398.

Brown, K. B. (2012). Seeking questions, not answers: The potential of Inquiry-based approaches to teaching library and information science. *Journal of Education for Library & Information Science, 53*(3), 189-199.
Bruner, Jerome (1986). *Actual Minds, Possible Worlds.* Cambridge, Mass.: Harvard University Press.
Buckner, E., & Kim, P. (2014). Integrating technology and pedagogy for Inquiry-based learning: The Stanford mobile Inquiry-based learning environment (SMILE). *Prospects (00331538), 44*(1), 99-118. doi:10.1007/s11125-013-9269-7
Cakir, M. (2008). Constructivist approaches to learning in science and their implication for science pedagogy: *A literature review. International Journal of Environmental and Science Education, 3*(4), 193–206.
Callison, D., & Baker, K. (2014). Elements of information inquiry, evolution of models, & measured reflection. *Knowledge Quest, 43*(2), 18-24.
Capps, D., & Crawford, B. (2013). Inquiry-based instruction and teaching about nature of science: Are they happening? *Journal of Science Teacher Education, 24*(3), 497-526.
Chang, C., & Wang, H. (2009). Issues of inquiry learning in digital learning environments. *British Journal of Educational Technology, 40*(1), 169-173. doi:10.1111/j.1467-8535.2008.00850.x
Corder, G., & Slykbuis, J. (2011). Shifting to an Inquiry-based experience. *Science & Children, 48*(9), 60-63.
Cunningham, D., & Duffy, T. (1996). Constructivism: Implications for the design and delivery of instruction. *Handbook of research for educational communications and technology*, (pp.170-198). New York: Simon & Schuster Macmillan.
Donhauser, M., Hersey, H., Stutzman, C., & Zane, M. (2014). Inquiry learning: The starting point. *School Library Monthly, 31*(2), 8-10.
Driscoll, M. P., (Ed.). (2005). *Psychology of learning for instruction* (3rd ed.). Boston: Pearson Allyn and Bacon.
Edelson, D. C., Gordin, D. N., & Pea, R. D. (1999). Addressing the challenges of Inquiry-based learning through technology and curriculum design. *Journal of the Learning Sciences, 8*(3-4), 391-450.
Fazio, X., Melville, W., & Bartley, A. (2010). The problematic nature of the practicum: A key determinant of pre-service teachers' emerging Inquiry-based science practices. *Journal of Science Teacher Education, 21*(6), 665-681. doi:10.1007/s10972-010-9209-9
Fouché, J. (2013). Rethinking failure. *Science Teacher, 80*(8), 45-49.
Hanushek, E. A. (2004). Our school performance matters. *Journal of Education, 185*(3), 1-6.
Haug, B. (2014). Inquiry-based science: Turning teachable moments into learnable moments. *Journal of Science Teacher Education, 25*(1), 79-96. doi:10.1007/s10972-013-9375-7
Hermann, R. S., & Miranda, R. J. (2010). A template for open inquiry. *Science Teacher, 77*(8), 26-30.
Inoue, N., & Buczynski, S. (2010). You asked open-ended questions, now what? understanding the nature of stumbling blocks in teaching inquiry lessons. *Mathematics Educator, 20*(2), 10-23.
Ireland, J., Watters, J., Brownlee, J., & Lupton, M., (2012). Elementary teacher's conceptions of inquiry teaching: Messages for teacher development. *Journal of Science Teacher Education, 23*(2), 159-175. doi:10.1007/s10972-011-9251-2
Jiang, X., & Perkins, K. (2013). A conceptual paper on the application of the picture word inductive model using Bruner's constructivist view of learning and the cognitive load theory. *Interdisciplinary Journal of Teaching & Learning, 3*(1), 8-17.
Keller, J. M. (1987). Strategies for stimulating the motivation to learn. *Performance Instruction, 26*(8), 1-7.
Keys, C. W., & Bryan, L. A. (2001). Co-constructing Inquiry-based science with teachers: Essential research for lasting reform. *Journal of Research in Science Teaching, 38*(6), 631-645. doi:10.1002/tea.1023
Ku, K., Ho, I., Hau, K., & Lai, E. (2014). Integrating direct and Inquiry-based instruction in the teaching of critical thinking: An intervention study. *Instructional Science, 42*(2), 251-269. doi:10.1007/s11251-013-9279-0
Lee, V. (2011). The power of inquiry as a way of learning. *Innovative Higher Education, 36*(3), 149-160. doi:10.1007/s10755-010-9166-4
Li, Q., Moorman, L., & Dyjur, P. (2010). Inquiry-based learning and e-mentoring via videoconference: A study of mathematics and science learning of Canadian rural students. *Educational Technology Research & Development, 58*(6), 729-753.
Liu, O. L., Lee, H., & Linn, M. C. (2010). Multifaceted assessment of Inquiry-based science learning. *Educational Assessment, 15*(2), 69-86.
Luera, G. R., Killu, K., & O'Hagan, J. (2003). Linking math, science, and Inquiry-based learning: An example from a mini-unit on volume. *School Science & Mathematics, 103*(4), 194-207.
Marriott, C. E. (2014). Just wondering. *Knowledge Quest, 43*(2), 74-76.
Marshall, J. C., Smart, J., & Horton, R. M. (2010). The design and validation of EQUIP: An instrument to assess Inquiry-based instruction. *International Journal of Science & Mathematics Education, 8*(2), 299-321.

Marshall, J. C., & Horton, R. M. (2011). The relationship of teacher-facilitated, Inquiry-based instruction to student higher-order thinking. *School Science & Mathematics, 111*(3), 93-101.

Minner, D. D., Levy, A. J., & Century, J. (2010). Inquiry-based science instruction—what is it and does it matter? Results from a research synthesis years 1984 to 2002. *Journal of Research in Science Teaching, 47*(4), 474-496.

National Research Council (NRC). 2000. *Inquiry and the national science education standards: A guide for teaching and learning.* Washington, DC: National Academies Press.

Organization for Economic Co-operation and Development (OECD), 2012. PISA 2012 *country-specific overviews-United States*

Pedaste, M., Mäeots, M., Siiman, L. A., de Jong, T., van Riesen, S. A., Kamp, E. T., . . . Tsourlidaki, E. (2015). Phases of Inquiry-based learning: Definitions and the inquiry cycle. *Educational Research Review, 14*, 47-61.

Richey, R. C., Klein, J. D., & Tracey, M. W. (2011). *The instructional design knowledge base: Theory, research, and practice*. New York: Routledge.

Schroeder, C. M., Scott, T. P., Tolson, H., Huang, T. Y., & Lee, Y. H. (2007). A meta-analysis of national research: Effects of teaching strategies on student achievement in science in the United States. *Journal of Research in Science Teaching, 44*(10), 1436-1460.

Settlage, J. 2007. Demytholgizing science teacher education: Conquering the false ideal of open inquiry. *Journal of Science Teacher Education* 18: 461–467.

Soprano, K., & Yang, L., (2013). Inquiring into my science teaching through action research: A case study on one pre-service Teacher's Inquiry-based science teaching and self-efficacy. *International Journal of Science & Mathematics Education, 11*(6), 1351-1368.

Takaya, K. (2008). Jerome Bruner's theory of education: From early Bruner to later Bruner. *Interchange, 39*(1), 1-19. doi:10.1007/s10780-008-9039-2

Towers, J. (2012). Administrative supports and curricular challenges: New teachers enacting and sustaining inquiry in schools. *Canadian Journal of Education, 35*(1), 259-278.

Tretter, T. R., & Jones, M. G. (2003). Relationships between Inquiry-based teaching and physical science standardized test scores. *School Science & Mathematics, 103*(7), 345-350. doi:10.1111/j.1949-8594.2003.tb18211.x

Truxaw, M. P., Casa, T. M., & Adelson, J. L. (2011). A stance toward inquiry: An investigation of preservice teachers' confidence regarding educational inquiry. *Teacher Education Quarterly, 38*(4), 69-95.

Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard university press.

Wilhelm, J. D. (2014). Learning to love the questions. *Knowledge Quest, 42*(5), 36-41.

Exploring the Implications of Mobile Technology Integration within Higher Education Professional Development

Jeanna R. Cronk
Boise State University Doctoral Student
Northwood University Learning Management System Coordinator
4000 Whiting Drive
Midland, MI 48640

Index Descriptors: Mobile Learning; Professional Development

Introduction

Recent studies have shown that mobile devices and more specifically, smartphones, are prevalent within the higher education community (Kearney & Maher, 2013; Kukulska-Hulme, 2012). However, the success of mobile technology integration within a class is dependent upon the teacher's pedagogical planning and implementations (Ekanayake & Wishart, 2014). Given these concerns, the purpose of this paper is to explore mobile learning and how the integration of mobile technology can be advanced by its inclusion within higher education professional development programs. To date, most of the published studies in this area have reported either the direct implementation of mobile technology within actual courses or the integration of mobile technology solely within the pre-service teacher education departments at the university level.

Mobile Devices

College students have a constant connection with their mobile devices, carrying them in their pockets or handbags, exercising with them, and even sleeping next to them. This paper will focus on the 'smartphone' as the preferred mobile device, as students carry these mobile computing capable phones on their persons throughout their daily lives. Whereas a tablet or laptop computer is generally only carried with a specific intention, for example when traveling to the campus library to complete a written assignment for a course.

The prolific nature of mobile technologies is creating an urgent implementation drive in education (Ally, Grimus, & Ebner, 2014). Mobile devices have a "notable capability to support intense and ubiquitous cooperative learning, social interaction, and sharing" (Kukulska-Hulme, 2012, p. 249). The combination of this ever-present connection and the abilities that mobile devices offer in teaching and learning, are pushing the exploitation of mobile devices on college campuses.

Moreover, with a mobile device already in the hands of each college student, faculty have the unique opportunity to personalize the learning experience. Ally, Grimus, and Ebner (2014) identified mobile personalized learning as having characteristics of social learning and collaboration, new generation learning, just-in-time availability, and authentic learning experiences. These findings suggest that students are expecting to utilize their mobile devices in the college classroom and the 'personal and portable nature' of mobile devices can enable learning that is informal in scope, but integrated into the everyday life of students (Schuck, Aubusson, Kearney, & Burden, 2013).

Mobile Learning

Mobile Learning Defined

This new type of mobile learning, or m-learning, has been previously described as 'noisy' and problematic to define and evaluate (Traxler, 2007). However, as the trend for mobile learning had been previously restricted by the abilities of the devices themselves, research is now showcasing that the needs of faculty and the learners themselves, are instigating the usage.

In 2003, Seppälä and Alamäki, stated that an essential element of mobile learning is the ability to "experience the authentic joy of learning" (p. 335) whenever and wherever the learner happened to be. Gikas and Grant (2013) expanded the definition of mobile learning beyond just the timing and location to include learning that

is “both formal and informal, and context aware and authentic for the learner” (p. 19). For the purposes of this paper, mobile learning includes student engagement or assessment related to course content that can be easily accessed via a mobile device both inside and outside of a course’s location and stated times.

In essence, current higher education students are utilizing mobile technology for their personal lives, but not as extensively in their education. While students may not yet be prepared to link their personal usage of mobile technology to their studies, faculty can facilitate and guide those connections. As noted by Kearney and Maher (2013), an important pedagogical method utilized with mobile learning is the use of class-based discussion to aid the students in relating their ‘out-of-class’ informal learning experiences to the traditional classroom-based learning. With the increased availability and functions of today's mobile devices, faculty that integrate mobile technology and Web 2.0 tools into their classrooms will assist students in preparing for future careers.

Examples of Mobile Learning

As Bennett, Bishop, Dalgarno, Waycott, and Kennedy noted in 2012, vendors of traditional educational tools, such as the learning management system, are repurposing their products to integrate some Web 2.0 features. These vendors wish to establish themselves as a ‘one-stop-shop’ of sorts that could function like the popular Web 2.0 tools, but also include tracking and grading features. With the multitude of Web 2.0 and mobile technology resources currently available, instructors that experience problems with one application are able to simply drop one tool and find a suitable replacement for their classroom needs (Gikas & Grant, 2013).

Gikas and Grant (2013) conducted a study to gauge student perspectives on mobile learning. They used focus group interviews to record student responses and reported that students from their study were particularly satisfied with the ease of sharing and responding to classmates via Twitter with their smartphones. Students within the study compared the quick access of ‘tweets’ to the tedious procedure of logging into the school’s learning management system, opening the respective course, and then posting to the content related discussion board. Another benefit of the micro-blogging site, Twitter, is the ability to create push notifications that can alert students of new materials shared from their instructors. As these notifications do not require a log-in process, the content can be even easier to obtain by the learners. Twitter has also been noted as an effective tool in creating a ‘backchannel’ conversation during a synchronous lecture or webinar.

Following are additional examples of studies that included mobile learning instances and implementations. Bennett et al. (2012) conducted a large cross-institutional study to explore successful implementations of Web 2.0 technologies in higher education. The six implementation projects were from a variety of college programs of study including two Science classes, two Education courses, one Journalism class, and one section of Psychology. The authors reported that of the six implementations, the faculty that closely aligned pedagogy with the technology were the most successful at impacting student learning. Two of these successful examples from the study included student created, co-authored, and shared content in both image and text formats.

Another example of inclusion of mobile devices was presented by Kearney and Maher (2013) as they examined the use of iPads in pre-service teachers’ professional development. The authors found that students used the provided iPads in a variety of ways including (a) documenting real-world examples for their classroom sessions, (b) organizing their professional learning, (c) accessing productivity apps, and (d) evaluating, observing, recording, and annotating reflections. The students’ use of the iPads reflected both authentic learning and personalization of their learning inside and outside of the classroom setting, in both formal and informal environments, all critical elements of mobile learning. This further documents the ability of mobile devices to enhance a student’s higher education experience.

Additional examples of the ways that teachers are incorporating mobile devices into their classrooms is the use of SMS-message polling and feedback during lectures (Schuck et al., 2012; Seppälä & Alamäki, 2003), having students utilize mobile devices for self-reflection, peer assessment, peer support, and idea-sharing (Ally et al., 2014), and when students create video journals, e-portfolios, wikis, and micro-blogs with mobile devices (Cochrane & Narayan, 2012).

One study that was conducted to determine early uses of mobile devices in K-12 classes found that teachers aimed for creativity, motivation, reinforcement, and alternative assessments when they implemented mobile devices into their lessons (Grant, Tamim, Brown, Sweeney, Ferguson, & Jones, 2015). Five themes noted by the researchers were (a) how influences of device ownership effected its use, (b) student accountability supported by administration, (c) use of devices as student motivators, (d) teachers’ desire for corresponding professional development, and (e) common, but manageable technical difficulties.

In 2012, Cochrane and Narayan developed a professional development course that provided participants with a community of practice and the opportunity to experience mobile Web 2.0 tools. Of particular interest was a

focus on social learning and its impact on the roles of teachers and learners. The study found that the constant contact that is inherent with social media frameworks also enables mobile devices to be used for sustained engagement with educational curriculum.

An interesting side note reported by McFarlane, Roche, and Triggs (2007) is that learners appear to prefer working on personally owned devices, rather than ones that were provided by the institution. As students are most familiar with their private mobile device, this could imply that BYOD (Bring Your Own Device) programs in higher education may be the most desired by students. Budget conscious universities would most likely regard a BYOD program as favorable when compared to the prospect of an institution purchasing and maintaining the mobile devices.

To summarize, studies have shown that the pedagogy behind mobile learning includes personalized learning, authenticity, and collaboration (Kearney, Schuck, Burden, & Aubusson, 2012). The results of these implementation studies suggest that mobile technology "has the potential to take higher education aggressively in a flexible, student-centered direction" (Hargis, Cavanaugh, Kamali, & Soto, 2014, p. 46).

Success with Mobile Learning

Researchers have argued that "mobile computing devices can be used as the bridge between formal and informal learning opportunities" (Gikas & Grant, 2013, p. 19). These same researchers explored three reoccurring themes in mobile learning in 2013, (a) constant connectivity, (b) collaborative learning, and (c) authentic learning. They found that quick access to information, collaboration, communication, variety, and authenticity were all advantages of using mobile devices for student learning. The results from this study are consistent with those of Hargis, Cavanaugh, Kamali and Soto (2014), who observed that learner engagement increased as mobile technology 'empowered' the students to conduct their own research and increase their independence as learners.

Another important facet of successful implementations of mobile technology is the level of administrative support perceived by faculty. Whether the integration was self-initiated by the instructor or requested by the institution, Grant, Tamim, Brown, Sweeney, Ferguson, and Jones (2015) found that having an administrator serving as a 'champion' for the technology can increase the success of the implementation.

Barriers to Mobile Learning

This section discusses the following two themes that have emerged as barriers to successful mobile learning: access and faculty perceptions. The first theme, access, includes the ability (or inability) to connect to a wireless network, the broadband support infrastructure at an institution, the limitations of a mobile device's battery life or memory capacity, and technical difficulties experienced by the students (Ally et al., 2014; Gikas & Grant, 2013; Power & Thomas, 2007). To combat these access concerns, higher education institutions will need to respond to the increased demand on campus bandwidth, while device manufacturers will likewise need to continue increasing device battery capabilities. Additionally, with current cloud based storage solutions (e.g. Google Drive), the memory capacity of mobile devices will eventually be eliminated. The final stated access limitation, technical difficulties, could be fairly easy to overcome with assistance from the instructor and increased familiarity with the device (Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012).

The second barrier theme of mobile technology integration, faculty perceptions, will not be as easy to overcome. Instructors that have not previously identified the pedagogical rationale for mobile use in education, will likely forbid the tools in their courses. As Gikas and Grant (2013) noted, students that wished to further utilize their mobile devices were prohibited in some classrooms by professors that were considered 'anti-technology.' Additionally, those instructors that feel overwhelmed by the vast number of Web 2.0 and mobile technologies are likely to avoid them and continue with their traditional teaching methods. As Kukulska-Hulme (2012) documented, college faculty that do not understand the learning implications of mobile devices are reluctant to implement them. She reported that these faculty perceived too large an amount of time and effort in order to master such an integration.

Another aspect of this perception barrier to consider is the potential misalignment between assessments and mobile learning (Hargis et al., 2014). Secondary (9-12) teachers have expressed concerns that a new mobile enhanced classroom will have a negative effect on standardized testing results. The format of nationwide assessments is drastically different from the type of personalized and authentic learning assessments that can take place in a mobile learning environment. Teachers are concerned that student achievement levels will likely not transfer from a flexible learning format to that of a rigid standardized test. At the higher education level, universities that are looking to retain or obtain accreditation may need to consider this implication as accrediting bodies often

require capstone assessments in degree programs as well (McFarlane, Roche, & Triggs, 2007).

Hasty Mobile Integrations

Both the abundance of mobile technologies and the prospect of engaging students 'where they are' are building a sense of urgency and motivating professors to quickly adopt mobile devices in their classes (Ally et al., 2014). Grant et al. (2015) reported that novice attempts at mobile integration appeared to merely be a replacement for desktop computing, not a true mobile learning experience. Furthermore, Matzen and Edmunds (2007) found that teachers integrated technology much in the same way as they were taught with it. These cases highlight the need for faculty guidance when selecting the most effective technologies for their class.

The current published studies involving professional development and mobile technology indicate that it is too focused on how to "use" the applications (apps), rather than guiding the alignment of content and pedagogy with mobile learning opportunities. Frequently, professional development is short term, with a focus on the technical skills and not the instructional practices. While faculty need time to practice using the devices and build their confidence levels with the tools, they also need ongoing collaboration among their peers to establish better lesson planning with the technology (Ekanayake & Wishart, 2014; Matzen & Edmunds, 2007; McFarlane et al., 2007).

To summarize, students are already constantly connected to their devices and will be expected to use them for both formal and informal learning experiences, inside and outside of the classroom. However, faculty may not experience the same level of comfort and intimacy with their mobile devices. Instructors will not only need training on how to successfully implement mobile devices with pedagogical rationale at the heart of this training, but will also need a working knowledge of their selected resources. An effective strategy for targeting both needs is to have the faculty experience mobile technology integration from a student's perspective via professional development opportunities.

Professional Development

As the ultimate goal of professional development is to improve classroom practices and student achievement, it should model the pedagogies of mobile technology that faculty can later emulate in their own course implementations (Reeves & Li, 2012). Professional development in higher education has been offered in a variety of formats including, but not limited to, formal and informal instruction, mentoring, demonstrations by vendors or university staff, mandatory or voluntary workshops by teaching and learning centers, pilot studies, and communities of practice (Ally et al., 2014; Drouin, Vartanian, & Birk, 2014; Matzen & Edmunds, 2007). With a long-term goal of flexible delivery and access to information on mobile devices, the successful professional development programs must be ongoing, collaborative endeavors (Ally et al., 2014; Seppälä & Alamäki, 2003).

An example of the successful inclusion of mobile technology within professional development as reported by Cochrane and Narayan (2012) required instructors to develop and teach a lesson from their perspective curriculum. The presence of sustained engagement and scaffolding were cited as key elements that aided the participants in shifting their teaching strategies to adopt mobile technology for their own classes. Additionally, the opportunity for pedagogical self-reflection by the enrolled participants allowed for preparations of future adjustments and implementation approaches.

In 2012, Kukulska-Hulme examined how adopting mobile technology during faculty development at a higher education institution can influence the adoption of mobile devices within the classroom. Her results indicated that faculty found added value in the use of mobile technology during development sessions that were focused on the method of learning with the mobile products, not solely on how to use the devices. She also reported faculty support of the inclusion of reflection opportunities regarding the use of mobile technologies for teaching and learning.

Computerized Professional Development

As the research regarding mobile technology within professional development is still in its infancy, it is reasonable to consider the documentation regarding computerized professional development to draw connections between the two. Studies related to computerized professional development programs have shown that teachers seem to readily accept the format, are able to learn from this content delivery method, and acquired teaching skills result in improved student outcomes and satisfaction (Fisher, Schumaker, Culbertson, & Deshler, 2010).

In a similar study aimed at examining the technological readiness of teachers, conducted by Reeves and Li (2012), showed that teachers felt the online professional development was as effective as a face-to-face format. The

researchers noted that the technology skill level of faculty must be addressed prior to successful implementation of a virtual professional development program. Additionally, this skill level of participating instructors improved as a result of the online professional development, specifically in the areas that were utilized during the course. These results are conducive to the logic of including mobile technology within professional development as it would in turn, increase the mobile abilities of those participating faculty members.

Mobile Professional Development

In 2014, Ekanayake and Wishart conducted a case study with a group of science teachers in Sri Lanka who were implementing the use of mobile phones into their curriculum. The authors designed a faculty development program to aid the teachers in their incorporation of the new technology. The program started with a planning session, then the teachers conducted their classroom lessons, followed by a collaborative, concluding review and reflection session. The study involved a three day professional development workshop series whereby the instructors experienced hands-on training using the phones and also worked in small groups to plan lessons and later evaluate the success of those lessons. Eleven months after the program, the participating teachers were contacted and the researchers reported a threefold increase of the integration of mobile devices into the participating teachers' science lessons. These results indicate that the inclusion of the mobile devices during the professional development series can have a profound impact on the implementation of mobile technology within the classroom.

Data collected by Hargis et al. (2014) during a mandatory iPad deployment among the United Arab Emirates (UAE) showed that engaging college staff early and often resulted in a significant shift from 'Entry levels' of adoption to 'Adaptation' by faculty. The professional development opportunities presented to faculty in this study were focused on providing a safe, collaborative community that would allow instructors to freely exchange thoughts and ideas regarding the iPad's use within the curriculum. The researchers presented their findings in the format of a SWOT (strengths, weaknesses, opportunities, and threats) analysis. Strengths included faculty support, student engagement, and individualized learning; weaknesses included non-technical faculty, traditional student perceptions of learning, and a lack of device storage; noted opportunities included further faculty collaboration, alternative assessments, and faculty created apps; the only threat reported was the disparity between traditionally required assessments and mobile teaching.

Kukulska-Hulme (2012) reported four specific themes that have emerged as most helpful for faculty development with mobile devices: (a) detailed activities, (b) hands-on experiences with the faculty's own device, (c) ample discussion, and (d) technical support. In reporting their initial research findings, McFarlane et al. (2007) found that teachers valued the chance to become familiar with mobile devices prior to considering their teaching and learning implications. Additionally, as teachers were provided with the opportunity to collaborate with mentors or colleagues regarding mobile technology implementation, their usage of these devices increased. The researchers documented that it was most effective to start with small implementations of mobile technology that were well planned and conceived.

Barriers to Mobile Professional Development

As noted by Fisher, Schumaker, Culbertson, and Deshler (2010), virtual workshops can reduce the costs of professional development programs and remove barriers to access often experienced by adjunct faculty members. In contrast, poor technical skills or an aversion to mobile technology could adversely affect an instructor, as they will be hesitant to join a virtual professional development program until they are confident in their skills with the technology (Reeves & Li, 2012).

Pace of Implementation

While the advancing technology and student expectations may be pushing mobile technology integration, it is the faculty that are charged with the effective implementation of mobile learning (Gikas & Grant, 2013). As is common with the spread of innovative technologies among higher education, there are those educators that will always be on the forefront, experimenting with the tools before any of their colleagues. However, the unique student-driven nature of mobile technology is putting a number of faculty in a mindset that there is little value added by mobile learning.

As Rudd and Watts (2008) stated in their interpretation of Everett Rogers' diffusion of innovations model:

> The diffusion model is based on two underlying premises: (1) that communication is essential for the diffusion and subsequent acceptance or rejection of an innovation and (2) that new products, practices, and

ideas can alter the structure and function of a social system. (p. 268)

Looking at the integration of mobile technology through the lens of the diffusion of innovations model, it can be expected that increasing the awareness of pedagogical successes involved with mobile integration could lead to a wide-spread implementation of such technology. According to McFarlane et al. (2007), factors that have the greatest impact on the speed of technology adoption are (a) a teacher's prior experience with technology, (b) their attitude and confidence with technology, (c) their relationship with their classes, and (d) their outlook on taking risks. While professional development cannot adjust prior experiences, it can help to drive the acceptance of mobile technology among a body of faculty. As Rudd and Watts (2008) stated, it is important to identify the 'early adopters' within an institution to target and ensure they are "on-board" with new materials.

Communities of Practice

Of special note in the research surrounding mobile device implementations, is the reference to communities of practice. Reeves and Li (2012) presented an example whereby such a community could be 'manufactured' in a professional development environment:

> The community of practice model is well regarded, grounded in social learning theory and has at its core that premise that the shared expertise of community members is more robust in terms of development than the sum of its members' knowledge/skills. Real communities of practice *emerge* from practice, although sometimes they are manufactured. (p. 393)

In 2014, Drouin, Vartanian, and Birk, explored the impacts of a community of practice on the distribution of mobile tablets to 139 university faculty members. The findings reported showed that a community of practice could engage faculty members from across campus department lines. However, the professional development program conducted in this study included an application process which may have prohibited less-enthusiastic faculty from participating altogether.

Schuck, Aubusson, Kearney, and Burden (2013) also investigated the impact of a professional learning community when faculty were implementing mobile technology within their courses. The study involved professors from the college of education that implemented mobile technologies for students to complete project-based learning activities, such as blogging, polling, and the creation of video podcasts. The results of the study suggested that the personal learning community aided the members with advancing their uses of mobile devices while also further developing the professional relationships among the faculty involved.

In the prior mentioned study conducted by Cochrane and Narayan (2012), participants continued to interact with one another and build their community of practice after the course was completed. This included engaging with future course participants during discussions held via Twitter. With regard to the initial study participants, they also became technology leaders within their respective university departments, capable of transferring their experiences and successes to the institution as a whole.

In summary, the collaborative nature of a faculty learning community has the ability to promote the acceptance and successful implementation of technology tools (Ekanayake & Wishart, 2014; Kukulska-Hulme, 2012; Rudd & Watts, 2008).

Discussion

This paper provides an overview for research in mobile learning and the potential impact of mobile devices on professional development in higher education. A traditional format for the integration of new technologies at the university level is for those involved in faculty development to promote and provide training prior to wide-spread implementation. However, the ubiquitous nature of mobile devices among college students is causing a unique student driven demand for integration of such technologies. Therefore, those in professional development roles are racing to help faculty properly implement mobile technology.

This need has spawned the creation of dynamic professional development that "leverages teachers' use of their mobile phones…regardless of time, place, or location" (Walsh, Power, Khatoon, Biswas, Paul, Sarkar, & Griffiths, 2013, p. 198). These mobile technology implementations are also changing the relationships between teachers and learners, essentially transitioning the role of the college professor to that of facilitator (Idrus & Ismail, 2010).

Conclusion

The current research that has been focused on the use of mobile technology within higher education has

emphasized pre-service teacher education programs. This paper has explored the results of this research and determined that connections can be made for faculty development programs in a range of university departments.

Additionally, the research conducted with large scale university mobile implementations have been based around mandatory, institution provided device integrations (i.e. one-to-one iPad initiatives). Thus, the results of future studies aimed at BYOD programs within higher education could offer an alternative viewpoint for professional development mobile technology inclusion.

An additional implication that may evolve from the widespread integration of mobile technology within higher education is the expectation of constant connectivity, often displayed by students in online courses. As mobile devices are permeating the college campus, this mindset could likely transfer to those students enrolled in face-to-face courses when mobile technology is integrated into the course methods.

Furthermore, the implementation of mobile technology could cause a new educator to evolve, that is not only comfortable with integrating mobile technology, but can also use it in more constructivist, learner-centered ways (Matzen & Edmunds, 2007). Looking forward, there is continued need for future research involving mobile technology initiatives across university professional development offerings.

References

Ally, M., Grimus, M., & Ebner, M. (2014). Preparing teachers for a mobile world, to improve access to education. *Prospects*, *44,* 43-59. doi:10.1007/s11125-014-9293-2

Bennett, S., Bishop, A., Dalgarno, B., Waycott, J., & Kennedy, G. (2012). Implementing web 2.0 technologies in higher education: A collective case study. *Computers and Education*, *59*(2), 524-534. doi:10.1016/j.compedu.2011.12.022

Cochrane, T., & Narayan, V. (2012). Redesigning professional development: Reconceptualising teaching using social learning technologies. *Research in Learning Technology*, *21*(3), 1-19. doi:10.3402/rlt.v2li0.19226

Drouin, M., Vartanian, L. R., & Birk, S. (2014). A community of practice model for introducing mobile tablets to university faculty. *Innovative Higher Education*, *39*(3), 231-245. doi:10.1007/s10755-013-9270-3

Ekanayake, S. Y., & Wishart, J. (2014). Integrating mobile phones into teaching and learning: A case study of teacher training through professional development workshops. *British Journal of Educational Technology*, *46*(1), 173-189. doi:10.1111/bjet.12131

Fink, L. D. (2013). Innovative ways of assessing faculty development. *New Directions for Teaching and Learning, 133*, 47-59. doi:10.1002/tl.20045

Fisher, J. B., Schumaker, J. B., Culbertson, J., & Deshler, D. D. (2010). Effects of a computerized professional development program on teacher and student Outcomes. *Journal of Teacher Education*, *61*(4), 302-312. doi:10.1177/0022487110369556

Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, *19*, 18-26. doi:10.1016/j.iheduc.2013.06.002

Ginsberg, S. M., & Bernstein, J. L. (2011). Growing the scholarship of teaching and learning through institutional culture change. *Journal of the scholarship of teaching and learning, 11*(1), 1-12.

Grant, M. M., Tamim, S., Brown, D. B., Sweeney, J. P., Ferguson, F. K., & Jones, L. B. (2015). Teaching and learning with mobile computing devices: Case study in K-12 classrooms. *TechTrends, 59*(4), 32-45. doi:10.1007/s11528-015-0869-3

Hargis, J., Cavanaugh, C., Kamali, T., & Soto, M. (2014). A federal higher education iPad mobile learning initiative: Triangulation of data to determine early effectiveness. *Innovative Higher Education*, *39*(1), 45-57. doi:10.1007/s10755-013-9259-y

Idrus, R. M., & Ismail, I. (2010). Role of institutions of higher learning towards a knowledge-based community utilising mobile devices. *Procedia - Social and Behavioral Sciences*, *2*(2), 2766-2770. doi:10.1016/j.sbspro.2010.03.412

Kearney, M., & Maher, D. (2013). Mobile learning in Maths teacher education: Using iPads to support pre-service teachers' professional development. *Australian Educational Computing*, *27*(3), 76-84.

Kearney, M., Schuck, S., Burden, K., & Aubusson, P. (2012). Viewing mobile learning from a pedagogical perspective. *Research in Learning Technology*, *20*, 1-17. doi:10.3402/rlt.v20i0/14406

Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning? *The Internet and Higher Education*, *15*(4), 247-254. doi:10.1016/j.iheduc.2011.12.002

Matzen, N. J., & Edmunds, J. A. (2007). Technology as a catalyst for change: The role of professional development. *Journal of Research on Technology in Education, 39*(4), 417-430.

McFarlane, A., Roche, N. & Triggs, P. (2007). *Mobile learning: Research findings.* Bristol: University of Bristol.
Power, T., & Thomas, R. (2007). The classroom in your pocket? *Curriculum Journal*, *18*(3), 373-388. doi:10.1080/09585170701590031
Reeves, T. D., & Li, Z. (2012). Teachers' technological readiness for online professional development: Evidence from the US e-Learning for Educators initiative. *Journal of Education for Teaching*, *38*(4), 389-406. doi:10.1080/02607476.2012.707921
Rudd, R. E., & Watts, V. (2008). Diffusion of innovations. In S. Boslaugh (Ed.), *Encyclopedia of Epidemiology* (pp. 268-270). Thousand Oaks, CA: SAGE Publications, Inc.
Schuck, S., Aubusson, P., Kearney, M., & Burden, K. (2013). Mobilising teacher education: A study of a professional learning community. *Teacher Development: An International Journal of Teachers' Professional Development, 17*(1), 1-18. doi:10.1080/13664530.2012.752671
Seppälä, P., & Alamäki, H. (2003). Mobile learning in teacher training. *Journal of Computer Assisted Learning*, *19*(3), 330-335. doi:10.1046/j.0266-4909.2003.00034.x
Walsh, C. S., Power, T., Khatoon, M., Biswas, S. K., Paul, A. K., Sarkar, B. C., & Griffiths, M. (2013). The 'trainer in your pocket': Mobile phones within a teacher continuing professional development program in Bangladesh. *Professional Development in Education*, *39*(2), 186-200. doi:10.1080/19415257.2013.766232

A Rationale for Revising Bloom's [Revised] Taxonomy

Afnan N. Darwazeh
An-Najah National University
Nablus, Palestine
Email-afnandarwazeh@yahoo.com

Key Words: Bloom, taxonomy, cognitive domain, cognition, meta-cognition, omponent display.

Abstract

This paper was intended to give a further revision to Anderson 's [revised] Blooms' taxonomy (2001). The rationale is that a two-dimensional representation is required and other related information should be added. Therefore, the aim of this paper was to: 1) present Anderson's revised taxonomy as a match to Bloom's taxonomy**,** 2) summarize the results of an analysis of Anderson and Krathwohl's revision of Bloom's Taxonomy, 3) provide a further revisions and 4) share a new diagram of a revision to the [*revised*] Bloom's Taxonomy.

Introduction

In early 1940's, the cognitive researchers and psychologists had stated based on cognitive and human information processing theories that human's mind applies different mental processes while he or she manipulates, insights, stores, and retrieves information (e.g., Darwazeh, 1994, 1995, 2004, 2011, 2013; Gagne, 1977; Guilford, 1956; Lindsay & Norman, 1977; Piaget, 1952; Rothkoph, 1966; Rumelhart & Ortony, 1977; Wittrock, 1974a, 1974b). These mental processes differ in terms of *types* such as memorization, comprehension, discrimination, analysis and the like, and also in terms of *level of difficulty*, such as simple, medium or complex levels.

One of the most prominent instructional psychologists who tried to apply the cognitive principles in the field of instruction was Benjamin Bloom. In 1956, Bloom and his associates published a taxonomy of educational objectives in a cognitive domain. Bloom and his associates classified different forms and levels of learning based on mental processes that students involved in while they learn. However, after almost six decades of using Bloom's original taxonomy, some educators have begun to wonder whether the taxonomy still valid to this age which characterized of a lot of research and studies on intellectual skills and human thinking and learning. One of those educators was Lorin Anderson (www.tandfonline.com). Anderson and Krathwohl (2001) revised Bloom's taxonomy to be more adaptive to our current age by proposing another taxonomy that will meet curriculum designers, teachers, and students' needs more better than the Bloom's one. However, based on a thorough assessment, the author contend that Anderson and Krathwohl's (2001) revised Bloom's taxonomy still fails to match with what the cognitive psychologists had found recently related to types and difficulty levels of mental processing (e.g., Darwazeh, 1995, 2011; Darwazeh & Branch, 2015; Lindsay & Norman, 1977; Merrill, 1983; Reigeluth & Darwazeh, 1982; Tuckman, 1992; West, Farmer, and Wolff, 1991).

Accordingly, Darwazeh (Darwazeh & Branch, 2015) have made a revision to Anderson's [Revised] Bloom's taxonomy based on an extensive review of the literature in cognitive psychology and information processing theory. But, after receiving responses and thoughts from their attendees during last year's roundtable discussion at 2015 AECT, and based on a further review of the literature in cognitive and information processing theory (e.g., Lindsay & Norman, 1977; West, Farmer, and wolff, 1991; Gagne, 1977; Gagne and Driscoll, 1988; Merrill, 1983) Darwazeh expanded the revision to Anderson revised Bloom's Taxonomy.

Therefore, the **aim** of this paper was to provide further revisions to Anderson's revised Bloom's Taxonomy.

Anderson's Revised Taxonomy as a match to Bloom's Taxonomy

Anderson in 1990, a former student of Bloom, updated and revised the taxonomy reflecting relevance to 21st century work for both students and teachers as she said (Anderson & Krathwohl, 2001). Anderson changed the taxonomy in three broad categories: terminology, structure and emphasis (Forehands, 2005). Anderson modified the original terminology by changing Bloom's categories from nouns to verbs. Anderson also renamed the knowledge

category into remember, comprehension into understanding and synthesis into create categories. In addition, Anderson changed the order of synthesis category and put it to be at the top the triangle under the name of *Create* (Taylor & Francis, 2002). Thus, Anderson and Krathwohl's (2001) revised Bloom's taxonomy became: Remember, Understand, Apply, Analyze, Evaluate and Create (See Figure 1).

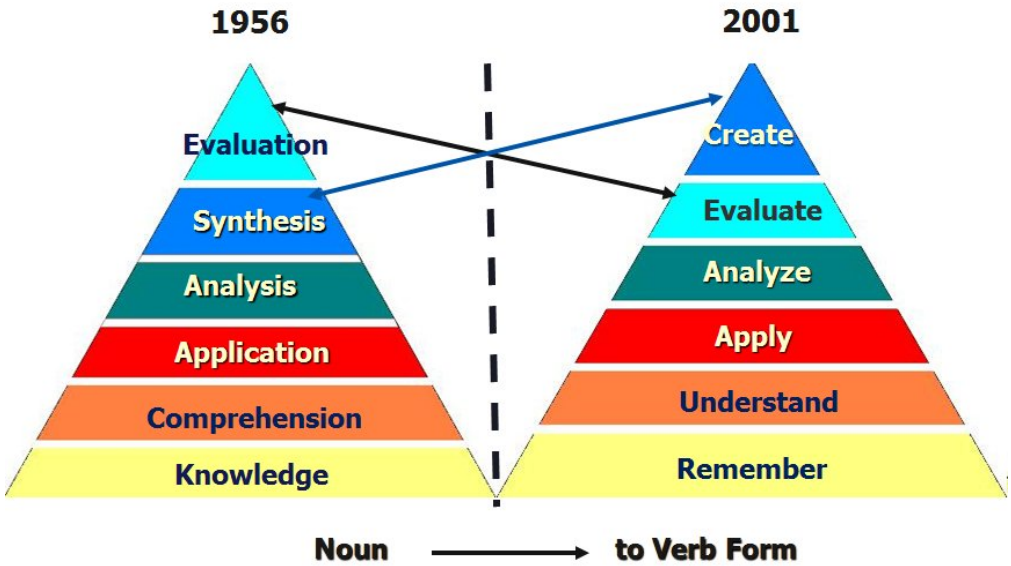


Figure 1. The Revised Bloom's Taxonomy by Anderson and Krathwohl (2001).

In addition, Anderson and Krathwohl (2001) (www.learningandteaching.info) made structural changes to the original Bloom's taxonomy. Anderson considered two dimensions in her revised taxonomy instead of one, a products dimension. The two dimensions are: 1) *knowledge* (or the kind of knowledge to be learned) and 2) *cognitive* process (or the cognitive processes to be used in acquiring knowledge). The intersection of the knowledge and cognitive categories form 24 separate cells as represented in Figure 2. From Anderson's point of view, the Knowledge Dimension on the left side is composed of four kinds: Factual, Conceptual, Procedural, and Meta-Cognitive knowledge. The Cognitive Process Dimension across the top of the grid consists of six levels: Remember, Understand, Apply, Analyze, Evaluate, and Create (See Figure 2).

	The Cognitive Process Dimension					
	Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
Factual Knowledge	List	Summarize	Classify	Order	Rank	Compile
Conceptual Knowledge	Describe	Interpret	Experiment	Explain	Assess	Plan
Procedural Knowledge	Tabulate	Predict	Calculate	Differentiate	Conclude	Compose
Meta-Cognitive Knowledge	Appropriate use	Execute	Construct	Achieve	Action	Actualize

Figure 2. Knowledge and Cognitive Dimensions of Bloom's Taxonomy as revised by Anderson.

Summary of the Revision to Anderson Revised Bloom's Taxonomy

Based on an analysis of the Anderson revision of Bloom's original 1956 taxonomy and an extensive review of literature and analyses of studies in the field of cognition and human information processing, Darwazeh made major modifications to Anderson's revision accompanied with justifications (Darwazeh & Branch, 2015). These modifications are summarized as follows:

1- Moving the meta-cognitive process from the knowledge dimension to the cognitive dimension.
2- Considering the meta-cognitive process as the most complex level of the cognition dimension not of the knowledge dimension like what Anderson claimed.
3- Dividing remember level into two levels: facts' remembrance, and generalities' remembrance.

4- Adding the organizing mental process to the cognitive dimension
5- Reordering the cognitive process levels by putting the application level after organizing process.
6- Ranging each level of cognitive process horizontally from simple to complex according to the number of items that the learner gets involved in while s/he learns.
7- Adding the principle type of knowledge to knowledge dimension**.**

Further Revision to Anderson [Revised] Bloom's taxonomy with justifications

Darwazeh had made a further revisions and additions accompanied with justifications to Anderson Revised Bloom's Taxonomy based on thoughts and notes that she received from her attendees during last year's roundtable discussion session at 2015 AECT. These new additions and justifications are summarized as follows:

First: The organizing mental process is not existed in Bloom's taxonomy nor Anderson revision of Bloom's Taxonomy. The author cannot neglect this kind of mental process like Bloom and Anderson did in their taxonomies and put it under syntheses, because organizing process has been used by human being from early beginning of life beside the analysis process, so it should be added in a different category.

Second: Psychologists also had differentiated between organizing and synthesizing processes. For example, West (West et al, 1991, pp. 36-44) defined Organizing as a mental process which requires from the learner to chunk, categorize, classify, tabulate, or ordering information according to a certain principle. Lindsay and Norman (Lindsay & Norman, 1977, pp. 304-310), and Reigeluth and Darwazeh (Reigeluth & Darwazeh 1982) on the other hand defined synthesizing as a mental process which requires from the learner to figure out the relationship between the learned ideas in the passage and integrate them together in order to see the whole picture. Those psychologists also differentiated between the organizing and synthesizing processes in terms of their functions. Organizing process is one function of the short term memory beside the rehearsal, whereas the synthesizing process is one function of the long term memory beside explaining, concluding, connecting, etc., so organizing and synthesizing should be separated in two categories.

Third: The difficulty level for analysis, organization, syntheses and applications should be replaced. The application process is more difficult to perform than the analysis, organizing and synthesizing processes, so the application should come after them. The reason for that is, the application process defined by either Bloom (1956) and Merrill (1983) as the usage of previous acquired knowledge (generalities) in new situations. We don't think that the learner can use or apply the acquired knowledge in a new, novel, or strange situation unless he or she inspects, analyzes, organizes, re-organize, and synthesize its components. These processes of analyzing, organizing and synthesizing will help him or her to see where the previous learned knowledge will fit in a new situation, thus, to use and apply them correctly.

Fourth: Anderson and Krathwohl (2001) looked at the syntheses process as a creative process, which we dispute, because the syntheses process does have a different meaning and definition than creative. It also is easier to perform by the learner than the creation process. Creation needs from the person to give something new and original, whereas, the syntheses needs from the person to see the relationships among the ideas that have been taught either horizontally (i.e., among the ideas which have coordinate relationships), or vertically (i.e. among the ideas which have super ordinate-subordinate relationships) in order to see the whole picture through comparison and contrast (See, Gropper, 1974; Reigeluth & Darwazeh, 1982). The author also differentiated between two types of the syntheses: a- an internal syntheses in which the learner figure out the relationships between and among the individual ideas that have been taught in the text, and interrelate and integrate them together, b- the external syntheses in which the learner figure out the relationships among the learned ideas in the text and relate them with other external ideas in other texts, subjects or situations (i.e., beyond the subject-matter that have been learned). The author believes the external syntheses is more difficult to perform than the internal one because it needs to see the relationship between the learned idea and other external related ideas outside the text. The internal and external syntheses should come before the application process as we mentioned above. Therefore, the syntheses process is considered to be a prerequisite of application process especially the external syntheses which helps student to see how the learned ideas relate to new and novel situation before starting to apply them in that situation.

Fifth: Another limitation to Anderson's Revised Taxonomy was ranging the knowledge dimension from concrete to abstract starting form factual knowledge, forward to the concepts, then procedures, ending with meta-cognitive knowledge to be the most abstract knowledge the student can learn (See Figure 3).

Concrete knowledge →			abstract knowledge
Factual	**Conceptual**	**Procedural**	**Meta-cognitive**
Knowledge of terminology, Knowledge of specific details and elements,	**Knowledge of classifications and categories, Knowledge of principles and generalization, Knowledge of theories, models, and structures,**	**Knowledge of subject –specific skills and algorithm, Knowledge of subject-specific techniques and methods, Knowledge of criteria for determining when to use appropriate procedures,**	**Strategic knowledge, Knowledge about cognitive tasks including appropriate contextual and conditional knowledge, Self-Knowledge**

Figure 3. The Knowledge Dimension adapted from Anderson and Krathwohl, 2001, p. 46

Gagne (1977) and Merrill (1983) did not consider procedural knowledge (or motor chain) to be more abstract than conceptual knowledge (or verbal chain) rather a less difficult. In fact, any general knowledge (generalities) could be presented on either concrete level or abstract level depending on how the teacher starts to present the information first. If the teacher starts with a tangible specific example of the generalities either for the concept, principle or procedure, then the knowledge that the learner is expected to acquire will be on a concrete level, whereas if s/he starts with a generality by giving the definition of the concept, principle, or procedure first, then the knowledge that the learner is expected to acquire will be on abstract level. Gagne (Gagne, 1977) in his **hierarchical** learning theory considered the concrete concepts (tangible examples) are less difficult to acquire than the abstract concepts (definitions), and the concepts in general are less difficult to acquire than the principles, etc. The issue here is a matter of difficulty level rather than the abstractness itself. Therefore, the conceptual knowledge is not less abstract than the principle or procedural knowledge but less difficult to acquire. The conceptual knowledge also is not more abstract than the factual knowledge but more difficult. For example, "H2O" as a fact is not less abstract than the definition of "table" but is less difficult to remember (See, Figure 3 again).

Sixth: Anderson knowledge dimension is missing a major type of knowledge, the principle type or relationships knowledge (Gagne, 1977; Merrill, 1983; West, et al. 1991, p. 14-15). Anderson (Anderson & Krathwohl, 2001, p44) put the principle under the conceptual type of knowledge (See Figure 4), which is not true according to Gagne's hierarchical learning theory (Gagne, 1977), Merrill's Component Display Theory (Merrill, 1983) and West (West et al. 1991). The principle is a different type of content beside the concept, procedure, or fact.

Seventh: Anderson and Bloom named their taxonomies as "educational taxonomies". The author believes that this name doesn't represent what's going on in students' mind nor reflect their learning processes. So, the author prefers to rename educational taxonomy into "Learning Taxonomy" in order to suite what happens in students' mind not to express t their education in general.

A Suggested Proposed Learning Taxonomy

Based on the previous notes, additions, rationales, justifications and modifications, the author proposed a new taxonomy under the name "Learning Taxonomy" instead of educational taxonomy. The new proposed hierarchically learning taxonomy had two dimensions. One is related to **Cognitive** Dimension, and the other is related to **Knowledge** Dimension. The cognitive dimension consisted of ten mental processes ranged vertically from simple to complex according to the level of difficulty of mental processes, and horizontally ranged from simple to complex according to the number of items that the students get involved in while learning. These mental processes are: facts' remembrance, generalities' remembrance, comprehension, Analysis, organizing, syntheses, application, evaluation, creation, and meta-cognition. Whereas the knowledge dimension consisted of four types of knowledge according to Merrill's Component Display Theory (Merrill, 1983). They are: facts, concepts, principles, and procedures (See Figure 4).

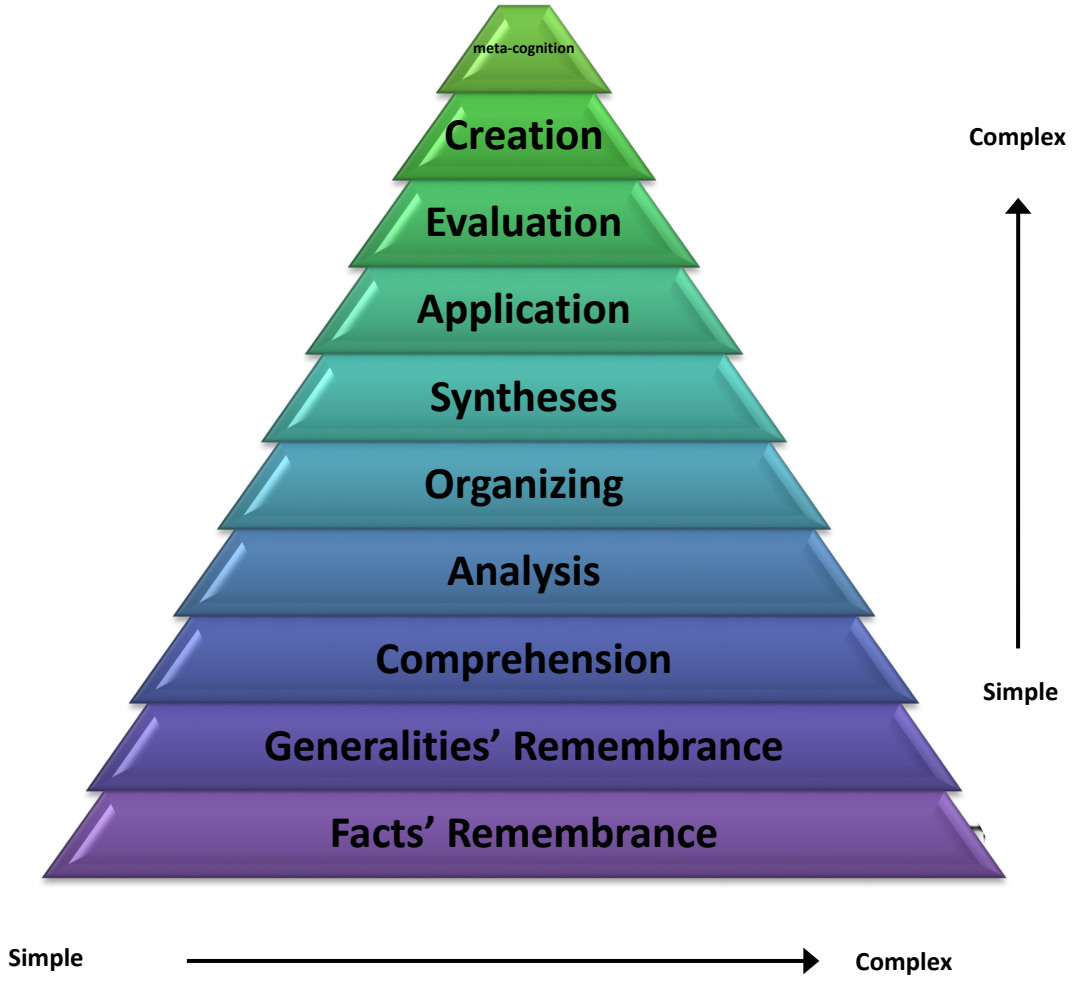


Figure 4. A Suggested Proposed Learning Taxonomy by "Darwazeh"

The intersection of the ten cognitive processes (facts' remembrance, generalities' remembrance, comprehension, analysis, organizing, syntheses, application, evaluation, creation, and meta-cognition) with the four knowledge types (facts, concepts, principles, and procedures) forms a grid with 32 separate cells (See Figure 6). Check marks represent that students can exhibit this kind of behavior related to this certain type of knowledge, and X marks represent that students can't exhibit. The rationale is that once the facts are a kind of specific information or knowledge which can't be generalized to more than one new situations, thus, the student can't comprehend, apply, evaluate, or create them. A learner can remember them on specific level of learning only, but not on a general level. The student also can discover the facts but can't create them, because they are existed in the world already. The student can also recognize, analyze, organize, re-organize, synthesize the elements of facts either names, symbols, dates, labels based on a certain principle. For example, the student can re-order the list of names alphabetically, once recognized and analyzed. He can also make a connection between their elements. For example, the student can connect between titles of the books and their authors. Finally, the student can accept the fact either he likes it or dislikes it. So he can't evaluate facts, but he can accepted or rejected (See Figure 5).

Figure 5. Knowledge and Cognitive Dimensions of the Proposed Learning Taxonomy

Content types' Dimension		Cognitive Processes' Dimension									
		Facts' Remembrance	**Generalities' Remembrance**	**Comprehension**	**Analysis**	**Organizing**	**Syntheses**	**Application**	**Evaluation**	**Creation**	**Meta-Cognition**
	Factual Knowledge	✓	x	x	✓	✓	✓	✓	x	x	x
	Conceptual Knowledge	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Principle Knowledge	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Procedural Knowledge	x	✓	✓	✓	✓	✓	✓	✓	✓	✓

Conclusion

This paper tried to offer a further revisions and justification to Anderson [revised] Bloom's taxonomy. Accordingly, the author tried to propose a new diagram of learning taxonomy with more mental processes sequenced in a different path in order to be more consistence with human memory's function.

Therefore, the new proposed leaning taxonomy is intended generally to be used in a broader and comprehensive frames by teachers, supervisors, educators, instructors, professional trainers, curriculum planners and evaluators who intend to promote students' thinking and skills, in order to be good thinkers, creators, discoverers, builders, and critical thinkers, so they can live productively and comfortably in the Information Technology Age.

References

Anderson, L. W., and Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing: A Revision of Bloom's Taxonomy of Educational Objectives. New York: Longman.

Bloom, B. S. (1956). *Taxonomies of educational objectives***.** Handbook 1. Cognitive Domain. NY: McKay.

Bloom's Taxonomy of learning domains: The three types of learning. www.nwlink.com.

Darwazeh, A. N. (2011). The degree that the Qalqilia schools' teachers consider the Bloom's Taxonomy in cognitive domain when they planning for teaching. *An-Najah University Journal for Research***,** 25(10), 2560-2582.

Darwazeh, A. N. (2004). *Cognitive strategy activators: Tools for designing instruction (Research, Studies, and Implementation)*. Amman, Jordan: Dar Shorouk Press.

Darwazeh, A. N. (1995). The effect of promoting meta-Cognitive strategies on memory and comprehension levels of learning. An-Najah University Journal for Research, (9), 402-428. Nablus, Palestine.

Darwazeh, A. N. (1994). Under what conditions are embedded versus generative cognitive strategy activators effective. Two prescriptive models for designing instruction. A Proceeding Paper presented at the Annual Meeting of the American Association for Educational Communications and Technology. TN: Nashville (Feb., 16-20, 1994). ERIC Document: ED No. 373-767. In English language.

Darwazeh, A. N., and Branch, R. M. (2015). A Revision to the Revised Bloom's Taxonomy. A Proceeding Paper presented at the Annual Meeting of the American Association for Educational Communications and Technology. IN: Indianapolis (Nov., 3-7, 2015).

Forehand, M. (2005). Bloom's taxonomy: Original and revised. In M. Orey (Ed.), *Emerging perspectives on learning, teaching and technology*. Department of Educational and Instructional Technology. University of Georgia. AECT Publication.

Gagne, R. M. (1977**).** *The conditions of learning (3rd ed.)***.** USA: Holt, Rinehart and Winston.

Guilford, J. P. (1959). Three faces of intellect. *American Psychologist,* 14, 469-479.

Gropper, G. L. (1974). *Instructional strategies.* NJ: Educational Technology Publication.

Lindsay, P. H., and Norman, D. A. (1977). *Human information processing: An introduction to psychology.* New York: Academic Press.

Merrill, M. D. (1983). The component display theory. In C. M. Reigeluth (Ed.), *Instructional design theories and models: An overview of their current status*. NJ: Lawrence Erlbaum Associates.

Piaget, J. (1952). *The origin of intelligence in children.* New York: International Universities Press.

Reigeluth, C. M., and Darwazeh, A. N. (1982). The elaboration theory's procedure for designing instruction: A conceptual approach. *Journal of Instructional Development*, 5(3), 22-32. USA.

Rothkopf, E. Z. (1966). Learning from instructive material: An exploration of the control inspection behavior test-like events. *American Educational Research Journal,* 3(4), 241-249.

Rumelhart, D. E., and Ortony, A. (1977). The representation of knowledge in memory. In R. C. Anderson, J. J. Spiro, & W. E. Montague (Eds.), *Schooling and the acquisition of knowledge.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Revised Bloom's Taxonomy. www.learningandteaching.info

A Revision of Bloom's Taxonomy: An Overview. www.tandfonline.com

Tuckman, B. W. (1992). *Educational psychology: From theory to practice.* USA: Harcourt Brace Jovanovich.

West, C. K., Farmer, J. A., and Wolff, P. M. (1991*). Instructional design: Implications from cognitive science.* USA: Allyn and Bacon.

Wittrock, M. C. (1974a). A generative model of mathematics education. *Journal for Research in Mathematics Education*, 5(4), 181-196.

Wittrock, M. C. (1974b). Learning as a generative process. *Educational Psychologist,* 11(2), 87-95.

Children Have Rights Too Except When They Don't: Understanding Your Students' Rights

Suzanne Ensmann
Morehead State University, USA

Lenora Jean Justice
Morehead State University, USA

Abstract

Teachers might assume that all children should have equal rights to basic necessities such as shelter, food, and a safe environment to sleep. But, do they? There are times when students have no rights. Educators are trained that they are the first line of defense for students since they may be the ones to observe signs of students lacking basic provisions sometimes including abuse or neglect interfering with their well-being. For these reasons, educators need to know about children's rights to help discern when a situation is actionable, but, just as importantly, how to help the student when it is not. This research provides teachers with 21st Century solutions when it comes to the problems of children's rights by offering technology tools to teach students about the complex issues of children's rights and to teach coping skills that will help build their self-efficacy through difficult times.

Introduction

Many current and pre-service teachers would agree that students have rights regardless of ethnicity, gender, physical appearance, socio-economic position, sexual orientation, and physical or mental abilities. The reality is that this is not always true. There are times when students have no rights, not even to a roof over their head, food in their bellies, or to healthcare if they are sick or hurt. Educators are trained that they are the first line of defense for their students since they may often recognize physical or mental abuse, negligence, or other issues interfering with the well-being of their students.

Most educators will gladly become advocates for their students when given the opportunity. But what happens when the situation is not clearly definable? For example, divorce is a common result of many parents' marriages. This could lead to a student having to transfer his or her Physical Education or team uniform, homework, school supplies, school wardrobe, lunchboxes, text books, and book bags from one parent's home to the other. Naturally this increase in responsibility will lead to situations of forgetting homework, uniforms, or permission slips since the student may still be quite young and not prepared for this level of responsibility. Additionally, what if one parent becomes homeless and the student is forced to sleep in a car during visitation with that parent? If the student is a child, he or she can lose his or her rights as the parent's right to visitation supersedes any rights of the child, depending on the state of residence in the U.S. In cases such as these, an educator may identify problems to a student's well-being, like a student who constantly forgets homework or who falls asleep in class every day, but not know how to improve the situation. Teachers need to know about student rights to understand when the situation is actionable as well as how to help the student. The objectives of this research are to provide educators with an awareness of inequalities still in existence for American children and to provide resources for educators to support students both personally and academically.

Background

Children's Documented Rights and Inconsistencies

To understand the tremendous need of teaching on this subject one must first understand the scale of inequality afforded to children directly dependent upon their location of residence. In American Courts, it has long been the presumption that the best interests of the children are best determined by the adults involved in their lives and invested in their well-being. According to the Center for Disease Control and Prevention (2014), approximately 53% of all marriages in the United States end in divorce. Considering this high rate of divorce, it can be assumed that many couples disagree about important matters enough to hire lawyers and, potentially, go to a judge to end

their marital bonds. Consequently, if they are parents, many of these dissolving couples also disagree regarding critical issues affecting their children. Can these children decide their own future for themselves or are they simply divided between the parents like the furniture and other assets without their words heard?

In the United States, the answer to this question varies dependent upon the court and location in which the children reside. Within the legal system children have been deemed to be capable of expressing themselves in some court divisions but not in others. For example, in criminal cases the law provides them the right to speak across the nation in all cases in which they are involved (Administrative Office of the U.S. Courts, 2015). Similarly, forty states in the U.S. have also made it legal for children to have the right to be heard in their own dependency cases, which is different from divorce cases. Legislation providing the child's right to be heard has not been adopted nationwide in courts such as the Family Courts which hear divorce cases, however, causing an inequality of rights for a large vital population of citizens: the children. Even in states and counties which preserve children's rights, attorneys appointed for children may completely disregard the opinions of children since the courts will often override the children's opinions in favor of the parents' opinions. In the Family Court Review journal, Taylor (2009, p. 617). expresses: "Denying the child a voice in the lawyer's advocacy 'reinforces...the lessons, learned most thoroughly by abused and neglected children, that he [she] should not expect to have any control over his [her] fate."

In 1979, during the Convention on the Rights of the Child (CRC), the United Nations (U.N.) addressed this specific issue of inequality and formulated a treaty based upon the need to protect children (Office of Legal Affairs, 2016). Ten years later, the U.N. adopted the CRC Treaty listing articles delineating basic human rights they should be afforded. Article 12 of the CRC Treaty was included to specifically address that children not only should have the right to express their views, but that those views be given due weight in all proceedings affecting the them. See Figure 1.

Figure 1. Dependent upon U.S. state, county, or judge children's words are often ignored until they are adults. Article 12 of the U.N. CRC states children have a right to be heard in all proceedings affecting them.

On the 20th of November 1989, the majority of countries ratified the treaty in one day. Somalia was the second to last country to ratify in 2014. According to The Emory International Law Review, "It is indisputable that the United States played a pivotal role in the drafting of the Convention and, thus, in changing the world for children" (Cohen, 2006, p. 185). Although President Reagan was involved in the initial creation of the treaty, to date, the U.S. is the last country still outstanding to ratify the CRC Treaty. See Figure 2.

Figure 2. These are the countries, which have ratified the CRC Treaty. Source: By L.tak (Own work: https://commons.wikimedia.org/wiki/File%3AConvention_on_the_Rights_of_the_Child.svg) [CC BY-SA 3.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons.

Consequently, the suggestion of parental alienation typically persuades these courts to uphold parental rights at all costs, even when abuse is alleged (Collins, 2012). To complicate these matters further, each state (and county) has their own guidelines in determining children's rights. For instance, in Florida, children have the legal right to speak in any proceeding affecting them in the Juvenile Delinquency and Dependency courts, but not in the Family Courts, which handles divorce. Cases have shown that children have even been deemed competent to speak when it comes to visitation with grandparents, but not regarding where they feel safe to sleep or desire to live. Conversely, California legislation denotes that children are afforded rights equal to other citizens, regardless of case. They may attend legal proceedings, which affect them even under the age of twelve. With the assistance of an adult, they may file their own legal actions to uphold their rights. The Brown vs. Simpson case precluded changing California laws to equate acts of Domestic Violence with acts of terrorism, even specifying protections for children. In California, contrary to Florida, a child may even request a Restraining Order for a Protective Injunction and the judge will hear their words in court (Legislative Counsel State of California, 2014).

Cases such as Collins vs. Collins provide a specific example of how the Minnesota courts, like Florida courts, did not take the children's words into consideration. To protect her children, in 1993 Holly Collins fled to another country and was awarded asylum to protect her children from crimes against humanity in the United States of America. The Collins children verbally noted being afraid of the parent awarded custody by the Minnesota courts and Ms. Collins was barred from them since she vehemently petitioned the courts on behalf of the children's rights to be heard. Evidence of abuse included skull fracture documentations and children's cries: "We're afraid to go… Don't make us go" (Collins, 2012). While the Netherlands granted Ms. Collins and her children asylum, the Minnesota courts filed a warrant for her arrest. As the children aged, they petitioned the Minnesota courts to drop the arrest warrant so they could return to the States with their mother. Only when they reached adulthood were they finally heard and the arrest warrant dropped so they could all returned to America.

Other Countries' Policies

All of the United Nations (with the exception of the U.S., as of this writing) have ratified the U.N. CRC Treaty and, as such, honor Article 12: The right for children to be heard in all proceedings affecting them. As an example of how this treaty impacts lives, the Netherlands, which is one such country to have ratified this treaty, awarded Holly Collins and her children asylum to protect them from the domestic violence they had experienced in the States. The CRC Treaty acts as the authority in supporting the foundation for change in legislation and action in protecting children's rights in the Netherlands.

Another example of how change came about due to the ratification of the CRC may be seen in Australia. Historically, the Family Law Courts in Australia have been the authority to make the decisions regarding all aspects of separation and divorce cases based upon the adults' disputes. Despite children being intimately involved in divorce cases, their input was minimal prior to the ratification of the CRC (Australian Law Reform Commission, 2014). After the adoption of the CRC Treaty, Australia rethought this processes to develop an inclusive focus on the children's desires along with parents' preferences by training judges for the psychological expertise needed to deal

with the psyche of these cases. For example, it is easy to legally divide assets based upon a simple financial algorithm, but the division of children involves emotional elements. The ratification and acceptance of the CRC prompted a complete process reform in Australian courtrooms so that mental health professionals, qualified with medical training, could speak on behalf of the children's preferences. This is a clear example of how there is an inequality for honoring and upholding children's rights as it differs based upon the country of residence.

When Children Lose Their Rights

In the U.S., because children's words are not given equal time in a court of law, parental rights take precedence, which often means the courts will divide the children with the other assets. Children are usually required to spend half of their time at one parent's home and the other half at another's. Even if children are required to go just twice a week or every summer or some holidays, how does this effect a student's ability to plan and organize for school? What if they have a project due and left the material at the other parent's house? If parents exchange children at a police station because of domestic injunctions to protect one or both of the parents, what emotional impact might this have on the children? What if one parent can no longer afford a home and now the children are living out of a car with no light to study at night? How do the children put all these new feelings that they may be trying to cope with aside when their classmate makes fun of them for not being clean or not able to answer the teacher's question?

For a moment, place yourself in that student's life. What would you need to do to be able to cope with living at two different locations, with two different people, who may or may not erupt at each other at any given moment? As a child, you are not allowed to drive, so you are dependent upon someone else to get you to school and any other after school activities and you do not have a say in the matter since you have no rights. Your schedule changes constantly effecting where you sleep at night and, perhaps, even if you have an opportunity to eat. Given this scenario, in your opinion, how vital is a teacher's help to survive these circumstances?

As awful as this scenario is, it is true that parental rights are held in higher standards than children's. The CRC treaty proposes basic human rights for children to more humanely align with those of adults. These rights extend across all borders (i.e., states) making equality consistent regardless of a child's place of birth. Although this is a huge stride in helping to protect children's rights, controversies against ratifying this worldwide treaty primarily stems from those concerned that the CRC will somehow override parental rights. This apprehension is unfounded since several articles of the CRC have been thoughtfully designed to support the family and parental rights (UNICEF, 2009) such as the following; (please note that the articles written below have been re-worded for a child's perspective):

- **Article 4:** The government has a responsibility to make sure your rights are protected. They must help your family to protect your rights and create an environment where you can grow and reach your potential.
- **Article 9:** You have the right to live with your parent(s), unless it is bad for you. You have the right to live with a family who cares for you.
- **Article 10:** If you live in a different country than your parents do, you have the right to be together in the same place.
- **Article 14:** You have the right to choose your own religion and beliefs. Your parents should help you decide what is right and wrong, and what is best for you.
- **Article 18:** You have the right to be raised by your parent(s) if possible.

In a perfect world, parents provide for the children's basic human rights like food, shelter, health care and children are happy within the family environment in which they are reared. When family life does not include support for essential basic human rights, like when the children are abused, however, the CRC upholds them for children. At the very least, Article #12, affords children an equitable voice:

- **Article 12**: The right to give your opinion, and for adults to listen and take it seriously.

What Can an Educator Do?

Educate Students about Their Rights

So, children have rights – except when they don't. But, how can educators help their students through the emotional quandaries and additional responsibilities they may face? Educators cannot interfere in family matters or parental rights. Educators' jobs are not to ratify the CRC or to create an amendment to the Constitution that considers age. This is a job for those in the legal and the political professions.

Instead, educators can help their students endure, and possibly even overcome, the challenges they face in these situations. Educators can teach students survival skills. Specifically, children need coping skills to work through their feelings and to manage, organize, and plan their world. Teachers can seize the opportunity to become a nurturer, instilling a sense of self-efficacy in their students. Additionally they can inform students to learn about the rights they do have and, perhaps, even empower them to become the lawyers and politicians who will change the laws provide equitable weight for children's words worldwide one day.

Incorporate Resources to Help Students Understand These Complex Issues

Educators should consider themselves first responders to children in need. Teachers on the frontlines in the classroom can use 21st Century technologies to empower and engage their students to accomplish learning goals with the most current resources. Certainly, prior to beginning any digital activity on the Internet, all students need to be taught some basic digital literacy skills including Internet safety and the responsibilities of navigating the Internet. If an educator is unsure about the process of teaching these digital literacy and civic responsibility skills, Common Sense Education (http://www.commonsensemedia.org/educators/scope-and-sequence) provides free materials for this purpose. This website contains quality lesson plans complete with directions, links, videos and resources aligned with Common Core standards and International Standards for Technology in Education (ISTE).

See Figure 3.

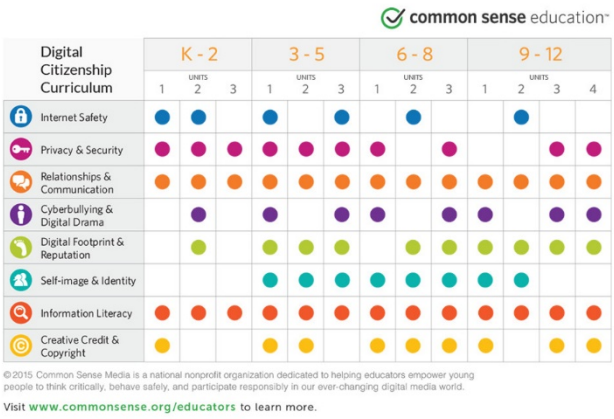
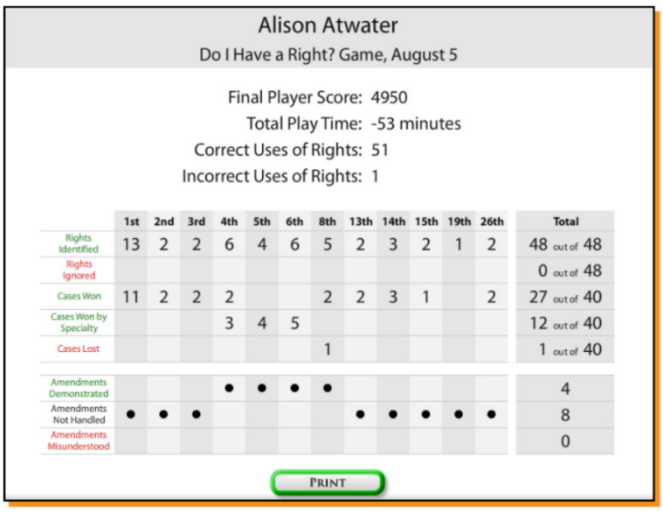


Figure 3. Common Sense Education provides free Digital Citizenship curriculum.

Justice Sandra Day O'Connor recognized the importance of teaching students how the government worked when she developed a legacy of iCivics resources including lesson plans, games, and webquests designed to engage students in their learning about the U.S. government and civic responsibilities. Students become well versed in the rights afforded to them by the U.S. Constitution and broaden their perspective with global issues. Since its inception, the iCivics website (http://www.icivics.org) offers free games which have been used by over 100,000 educators and played by over three million students in the U.S. (iCivics, 2013). All of their resources align to Common Core Standards in Social Studies but may easily be integrated with Language Arts and even Math. Guides and lesson plans are free for teachers, but most notably, teachers may create a portal classroom for students where they may direct, interact, and monitor their students' engagement in the games. Assessment is made easy for instructors as the student receives a certificate specifically stating objectives learned at the end of each game. Additionally, for students, the game instinctively fosters an environment that motivates the students to want to play versus have to complete schoolwork. See Figures 4 and 5.

The lessons expand from covering the basics of taking responsibility of oneself to serving others to the value of citizenship and specific rights students have. Most notably, however, the learning does not stop once the students leave the classroom. iCivics cleverly incorporates a service learning element which encourages the students to literally *play-it-forward* supporting real-world community causes with their points. Sponsors donate real-world dollars to the winning charitable cause.

Figure 4. iCivics, spearheaded by Justice Sandra Day O'Connor offers games to motivate students with certificates to evidence successful completion of learning objectives for teachers. Source: https://www.icivics.org.



Alison Atwater

Do I Have a Right? Game, August 5

Final Player Score: 4950
Total Play Time: -53 minutes
Correct Uses of Rights: 51
Incorrect Uses of Rights: 1

	1st	2nd	3rd	4th	5th	6th	8th	13th	14th	15th	19th	26th	Total
Rights Identified	13	2	2	6	4	6	5	2	3	2	1	2	48 out of 48
Rights Ignored													0 out of 48
Cases Won	11	2	2	2			2	2	3	1		2	27 out of 40
Cases Won by Specialty				3	4	5							12 out of 40
Cases Lost							1						1 out of 40
Amendments Demonstrated				•	•	•	•						4
Amendments Not Handled	•	•	•					•	•	•	•	•	8
Amendments Misunderstood													0

Print

Figure 5. iCivics Do I Have a Right game teaches students about rights according to American law and the responsibilities which come along with them. Upon successful completion students will be able to identify the Amendments according the U.S. Constitution. Source: https://www.icivics.org/games/do-i-have-right.

By playing digital based games, students learn problem-based and critical thinking skills while competing and collaborating in a fail-safe environment, which builds self-efficacy (Gee, 2008; Justice & Ritzhaupt, 2015). Engaging in lessons and playing games that teach students about the U.S. government, provides students with a virtual application to visualize how laws are made through citizens' voices in the U.S. Additional resources, such as Teach UNICEF (http://teachunicef.org/teaching-materials/topic/child-rights-crc) and Europa (http://ec.europa.eu/0-18/wrc_index_en.jsp?main=true&initLang=EN) provide engaging lesson plans and media including videos, cartoons, and games about the CRC treaty, which may be used to motivate and empower those students trying to find a voice in their own personal lives. For students who do not have access to technology, UNICEF offers printable Units and Lesson Plans for sixth through twelfth grade teachers to empower students with knowledge of the CRC: http://teachunicef.org/teaching-materials/topic/child-rights-crc. Simply seeing the CRC Articles might inspire them to grow up and become activists for change so all children may be afforded the equality of basic human rights, regardless where they live. See Figures 6, 7 and 8.

Here is a sample lesson:

1. Direct students to:

a. Gain the attention of the students by playing a YouTube video about the CRC: https://www.youtube.com/watch?v=y_2nA49p3yw
b. Read the CRC Articles with the Use Teach UNICEF lessons: http://teachunicef.org/teaching-materials/topic/child-rights-crc
c. Play the Europa CRC games: http://ec.europa.eu/0-18/wrc_index_en.jsp?main=true&initLang=EN

2. Discuss the CRC Articles and the games on a designated discussion board or face-to-face setting to build peer-to-peer knowledge using social constructivism learning theory.
3. Have students present on what they've learned. For example, have presentations include hands-on applications where the students teach the lesson.
4. Guide students to further reflect upon coping when faced with various issues that they have learned. Have them journal their thoughts and ideas on how to cope. Be a guide to steer them to resources when they lack ideas or have an inability to cope.

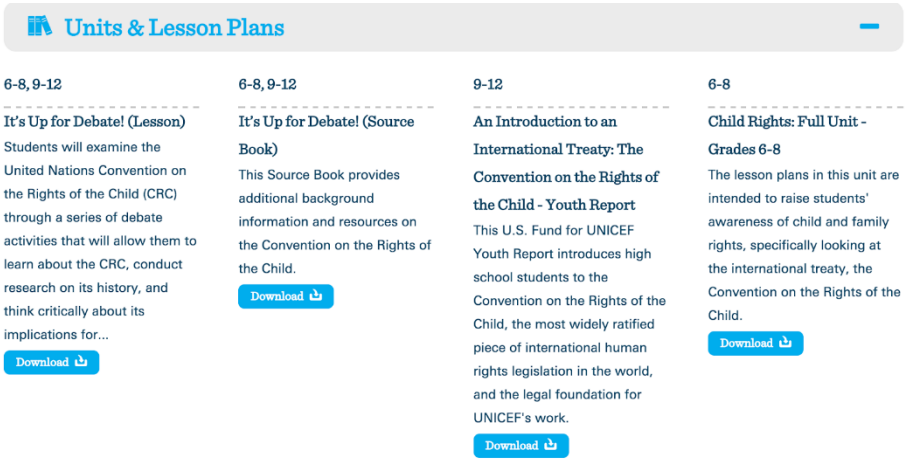


Figure 6. UNICEF lesson plans. Source: http://teachunicef.org/teaching-materials/topic/child-rights-crc.

Figure 7. Europa games engage students in learning what the CRC lists as the basic rights, which should be afforded to all children around the world. Source: http://europa.eu/kids-corner/index_en.htm.

Figure 8. Kangie the Kangaroo talks to children about the importance of having the basic right to stay with their family in a loving environment in the Europa games. Source: http://europa.eu/kids-corner/index_en.htm.

When the Situation Interrupts Learning

Although most parents' priorities are the success of their children, some situations, like a particularly rough divorce, can cloud the judgment of one or both parents or reduce the opportunities for one or both parents to provide food, shelter, and healthcare for their children. In situations like these, the educator may be the only person able to recognize a problem. First and foremost, the educator needs to pay attention. Has attendance become a problem? Also, listen to what the students are saying, but also notice their appearance. Are they clean? Are they constantly tired and sleepy? Have they stopped paying attention in class? Have they stopped talking and participating in class and with their friends outside of class?

Before doing anything, educators should review school policies and know the resources available at their school. For example, the school may have support groups for students facing certain challenges and issues. Additionally, the educator should discuss the situation with colleagues and administrators who may be able to support both teacher and students in this situation. Also, educators should stay abreast of resources available in the community (i.e., calling #211 for informational emergencies in Florida) and via social media tools.

After discerning some optional resources for these families, educators should talk to parents. Parents may not realize the effects of the divorce on their children or they may not know how to help their children. This is a sensitive conversation where the overwhelmed parent is never accused or persecuted. Remember the point is to support the children, not attack parents, so non-judgmentally providing resources may be exactly what are needed.

Finally, the teacher can help students by teaching them coping skills. For example, help students find their voice to communicate their own needs. Students can alert parents about problems with being prepared for school or lessons. They can tell parents they need a second set of gym clothes for each household or that they need to study for tomorrow's test. Also, helping students to set goals for themselves and organize themselves may give students strategies to survive this, or any, rough period of their lives.

Conclusion

Clearly, there is a disparity of equal rights across county, state, and country borders in the United States and not all children are afforded the same basic human rights including the right to be heard. According to Yuille (1988) children are as capable of providing accurate accounts of events as are adults. The U.N. CRC lists basic human rights all children should be afforded including Article 12: The right to express views freely in all matters affecting them; the views of the child being given due weight and in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting them. To date, all countries but the U.S. have ratified this treaty.

Educators will encounter hundreds of thousands of these students in their classroom on a daily basis. Without a voice, children may face emotionally trying situations more challenging than an adult can bear; but at the end of the day they will still be required to master the same competencies as their classmates. Educators have the opportunity to support these students to success. For this reason, in-service and pre-service teachers need to know about students' rights and school policies to become better advocates for their students. Moreover, educators will better understand when they should take action in any given situation where students' rights are concerned. Technology-based lessons including games and simulations can help students understand their rights through visual applications. Furthermore, teachers can provide students with goal setting and organizational life skills to aid them

in handling difficult situations while empowering and building their self-esteem. Strategies such as teaching students how to communicate their needs to adults, managing their time to submit work on time or planning for an upcoming events, may help them organize their home life and schoolwork to the best of their ability.

Educators have a distinct opportunity to support students and, perhaps, to make their students' world just a bit better. By teaching students that they can learn from their trials and pay it forward to make changes to better the world, they provide self-efficacy and a lifelong love of learning in the process. Development of a specific game to teach about the inequality of children's rights in America and how to cope with them is also needed. Additionally, this should teach about the CRC treaty. It is recommended to use the RETAIN model (Gunter, Kenny, & Vick, 2008) to assure sound digital game based learning and educational paradigms are used.

The authors realize that these suggestions may be years in the making. Right now, the best advocates for children are parents, guardians and educators. When situations arise that eclipse children's rights, these people are the first line of defense for a child. In those times when an educator can help, we encourage the educator to do so, within the guides established by their school, and to help students through the education of their rights and by teaching skills to cope and build their self-efficacy.

References

Administrative Office of the U.S. Courts (2015). Facts and case summary - In re Gault: United States courts. Retrieved December 13, 2015, from http://www.uscourts.gov/educational-resources/educational-activities/facts-and-case-summary-re-gault.

Australian Law Reform Commission - Reform Journal, (2014). "Monitoring 'Seen and heard'" [2000]. ALRC RefJl 15 (2000). Retrieved January 15, 2016, from http://www.austlii.edu.au/au/journals/ALRCRefJl/2000/15.html.

Centers for Disease Control and Prevention. (2014). FastStats: Marriage and divorce. Retrieved January 10, 2016, from http://www.cdc.gov/nchs/fastats/marriage-divorce.htm.

Cohen, C. P. (2006). Role of the United States in the drafting of the Convention on the Rights of the Child. *The Emory International Law Review*, *20,* 185.

Collins, H., (2012). *No way out but one.* (DVD). Garland Waller Productions.

Gee, J. P. (2008). Video games and embodiment. Games and Culture, 3(3-4), 253-263. doi: 10.1177/1555412008317309.

Gunter, G. A., Kenny, R. F., & Vick, E. H. (2008). Taking educational games seriously: using the RETAIN model to design endogenous fantasy into standalone educational games. *Educational Technology Research and Development*, *56*(5-6), 511-537.

iCivics. (2013). Our story. Retrieved January 11, 2016, from https://www.icivics.org/our-story.

Justice, L. J., & Ritzhaupt, A. D. (2015). Identifying the barriers to games and EMPOWERING STUDENTS WITH GAMES 40 simulations in education creating a valid and reliable survey. Journal of Educational Technology Systems, 44(1), 86-125.

Legislative Counsel State of California. (2014). Official California Legislative Information. Retrieved March 9, 2015 from http://www.leginfo.ca.gov/cgi-bin/displaycode?section=fam&group=06001-07000&file=6220-6229.

Office of Legal Affairs (2016). Convention on the Right of the Child. Retrieved January 10, 2016, from http://legal.un.org/avl/ha/crc/crc.html.

Taylor, L. (2009). A lawyer for every child: Client-directed representation in dependency cases. *Family Court Review, 47*(4), 605-633.

UNICEF (2009). UN Convention Rights of the Child in child friendly ... - Unicef. Retrieved December 13, 2015, from http://www.unicef.org/rightsite/files/uncrcchilldfriendlylanguage.pdf.

Yuille, J. (1988). The systematic assessment of children's testimony. Retrieved from http://psycnet.apa.org/psycinfo/1989-11672-001.

Faculty Development for Online Instruction in Higher Education

Rhonda Gregory
University of Memphis
186 Bradford Circle
Hendersonville, TN 37075
rhondag914@gmail.com

Trey Martindale
University of Memphis
3720 Alumni Ave.
Memphis, TN 38152
treymartindale@gmail.com

Two index descriptors: faculty development, online faculty support

Abstract

This paper presents a review of the literature about the current state of professional development for online instructors in U.S. institutions of higher education. Professional development requirements and experiences for instructors who create online courses vary widely among higher education institutions. Throughout the literature, many have proposed varied recommendations for overcoming identified barriers that threaten successful professional development programs. Factors investigated in this review included reasons for faculty professional development, challenges and barriers, best practices, essential elements, current practices and program models, and faculty perceptions.

Faculty Development for Online Instruction in Higher Education

Professional development for instructors who teach online exists in various formats, ranging from in-house workshops to online certification courses (such as those from the Online Learning Consortium or Quality Matters). Yet the majority of online instructors typically have received minimal training in pedagogy or instructional design (Ragan & Schroeder, 2014; Shelton & Saltsman, 2005). Many instructors attempt to teach online using the same methods and activities they have used in a traditional course (Shelton & Saltsman, 2005; Tobin, Mandernach, & Taylor, 2015). Many instructors perceive that institutions do not provide sufficient professional development for them as online educators (Herman, 2012, 2013). Not surprisingly, the reputation of online education has suffered as learners have experienced poorly designed and delivered online courses (Ragan & Schroeder, 2014). Ineffective online courses lead to decreases in student satisfaction, retention, and persistence (Elliott, Rhoades, Jackson, & Mandernach, 2015; Ragan & Schroeder, 2014).

Citing results from the 2010 Sloan-C survey report by Allen and Seaman, Herman (2012) explained that "training is available in 81% of institutions that offer online programs; most training takes the form of formal training courses and informal mentoring" (p. 91). While Herman saw this as an indication that institutions are placing value on faculty training, she also contended that the Sloan-C research study was too narrow. She argued that the "Literature on faculty development initiatives…provides a much more complete portrait of the variety of faculty development initiatives for online instruction, as well as some data on their overall effectiveness (Herman, 2012, p. 92). The purpose and objectives of this literature review are as follows, based on the published research literature:

- describe why online faculty professional development is important
- identify challenges and barriers to effective professional development
- identify best practices, strategies, and essential elements of comprehensive professional development
- describe current practices and program models of development
- describe faculty perceptions of professional development for online teaching

The Importance of Professional Development for Online Faculty

Continued Growth of Online Education

The number of fully online courses and programs in higher education increased significantly in the 1990s, coinciding with growth of internet access. Online education has continued to grow, and is currently a widely offered mode of course delivery across U.S. higher education institutions. The number of online courses and students continues to increase (Chang, Shen, & Liu, 2014; Hixon, Barczyk, Buckenmeyer, & Feldman, 2011; Marek, 2009; Ragan & Schroeder, 2014). As online courses and programs proliferate, more and more faculty are becoming involved with online education (Herman, 2012, 2013). Yet, sometimes faculty members are resistant to online teaching because it is unfamiliar or they have doubts about its effectiveness (Herman, 2012, 2013). As enrollments have continued to rise, accreditation agencies have been exerting pressure on institutions of higher education to assure high quality online programs through both assessment and faculty development (Herman, 2012, 2013; Ragan & Schroeder, 2014).

Faculty as Gatekeepers to Student Satisfaction and Success

The success of online learning, like any academic initiative, requires faculty acceptance and support (Esterhuizen, Blignaut, & Ellis, 2013; Ragan & Schroeder, 2014; Shelton & Saltsman, 2005). Faculty support is needed to affect institutional change (Shelton & Saltsman, 2005). Hardré (2012) also asserted that faculty members are the key to success at any institutional level, and has suggested that the reputation of community colleges, in particular, hinges on faculty training and development.

Faculty are one of the most valuable assets to higher education institutions (Palloff & Pratt, 2011; Ragan & Schroeder, 2014). Bigatel and Williams (2015) surveyed over 2,200 students in a Penn State Online Campus program. They asked about student perspectives on engagement levels and about instructor involvement in promoting engagement online. Results indicated that students felt more engaged by instructors who had participated in professional development about online teaching and engagement techniques. The results seem to indicate that professional development for effective online teaching is warranted, thus Bigatel and Williams concluded that institutions need to provide support for faculty growth and development. In a study of 191 non-profit institutions with active teaching and learning development units, Herman (2012) concluded that institutions who want quality online programs must invest in faculty development. Faculty who are aptly trained and supported as professionals are more likely to understand the nuances of online teaching and to deliver effective instruction. Through professional development, faculty can learn many skills related to technical tools, pedagogy, and communication strategies.

According to a review of the literature by Baran and Correia (2014), there is a direct correlation between online program quality and professional development for online faculty. They found that online instructor behaviors (e.g. course organization, teaching presence, and social presence) are critical to students' learning and satisfaction (p. 96). Ragan and Schroeder (2014), national experts in the online learning, agreed and stated that the investment of institutional resources in faculty development is positively correlated with student satisfaction and retention. In their recent book, *Evaluating Online Teaching: Implementing Best Practices*, Tobin et al. (2015) also recognized the positive relationship between teaching quality and student retention in online programs, but described the reason for the correlation as follows:

> Unlike the captured audience we have on our campuses who might dismiss a single, poorly instructed class from that same instructor again, online learners are more likely to dismiss the entire institution altogether, knowing well that the next institution is just a click away. (p. 218)

Elliott et al. (2015) explained the same type correlation between professional development and course quality, but from a different perspective. Their analysis of online faculty development programming over the course of one year at a single institution revealed that there can be a negative effect on the classroom environment and decreased student satisfaction if faculty do not practice what they learn within their professional development experience. Professional development is a key component for faculty to be able to deliver instruction effectively (Bigatel & Williams, 2015; Elliott et al., 2015).

Gaps in Faculty Preparation for Online Teaching

Online teaching is different than traditional teaching (Hixon et al., 2011; Tobin et al., 2015). The role of the instructor in higher education has changed and has become more complex as communication modes have changed

(Chang et al., 2014). New competencies are necessary beyond what is required in traditional face-to-face teaching (Ragan, Bigatel, Kennan, & Dillon, 2012). Marek's review of current literature (2009) revealed that faculty need to be prepared for new tools and pedagogical shifts. Teaching online using the same techniques and methods as face-to-face does not work well (Shelton & Saltsman, 2005). Ragan and Schroeder (2014) explained that faculty teaching online may have gaps in their preparation due to misunderstanding the online medium and its challenges.

Many researchers have recognized that faculty teach the way they were taught (Esterhuizen et al., 2013; Hixon et al., 2011; Marek, 2009; Ragan & Schroeder, 2014; Shelton & Saltsman, 2005). Shelton and Saltsman (2005) accounted for this in *An Administrator's Guide to Online Education* by noting that faculty begin teaching online without having any direct experience teaching or learning online themselves. Ragan and Schroeder (2014) asserted that many instructors do not have a background in educational theory and practice from which to draw when teaching their courses. Online teaching requires a paradigm shift for faculty because new instructional strategies (Hixon et al., 2011) are needed in order to move from a teacher-centered (instructivist) approach to a more learner-centered (constructivist) style (Esterhuizen et al., 2013).

Rapid technological changes create an additional gap in faculty preparation and readiness to teach online. Faculty must be competent in the teaching tools used in order to enable students to develop to their fullest potential (Esterhuizen et al., 2013). In their book, *The Excellent Online Instructor: Strategies for Professional Development*, Palloff and Pratt (2011) have identified five "phases of online faculty development" (pp. 20-29): visitor, novice, apprentice, insider, and master. Each phase clearly indicates a progression in instructor preparation and ability to utilize technology in online instruction. Esterhuizen et al. (2013) contended that rapid changes in technology tend to outpace strategy and pedagogy, making sustainability of professional development programs difficult. Training at various levels, like those outlined by Palloff and Pratt, is needed. Vaill and Testori (2012) described a three-tiered faculty development program for Bay Path College that addresses the need for differentiated levels of training and support. In their model, instructors receive ongoing technical support from an instructional designer and other staff in the institutions Center for Distributed Learning.

Challenges and Barriers to Effective Professional Development Programs

Physical Limitations: Time, Space, and Resources

Elliott et al. (2015) claimed that not having time to participate is one of the greatest barriers that prevents faculty from engaging in professional development, and faculty are more likely to select asynchronous opportunities because of time constraints. Hardré's (2012) study about faculty motivation found that community college faculty are overwhelmed by their teaching loads and have no time for other activities, including professional development. The challenge of time is compounded by a prevalent perception among faculty that online teaching requires more time and effort than in-person teaching (Herman, 2012; Hixon et al., 2011; Ragan & Schroeder, 2014). Shelton and Saltsman (2005) recognized the time issue, but contend that time requirements for online versus face-to-face are about equal, just distributed differently. However, online teaching can take up to 10 to 15 percent more time than teaching face-to-face (Allen & Seaman, 2010; Lazarus, 2003). So perceived or actual increased time to teach online, as well as time to participate in training, are factors that contribute to faculty resistance to online teaching.

Physical location of instructors also presents a significant challenge to successful professional development programs. With the growth in online education and the affordances of technology, many institutions rely on part-time faculty members who may reside far from the host institution to deliver online courses (Elliott et al., 2015; Ragan & Schroeder, 2014). Ragan and Schroder (2014) pointed out the need for local and online professional development opportunities in order to accommodate the location and schedule of faculty who live away from their institution's main campus.

There is a wide range of professional development program types, yet institutions must operate with limited financial and personnel resources (Elliott et al., 2015). When time and money to develop and deliver professional development are limited, institutions must strategically plan how they will support faculty development. According to Herman (2012, 2013), instructors may perceive that they are not given ample incentives to participate in online initiatives. This raises the question of whether or not instructors should be compensated financially or with release time for participating in professional development, which is another important issue for consideration. Marek (2009) drew attention to the fact that a lack of technology and/or instructional design support within an institution for faculty teaching online can lead to learned helplessness; as a result, instructors may give up. Time, money, and personnel are needed to effectively provide professional development, and lack of these critical resources will decrease the likelihood of effective online instruction.

Faculty Disinterest

Herman (2012, 2013) asserted that faculty are dissatisfied with the current professional development programs offered at their institutions. Faculty perceptions are critical to the success of a professional development and training program, so this poses a new challenge. Ragan and Schroeder (2014) suggested that mandated training is one way to ensure adequate participation. However, Hardré (2012) and Herman (2012) warned against mandated training. Herman argued that faculty will not accept it, and Hardré held the view that mandated training may be more harmful than helpful. Elliott et al. (2015) contended that instructors will only benefit from the professional development that they do attend and that lack of interest may be one factor in poor attendance. Therefore, professional development should be linked to faculty perceived needs and interests to foster motivation and avoid faculty resistance (Hardré, 2012).

Best Practice Strategies for Professional Development

The literature suggests a number of helpful recommendations to institutions for best practices in professional development programming. Esterhuizen et al.'s (2013) study considered faculty perceptions about technology enhanced learning in comparison to the views of an e-learning administrator. This strategy suggests, as do Palloff and Pratt (2011), that faculty members should be involved in deciding what professional development they need. Elliott et al. (2015) advised developers to consider best practices in online and adult education, including diversity among instructor backgrounds and experience in the design process. In order to ensure that programs will be of interest to faculty and to improve engagement, Elliott et al. also suggested careful consideration of both focus and format.

Faculty Involvement

Involving faculty in the nature and planning of their professional development is consistent with best practices in adult education and in online learning. Palloff and Pratt (2011) stated "Faculty need to be involved in determining what they learn and how they learn it" (p. 29). Researchers suggest several different models that institutions can follow to engage faculty with the process of professional development. Hixon et al. (2011) encouraged those responsible for faculty development to ask instructors for their suggestions when planning and to collect feedback from participants at each event. Likewise, Teräs and Herrington's model (2014) encouraged feedback between iterations of professional development. This approach provides an opportunity for rapid prototyping of a professional development intervention. Similarly, Tobin et al. (2015) suggested that the process of online course evaluations should elicit topics for future faculty training and development. Ragan and Schroeder (2014) advocated the establishment of communities of practice among faculty members and other online learning support experts. Palloff and Pratt also promoted the establishment of a community-oriented, collaborative approach. Marek (2009) proposed a model where both instructors and the institution share the responsibility for ensuring professional development.

The literature provides conflicting viewpoints regarding whether institutions should use individual faculty champions to lead online learning and professional development engagement among the faculty. Palloff and Pratt (2011) and Ragan and Schroeder (2014) supported faculty champions based on their experience as leaders in online learning. Ragan and Schroeder explained that faculty champions serve as a positive influence on professional development and also suggested enlisting the union or faculty senate to drive institutional change. These proponents believe that faculty champions can affect positive cultural change. In contrast, Marek (2009) warned against relying on faculty champions, citing fleeting and irregular progress, shifting outcomes, and an inability to scale the efforts up across the institution (p. 278).

Flexibility and Diversity

Professional development should be flexible (Bigatel & Williams, 2015). Hardré (2012) explained that self-determination theory (giving choice and freedom in work) applies to adult professionals. Herman (2012) maintained that institutions should allow instructors to choose their own training based on their interests and needs. An assumption that institutions should provide options at every level to meet the needs of individuals is central to Palloff and Pratt's (2005) five phases of professional development. Most successful professional development programs are flexible and allow self-paced scheduling (Elliott et al., 2015).

One benefit to creating a flexible system of professional development is the ability to accommodate a diverse faculty. Elliott et al. (2015) described the diversity of instructor backgrounds in terms of individuality as well as teaching experience. As previously noted, Ragan and Schroeder (2014) ascribed instructor misunderstandings about online learning to gaps in their professional preparation. Considering issues of diversity allows faculty developers to address an individual's beliefs about teaching and to contextualize professional development based on needs of the local faculty (Esterhuizen et al., 2013; Shelton & Saltsman, 2005).

Form and Focus

While maintaining flexibility of design, professional development programs should also consider issues related to both form and focus (Ragan & Schroeder, 2014). Palloff and Pratt (2011) suggested offering variety of times, topics, and formats to meet a wide variety of instructor needs. Ragan et al. (2012) concurred and recommended that topics, duration and timing of courses, workload demand, and delivery format be carefully considered when designing faculty professional development. Marek (2009) recommended the addition of discipline-specific topics, as applicable, to professional development programs for online instructors.

Whatever form of professional development is provided, Elliott et al. (2015) suggested that individualized training and follow-up be available after other programs. Support for individuals should be a component of the institution's plan for ongoing development and should also provide program and discipline specific support (Marek, 2009). To avoid exhausting staff and financial resources, Riedinger and Rosenberg (2006) moved much of their faculty development training online. They described the evolution of their professional development program which ultimately led to an online teaching certification course. Their shift from face-to-face workshops to an online mode of training freed up their support staff's time to provide more follow-up, personalized support.

There are several examples of online or blended online and face-to-face professional development programs like that of Riedinger and Rosenberg (2006). In their model, they included blended and online elements by holding a face-to-face kickoff session before transitioning participants to an online course. Then they followed-up with one-to-one support. This example is consistent with a point made by Elliott et al. (2014) that professional development should emulate the environment and technologies that instructors will ultimately teach with. Similarly, Lane (2013) established an online certificate program to address the need for pedagogically-driven, technology enhanced professional development model. Many of these "certificates in online teaching" have become available, both as for-credit courses, and as continuing education. For example, see the Online Learning Consortium (http://onlinelearningconsortium.org/learn/teaching-certificates/), Penn State World Campus (http://wcfd.psu.edu/programs/certificate_ot/), and Walden University (https://www.waldenu.edu/certificates/online-teaching-in-higher-education-post-masters).

Emulating the environment of online teaching affords an opportunity to provide interactive, hands-on, active learning for faculty members (Elliott et al., 2015). Kinuthia (2005) and Herman (2012) both recommended well-defined, task-centered programs with immediate application of concepts. Esterhuizen et al. (2013) agreed and asserted that professional development should provide real life interaction so that "faculty should experience the affordances of e-learning personally" (p. 62) because their attitudes, competence, and access to technology will affect how it is used. For these reasons, Teräs and Herrington (2014) strategically included authentic e-learning elements into the design of their international online teacher development model.

While providing opportunities for realistic, active learning experiences, Tobin et al. (2015) pointed out that it is important to allow for faculty risk-taking. They reasoned that instructors need the freedom and permission to experiment with innovative pedagogies and technologies as a matter of personal growth and for research of the field. Esterhuizen, et al. (2013) also asserted that professional development should allow for experimentation and new approaches, and they suggested that institutions should provide facilities where instructors can develop interests and skills.

In some situations, it may be preferable to provide professional development external to the institution. Hardré (2012) suggested that it may be preferable to do so in place of on-site professional development. For instance, Hardré noted that engagement in professional development outside of their institution may provide a more well-rounded experience for instructors. External professional development options will likely cover more topics than online teaching, such as research or mindfulness practices. Marek (2009) also incorporated this idea of external professional development as one of the layers of support in her proposed professional development model.

Other Best Practices

The published scholarly literature provides additional best practice recommendations to support effective professional development of online instructors. Institutions should reward faculty members for their participation. Possible rewards include course release time, financial stipends, and recognition or title (Herman, 2013; Marek, 2009). Within the programs, Ragan and Schroeder (2014) mentioned the importance of directly addressing the differences between online and face-to-face formats. Tobin et al. (2015) extended this notion by adding that information about how online teaching evaluation works should also be explicitly covered. They further suggested that evaluations should elicit topics for future training and development. Tobin et al. also placed importance on communication of institutional value for good teaching to faculty. Shelton and Saltsman (2005) recommended providing concrete examples and sample materials. They also recommended that institutions provide instructional design assistance, intellectual property information, and assistance with copyright, technology use, and media creation (Shelton & Saltsman, 2005).

Essential Elements of a Comprehensive Professional Development Program

Pedagogy First, Technology Second

The literature overwhelmingly supports the position that technical training alone is not sufficient for professional development of online instructors (Chang et al., 2014; Marek, 2009; Ragan & Schroeder, 2014; Riedinger & Rosenberg, 2006; Shelton & Saltsman, 2005; Teräs & Herrington, 2014). Lane (2013) argued that the majority of instruction provided to online instructors is technology-focused, particularly on the learning management system (LMS). Emphasizing technology over pedagogy is an inadequate approach (Hixon et al., 2011; Lane, 2013). Recognizing this dilemma, Lane created a more comprehensive approach to faculty development which encompassed both pedagogy and technology in an open online format. She surveyed participants from the pilot and found that the many participants were pleased with their personal achievements in both technology and pedagogy.

Chang et al. (2014) conducted a survey of one-third of the online instructors in Taiwan about their perspectives on the role as an online instructor and related teaching practices. Statistical analysis of the results showed that the instructors believed content expertise and instructional design to be more important that technology use. They found this to be consistent among faculty members who had completed varying degrees of training, however, they found a significant difference among their practices. The results suggested the need for a comprehensive faculty training.

Riedinger and Rosenberg's (2006) online certification course model was developed in part to address their faculty's need for strategic training that covered both technology and pedagogy. They identified several challenges to their existing attempts at professional development. One primary concern was the diversity of faculty skill levels and pedagogical knowledge. Their approach to faculty training was to provide support in both areas so that faculty members would be empowered to integrate technology into their course design and instruction effectively.

The best online teaching is a combination of technology skill and course design, so the focus of professional development should be first on pedagogy, then on technology (Chang et al., 2014; Esterhuizen et al., 2013). Professional development should extend beyond basic uses of technology to include strategies and suggested use cases (Kinuthia, 2005). In Kinuthia's expert opinion, training should establish a connection between content, methods, and technology.

Online Student Engagement

Specific pedagogies related to student engagement and motivation in an online environment are important elements of faculty development. According to Bigatel and Williams (2015), "student engagement is a strong predictor of student persistence and degree completion. As a result, training instructors in strategies to encourage student engagement is a valid goal for any faculty development program" (Discussion section, para. 1). Bigatel and Williams studied student perceptions about how well faculty engaged them in their courses. They found that faculty who engage in professional development were better at engaging their students online than faculty who had not participated in professional development. In their review of the literature, Bigatel and Williams pointed out the growing population of adult online learners and the need for faculty to shift from a teacher-centered approach to a student-centered approach and to design courses that promote student interaction and participation. Chang et al.

(2014) also concluded that teaching strategies for student engagement is one of the greatest needs within faculty professional development.

Suggested Focus Areas

Results of various studies provide an array of findings about which components of professional development programs are most important. To summarize each one briefly will afford an opportunity to highlight similarities as well as differences. Bigatel and Williams (2015) recommended four core elements: 1) professional, 2) instructional, 3) leadership, and 4) organizational (e.g. time management). Baran and Correia (2014) presented a concomitant component framework with three elements: the organization (institutional culture), community (peer-to-peer engagement), and teaching (including technology and pedagogy). Chang et al. (2014) listed instructional design, critical reflection, and facilitation as their critical components whereas Esterhuizen et al. (2013) proposed that content, pedagogy, and technology are the three core components of successful professional development. Kinuthia's (2005) suggestions included course development, instructional techniques, and assessment. According to Hardré (2012), professional development should acknowledge instructor needs regarding teaching and scholarship, but should also meet their personal needs and promote overall well-being.

Some researchers speak more broadly about the focus of professional development in terms of online learning. For instance, Ragan et al. (2012) defined several online teaching competencies, and Hixon, et al. (2011) mentioned instructional design and improvement of course quality. Similarly, Shelton and Saltsman (2005) recommended coverage of all aspects of the online program, course development, and instruction. Ragan and Schroeder (2014) described competency based techniques of professional development and also articulated ten specific dimensions of faculty preparation: teaching presence, changing classroom dynamics, time and workload management, new learner characteristics, teaching via technology, quality assurance of online teaching, accessibility for the disabled, legalities (e.g. ownership, privacy, and intellectual copyright), course construction processes, and the complexity of online learning systems.

From these examples, it is clear that instruction (i.e. teaching) is the most commonly suggested component for professional development. Course design and development (i.e. instructional design) is the second most mentioned area of focus. Several studies mentioned other teaching and design tasks, such as assessment, instructor presence, accessibility, and copyright. It may be assumed that these types of components are inherent within some professional development models. The level of specificity of teaching and design topics will likely vary from one program to another and from institution to institution based on the unique context of each environment. This variation is important to note, because it exemplifies the need for explicit training about institutional and program frameworks. Finally, the research above suggests that technology training, while important, should be provided within the context of teaching skills.

Current Practices in Online Faculty Professional Development

Types of Programs

The types of professional development offered vary among higher education institutions. As previously mentioned, there are limited resources available to support and maintain in-house professional development and training for online faculty members. Nonetheless, the literature reveals a fairly extensive list of types of professional development programs. Elliott et al. (2015) stated that face-to-face, optional events are prevalent within higher education. More formalized formats include workshops, panel discussions, showcases, training programs, seminars, teleconferences, mini courses, and directed publications (e.g. junior faculty survival guides) (Bigatel & Williams, 2015; Baran & Correia, 2014; Elliott et al., 2015). Hixon et al. (2011) pointed out that training courses can be conducted by internal or external personnel. Informal, more individualized format types include one-to-one assistance, brown-bag lunches, meetings, e-learning or self-paced online resources, and question-and-answer sessions (Bigatel & Williams, 2015; Baran & Correia, 2014; Elliott et al., 2015). Mentoring is a type of professional development that can be formal or informally practiced (Hixon et al., 2011). Shelton and Saltsman (2005) proposed that formal mentoring should be established to support inexperienced faculty.

Herman (2012) spoke of many of the aforementioned types of professional development activities and categorized 25 different types into six categories: institutionally-supported self-teaching, peer mentoring, collaborative course design, workshops, online training, and quality assurance evaluation programs. According to Herman's study, the most frequently offered type was self-help resources and technical service and support. Herman also found consultation with an instructional designer was a commonly reported type of professional development.

Professional Development Models Within the Literature

Research studies provide rich examples of various models for professional development. There are six examples listed below and then explained in the following paragraphs.

1. Riedinger and Rosenberg (2006) presented a blended professional development program that includes a face-to-face introduction followed by online instruction. This model leads to certification for online teaching.
2. Ragan et al. (2012) proposed a model from Penn State University that includes twelve courses, spans four levels, and is by far the most detailed and comprehensive.
3. Marek's (2009) proposed multi-layer support system is perhaps the next most comprehensive model of the six, which suggests support for faculty in their program, from the institution, and by continuing education.
4. Vaill and Testori's model development (2012) began with consideration of existing models and resulted in a three-tiered approach that included initial training, peer mentoring, and ongoing support.
5. Lane (2013) proposed an open online program that also leads to certification for online teachers.
6. Teräs and Herrington (2014) developed a rapid-prototyping model for professional development.

Riedinger and Rosenberg (2006) offered a blended model of professional development that leads to certification. In order to meet the diversity of instructor needs, interests, and abilities, they moved their program online following best practices in course design. They also established a mentoring program to follow the online training. The format of the training began with an initial two and one-half hour face-to-face workshop, followed by online courses with one-to-one support and assistance available from the facilitators. Their end goal was to train and empower faculty and avoid cookie-cutter courses to create effective student learning. Their article provides results in the form of lessons learned. On the positive side, they saw an overwhelming response to participate, saw collegial camaraderie development among some faculty, and witnessed some course improvements made as a result of training. On the negative side, faculty quickly adopted a "student attitude" and demonstrated behaviors such as submitting assignments late, whining, and complaining about the workload. Surprisingly, there were also some instances of "flaming" and other inappropriate discussion posts. Some faculty expressed resistance to group work assigned in the course. Lessons learned also indicated a need to provide models and information about student-centered learning and to provide clarity and repetition in directions.

Marek's (2009) study looked into the issue of faculty support for online teaching within the discipline of library and information science (LIS) at a master's degree level. Guiding questions involved finding examples and best practices for faculty support structures in online course design, delivery, and content. Marek asserted that a systematic approach to faculty development was needed and proposed a model with a multi-layer support system "culture of support" model (p. 287). In the model, program specific supports are in the center circle and include incentives, content specific assistance, and peer mentoring and support. In the middle layer surrounding program supports is the institution support piece. This middle layer includes technology workshops and training, reward systems, policy development, instructional design support, etc. Finally, the outermost layer pertains to external continuing education, e.g. conferences, college courses, or commercial training.

The design of Penn State's World Campus could be used as a model for online faculty development. Ragan et al. (2012) presented the results of two studies conducted at Penn State University. The first study identified online teaching competencies; the second discussed the impact of their findings on the design and development of faculty professional development for online teaching. Results of the studies led to the development of a comprehensive, integrated professional development program entitled Online Learning curriculum. The Online Learning curriculum series includes twelve courses, covers four levels, and is delivered in a broad range of formats and frequencies. The series leads to a certificate for online teaching.

In their paper, Vaill and Testori (2012) described one college's approach to faculty development for online course creation and instruction. They considered various types of professional development programs, such as the models available from Walden, Purdue, and the University of Tennessee at Knoxville. They describe a three-tiered training program that consists of initial training, peer mentoring, and ongoing support from an instructional designer. Results of their reflective study showed that 106 total faculty received training from 2007-2011. Eighty-four percent of instructors who completed post-training surveys reported feeling more prepared to teach online following the orientation component.

Lane (2013) proposed an open online "Program for Online Teaching Certificate Class" (para. 5) in which instructors could learn how to use open tools on the web, such as blogs and social media, to develop professional identities online while bolstering their ability to create a more student-centric learning environment. In Lane's study,

a limited online class was first offered in the 2010-2011 academic year, followed by a full 24-week open online class in 2011-2012. There were about 90 participants enrolled the second year. There was no predetermined group for the study because the majority of enrollees were full-time college faculty members; however, some participants were from outside of higher education. About one-third of the participants completed the course.

Lane surveyed participants in several topical areas and at various times throughout the year. Survey questions addressed their learning experience, opinion of the class design, experience in the class community, and confidence in selecting tools that would fulfill their teaching goals. Overall results showed that participants had positive perceptions and experiences, and completers reported satisfaction with the learning experience in terms of meeting their personal goals. However, there was mixed feedback about seeing the course as a model for pedagogy in an online environment. Some challenges emerged with the design of mentoring and synchronous sessions due to drop out and limited participation. Nevertheless, participants who completed the course felt better prepared to teach from their pedagogical perspective and to choose technologies to support them, which was a major goal of the study.

Teräs and Herrington (2014) reported on the creation of a professional development intervention they created using a rapid prototyping design process. The researchers wanted to design an intervention to address the need for support and professional development resources for higher education teachers. The intervention included three learning modules, and the program ran over three semesters. The designers took feedback from each previous module into account to address concerns and challenges in the design of the next module. Challenges identified after module one included confusion about authentic tasks, challenges with online collaboration, insufficient facilitation, and an unclear assessment process. The designers implemented improvements in some areas, but not all. The design incorporated meaningful professional development needs, including pedagogy and application in teaching, not just technology training workshops.

Faculty Perceptions Regarding Professional Development for Online Teaching

Effect of Experience on Perception and Need

Herman (2012, 2013) found that faculty who have not taught online perceive online instruction as less effective than traditional instruction, but that this perspective changes when they get online teaching experience. Because faculty needs and experiences change over time, initiatives should also change in response (Elliott et al., 2015; Palloff & Pratt, 2011). There is a need for comprehensive practice-based training at the onset of online course adoption (Esterhuizen, et al., 2013). Intermediate to advanced training opportunities are also needed to support faculty who have already mastered the basics (Palloff & Pratt, 2011). Chang et al. (2014) showed that instructors who had completed varying levels of faculty training prior to their survey initially held the same perceptions about online instructor roles and practices. However, instructors in this study reported changes (improvements) in their actual teaching practices as they received more training.

Hixon et al. (2011) offered a unique perspective about current faculty development needs. They proposed that most early adopters are already trained, so there is presently a need to understand how later adopters are different in order to meet their needs for professional development. Hixon et al. generally viewed these late-comers as more reluctant, less confident of their technical skills, and less confident in value of technology in education. Rather than assuming such a divide exists between early adopters and late adopters, Palloff and Pratt (2011) focused on the progressive stages that instructors work through as they gain exposure to and experience in teaching online. Palloff and Pratt expertly stated that "faculty at each stage of development may have very different training needs" (p. 20).

What Faculty Value in Professional Development

Esterhuizen et al. (2013) reported that online instructors tend to focus on daily tasks, in contrast to online program administrators who focus on strategy and planning. Regarding professional development and training, instructors value things relevant to to their needs as teachers and that they can actively apply in teaching, things that foster personal growth or self-improvement, and networking with colleagues (Elliott et al., 2015). Hixon et al. (2011) reported that instructors valued relevant and easy to find information, and feeling connected to mentors and other participants in professional development. Hixon et al. also stated that later adopters, in particular, valued more structure and support.

To accommodate instructor preferences when designing professional development, Palloff and Pratt (2011) made two recommendations to institutions. First, they suggested including self-driven tools for faculty to take

control of their own professional development. Second, they endorsed mentoring and peer collaboration. These recommendations are consistent with Marek's (2009) model wherein faculty share responsibility for their professional development.

Marek's research (2009) revealed that the most requested types of online instructor support included course release, formal courses, workshop training, and IT infrastructure. Marek also found that the most used types of support were informal peer support, conferences, and formal university training. Kinuthia's (2005) study of professional development needs in historically Black colleges and universities (HCBUs) revealed that the least desired formats were self-teaching, books, audio and video tapes, and formal courses. Faculty in Kinuthia's study preferred workshops and individual meetings, followed by web-based and informal help.

Motivators

Hardré's (2012) study utilized motivation theory to explore the reasons faculty pursue and engage in professional development, as well as their motivation for basic research and teaching research. She found that faculty are most often externally motivated to do professional development, even though they are more intrinsically motivated to teach. This is an important consideration when designing professional development, because it points to the need to connect the event to teaching tasks in order to draw on those internal motivators. Yet external motivators alone (e.g. title, promotion, financial reward, or release time) may be perceived by some faculty members as insufficient because of their motivation to help students is often stronger than these external rewards (Herman, 2013). That is not to say that external motivators are not needed. Financial rewards and assistance learning new technologies can be used to incentivize instructors to engage in professional development (Ragan & Schroeder, 2014).

Kinuthia's (2005) study showed that the top motivators for instructors to attend professional development included release time, professional growth, hardware and software allocations, financial stipends, and impact on promotion and tenure. Kinuthia also noted that peer pressure among faculty is a non-motivator. Finally, the ability to connect to other faculty and/or mentors in a meaningful way may provide motivation to develop professional skills (Hixon et al., 2011).

Conclusion

It is important for institutions of higher education to support faculty members who teach online by providing professional development and on-going support. Faculty are the gatekeepers to student success and satisfaction, yet many instructors lack the pedagogical and technical skills to teach effectively online. Online instructors have diverse training and support needs, making the development of a one-size-fit all approach implausible and ineffective. When designing a faculty development program, it is critical that the faculty be involved so that their unique needs are met.

Essential elements of comprehensive professional development include a strong emphasis on instructional design, facilitation of student learning, and student-oriented pedagogical strategies. While technical training and support is needed, it should be secondary to instructional training. Institutions should also clearly communicate the cultural and programmatic design and expectations to their faculty. It is considered best practice to design professional development programs that are flexible and diverse in topic, scope, sequence, and venue.

This paper provides summaries of six distinct professional development models within the literature. Model designs ranged from one-time only online teaching courses to fully developed programs that include multiple courses. Some programs lead to institutional certification for online teaching, which may influence faculty motivation to participate. In each model and throughout this review of the literature, an attempt was made to consider faculty perceptions about professional development for online teaching. Professional development for faculty who teach and develop online courses must meet their needs. Institutions should provide rewards and incentives whenever possible to encourage instructor participation in professional development. But even when external motivators are not available, the professional development should be clearly aligned with achieving effective and engaging online instruction.

References

Allen, I. E., & Seaman, J. (2013). *Changing course: Ten years of tracking online education in the United States*. Retrieved from: http://www.onlinelearningsurvey.com/reports/changingcourse.pdf

Baran, E., & Correia, A. P. (2014). A professional development framework for online teaching. *Tech Trends: Linking Research and Practice to Improve Learning, 58*(5), 96-102.

Bigatel, P. & Williams, V. (2015). Measuring student engagement in an online program. *Online Journal of Distance Learning Administration, 18*(2). Retrieved from: http://www.westga.edu/~distance/ojdla/summer182/bigatel_williams182.html

Chang, C., Shen, H.Y., Liu, E. Z. (2014). University faculty's perspectives on the roles of e-instructors and their online instruction practice. *International Review of Research in Open and Distance Learning*, *15*(3)*,* 72-92.

Elliott, M., Rhoades, N., Jackson, C. M., & Mandernach, B. J. (2015). Professional development: Designing initiatives to meet the needs of online faculty. *Journal of Educators Online, 12*(1), 160-188.

Esterhuizen, H. D., Blignaut, S., & Ellis, S. (2013). Looking out and looking in: Exploring a case of faculty perceptions during E-learning staff development. *International Review of Research in Open & Distance Learning, 14*(3), 59-80.

Hardré, P. L. (2012). Community college faculty motivation for basic research, teaching research, and professional development. *Community College Journal of Research and Practice, 36*(8), 539-561. doi:10.1080/10668920902973362

Herman, J. H. (2012). Faculty development programs: The frequency and variety of professional development programs available to online instructors. *Journal of Asynchronous Learning Networks, 16*(5), 87-106.

Herman, J. H. (2013). Faculty incentives for online course design, delivery, and professional development. *Innovative Higher Education, 38*(5), 397-410. doi:10.1007/s10755-012-9248-6

Hixon, E., Barczyk, C., Buckenmeyer, J., Feldman, L. (2011). Mentoring university faculty to become high quality online educators: A program evaluation. *Online Journal of Distance Learning Administration, 14*(5), n.p. Retrieved from http://www.westga.edu/~distance/ojdla/winter144/hixon_Barczyk_Buckenmeyer_feldman144.html

Kinuthia, W. (2005). Planning faculty development for successful implementation of web-based instruction. *Campus - Wide Information Systems, 22*(4), 189-200.

Lane, L. M. (2013). An open, online class to prepare faculty to teach online. *Journal of Educators Online, 10*(1). n.p.

Lazarus, B. D. (2003). Teaching courses online: How much time does it take? *Journal of Asynchronous Learning Networks, 7*(3), 47-54. Retrieved from http://onlinelearningconsortium.org/jaln_full_issue/volume-7-issue-3-september-2003/

Marek, K. (2009). Learning to teach online: Creating a culture of support for faculty. *Journal of Education for Library and Information Science, 50*(4), 275-292.

Palloff, R. M., & Pratt, K. (2011). *The excellent online instructor: Strategies for professional development*. San Francisco, CA: Jossey-Bass.

Ragan, L. C., Bigatel, P. M., Kennan, S. S., & Dillon, J. M. (2012). From research to practice: Towards the development of an integrated and comprehensive faculty development program. *Journal of Asynchronous Learning Networks, 16*(5), 71-86.

Ragan, L. C., & Schroeder, R. (2014). Supporting faculty success in online learning: Requirements for individual and institutional leadership. In M. G. Moore (Ed.), *Leading the e-learning transformation of higher education: Meeting the challenges of technology and distance education* (pp. 108-131). Sterling, VA: Stylus Publishing.

Riedinger, B., & Rosenberg, P. (2006). Uniting technology and pedagogy: The evolution of an online teaching certification course. *EDUCAUSE Quarterly, 29*(1), 32-39.

Shelton, K., & Saltsman, G. (2005). *An administrator's guide to online education*. Greenwich, CT: Information Age Publishing.

Teräs, H., & Herrington, J. (2014). Neither the frying pan nor the fire: In search of a balanced authentic e-learning design through an educational design research process. *International Review of Research in Open & Distance Learning, 15*(2), 232-253.

Tobin, T. J., Mandernach, J., & Taylor, A. H. (2015). Evaluating online teaching: Implementing best practices. San Francisco, CA: Jossey-Bass.

Vaill, A. L., & Testori, P. A. (2012). Orientation, mentoring and ongoing support: A three-tiered approach to online faculty development. *Journal of Asynchronous Learning Networks, 16*(2), 111-119.

Understanding The Use of Tablet Devices in The Classroom When Teaching a Group of Learners Diagnosed with Autism

Andrea Lynn Halabi, M.S.
School of Education
Iowa State University
1620 Lagomarcino Hall
Ames, Iowa 50011
andrea.lynn.halabi@gmail.com

Ana-Paula Correia, Ph.D.
School of Education
Iowa State University
2633 Lagomarcino Hall
Ames, Iowa 50011
correia.ana@gmail.com

Abstract

The purpose of this case study was to better understand the use of tablet devices while teaching a group of learners diagnosed with autism. Five children diagnosed with autism between the ages of 8 and 11 participated in activities involving traditional paper and pencil and iPads. Observations and opportunistic interviews with learners and teacher were conducted. An in-depth semi-structured interview was also done with the teacher. Data were analyzed using the Interpretive Descriptive method. The overall study provided an understanding of the motivational impact tablet devices potentially have on learners' engagement and participation in learning activities and their use as reward mechanisms and entertaining strategies to seize and retain the learners' attention.

Introduction

Once considered rare, Autism Spectrum Disorder (ASD) is now believed to be one of the most common and most encumbering of childhood disorders (Matson, Nebel-Schwalm, & Matson, 2007). Children across the autism spectrum differ from one another. As a group, they demonstrate comparable social impairment characteristics in communication, learning, sameness, repetitiveness, nonconforming behavior, and "the frequency, type, and quality of social interaction and social relationships with others" (Wolfberg, Bottema-Beutel, & DeWitt, 2012, p. 74). These influence their academic performance, behavior, social and family relationships, and involvement in activities (Simpson et al., 2003). For example, general participation in activities is one such social skill that can be especially difficult for children with autism and it grasps the least attention in terms of interventions in the school systems.

Educational Laws

Children with special needs have historically received unequal treatment in the U.S. education system. Traditionally, these learners were separated from their peers (Harrower & Dunlap, 2001). However, in the early 20th century, the enactment of required attendance laws in the states began to change the educational opportunities for these learners (Yell, Rogers, & Rogers, 1998). Additionally, the recent theoretical arguments related to social development and legal issues related to civil rights intensified the demand to include these learners in general education classrooms along with their developing peers (Harrower, 1999; McDonnell, 1998). And parents of learners with disabilities joined forces with activists during the late 1960s and early 1970s to force states to provide an equal educational opportunity for these learners. Their actions resulted in a fundamental rise of federal legislation (Yell et al., 1998).

The increase in autism and the shift in educational paradigms empowered by the educational and disability laws: Individuals with Disabilities Education Act (IDEA), No Child Left Behind Act (NCLB), Section 504 of the

Rehabilitation Act, Americans with Disabilities Act (The ADA), and Assistive Technology Act; classrooms and especially inclusive settings can be academically and socially beneficial for both learners with and without disabilities (Sharpe, 1994; Daniel & King, 1997; Huber, Rosenfeld, & Fiorello, 2001).

Researchers, practitioners, and parents may disagree at times about the definition of the "best" environment; however, litigation regarding the education of learners with ASD has become more common than any other type of litigation, due to IDEA and its regulations (Ivanonne et al., 2003). These litigations are not only breaking the different learning experience barrier for students with special needs, but they are also providing students and schools with the proper technology needed in schools to supplement the needs for enriched education.

Technology in the Classroom

Educational laws, technology advances and access to technology in the classroom are providing millions of children with special needs services at schools designed with their distinctive needs in mind advances that can attain improved learning outcomes (Burton, Anderson, Prater, & Dyches, 2013; Cihak & Bowlin, 2009).

More importantly, the increase in Internet use as an instructional tool along with other technology advances have turned technology into a practical tool to teach social and emotional skills to children diagnosed with ASD (Neely, Rispoli, Camargo, Davis, & Boles, 2013; Tanaka et al., 2010; Scadden, 1998; Lombardi & Ludlow, 1997). Studies from advocacy organizations, research centers and universities have found that technology can improve social interactions for the children and enable adults to learn more about them (Strain & Bovey, 2011; Dawson, et al. 2010).

Tablet devices (i.e., iPads) have opened up the world of technology to the average classroom and have been instrumental in assisting some of the most challenged learners to read, talk, and connect. They have become more than just a novelty for many learners with ASD (Neely et al., 2013; Shah, 2011) by "altering the paradigm of traditional education and blurring the lines between assistive technology and instructional technology" (O'Malley et al., 2013, p. 2). They are "more normalizing and less stigmatizing" for individuals with a disability and they are a "common somewhat a coveted consumer product" especially for children with special needs motivating them to use it without drawing attention to their disability (Lorah et al., 2013, p. 638).

Besides, table devices are becoming more and more affordable, flexible, and a socially acceptable tool with features that have the potential to motivate learners with ASD to learn and to enhance their communication performance (Lorah et al., 2013; Light & McNaughton, 2012). One example is Hart & Whalon's (2012) study that found a positive impact of using the iPad for video self-modeling on responding in class. Others studies have found similarly positive outcomes on tasks including checking spelling (Kagohara et al., 2012) and teaching numeracy skills (Jowett, Moore & Anderson, 2012). On the other hand, Keller and Suzuki (2004) caution that many features offered by tablet devices are appealing to learners only because they are innovative and may lose their appeal as learners adapt to them. Studies conducted on the use of technology indicate motivation plays an important role when learners interact with technology.

Theoretical Perspective

The ARCS Model serves as the theoretical framework given the audience and context of this study. The ARCS model offers strategic and systematic design process featuring an analysis of audience motivation and problem-solving approach that guide instructors with the appropriate motivational strategies for learners (Keller, 2008). For Keller, motivating the learners is a "sequential learning process" (Wongwiwatthananukit & Popovich, 2000; Keller, 1987). He suggested that educators must initially gain the learners' attention before initiating any activities to intrigue their curiosity in understanding the reason the activities are relevant to them personally and implement motivational strategies to build confidence in completing the tasks to achieve the level of satisfaction desired resulting in sustained motivation (Wongwiwatthananukit & Popovich, 2000).

Keller's ARCS model is based on a synthesis of motivational concepts and has three distinguishing features: (1) it represents sets strategies to improve the motivational instruction appeal, (2) it incorporates a systematic motivational design process, and (3) it consists of the four principal conditions that typify human motivation and they are: Attention (A), Relevance (R), Confidence (C), and Satisfaction (S) (Keller & Suzuki, 2004; Song & Keller, 2001; Keller, 1987).

Research Strategy

Two research questions guided this research:

(1) How do the motivational principles of the ARCS model impact the learners' motivation with classroom activities (i.e., with excitement? apathy? sense of accomplishment)?
(2) How do learners interact with technology used in the classroom (i.e., as an instructional tool? as a rewarding mechanism? as an entertaining strategy?)

The methodological approach taken in this study was a qualitative case study. The study agrees with Stake's (1995) definition of an instrumental case study in that research provides an understanding of a particular issue. In this case, the motivation of learners with autism using the technology of a tablet device while partaking in a class mathematics activity.

Additionally, the study purpose and problem statement agree with Yin's (2003) conditions and Stake's (1995) criteria supporting a single case study methodology. Yin's (2003) three conditions that justify the research strategy are; "(1) the type of research questions posed, (2) the extent of control an investigator has over actual behavioral events, and (3) the degree of focus on contemporary as opposed to historical events" (p.5) justify the case study choice. Stake's (1995) three criteria that supported the design choice are: "(1) Which cases are likely to maximize what is learned? (2) How easy is it to access research informants? (3) Carefully consider the uniqueness and context of alternative selections, for those may aid or restrict our learning" (p. 4).

Data Sources

The study sample was five male learners with autism in a metropolitan area of a U.S. Midwestern state. The learners ranged between 7 and 12 years of age and between grade levels 2 through 6 academically. The ethnic makeup of the sample included White and African-American (Table 1). Data collection took place in December 2014.

Table 1. Participants' Basic Demographic Information

Pseudonyms	Race	Age
Abel	African-American	10
Mark	African-American	8
Rick	White	8
Joel	White	11
Patrick	White	9

The public school where the study was conducted serves approximately 180 learners in grades PK-5 with a learner: teacher ratio of 13:1. The school offers gifted and talented classes and special education programs in addition to standard statewide class curriculum. The school district where the school is located provides a full continuum of quality educational services for learners with disabilities, including comprehensive services to help meet the academic, social, emotional, behavioral, adaptive, and physical needs of all learners with disabilities. Learners with low-incidence disabilities such as autism or hearing impairments are served in district-wide programs at selected schools. All programming provided for learners with special needs is consistent with the federal law, the Individuals with Disabilities Education Act (IDEA).

Behavior signs are posted throughout the classroom. The common sign in all nine classes I visited in October 2014 was the "*ZONES of Regulation*" sign (Figure 1). This particular sign encompasses four colors (1) blue, (2) green, (3) yellow and (4) red. Each of these four colors represents different level of expressive feelings and behaviors. The colors are used as a communication tool to help the learners identify their feelings when they are in a state hindering them from being expressive verbally. Moreover, the teacher utilizes the sign in the classroom as an activity for the students to practice their behavioral reactions when presented with certain real-life scenarios.

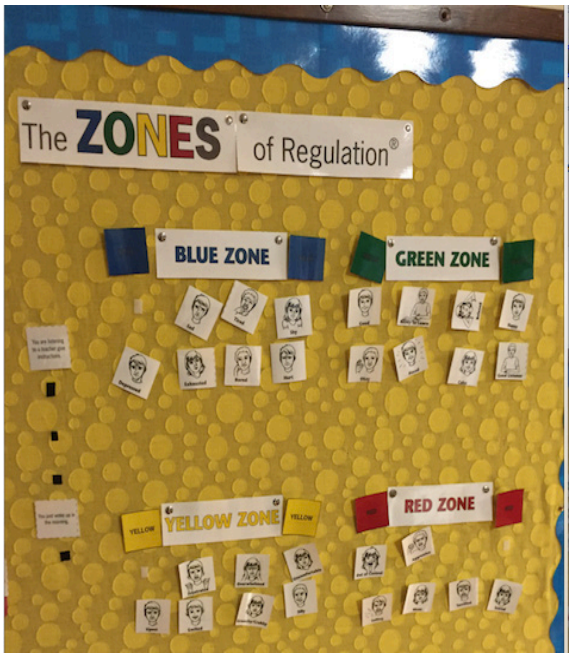


Figure 1. "The ZONES of Regulation" poster.

The classroom is divided into four sections. Section 1 is located toward the back of the room and serves as the main area for all the academic activities. In this same area, there is a large electronic whiteboard used for curriculum activities (see Figure 2), the learners personal work desks blocked separated from their peers with black walls (see Figures 3 and 4), and the teacher's desk in the far corner with a stationary desktop that learners use at times.

Section 2 is at the main entrance and features a large board where curriculum flyers of the chapters and progress are posted (see Figure 5). This area is also dedicated to game time. Learners are provided with a large TV screen where they play Wii games during their 'Free-Time' and watch movies.

Section 3 is the large sensory room located across the main classroom door where learners spend time alone when they are unable to manage their social behavior such as frustration and anger. Lastly, section 4 is the play area found to the left hand side from the main entrance. A mid-size wooden table is provided with games such as Candy Land, LEGO®, and drawing activities. Due to confidentiality and privacy for all participants, pictures are not available for sections 3 and 4.

Figure 2. The electronic whiteboard.

Figure 3. Individual student's desk.

Figure 4. Black dividers between desks.

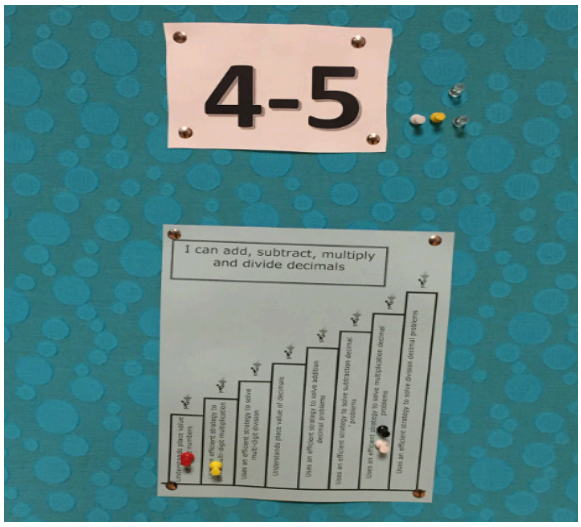
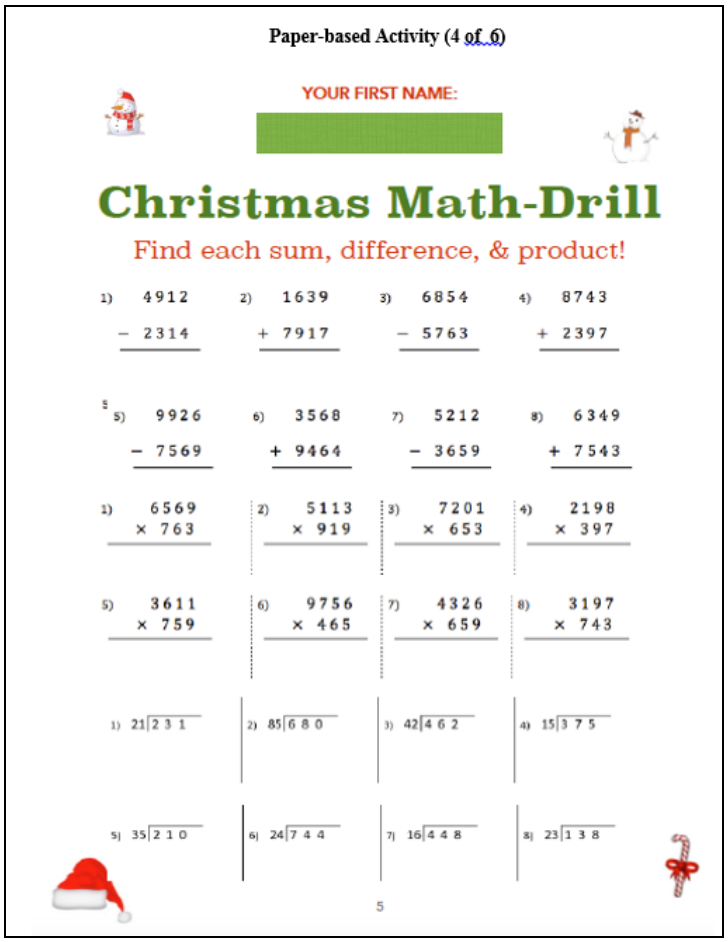


Figure 5. Grade levels 4 & 5 mathematics curriculum.

The case study consisted of a traditional paper and pencil activity (Paper-based) and activities using iPads (Educational Application-based activity). The decision to choose an activity presented both on paper and on the tablet device was to observe any potential changes in the learners' participation and motivation while conducting the activity. The teacher requested to structure each of the 30-minute sections in 2-15 minute intervals, giving the learners a 5-minute break due to the short attentiveness they exhibit, a characteristic of children in the autism spectrum (Mirenda, 2001).

The mathematics educational application used on the iPad, Math-Drills app by Instant Interactive, is aligned with the Common Core Standards. It allows learners to master basic mathematics in the four operations – addition, subtraction, multiplication, or division - by practicing and monitoring their progress (see Figure 6). The Paper-based activity consisted of a mathematics handout featuring addition, subtraction, division, and multiplication topics, ranging from single to four digit problems along with supplemental charts and tables for each topic (see Figure 7).

Figure 6. Features from the Math-Drills app.



Paper-based Activity (4 of 6)

YOUR FIRST NAME:

Christmas Math-Drill

Find each sum, difference, & product!

1) 4912 − 2314
2) 1639 + 7917
3) 6854 − 5763
4) 8743 + 2397

5) 9926 − 7569
6) 3568 + 9464
7) 5212 − 3659
8) 6349 + 7543

1) 6569 × 763
2) 5113 × 919
3) 7201 × 653
4) 2198 × 397

5) 3611 × 759
6) 9756 × 465
7) 4326 × 659
8) 3197 × 743

1) 21|231
2) 85|680
3) 42|462
4) 15|375

5) 35|210
6) 24|744
7) 16|448
8) 23|138

5

Figure 7. Features from the Paper-based Math activity.

The main methods of data collection were physical observation of the participants completing the activities and of their typical classroom behavior, coordinating classroom activities over a two-day period, along with an in-depth, semi-structured interview with the classroom teacher. Spontaneous interviews (with no pre-arranged appointment) resulted from conversations the researcher had with the children as they completed the proposed activities.

Handwritten notes were taken during these impromptu talks. Observations were also made (see Figure 8). Observations represent "the process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the researcher setting" (Schensul, Schensul, & LeCompte, 1999, p. 91). Their purpose is to enable the researchers to learn about the activities of the people under study in the natural setting through observing and participating in those activities. It provides the context for development of sampling guidelines and interview guides (DeWalt & DeWalt, 2010).

OBSERVATIONAL PROTOCOL FORM

Observation Protocol

Study Title: Understanding the use of tablet devices in the classroom when teaching a group of learners diagnosed with autism

Grade Level: _____ Date: _____

Time: _____ Place: _____

Observation	**Reflection**

Figure 8. Observational Protocol Form.

The Interpretive Descriptive model was used to analyze the data collected. For example, while examining the learners' use of the tablet device outside of their classroom routine, a change in their behaviors was evident. Its usage did not align with their perception of what it is typically used for in the classroom, resulting in a readjustment to a different routine on a short notice. The readjustment led to challenges, rejection, uncontrollable behaviors, lack of interest, focus, and motivation from some learners.

Reliability and validity were addressed through descriptive observations, member-checking, and established techniques of qualitative data analysis.

Major Findings

Data analysis led to four main findings:

(1) The strategic motivational use of the tablet device in the classroom was evident while observing the participants and conducting the semi-structured interview with the teacher. The tablet device, iPad, provided by the school district to these learners is integrated as both an instructional and a motivational tool. Although the learners may use it when practicing or reviewing mathematics problems or reading activities, the tablet device is strongly emphasized as a motivational reward strategy to encourage learners to complete the classroom activities.

(2) The classroom activities' impact on learners' social interactions revealed their distinctive perceptions of each activity - the Paper-based or the Educational Application-based type. The Paper-based activity depicted an instructional activity while the Educational Application-based activity represented an entertaining activity similar to that of a reward. For instance, upon handing out the Paper-based activity while learners were gathered on the carpet in the center of the classroom, the learners immediately headed toward their personal work desks after the teacher's instruction. In contrast, during the Educational Application-based activity upon seeing the iPads learners disregarded the teacher's instruction, remained seated as one group working interactively on the tablets (as they typically do when it is earned as a reward), and seemed less tense.

(3) The learners' behavioral changes resulting from change in classroom routine were apparent during observation. The tablet device was used to conduct a full mathematics activity for 30 minutes for this study when normally it is used for eight minutes for lesson reviews, practices, and reward incentives. The change in its usage did not align with their perception of what it is typically used for in the classroom, resulting in behavior changes. For example, one of the participants being a low conceptual was anxious when he was informed of the minor changes to the schedule to accommodate the "special activity," as the teacher referred to it. The anticipation resulted in severe agitation the day before the researcher's arrival and during the paper-based activity.

(4) The teacher's motivational strategy features the use of the iPad as a reward mechanism. The mathematics activity featured the four basic operations, which aligns deliberately with the school math curriculum. Their curriculum is based on the state Common Core and the Core Plus More. The Core Plus More allows the teacher to integrate additional teaching strategies, such as visual learning and individual goals, while maintaining the same content as in the general education classes. The teacher's overall teaching method is designed for the ''concrete'' learners, who communicate and learn best through the use of objects, pictures, and other tangible methods and for the ''abstract'' learners, who find spoken and written language and other symbolic content meaningful (Mesibov & Shea, 2010). His overall structured educational and teaching strategies are based on the comprehensive principles of the "culture of Autism rather than a specific curriculum, manual, or set of intervention techniques" (Mesibov & Shea, 2010, p. 576).

The teacher's motivational strategy is supported by Keller's ARCS motivational model and systematic approach that guides the design of appropriate motivational strategies for learners (Keller, 2008). Using the iPad as a motivational reward for completing in-class activities grabs the five participants' *attention,* in the case of this particular classroom. The educational games chosen by the teacher and provided on the iPads are *relevant* to the lessons and curriculum determined by the school curriculum and taught in class. The personal control the teacher gives to learners through playing any activity of their choice on the iPad boosts their *confidence* in applying new and existing skills. Such confidence has the potential to increase their success in completing the games, daily life activities, and classroom activities, resulting in personal *satisfaction* leading to improved academic and personal performance. Hence, the teacher is implementing strategically an electronic device in the classroom to encourage learners to participate and complete their curriculum activity.

Recommendations for Future Research

While the phenomenon of using table devices in the classroom and the potential increase in autism in children in the U.S. is rising, there remains a lack of in-depth research on the overall effectiveness of tablet devices for learning and teaching and on how their integration within the curriculum as an essential instructional tool should be approached. The following are recommendations for future research:

- Expand the study timeline over one month to collect more data to determine if the behaviors observed are common or happened to occur on the two days the researcher was present.
- Further research to determine if an increase on the sample size would provide validation to the findings of this study.
- Further research in multiple classrooms with different autism and social behavior programs to identify the different types of behaviors generated from learners on different levels of the spectrum and with different special needs.
- Further research to classify the motivations of learners with autism in classrooms where tablet devices are integrated as an instructional tool versus where they are used as reward mechanism or entertaining strategy.
- Further research to interview the participants' parents to determine learners' usage of the table devices and the ways this technology would impact their child's development.

Conclusions

Although research supports the findings, in that technology tools such as iPads hold promise for children with autism in terms of improving communication and developing social skills behaviors, other factors are also important to motivate children with autism to engage and participate. They are: (1) emotional and academic support, (2) teachers who are well trained in working with children with special needs, (3) proper use of the technology tools aimed at these learners, along with strategic instructional planning. The combination of the iPad's sensory, visual, and interactive features with the Math-Drills application's tracking and instant feedback revealed a positive impact on learners' motivation while they were attempting to finish 100 mathematics problems.

The findings from this study demonstrated motivation to be a critical element in seizing these learners' attention and retaining it, in order to encourage engagement and participation in the learning. The findings also revealed a loss of interest in the reward upon changing the structured routine. The change in their structured routine increased anxiety, frustration, and uncontrollable social behaviors, which were lessened as a result the motivational impact of the reward on the learners.

The study revealed that technology in general and tablet devices in particular are used in the classroom as reward mechanisms and break-time strategies. The findings disclosed the use of a tablet device such as the iPad to be a motivational reward and break time tool. Based on the data analyzed, one can say that the outcome of the study would have been different had the learners been more motivated, had the iPad been an essential instructional tool element rather than a reward mechanism, had the students had longer attention spans to focus and remain motivated, and had they been more accustomed to doing all the activities (including instructional activities) on the iPad, using an educational app.

The findings raise awareness concerning the impact the teacher has on the students' perception of the technology device as an instructional tool and to motivate learners grounded on how it is implemented in the classroom. The teacher's strategy sets the expectations and creates students' perceptions of it as an entertaining reward. Moreover, this study provides a valuable depiction of the learners' reactions to the change in their daily structured schedule, in their social skills behaviors, and of their practices to control and manage their behaviors. One of these practices is expressing their feelings and emotions by identifying with the codes on the *Zones of Regulation* poster found throughout the classroom. It helps students by showing the steps they need to take, such as deep breaths to regain control of their behaviors. Another practice is spending time in the sensory room to regain their tranquility and release the tension.

In summary, the overall study provided an important insight into the motivational impact that tablet devices have on learners on the autism spectrum related to motivation and participation in learning activities contingent on the strategic instructional or reward mechanism implementation in the curriculum. Moreover, it described how learners interacted with technology when it was integrated in the curriculum as a reward mechanism to seek and retain their attention, and how it is an entertaining strategy for the teacher to use to motivate and excite the students to help grab their attention.

Scholarly Significance

Witnessing the changes in the special education laws to ensure all schools are as readily and fully accessible to persons with disabilities, the advancements in technology that are changing our perspectives of what is impossible, and the significant changes in the perceptions towards children and adults with disabilities have inspired a passion to examine how readily accessible technology devices can overturn the disability label, attest to every child's capacity to develop and perform to the best of their abilities, and ascertain their place within the community and society as a whole.

One of the intent of this study is to remove the 'disability' stigma and focus on our ability to serve children with disabilities equally with all others, whether the subject is human rights, economic efficiency, or social desirability. Research on technology in the classroom has not extensively focused on either learners or the learning contexts of these groups. This case study was an attempt to fill that gap.

References

Burton, C. E., Anderson, D. H., Prater, M. A., & Dyches, T. T. (2013). Video self-modeling on an iPad to teach functional math skills to adolescents with autism and intellectual disability. *SAGE Open*, October-December 2014, 1-11. doi: 10.1177/2158244014556640

Cihak, D. F., & Bowlin, T. (2009). Using video modeling via handheld computers to improve geometry skills for high school students with learning disabilities. *Journal of Special Education Technology*, *24*(4), 17-29.

Daniel, L. G., & King, D. A. (1997). Impact of inclusion education on academic achievement, student behavior and self-esteem, and parental attitudes. *Journal of Educational Research, 91*(2), 67-80.

Dawson, G., Rogers, S., Munson, J., Smith, M., Winter, J., Greenson, J., ... & Varley, J. (2010). Randomized, controlled trial of an intervention for toddlers with autism: the Early Start Denver Model. *Pediatrics*, *125*(1), e17-e23.

DeWalt, K. M., & DeWalt, B. R. (2010). *Participant observation: A guide for fieldworkers*. Walnut Creek, CA: Rowman Altamira.

Dolah, J., Yahaya, W. A. J. W., & Chong, T. S. (2011). A preliminary investigation: Potential of interactive multimedia learning awareness (IMLA) in enhancing awareness of autistic characteristics among parents and society in Malaysia. *Electronic Journal of Computer Science and Information Technology*, *3*(1), 19-25.

Harrower, J. K. (1999). Educational inclusion of children with severe disabilities. *Journal of Positive Behavior Interventions, 1*(4)*,* 215-230.

Harrower, J. K., & Dunlap, G. (2001). Including children with autism in general education classrooms a review of effective strategies. *Behavior Modification, 25*(5), 762-784.

Hart, J. E. & Whalon, K. (2012). Using video self-modeling via iPads to increase academic responding of an adolescent with autism spectrum disorder and intellectual disability. *Education & Training in Autism & Developmental Disabilities, 47*(4), 438-446.

Huber, K. D., Rosenfeld, J. G., & Fiorello, C. A. (2001). The differential impact of inclusion and inclusive practices on high, average, and low achieving general education students. *Psychology in the Schools, 38*(1), 497-504.

Iovannone, R., Dunlap, G., Huber, H., & Kincaid, D. (2003). Effective educational practices for students with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 18*(3), 150-166.

Jowett, E. L., Moore, D. W. & Anderson, A. (2012). Using an iPad-based video modelling package to teach numeracy skills to a child with an autism spectrum disorder. *Developmental Neurorehabilitation, 15*(4), 304-12

Kagohara, D. M., Sigafoos, J., Achmadi, D., O'Reilly, M. & Lancioni, G. (2012). Teaching children with autism spectrum disorders to check the spelling of words. *Research in Autism Spectrum Disorders, 6*(1), 304-310.

Keller, J. M. (2008). First principles of motivation to learn and e3-learning. *Distance Education*, *29*(2), 175-185.

Keller, J. M. (1987). Development and use of the ARCS model of instructional design. *Journal of Instructional Development*, *10*(3), 2-10.

Keller, J. M., & Suzuki, K. (2004). Learner motivation and E-learning design: a multinationally validated process. *Journal of Educational Media, 29*(3), 229-239.

Light, J., & McNaughton, D. (2012). Supporting the communication, language, and literacy development of children with complex communication needs: State of the science and future research priorities. *Assistive Technology*, *24*(1), 34-44.

Lombardi, T., & Ludlow, B. (1997). Special education in the 21st century. Morgantown, WV: West Virginia University. (ED 406086)

Lorah, E. R., Tincani, M., Dodge, J., Gilroy, S., Hickey, A., & Hantula, D. (2013). Evaluating picture exchange and the iPad™ as a speech generating device to teach communication to young children with autism. *Journal of Developmental and Physical Disabilities*, *25*(6), 637-649.

Matson, J. L., Nebel-Schwalm, M., & Matson, M. L. (2007). A review of methodological issues in the differential diagnosis of autism spectrum disorders in children. *Research in Autism Spectrum Disorders*, *1*(1), 38-54.

McDonnell, J. (1998). Instruction for students with severe disabilities in general education settings. *Education and Training in Mental Retardation and Development Disabilities, 33*(3), 199-215.

Mesibov, G. B., & Shea, V. (2010). The TEACCH program in the era of evidence-based practice. *Journal of Autism and Developmental Disorders*, *40*(5), 570-579.

Mirenda, P. (2001). Autism, augmentative communication and assistive technology: What do we really know? *Focus on Autism and Other Developmental Disabilities, 16*(3), 141-151.

Neely, L., Rispoli, M., Camargo, S., Davis, H., & Boles, M. (2013). The effect of instructional use of an iPad on challenging behavior and academic engagement for two students with autism. *Research in Autism Spectrum Disorders, 7*(4), 509-516.

O'Malley, P., Jenkins, S., Wesley, B., Donehower, C., Rabuck, D., & Lewis, M. E. B. (2013). Effectiveness of using iPads to build math fluency. Retrieved from ERIC database. (ED541158).

Scadden, L. (1998). The Internet and the education of students with disabilities. *Technology and Disability, 8*(3), 141-148.

Schensul, S. L., Schensul, J. J., & LeCompte, M. D. (1999). *Essential ethnographic methods: Observations, interviews, and questionnaires* (Vol. 2). Walnut Creek, CA: Altamira Press.

Shah, N. (2011). Special education pupils find learning tool in iPad applications. *Education Week*, *30*(22), 1-16.

Sharpe, M. N. (1994). Effects of inclusion on the academic performance of classmates without disabilities: A preliminary study. *Remedial and Special Education, 15*(5), 281-287.

Simpson, R. L., de Boer-Ott, S. R., & Smith-Myles, B. (2003). Inclusion of learners with autism spectrum disorders in general education settings. *Topics in Language Disorders, 23*(2), 116-133.

Song, S. H., & Keller, J. M. (2001). Effectiveness of motivationally adaptive computer-assisted instruction on the dynamic aspects of motivation. *Educational Technology Research and Development*, *49*(2), 5-22.

Stake, R. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
Strain, P. S., & Bovey, E. H. (2011). Randomized, controlled trial of the LEAP model of early intervention for young children with autism spectrum disorders. *Topics in Early Childhood Special Education*, *31*(3), 133-154.
Tanaka, J. W., Wolf, J. M., Klaiman, C., Koenig, K., Cockburn, J., Herlihy, L., et al. (2010). Using computerized games to teach face recognition skills to children with autism spectrum disorder: The Let's Face It! program. *Journal of Child Psychology and Psychiatry, 51*(8), 944-995.
Wolfberg, P., Bottema-Beutel, K., & DeWitt, M. (2012). Including children with autism in social and imaginary play with typical peers: Integrated play groups model. *American Journal of Play, 5*(1), 55-80.
Wongwiwatthananukit, S., & Popovich, N. G. (2000). Applying the ARCS model of motivational design to pharmaceutical education. *American Journal of Pharmaceutical Education*, *64*(2), 188-196.
Yell, M. L., Rogers, D., & Rogers, E. L. (1998). The legal history of special education - What a long, strange trip it's been! *Remedial and Special Education, 19*(4), 219-228.
Yin, R. K. (2003). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.

The Use of Digital Storytelling in Teacher Education

Omer Faruk Islim
Ahi Evran University, College of Education
Kirsehir, Turkey
omerfarukislim@ahievran.edu.tr

Pelin Yuksel Arslan
Inonu University, College of Education
Malatya, Turkey
pelin.arslan@inonu.edu.tr

Soner Yildirim
Middle East Technical University, College of Education
Ankara, Turkey
soner@metu.edu.tr

This study was conducted in one of the top Turkish Universities during the 2014-2015 academic year as a part of Principles and Methods of Instruction course offered to second year College of Education students. As a requirement of this course, students (pre-service teachers) were asked to design and develop three to five minutes long digital stories in order to teach a topic to their prospective of students.

At the beginning of the semester, students were informed about digital storytelling, tools to be used for designing and how to develop digital stories. Then, some examples and non-examples were presented in order to clarify what is being expected from them. After that, students were asked to shape their groups consisted of four people, decide their topic, and inform the instructor within a week. Groups and the topics approved by the instructor were allowed to start to design and develop their digital stories. Students designed and developed their digital stories within a two-month period that they got support about software and feedback about their digital stories.

After the time was over, each group presented their digital stories to their classmates. A peer-review process was utilized during the evaluation of digital stories. Each digital story was evaluated by other students by using a digital story evaluation rubric and graded by the average.

The actual data of the current study were collected via focus group interviews conducted with each group. There were 13 groups, and total of 52 students. Average duration of each interview was around 15-minutes. During the interviews, students were asked about their topic, the reasons of choosing that topic, design process of digital storytelling, the software they used, the reasons of selecting that software, advantages of this assignment, and further advices for using this assignment in forthcoming years.

When students were asked about the reasons of choosing their topic, the most common answer given by five groups was being interested or being interesting. Five groups mentioned that either the topic was interesting or they were interested with the topic. The second most common reason given by four groups was being easy to tell. Four groups mentioned that they chose the topic due to well-defined steps that they could tell the others easily. Other than these two most common reasons, being knowledgeable about the topic was mentioned by two groups, having trouble about the topic and necessity were mentioned by one group each.

When students were asked about their design process it was revealed that eight out of thirteen groups prepared storyboards, while five of them did not. All the groups prepared storyboard mentioned that preparing a storyboard prior to development process helped them to accelerate development process, and helped them to use time more efficient. Furthermore, when students asked about the software they used and the reasons of choosing that software, it was seen that each group used more than one software based on their needs. Based on the students' responses the most used software was "MS Moviemaker" by seven groups. Besides "Adobe Photoshop", "GoAnimate", and "Sony Vegas Pro" were used by two groups; "iMovie", "Active Presenter", "Blender", "Videoscribes", "iTunes", "Natural reader", "Vivedo", "Zimmer twins", and "Pawtoon" was used by one group for similar purposes. The most common reason of selecting these programs was having prior knowledge about that program was mentioned by all the groups. Furthermore, being simple and easy to use, having all the features they

need, and being effective were the other reasons mentioned by two different groups. Moreover, being free was mentioned by one group as a reason of choosing that software.

After the questions of design and development phases, researchers asked to students to evaluate the overall process of digital storytelling. All groups stated that the processes of digital storytelling were useful as an instructional pattern. When the students were questioned about the advantages in detail, most common advantage mentioned by ten groups was “having deep information and learning about the related subject”. The second most common advantage stated by four groups was “having opportunity to implement the learned subject”. Furthermore, the other advantages could be listed as “encouraging to investigate” and “providing to learn the process of design and developmental phase” by three groups each, “learning new software” and “making the lesson more joyful” by two groups each, and “developing critical thinking”, “supporting teamwork”, “providing learning the subjects which are more complex during the lessons”, “developing a new product”, and “supporting knowledge share” by one groups each.

Lastly, students were asked to keep using this assignment in forthcoming years and their suggestions to improve it. All groups suggested to keep using this assignment in a similar way, but they offered to discuss the digital story ideas prior to start design and development of digital stories, to be introduced more detailed about the process and the software, and to be given longer duration due to other projects they are responsible for.

Acknowledgement

The conference attendance of this paper was supported by the Ahi Evran University Scientific Research Projects Coordination Unit. Project Number: EGT.A3.16.007

Creative Solutions for Preventing Cyberbullying: Everyone Deserves to Feel Safe in School

Dr. Lenora Jean Justice
Morehead State University, Morehead, Kentucky
408 Ginger Hall, Morehead, Kentucky 40351

Index Descriptors: Cyberbullying, Bullying, Safe School, Positive School Environment

Abstract

Parents, administrators, and teachers, increasingly call for digital teaching tools in the classroom; however, Internet access allows for gossip, harassment, and intimidation, which can potentially lead to cyberbulling. If educators are called upon to expand the use of technology in learning, how can they prevent the dark side of technology, cyberbullying, from disrupting this process? This paper covers creative ways to prevent cyberbullying while encouraging tolerance and acceptance of potentially marginalized students.

What is Cyberbullying?

Simply put, cyberbullying is a form of bullying that is done through technology. Although it can be compared to bullying, a major difference is that cyberbullying can take place in the safety of a student's home with his or her parents in the next room. Also, a cyberbully's identity is often hidden by the technology; therefore, he or she feels less inhibited and will often say things that normally would not be said to a person's face (Diamanduros & Downs, 2011; Paullet & Pinchot, 2014). Additionally, since cyberbullying usually takes place on the Internet, the potential audience can range in the thousands (Morgan, 2013). Subsequently, a student who is cyberbullied may understandably feel as if the whole school knows.

The consequences of cyberbullying are staggering. Victims can begin to experience eating disorders, chronic illness, depression, significantly lower self-esteem, externalized violence, academic problems, family problems, mental health problems, and suicidal thoughts or actions (Feinberg & Robey, 2009; Morgan, 2013; Patchin & Hinduja, 2012; Simmons & Bynum, 2014; Wolfer et al., 2014). Although the most pronounced effects are observed in the victims, anyone touched by the cyberbullying, including the bully and any witnesses, even virtual witnesses, can suffer some the same negative consequences (Garaigordobil & Martinez-Valderry, 2015). Even though most cyberbullying happens outside of school, the common denominator is school since this is where cyberbullies often find their victims (Feinberg & Robey, 2009; Patchin & Hinduja, 2012). Unfortunately, because school is the common denominator, there is a lot of finger-pointing about who should stop and/or prevent cyberbullying. Research suggests that it takes everyone, educators (i.e., teachers, administrators, media specialists, staff), parents, and students, to stop cyberbullying (Beale & Hall, 2007; Diamanduros & Downs, 2011; Garaigordobil & Martinez-Valderry, 2015; Panter, 2009; Patchin & Hinduja, 2012; Stanbrook, 2014).

Who are the Victims of Cyberbullying?

Current research has found that there are some characteristics of students that make them more susceptible to cyberbullying (Beale & Hall, 2007; Feinberg & Robey, 2009; Simmons & Bynum, 2014). For example, students who are physically different (i.e., overweight, underweight, race, gender variant, disabled), intellectually different (i.e., gifted, learning disabled), emotionally different (i.e., overly sensitive, depressed, anxious, fearful), unpopular, and/or more isolated are more likely to be victims. In other words, these students are looking for acceptance and positive attention, which makes them more vulnerable to manipulation and, usually, less attentive to online privacy and safety. Also, students who become targets for cyberbullying are the exact group of students who are not well equipped to handle this type of harassment. For example, Feinberg and Robey (2009) suggest that vulnerable young people who have few coping skills, poor relationships, mental health problems, and/or family problems will not be able to overcome cyberbullying without intervention.

Preventing Cyberbullying: Advice for Educators

Cyberbullying is such a complex problem that educators should not try to tackle it alone. Parents, administrators, teachers, students and, when necessary, law enforcement are needed to solve the challenges of cyberbullying. For this reason, please see Appendix A, Cyberbullying Advice for Administrators, Appendix B, Cyberbullying Advice for Parents, and Appendix C, Cyberbullying Advice for Students for more information about preventing/stopping cyberbullying. Educators should be aware that many cyberbullying victims will not report incidents because they are worried that they will lose their Internet privileges in an effort to separate the victim from the cyberbullying or they are ashamed of the embarrassing material used in the cyberbullying process. Consequently, many victims prefer anonymous help through the Internet, so web-based interventions and anonymous reporting may be solutions to the non-reporting problems (Jacobs Vollink, Dehue, & Lechner, 2014). If a student does report cyberbullying, then teachers should respond promptly. Even in a minor case, the victim needs to feel safe again as soon as possible and the cyberbully needs to be stopped so that the incident does not escalate (Morgan, 2013). Above all else, if a victim or a witness comes to you about a cyberbullying incident, do something. It took a lot of courage to report it and given the potential negative outcomes of cyberbullying to all parties involved, you are responsible for doing your part at stopping cyberbullying.

Perhaps the best strategy for an educator is the old adage: "the best offense is a great defense". Or, in other words, preventative strategies are the best protection that an educator can offer students. For example, educators can raise awareness about cyberbullying by helping students understand that 'friending,' privacy settings, and sharing and re-posting online makes them targets for cyberbullies (Bryce & Klang, 2009; Furnell, 2010). Additionally, because mainstream news and late night talk shows will often offer news items of social media goofs, these instances make great talking points as contextual examples for students of what they should and should not do. Additionally, educators should have rules and/or policies in place for Internet use, which should reflect those established by the school and/or administrator(s), and should monitor students' activities online while reducing the amount of spare time online (Demaray & Brown, 2009; Patchin & Hinduja, 2012). Moreover, Patchin and Hindjua (2012) claim that one way to prevent cyberbullying is to promote a positive school environment. To promote a positive school environment, teachers should demonstrate emotional support, a warm and caring atmosphere, a strong focus on learning and academia, and foster student self-esteem. Additionally, neither students nor faculty should tolerate abusive conduct; accordingly, students and faculty should follow a respect policy or honor code.

Perhaps one of the most creative ways to prevent cyberbullying is to stop the marginalization of potential victims. Since students who are 'different' have a tendency to become victims of cyberbullying, an educator can make those characteristics more acceptable in class. For example, if racism seems to be an issue, perhaps reading a story about a minority scientist, war hero, or other positive role model would help in creating more tolerance and understanding. Or, if an educator hears some conversation questioning the gender identity of another student, perhaps discussing current events, like Caitlyn Jenner, or reading a novel with a transgender main character may make the student feel more welcome and the other students less antagonistic. Norton & Herek (2013) suggest that positive interactions can help reduce negative attitudes toward stigmatized groups of people, then, perhaps, these positive interactions may stop or even prevent cyberbullying.

Literature Cited

Beale, A. V., & Hall, K. R. (2007). Cyberbullying: What school administrators (and parents) can do. *The Clearing House*, 81(1), 8-12.

Bryce, J., & Klang, M. (2009). Young people, disclosure of personal information and online privacy: Control, choice and consequences. *Information Security Technical Report*, 14(2009), 160-166.

Demaray, M. K., & Brown, C. F. (2009). Prevent cyberbullying: Suggestions for parents. *NASP Communique*, 38(4), 1-5.

Diamanduros, T., & Downs, E. (2011). Creating a safe school environment: How to prevent cyberbullying at your school. *Library Media Connection*, 30(2), 36-38.

Feinberg, T. & Robey, N. (2009). Cyberbullying: School leaders cannot ignore cyberbullying but rather must understand its legal and psychological ramifications. *Principal Leadership*, 9(1), 26-31.

Furnell, S. M. (2010). Online identity: Giving it all away? *Information Security Technical Report*, 15(2010), 42-46.

Garaigordobil, M., & Martinez-Valderrey, V. (2015). Effects of cyberprogram 2.0 on "face-to-face" bullying, cyberbullying, and empathy. *Psicothema*, 27(1), 45-51.

Jacobs, N., Vollink, T., Dehue, F., & Lechner, L. (2014). Online Pestkoppenstoppen: Systematic and theory-based development of a web-based tailored intervention for adolescent cyberbully victims to combat and prevent cyberbullying. BMC Public Health, 14(1), 396

Justice, L. J. & Hooker, S.D. (in press). Creating digital safe spaces for gender expression and sexual diversity. In Dreon, O. & Polly, D. (Eds.), *Handbook of Research on Teacher Education for Ethical Professional Practice in the 21st Century*. IGI Global Publishing.

Morgan, H. (2013). Malicious use of technology: What schools, parents, and teachers can do to prevent cyberbullying. *Childhood Education*, 89(3), 146-151.

Norton, A. T., & Herek, G. M. (2013). Heterosexuals' attitudes toward transgender people: Findings from a national probability sample of US adults. *Sex roles*, *68*(11-12), 738-753.

Panter, S. L. (2009). Teaching elementary students to be safe on the Internet. *Library Media Connection*, 27(6), 32-33.

Patchin, J. W., & Hinduja, S. (2012). School-based efforts to prevent cyberbullying. *The Prevention Researcher*, 19(3), 7-9.

Paullet, K., & Pinchot, J. (2014). Behind the screen where today's bully plays: Perceptions of college students on cyberbullying. *Journal of Information Systems Education*, 25(1), 63-69.

Simmons, K. D., & Bynum, Y. P. (2014). Cyberbullying: Six things administrators can do. *Education*, 134(4), 452-456.

Stanbrook, M. B. (2014). Stopping cyberbullying requires a combined societal effort. *CMAJ*, 186(7), 483.

Wolfer, R., Schultze-Krumbholz, A., Zagorscak, P., Jakel, A., Gobel, K., & Scheithauer, H. (2014). Prevention 2.0: Targeting cyberbullying @ school. *Prevention Science*, 15(6), 879-887.

Appendix A – Cyberbullying Advice for Administrators

School administrators are responsible for ensuring that all students, faculty, and staff are provided an opportunity to teach and learn in an environment free from fear and intimidation. The following list of tips for administrators is directly related to preventing cyberbullying (Justice & Hooker, in press):

1) Review policy – make sure the school's acceptable use policy, the school board's antibullying policy, and any other relevant school policy include cyberbullying with agreed upon punishments. Be sure to understand all the legal obligations and restrictions in dealing with and disciplining cyberbullies.
2) Establish a Cyberbully Task Force – this panel should be made up of teachers, parents, students, and law enforcement officers in an effort to establish policies, punishments, and acceptable usage or honor/ethics policies.
3) Education – provide training and awareness for students, faculty, staff, and parents by integrating activities in student curriculum, offering trainings specific to teachers, counselors, and various staff members, and sending informational letters parents and, potentially, offer information seminars once a month.
4) Coordinate with other schools – by being consistent throughout grade levels and among schools, students will be more likely to not participate in cyberbullying.
5) Create an anonymous reporting system – since students are afraid of punishment, embarrassment, and/or retaliation, they will rarely report cyberbullying incidents. By creating an anonymous reporting system, victims and witnesses can report cyberbullying without worry.
6) Investigate all reports of cyberbullying – victims and witnesses are not very likely to inform anyone about cyberbullying; therefore, it is important to carefully consider every incident of reported cyberbullying. Assure confidentiality for the victim and witness while promptly punishing those involved in bullying.
7) Provide support – since all participants (i.e., victims, bullies, and witnesses) face negative outcomes of cyberbullying, all participants should receive some sort of interventative support such as targeted skill development, counseling, monitoring, and referral to professional assistance.
8) Safeguard faculty and staff – everyone needs protection from cyberbullying, including faculty and staff. Respond to cyberbullies who victimize school employees just as you would respond to cyberbullies who victimize students.
9) Teach technology savviness – cyberbullies often succeed because of the disconnect between teacher and parent knowledge and opinions about technology and student knowledge and opinions about

technology. If everyone is on the same page, cyberbullies are unable to easily hide their activities and so bully less.

10) Create a positive school environment – schools should be a place where students feel encouraged, safe, and supported. A positive school environment does not tolerate abusive conduct like cyberbullying. Students in this positive environment will be more likely to be respectful and not participate in any form of bullying.

Appendix B – Cyberbullying Advice for Parents

Parents are usually very invested in their children. They want to protect them, but at the same time realize that they need their own space and privacy to grow up. It can be quite difficult at times to balance these two opposing conditions. The following list of tips for parents is directly related to preventing cyberbullying (Justice & Hooker, in press):

1) Talk regularly – by communicating often with your children, you become more approachable to them when they have problems, but you also may be able to pick up on problems with which they are facing. Additionally, on occasion talk specifically about Internet etiquette and use teachable moments that crop up in the news on your own social media feeds.
2) Monitor them – if they know that you may be reading what they are writing, they will be more accountable for what they post. Perhaps move the computer out to an open area where the screen can be read by anyone at any time.
3) Consider blocking software – some firewalls can make certain websites inaccessible and some software can record every keystroke. Again, children may reconsider posting if there is a potential their parent could read it.
4) Work with your school system – participate with any activities and seminars your child's school provides. Read their cyberbullying policies and notices. Also, if asked, participate in the cyberbullying task force or any cyberbullying panels to help set the policies and etiquette for technology use.
5) Create family rules – establish acceptable use policies, limit time online, and reduce use of social networks, chat rooms, and instant messaging. This may reduce the potential for victimization since this helps children to reduce their amount of sharing online, which could help protect their privacy.
6) Become tech savvy – understand why your child uses technology and the lingo involved. Parents often see technology as a tool, but children see it as a social lifeline. It is their direct connection to their friends, so they use it different ways. Also, some of their language is designed to mask the true message from parents.
7) Be careful when your child uses chat rooms and instant messaging – make sure your child uses a generic nickname to remain anonymous, have your child avoid private chats since it could be a predator or aggressor, make sure your child's understand that all conversation should remain polite (i.e. suggest that they can't say anything that they wouldn't say to someone's face), make sure your child doesn't click on any links or open any files sent since a virus could easily be passed this way, make sure your child knows not to log in to these sites on a public computer since it may have a virus, and have your child understand that under no circumstances should he or she exchange pictures, videos, or phone numbers or set up a face-to-face meeting with someone from a chat room, even if they appear to be someone the child already knows.
8) Be aware that your child may be the cyberbully – even unintentionally, anyone can be a cyberbully. Pay attention to what your child is posting online.
9) If you think your child is being cyberbullied:
    a. Don't overreact, keep an open line of communication with your child through the whole process.
    b. Print all messages, do not delete or erase any contact
    c. Make appointments and talk with administrators, teachers, and counselors
    d. Consider contacting the police/local law enforcement, especially if the cyberbully has used any threats
    e. Have your child block or unfriend the cyberbully to stop more messages from being posted
    f. Have your child change their screen or profile name
    g. File a complaint with the website used to cyberbully
    h. Consider professional help, especially with emotional distress caused by cyberbullying

Appendix C – Cyberbullying Advice for Students

Students are just trying to make it through each day. They want to be safe and protected, but at the also they want their own space and privacy to grow up. It can be quite difficult at times to balance these two opposing conditions. The following list of tips for students is directly related to preventing cyberbullying (Justice & Hooker, in press):

1) Talk regularly – by communicating often with the adults in your life, they become more approachable to you when you have problems. Additionally, on occasion talk specifically about Internet etiquette and use teachable moments that crop up in the news on your own social media feeds. For instance, if you think something questionable was posted, ask a parent or a teacher their opinion.
2) Understand and accept the rules – your school and your family may have established acceptable use policies and/or Internet etiquette policies. Accept and follow them since these rules were put in place to protect you.
3) Do not try to friend everyone – if you are friending strangers, you are opening yourself up to the potential of being bullied. Understand that friends should be people you do see outside of a social network and those people who you do care about.
4) Protect your privacy – be careful handing out information that can be pieced together to identify you. Be aware that terms of service agreements may have policies of sharing your information for commercial purposes. Also understand that you have no legal repercussions if your data is mined or hacked from websites.
5) Do not share passwords – if you share a password, that person could share it with someone else without your knowledge. Anyone who has your password can change your information or post misinformation to cause you or your relationships harm. Additionally, someone with your password could log in as you and post terrible things to your friends. Posing as you, everyone would think you posted.
6) Watch what you share – you should realize that anything you post can be re-posted and re-shared until complete strangers are seeing your post. Therefore, be careful about the content you are posting. If you think it might embarrass you if certain people were to see it, then don't post it. If you think it might be found very offensive by some people, then don't post it. Both of these situations could trigger a cyberbullying incident.
7) Stop it if you see it – if you witness cyberbullying, then do something about it. You will face some of the same negative outcomes as the victim, so for yourself as well as the victim, report it, and get help.
8) If you are being cyberbullied:
    a. Tell an adult (i.e., parent, teacher, counselor, law enforcement officer)
    b. Don't engage the cyberbully, just don't respond
    c. Print all messages, do not delete or erase any contact
    d. Block or unfriend the cyberbully to stop more messages from being posted
    e. Change their screen or profile name
    f. File a complaint with the website used to cyberbully

Creating Ways to Include LGBTQ Students: Everyone Deserves an Education

Dr. Lenora Jean Justice
Morehead State University, Morehead, Kentucky
408 Ginger Hall, Morehead, Kentucky 40351

Dr. Steven D. Hooker
University of North Carolina Wilmington
Education Building 322, Wilmington, North Carolina 28403

Index Descriptors: LGBTQ, Diversity

Abstract

When asked, most educators would agree that a safe and supportive school environment is an absolute must for effective teaching and learning. However, school can be dangerous for lesbian, gay, bisexual, transgender, and questioning (LGBTQ) students. How can educators guarantee that LGBTQ students feel safe enough to learn effectively? Creative suggestions for an inclusive school environment by promoting awareness and by providing inclusive activities and strategies that are specific to LGBTQ students are included in this paper.

Introduction

In the past year, mainstream news stories have brought attention to the lesbian, gay, bisexual, transgender, and questioning (LGBTQ) population. For instance, in April, 2015, Bruce Jenner revealed that he was transforming into Caitlyn Jenner. A few months later, the United States Supreme Court ruled that same-sex marriage was legal nationwide in the United States. Serious conversations have been generated by these events, a public gender transformation and lawful same-sex marriages. Students, both those who can identify with these issues and those who are just curious, have questions about these events and LGBTQ topics in general. For example, many parents, as well as teachers, were faced with difficult questions by students of all ages trying to understand complex issues like gender when Bruce Jenner became Caitlyn Jenner: "How can a boy become a girl?", "Is he only dressing like a girl, but he's still a boy?", "Is she a real girl just like my sister?", and, "Can I be either a girl or boy if I want to?". This questioning often did not stop with gender, but also included identity, sexuality, and marriage, too.

On the other hand, these events, the introduction of Caitlyn Jenner and the legalization of same-sex marriage, evoked many jokes, memes, and trash-talk. This negative discussion became mainstream through social media, late night talk shows, and Internet video clips, many of which were repeated and distributed in classrooms – ostracizing any students who may be LGBTQ. How do educators ensure these students are not belittled, marginalized, or made to feel insignificant and worthless? How do educators guarantee that all students, including those who are LGBTQ, feel safe to learn and grow in schools?

Challenges LGBTQ Students Face

If a student is not of heterosexual orientation or has a gender variation of that other than his or her biological sex, schools are a dangerous place (Fetner, Elafros, Bortolin, & Drechsler, 2012; Ressler & Chase, 2009; Sears, 2005; Singh, 2013). It is no wonder that these types of students feel unsafe in schools since they face, almost on a daily basis, derogatory remarks (i.e., "faggot" or "dyke"), harassment (both verbally and physically), physical assault and/or injury, and/or threatening, perhaps even threatening with a weapon (Ressler & Chase, 2009). Furthermore, because school is an unsafe and an intimidating environment, LGBTQ students often abandon school by being absent, dropping out, and/or becoming less likely to pursue a post-secondary education (Kosciw, Diaz, & Greytak, 2012; Peters, 2003). It is not surprising that these students would lose hope when it is the people who are supposed to secure the safety of all students (i.e., principals, teachers, resource officers, staff) that are the very people creating the hostile environment. Sometimes, even well meaning employees can unintentionally marginalize and exclude LGBTQ students (Beemyn, 2005; Fish & Jeltova, 2005; Ressler & Chase, 2009).

Most educators claim that they have a safe and supportive school climate that is effective for teaching and learning. The reality is that this is simply not true. For example, even students who are heterosexual and fit into the

male-female gender system can face five times more antigay harassment than LGBTQ students (Ressler & Chase, 2009). Moreover, some zero-tolerance policies – even those designed to protect LGBTQ students – can perpetuate the cycles of fear, hatred, and violence because victims, alongside the perpetrators, are punished. Marginalizing and excluding these students from regular student activities, even in for the purposes of protecting them is counterproductive. Norton & Herek (2013) suggest that a person's prejudice is reduced when interacting with a member of a stigmatized group; therefore, any separation and isolation maintains ignorance of the similarities as well as misunderstanding of the differences between diverse groups of students.

Advice for Educators

More recently, schools have begun to realize that policies based on a binary male-female gender classification system are no longer considered effective (Beemyn, 2005). For instance, some schools that were built with male/female bathrooms and locker rooms are now sensitive to students that are gender variant or transgender. They are trying to accommodate these students so they are not marginalized or excluded from the general population of students. Although, schools are trying to design inclusive policies and to educate their employees about diverse students, such as LGBTQ individuals, the lack of a widely accepted vocabulary and language is a hindrance. Without proper terminology that captures the complexities of gender and sexuality, there can be little discussion and understanding of LGBTQ students (Beemyn, 2005; Norton & Herek, 2013; Ressler & Chase, 2009). Nevertheless, educators can still improve the school environment for LGBTQ individuals (i.e., students, parents, peers) by learning about this type of diversity and by providing an inclusive education (Beemyn, 2005). For example, teachers unaware of LGBTQ diversity often assume that everyone is heterosexual unless told otherwise; whereas, teachers who are aware of LGTBQ diversity may not try to fit their students into strictly defined categories (Lugg & Tooms, 2010). Subsequently, these aware educators may use inclusive language, posters and signs, guest speakers, and group collaborators. Additionally, these aware educators may even protect LGBTQ students by stopping homophobic language and name-calling in their presence. These aware educators may petition their schools to allow for the use of an LGBTQ inclusive curriculum, the formation of a gay-straight alliance and/or support group for LGBTQ students, and, perhaps, even create an LGBTQ awareness day (Beemyn, 2005; Lipkin, 1999; Lucas, 2002).

Another creative strategy for inclusion of LGBTQ students is to be able to relate to, or see others like them, in what they are studying. Every student, regardless of his or her gender or sexual orientation, needs a role model, guide, or mentor. Those students who may be marginalized or excluded especially need to identify with someone in the school or the curriculum (NEA, 1991). Therefore, having LGBTQ literature on the shelves of school libraries, identifying LGBTQ individuals who influenced specific subjects (i.e., science, math, English, poetry, technology), and perhaps identifying LGBTQ diversity within contextual learning is inclusive techniques for making LGBTQ students feel safe and accepted. Additionally, positive interactions with this type of diversity can reduce a person's prejudice through the realization that there is nothing to fear and that there is nothing wrong with this type of diversity (Norton & Herek, 2013). See Appendix A for some general literature choices that feature LGBTQ issues and characters.

Additionally, several suggestions for educators on how to develop an inclusive school environment by promoting awareness and by providing inclusive activities and strategies that are specific to LGBTQ students are provided (Bailey, 2003; Justice & Hooker, in press; Sapon-Shevin, 2008). First, educators should investigate the school's policies. Knowing how the school defines diversity, especially LGBTQ issues, harassment, and punishment will help any educator determine school approved support systems and inclusiveness. Also, knowing policies and procedures helps an educator determine who to speak to when there is a need for issues to move upward through the chain of command. Educators should also inspect their libraries and counselors' offices for LGBTQ materials. Not only should there be inclusiveness in general literature and curriculum-specific activities, there should be information on the health and well being of students who are LGBTQ, especially the Questioning group. For example, many counselors are concerned about the health and mental health of students in general. They have many pamphlets and other informational materials on depression, body shape (i.e., thin/large, severe weight loss/gain), abuse, disabilities, and so on. There should be information pertaining to LGBTQ health issues, gender identity, and sexual identity as well for those students who are LGBTQ or who have parents, guardians, or peers that are LGBTQ.

For those educators who are in a position to do so, they should create a safe space for LGBTQ students. This learning space should be gender neutral (Steensma, 2013). For example, there should not be separate toys for girls and for boys. Or, pink items (i.e., pencils, paper, blankets, chairs) for girls and blue ones for boys. Encouragement of certain jobs should not be gender specific, like nurses should be girls and doctors should be boys. When choosing avatars in virtual spaces or school-supported software, educators should accept a student's avatar choices regardless

of the student's biological gender (i.e., a boy choosing a girl avatar or a girl choosing a boy avatar). Neutralizing these forms of stereotyping may stop gender identity confusion which could potentially marginalize and embarrass students. Additionally, educators should not assume heterosexuality at any age. For example, people will often ask about or tease a girl about her boyfriend or a boy about his girlfriend. Although this type of dialog may be meant good-naturedly, assuming heterosexuality, even at a young age, can confuse a child. A child continuously exposed to this assumption may believe everyone is supposed to be heterosexual so there must be something wrong with anyone who is not. A misconception such as this could prompt children to have a lower tolerance for anyone that is not heterosexual, including themselves. Educators should be a role model of acceptance for their students. For instance, educators can adopt a zero-indifference policy by stopping name-calling and harassment, not assuming heterosexuality, and maintaining and supporting open-mindedness in the presence, educators show students how to accept and include everyone. Punishment is not always necessary, especially when the situation can become a teachable moment. Moreover, educators can proactively teach positive social skills such as how to make friends, give compliments, and how to handle teasing and/or hurt feelings. Additionally, by having students work together, they learn more about their own similarities and differences which can reduce prejudices.

Educators can create an inclusive environment for LGBTQ students, a group of students who are regularly marginalized and face the consequences of this isolation. These marginalized students often feel as if they are being constantly judged by every person they meet (Nasir & Al-Amin, 2006). For example, Peters (2003) suggests that many LGBTQ students have had to grow up in environments that teach them to hate themselves, which can result in substance abuse, sexual risk-taking, dropping out, and increased suicide risk. Norton & Herek (2013) suggest that increasing positive interactions within safe spaces may promote positive interactions between marginalized students and non-marginalized students; therefore, the creation of safe learning spaces may increase positive interaction between LGBTQ students and heterosexual students. By incorporating this group of individuals into the whole student population, perhaps the cycle of ridicule, criticism, threatening behavior, and harassment can be stopped. All students deserve the right to feel safe in schools to learn and grow. Only inclusion will eliminate fear and intimidation for this, or any, marginalized group.

Literature Cited

Bailey, N. J. (2003). Safety for gay and lesbian students in our schools. *Education Digest, 68*(6), 46-48.

Beemyn, B. (2005). Serving the needs of transgender college students. In J. Sears (Ed.), *Gay, lesbian, and transgender issues in education: Programs, policies, and practices* (pp. 105-124). New York, NY: Harrington Park.

Fetner, T., Elafros, A., Bortolin, S., & Drechsler, C. (2012). Safe spaces: Gay-straight alliances in high schools. *Canadian Review of Sociology*, 49(2), 188-207.

Fish, M.C. & Jeltova, I. (2005). Creating school environments responsive to gay, lesbian, bisexual and transgender families: Traditional and systemic approaches for consultation. *Journal of Educational and Psychological Consultation, 16*(1&2), 17-33.

Justice, L. J. & Hooker, S.D. (in press). Creating digital safe spaces for gender expression and sexual diversity. In Dreon, O. & Polly, D. (Eds.), *Handbook of Research on Teacher Education for Ethical Professional Practice in the 21st Century*. IGI Global Publishing.

Kosciw, J. G., Diaz, E. M., & Greytak, E. A. (2012). *2011 National School Climate Survey: The experiences of lesbian, gay, bisexual and transgender youth in our nation's schools*. New York, NY: GLSEN.

Lipkin, A. (1999). *Understanding homosexuality: Changing schools*. Westview Press.

Lucas, T. (2002). Homophobia: An issue for every pupil? *Education Review*, *17*(2), 66-72.

Lugg, C., & Tooms, A. (2010). A shadow of ourselves: identity erasure and politics of queer leadership. *School Leadership and Management*, 30(1), 77-91.

National Education Association (1991). *Training handbook for educators*. Washington, D.C.: National Education Association.

Nasir, N. I. S., & Al-Amin, J. (2006). Creating identity-safe spaces on college campuses for Muslim students. *Change: The Magazine of Higher Learning*,*38*(2), 22-27.

Norton, A. T., & Herek, G. M. (2013). Heterosexuals' attitudes toward transgender people: Findings from a national probability sample of US adults. *Sex roles*, *68*(11-12), 738-753.

Peters, A. J. (2003). Isolation or inclusion: Creating safe spaces for lesbian and gay youth. *Families in Society: The Journal of Contemporary Human Services*, 84(3), 331-337.

Ressler, P., & Chase, B. (2009). Sexual identity and gender variance: Meeting the educational challenges. *The English Journal*, 98(4), 15-22.

Sapon-Shevin, M. (2008). Learning in an inclusive community. *Educational Leadership, 66*(1), 49-53.
Sears, J. T. (2005) (ed.). *Gay, lesbian, and transgender issues in education: Programs, policies, and practices.* New York, NY: Harrington Park Press.
Singh, A. (2013). Transgender youth of color and resilience: Negotiating oppression and finding support. *Sex Roles*, 68(2013), 690-702.
Steensma, T., Kreukels, B., de Vries, A., & Cohen-Kettenis, P. (2013). Gender identity development in adolescence. *Hormones and Behavior*, 64(2013), 288-297.

Appendix A – Books with Gender Variant Characters

The following list includes books about those who are transgender, gender fluid, or gender variant. Teachers could use these books in their curricula to teach about nonconforming gender issues and the challenges involved with these issues.

Author	Title	Synopsis
Cris Beam	*I am J*	J has always known that he was a boy who happened to be born into a girl's body by mistake. Now he just has to convince everyone else.
Laney Cairo	*Circle of Change*	(e-book) This is the story of a romance between Kim, a teenager trans man, and Dash a gay college student, who initially rejects Kim but ultimately falls in love with him.
Kirstin Cronn-Mills	*Beautiful Music for Ugly Children*	Gabe, who was born Elizabeth, hosts a popular weekly radio show called "Beautiful Music for Ugly Children." He is not out at school and is still living as Elizabeth, but when someone discovers his secret he must figure out how to live an honest life and still stay safe.
Tanita S. Davis	*Happy Families*	When Emily, who was born as Christopher, tells her parents about her desire to live as a women, they send her into therapy, convinced she is ill. She is able to rely on her girlfriend and a few others in her life to help her through these family issues.
Rachel Gold	*Being Emily*	When Emily, who was born as Christopher, tells her parents about her desire to live as a women, they send her into therapy, convinced she is ill. She is able to rely on her girlfriend and a few others in her life to help her through these family issues.
Brian Katcher	*Almost Perfect*	When Logan meets Sage he is instantly attracted to her but how will he react when he learns that Sage was born male.
Julie Ann Peters	*Luna*	Regan is an average sixteen year old that is keeping secret the fact that her brother Liam is really a transgender girl named Luna
Ellen Wittlinger	*Parrotfish*	Just like the parrotfish that is born female but becomes male later in life, teenager Grady knows that even though he was born Angela, on the inside he is a boy. He is happy, but not everyone else is, especially his family, and he must rely on the people in his life who support him to move forward.

Using a Video Conferencing Tool in a Face-to-Face Class to Promote Engagement

Miguel Lara
California State University Monterey Bay

Troy Challenger
California State University Monterey Bay

Introduction

Even though the use of computers in university teaching has proliferated and become ubiquitous in the United States, there is a general concern that instructors are using computers just to continue applying the traditional methods of teaching instead of utilizing the technologies in new ways to promote an active learning classroom (Gebre, Saroyan, & Aulls, 2015; Selwyn, 2007). For instance, in a survey conducted by Collis and van der Wende (2002) about the use of technology in higher education, it was found that instructors use mainly Power Point for content delivery in lectures; however, the use of this tool alone has not radically impacted the learning process.

A relative new video conference software called "Zoom" (zoom.us) provides a free online tool that includes several features that have the potential to increase student engagement, such as screen sharing, screen mark up, remote control, and polling (Christopher, 2014). As other video conference tools, Zoom was originally designed for the online environment with the purpose to allow two or more people, who are geographically dispersed, to communicate and collaborate in real time.

Video conferencing tools are very common in online courses, in which they could be used to reduce the feeling of isolation among students (Howland & Moore, 2002) and promote instructor-student and student-student social presence (Gunawardena & Zittle, 1997). Given that students in a face-to-face setting are physically co-located and they can see and hear each other as well as the instructor, the use of a video conferencing tool in this setting might seem awkward in the first place. However, the Center for Academic Technologies at our university is exploring ways for instructors to use it as part of their face-to-face classes. This paper provides a specific example of one of these classes.

Using Zoom in an Internet Programming Course

Internet Programming is an elective undergraduate course of the Computer Science program. The first author of this paper has taught this class every semester for the past 2 years. The class has an average of 32 students, who are mainly in their sophomore or junior year. The class follows a flipped-classroom approach, in which students are asked to watch video tutorials and read the textbook before the class. The class consists of a 30-minute review followed by 70-minute hands-on practice in web development and Internet programming using PHP, JavaScript, jQuery, and HTML5.

The five main features of Zoom used as part of the class were: instructor screen sharing, screen mark up, student screen sharing, remote control, and screen recording. Zoom also provides several other features common to other videoconference programs such as whiteboard, polling, chat, and break out rooms but these features were not utilized.

Instructor Screen-Sharing

A survey was conducted by the end of the semester to students in both sections of the class offered in fall 2015. There were a total of 60 students but only 48 of them submitted the survey. Based on the survey results, 94% of respondents indicated considering that the feature that allows sharing the instructor's screen helped them to understand the topics better and that should be used in other programming classes.

Sharing the instructor screen was indeed the main reason why a video conferencing tool was used in this class: the computer lab has an obtrusive design in which the instructor station is placed in front of the whiteboard, blocking the view of about six to eight students. Several alternatives were explored such as Google Hangout on air

and Blackboard Collaborate. Zoom was selected because it was easier to be installed by the students and set up by the instructor.

The monitors in the computer lab have a display size of 20 inches and a screen resolution of 1600 x 900, which allowed students to use half of their screen to see the instructor's screen and the other half to access their own programs. Some students brought their own laptops and they used the lab's computer to see the instructor's screen and their own laptops to work on the activities.

> While the main goal of using Zoom was for those six to eight students to be able to see the instructors' screen, there was an overwhelming positive feedback by almost all of the students regarding this feature. Some of these positive comments were:
> "*I believe every class should use screen sharing it would allow for better understanding by being able to more clearly see what is being written on the screen."*
> "*I do feel that using screen sharing helped me understand the topic better since I was able to sit anywhere I wanted and still be able to have access to the content*"
> "*I very much enjoyed using Zoom as a regular part of the class. It's much easier to see code right in front of me rather than trying to squint at the screen*."
> *"I think it would be a great idea for any course that involves coding."*

There were no negative comments about using the instructor screen-sharing feature, however, some students did expressed their preference about following the class seeing the whiteboard instead:

> *"I found looking at the large screen in the front of the class the most helpful."*
> *"No, didn't feel it help any better since I was in the class. If i was not in the class it would be helpful."*

Student Screen-Sharing

Zoom also provides the feature to allow anyone attending the video conference session to share her/his screen. Only one screen can be shared at a time, so one must stop sharing the screen first for somebody else to share it. The person sharing the screen can decide whether to share the whole desktop, a whiteboard, or a specific application.

In some classes, students were asked to share their screens for the rest of the group to see their work. The class implements pair programming at least every other week. Pair programming is a technique in which two students work together to write a computer program; one of them writes part of the code while the other one reviews the code being typed and then they switch turns (Williams & Kessler, 2002). Pair programming has been found to increase retention and program quality (McDowell et al., 2006).

Students are randomly paired up and they are assigned a "challenge" program in which they must apply some of the content being covered that week. After a reasonable amount of time is given to complete the requested challenge, students use the screen-sharing feature to share their own screens and to show their code to everybody else. Based on the survey results, 42 out of the 48 students (87.40%) felt that learning was promoted by sharing their code or by seeing the code of their classmates. Some of their positive comments were:

> *"I think my learning did improve by sharing my screen, because once I have to show my code to others, it makes me think more about it."*
> *"Definitely. Seeing how other students had solved the problem was very good. Often they presented a different solution than me, and I learned something new because of it.*
> *"It is very important to see other solutions."*
> *"Yes, because you got ideas about different solutions."*

Those who did not consider that this featured help them mentioned:

> *"Not really, because most of the time it was similar to my screen."*
> *"Not really, I'd rather have the teachers code and explanation"*
> *"Not really… It would be better if I do screenshot of their screens to reference later."*

Remote Control

Through the remote control feature, video conference participants can be given the full control of a remote computer. This feature has the potential to facilitate classroom management because an instructor could give herself the remote control through a mobile device and be able to walk around the classroom, while still having full control to annotate, type, or execute any program in the instructor's computer. Ponce et al. (2015) identified analogous advantages of using iPads with software that provides similar features. They used iPads with a program called Splashtop Classroom and a program called MirrorOp, which allows instructors to annotate the screen remotely through an iPad.

This feature has also the potential to promote engagement since the instructor can give the remote control to students. As part of the Internet Programming class, a collaborative coding activity was conducted at least once per month: A programming challenge was presented to the class and after analyzing it and coming up with a collaborative solution, a computer program was written by most students. Through the remote control feature, random students were given the control of the instructor station, one at a time. Each of them contributed with a few lines of code or functions. This activity also served as a Classroom Assessment Technique since it was possible to identify the overall level of programming skills of the students. Only 32 out of 48 students (66%) felt this feature was helpful in promoting their learning. Some of the positive comments were:

> *"I do feel that my learning has been improved, I feel that all of us as a class have participated, and I learned different ways to do certain tasks by watching my peers."*
> *"It was a good way to allow students to contribute small amounts of code to a single file"*
> *"Yes, due to my classmates and instructors being able to see my mistakes in real time, and help me fix them."*

Most of the negative comments were about feeling too much pressure:

> *"Not very much because I think that I don't learn very much if I am in the center of the attention."*
> *"No, too much pressure"*
> *"Not really, I just had to type things twice since I had to type while i had remote control and on my own screen which sometimes lead to falling behind."*

Screen Recording

The last feature used in this class was screen recording. Zoom provides the ability for anyone attending the session to record the screen, and the instructor can also record the screen. In either case, the recordings are saved into the local computer in MP4 format.

Every class was recorded and uploaded to YouTube. The links to the recordings were then made available through the Learning Management System. The recordings helped a student with special accommodations and also students who missed the class. Based on the survey results, just 14 out of 31 students (45%) watched at least one of the recordings. Their comments about whether they had watched the recordings were:

> *"I have watched almost all of the class recordings, even if I missed class. I have a hectic schedule and sometimes have to decide to miss a class in order to study/finish an assignment for another, so it is great to be able to catch up on my own time over the weekend by watching the recordings."*
> *"Yes I looked at all the recordings to review the material and understand the material better."*
> *"Yes, especially when I was absent or when a topic was not clear enough for me, I was able to go back a see the lecture again."*
> *"A few, mostly to catch up on stuff the powerpoints couldn't explain."*
> *"Just one time. Because, there was something that I didn't catch up, so I watch the video for catching that"*

Conclusions

As with any other hard technology, the use of this videoconferencing tool should be carefully planned and integrated within the classroom activities. There are a few other features that could also be explored such as a whiteboard and a polling feature. There are many other free tools that provide some of these features as well, such as screen recording. The advantage of using this tool is to avoid having to switch between several applications.

In summary, based on the positive feedback from students, we believe that this free online videoconference tool might have some potential to promote engagement and facilitate learning in programming classes and perhaps

in other disciplines as well. Indeed, the semester right after this class was taught, students who took this class started asking other instructors about the possibility of using this tool in their classes as well. Currently, there are five instructors who are using Zoom in a variety of ways.

For instructors who decide to use this tool as part of the face-to-face courses, it is highly recommended to setup a new videoconference session in which participants are not allowed to stream video, since this could be highly distracting as students are seeing each others' video feeds in their screens. Audio must also be disabled to prevent static noise and echo.

References

Christopher, D. (2014). The Successful Virtual Classroom: *How to Design and Facilitate Interactive and Engaging Live Online Learning*. AMACOM Div American Mgmt Assn.

Collis, B., & van der Wende, M. (2002). *Models of technology and change in higher education. An international comparative survey on the current and future use of ICT in higher education*. Twente: CHEPS, Centre for Higher Education Policy Studies.

Gebre, E., Saroyan, A., & Aulls, M. (2015). Conceptions of Effective Teaching and Perceived Use of Computer Technologies in Active Learning Classrooms. *Executive Editors*, *27*(2), 204-220.

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer mediated conferencing environment. *American journal of distance education, 11*(3), 8-26.

Howland, J. L., & Moore, J. L. (2002). Student perceptions as distance learners in Internet-based courses. *Distance education, 23*(2), 183-195.

Lavandera Ponce, S., Bemposta Rosende, S., Villalba de Benito, M. T., & Escribano Otero, J. J. (2015). *Experiencias de uso de la tablet en el aula*.

McDowell, C., Werner, L., Bullock, H. E., & Fernald, J. (2006). Pair programming improves student retention, confidence, and program quality. *Communications of the ACM, 49*(8), 90-95.

Selwyn, N. (2007). The use of computer technology in university teaching and learning: a critical perspective. *Journal of Computer Assisted Learning,* 23(2), 83-94.

Williams, L., & Kessler, R. (2002). *Pair programming illuminated.* Addison-Wesley Longman Publishing Co., Inc.

Trends and Issues in Instructional Technology and School Library Media Educator Preparation Programs: A Roundtable Discussion

Kelly Paynter

Jimmy Barnes

Jacksonville State University

Abstract

Teacher preparation programs at institutions of higher education must evolve continually to meet industry, pupil, and technological demands. Two fields that have seen incredible change since their inception include School Library Media and Instructional (Educational) Technology. Although two separate programs of study, and occasionally, fields of certification, these concentrations often intersect regarding subject matter and candidate pools. Participants at this roundtable will deliberate issues, trends, and opportunities for these fields. Topics will cover ideal educator preparation program makeup; what students wish to obtain from these degrees; and the trajectory of related professions, viewed through a lens of recent research in the field.

Introduction

Colleges and universities are responsible for preparing students sufficiently for changing roles in a changing world. Two fields of study, Instructional Technology (IT) and School Library Media (SLM), have evolved considerably and are subject to regular updates, modification, and realignment with industry trends and student needs. The focus of this roundtable is to conduct productive conversations among interested parties who can help to shape an agenda for these programs. Viewing each program through the lens of current research, fruitful discussions about the implementation of theory into practice will be conducted to help refine the vision of these programs.

Instructional Technology

Integrating technology into teaching is not a new concept, yet for many school districts and educators, its potential remains untapped. School leaders struggle with the placement and integration of technology personnel—should they create separate school- or district-based positions or equip individual teachers with the needed skills? Donaldson (2012) defines IT in terms of the ethical creation, use, and management of resources to increase learning and improve performance. How, then, can colleges and universities meet this challenge when the model of implementation varies across districts, schools, and states?

Instructional technologists are expected to be proficient in a variety of areas. These include software, graphics, instructional delivery, programming, curriculum planning, learning management systems, purchasing decisions, and keeping up with new advances in technology (Davies, 2010; Ritzhaupt, 2014; Sugar & Holloman, 2009). In addition to technical prowess, successful individuals should become proficient in soft skills like time management, prioritizing, teamwork, and delegation. Such competencies will vary in scope, however, depending on the current roles of the people using IT in their jobs. A classroom teacher might emphasize the development of competencies such as course management software and instructional design abilities, while an individual employed at the district office might prioritize the managerial and teamwork competencies.

With the various roles that an instructional technologist should master, it can be difficult for schools of education to decide upon a focus for their IT programs. Should classwork aim to equip classroom teachers to become embedded technology leaders in their current positions? Or should assignments focus on what students will need to know should they become district technology leaders? Due to the sparsity of technology leadership positions, many classroom teachers will never get to work in an administrative position, but perhaps technology leadership principles can be applied directly in the classroom?

Some universities have made their masters-level instructional technology programs practitioner-focused and their specialist or doctoral-level programs leader-focused. What, then, of the individual who has already earned a master's degree in another field (such as Elementary Education) but who wants to pursue a specialist program in

Instructional Technology? How can professors ensure that this student receives a solid foundation in the skills s/he would have earned via a masters in IT? These questions must be addressed in order for institutions of higher education to maintain a focus for their IT programs.

Some authors (e.g. Selingo, 2015) have commented upon the trend of a purposeful "student swirl" in undergraduate programs of study; that is, students decide to take various classes that meet their needs across multiple institutions. Could graduate programs be the next logical extension of this movement? If students do not find the perfect IT program that meets their needs, might they take classes a la carte across various institutions? Of course, graduate programs generally allow students to transfer in far fewer classes than undergraduate programs, but in the technology world, certifications and professional learning units often count as much as degree themselves (Rob & Roy, 2013), so some graduate students may not consider degree completion to be to sole benchmark of success.

Another trend in the undergraduate arena is the idea that technology should be infused with teacher preparation, not taught as a stand-alone course. For example, Arizona State University's College of Education faculty "decided to drastically change the way [they] would address teaching and learning with technology—moving from a stand-alone technology integration course to a programmatic approach where technology is infused into content methods courses" (Foulger, Wetzel, Buss, Lindsey, & Pasquel, n.d., para. 1). While is this more easily conceptualized in undergraduate programs, how might this mentality affect graduate IT programs?

School Library Media

SLM preparation programs have experienced great shakeups in the past 15 years. Coatney (2010) believes that librarians struggle to maintain focus as either artists (teachers, curriculum programmers, planners) or scientists (researchers, materials managers, organizers). In reality, a 21st-century librarian must be adept at both of these roles. Johnston (2015) believes that the roles of the library media specialist and the instructional technology specialist have become fuzzy. The two jobs often overlap, and sadly some librarians and school-based technology coaches choose to compete instead of collaborate.

Many universities survey recent graduates about their experiences both as students and as new employees. What do new school librarians find most and least valuable about their classwork? de Groot and Branch (2011) found that graduates valued coursework about technology, leadership, research, advocacy, and evidence-based practice. They wanted more coursework about assessment, supervision of support staff, co-teaching, literacy development, copyright, and electronic publishing. Concepts of cataloging and print reference were criticized as being outdated.

At a recent conference for teacher educators, K. Paynter and J. Barnes (personal communication, March 23, 2016) had a discussion with some attendees who had completed SLM preparation programs. When asked what they wished they had learned more about while in library school, the respondents indicated a lack of preparation in proposal and grant writing; 1:1 initiative device management; non-instructional technology management (such as circulation of iPad carts or using a green screen); management of and interpersonal communication with student aides, parent volunteers, paraprofessionals, and/or other library media specialists; practical implementation of co-teaching; and how to use library circulation systems for specialized tasks, such as inventory and reports. These individual indicated a belief that SLM programs occupy a unique spot in the education preparation spectrum due to their focus on literacy instruction, but they also felt that a dual major in both IT and SLM was very beneficial to the modern library media specialist. They felt that IT degrees had more emphasis on instructional design than did SLM degrees.

Several publications offer suggestions about future topics and directions in librarianship. A recently-developed doctoral program for librarians includes classes in Frameworks for Best Practices, Strategic Leadership, and Inquiry and Research (Howard, 2015). Some believe that training to work as a virtual (online) librarian is needed (Hallstrom, 2013). Franklin (2011) promotes the idea that librarians should do more for special needs populations. School librarians need more instruction in local school leadership, technology leadership, and school improvement practices, according to Dotson and Jones (2011). Bell (2014) recommends that graduate schools equip librarians to become master problem-solvers.

Roundtable Questions

The following guiding questions will be used to promote discussion at the roundtable.

1. Briefly introduce yourself and describe how you are interested in and/or work with IT or SLM.

2. What new initiatives or changes regarding these two fields have you personally witnessed?
3. How do you feel institutions should encourage change in these fields, or how do you feel these programs are stagnant?
4. What industry trends might impact these programs?
5. What threats or opportunities do you perceive for IT and/or SLM programs?
6. How can schools of education structure IT programs so that they meet the needs of both classroom-based and central office-based individuals?
7. How should IT and SLM programs coexist? What are their areas of convergence and divergence?
8. How can IT preparation programs meet the needs of those students who are not current K-12 teachers?

Conclusion

Although examining the literature regarding the needs of IT and SLM educator preparation programs is useful, it is also very beneficial to have face-to-face meetings with professionals in the field. Through the use of guided questions, this roundtable will offer a place in which to have these critical conversations. After all, collaboration and communication are two skills that are highly valued by both library media specialists and instructional technologists.

References

Bell, S. (2014). MLD: Master's in library design, not science. *Library Journal, 139*(20), 1.

Coatney, S. (2010). The blind side of leadership, or seeing it all. *School Library Monthly*, *27*(2), 38-40.

Davies, P. M. (2010). On school educational technology leadership. *Management in Education, 24*(2), 55-61. doi:10.1177/0892020610363089

de Groot, J., & Branch, J. L. (2011). Looking toward the future: Competences for 21st-century teacher-librarians. *Alberta Journal of Educational Research, 57*(3), 288-297.

Donaldson, A. (2012). 'What exactly is it that you do?'. *Techtrends: Linking Research & Practice to Improve Learning, 56*(3), 3-4. doi:10.1007/s11528-012-0565-5

Dotson, K. B., & Jones, J. L. (2011). Librarians and leadership: The change we seek. *School Libraries Worldwide, 17*(2), 78-85.

Foulger, T., Wetzel, K., Buss, R., Lindsey, L., & Pasquel, S. (n.d.). *Technology infusion in teacher preparation*. Retrieved from http://asutechinfusionproject.weebly.com/

Franklin, R. E. (2011). Before the bell rings: The importance of preparing pre-service school librarians to serve students with special needs. *Knowledge Quest, 39*(3), 58-63.

Hallstrom, J. (2013). Building it together: Life as a virtual school librarian. *Library Media Connection, 31*(5), 22-23.

Howard, J. K. (2015). The evolution of NxtWave. *Knowledge Quest, 43*(4), 16-21.

Johnston, M. P. (2015). Blurred lines: The school librarian and the instructional technology specialist. *TechTrends: Linking Research and Practice to Improve Learning, 59*(3), 17-26.

Ritzhaupt, A. F. (2014). Development and validation of the educational technologist multimedia competency survey. *Educational Technology Research & Development, 62*(1), 13-33.

Rob, M. A., & Roy, A. (2013). The value of IT certification: Perspectives from students and IT personnel. *Issues in Information Systems, 14*(1), 153+.

Selingo, J. J. (2015). *The student swirl becoming more of a norm in higher ed*. Retrieved from http://www.sr.ithaka.org/blog/the-student-swirl-becoming-more-of-a-norm-in-higher-ed/

Sugar, W. & Holloman, H. (2009). Technology leaders wanted: Acknowledging the leadership role of a technology coordinator. *TechTrends: Linking Research & Practice to Improve Learning, 53*(6), 66-75.

The Added Value of Conducting Learning Design Meeting to the Online Course Development Process

Denise Shaver

Abstract

Do you find it challenging to have discussions with instructors about designing online courses and best practices in teaching? This article will highlight key components to conducting effective Learning Design Meetings. It outlines techniques used by our institution in engaging faculty in a discussion regarding better use of Learning Management Systems (LMS), storyboard layout, learning outcomes, student engagement, learning activities, formal assessments, and content delivery. Learning Design meetings have proven to be a compelling manner of decreasing faculty resistance while exposing instructors to best practices in pedagogy, andragogy, and online learning. Instructional Designers (IDs), Instructional Facilitators (IFs), and Course Authors who work in higher educational online settings should find this information useful. Novices in the field may find these practical techniques particularly beneficial.

Introduction

In fall of 2014, Andrews University, a small faith-based Midwestern university introduced a new process for online course development. This process included the use of Instructional Designers and Instructional Facilitators to shepherd course authors through the online course development process. The Course Author Manual was designed to detail prescriptive steps in the process for Course Authors. A corresponding Instructional Facilitator Manual was made for Instructional Designers and Facilitators to remember the actions that should transpire preceding and subsequent actions for each step. The Learning Design meeting is the second step in our online course development process. This meeting helps to set the tone for success, reduce faculty resistance to the process of online course development, and increase the rates of timely completion of online courses. Motivated by the need to find more effective ways for successful and appealing online course development, this paper explains the added value of our institution through the inclusion of Learning Design meetings in our online course development process. A description of the implementation of this meeting is the focus of this article. Anecdotal evidence of the meeting's success will be provided.

Context

Our institution is a small, liberal-arts, faith-based university located in southwestern Michigan in the United States. The on-campus student population is comprised of approximately 3,500 undergraduate and graduate students. Online student enrollment is 698. The trend for online education in America continues to grow. According to Waldis, Waldis, & Hatchey (2014), more than 30 percent of four-year college students and over 60% of community college students will take at least one online course. In sync with this educational trend, Andrews University currently offers 5 online programs with online courses offered in a variety of schools. It is estimated that nearly 350 online courses will be offered in the coming semester. Since the demand for online learning is growing at our institutions systems and personnel had to be put in place to meet the need.

Background

One of the ways the institution rose to meet the growing demand for online courses was the hiring of Instructional Designers and Instructional Facilitators. Dick and Ives (2008) described the work of an Instructional Designer as a design process and stated that it is "a conversation between designer and client, and extends it by focusing our lens on the skills that the designer employs to guide these conversations" (p. 69). This is a correct description of the work of the Instructional Designers at this institution. IFs within our school context are largely education doctoral students or graduate students with educational training and teaching experience who work under the supervision of the Lead Instructional Designer. Their primary responsibility is to guide instructors through the course development process and support them throughout the semester.

A guiding principle for implementing Learning Design meetings is for the IDs and IFs to listen to the instructor's goals and vision for the course. This invites a dialogue with the instructor and helps to eliminate presuppositions from the IDs and IFs regarding the course. The art of persuasion is the key to success in this type of meeting. Allowing the instructor's experience and opinion to drive the course development process leads to a more congenial working relationship. A relaxed atmosphere infused with humor and understanding disarms even the most resistant or reluctant participant.

Rationale

Instructors unaccustomed to online delivery modes often find the creation of an online course long, difficult, and frustrating. These attitudes can manifest themselves in overt or covert resistance. In his work on online course development and delivery McNeal (2015) found the following reasons for faculty resistance to online course development from faculty and administrators: 1) limited faith in the validity of online courses, 2) a way to undermine face-to-face enrollment, 3) the erosion of the traditional curriculum, and 4) an inherent advantage for the faculty offering the course. Upon embarking upon this process, our team encountered all of these reasons for resistance to an online course development process. An appealing and disarming approach to course development had to be introduced to counteract many of the pejorative dispositions to the online course development.

The course development process seeks to promote best practices in online teaching by producing courses most conducive for effective online learning. A Learning Design Meeting is the second meeting in our process and is intended to help course authors transfer face-to-face learning experiences to dynamic online delivery or to design an exclusively online class offered for the first time. The intent of the whole process is to create a supportive environment that encourages, rather than impedes creativity and authenticity. Often, the result of this recursive procedure is the development of a dynamic learning relationship between the teacher and the IDs and IFs.

This process organically arose from the challenges presented by the existing online development process. It was a natural outgrowth of the plethora of online delivery unawareness. In addition to the traditional campus, our university serves an international audience and has participated in distance education for over 50 years through correspondence courses. The transition from correspondence courses to online delivery resulted in online, self-paced courses. Since most instructors were accustomed to face-to-face educational delivery, most of them were unfamiliar with the best practices in online course development and teaching. A systematic process was needed to scaffold teachers interested or involved in teaching online in order to improve the quality of courses being offered.

The first two years of online course design support were chaotic and frantic. From an analysis of those failures and successes, a process was created that encompassed both the detailed procedures and steps of development inclusive of a backward design of course design. Internal resources such as an increase in manpower, the hiring of an Instructional Designer, and a team of Instructional Facilitators increased faculty support. An external consultant was contracted once the process was piloted to assist in finalizing the documents. The two documents that were created for this process was the Course Author and Instructional Facilitator Handbooks which provides the sequential operations of the course development process. These have been proven to be invaluable tools.

Theoretical framework

The inspiration for this instructional design technique emerged from a review of the literature. Kemp, J. E. (1977) *Instructional design: A plan for unit and course development* and Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience and school*. The ADDIE and KEMP instructional design models were adopted after explorative analysis. The ADDIE model consists of five cyclical phases: analysis, design, development, implementation, and evaluation. The Kemp model is a continuous process of planning, design, development, and assessment.

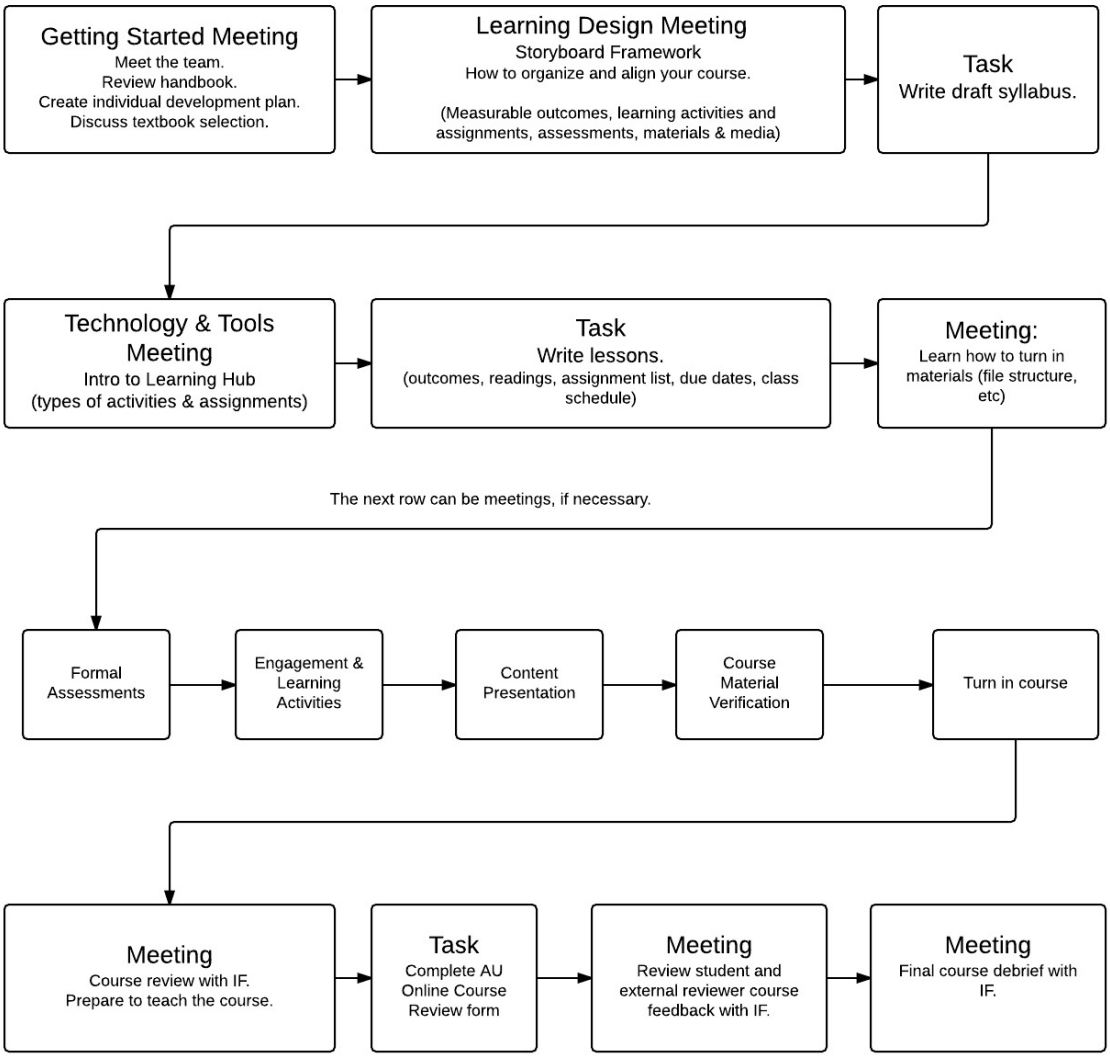
Phase one and two of the ADDIE model, the analysis and design phase, heavily influenced the creation of these procedures. In conjunction with the analysis phase of the model, our institution hones in on the establishment of course instructional goals and objectives and ascertains the level of the instructor's online instructional knowledge. From the design phase, the IFs target revising course outcomes, designing engaging activities, identifying the most appropriate types of assessment, content delivery, and begin exploring the use of educational technology tools. IFs also arrange for necessary educational technology tools training. One ID specializes in educational technology tool training. The most common sort of training is LMS-use training and video conference training. Other training tools are incorporated as required. This instructional design approach also incorporates the planning cycle from the KEMP model.

The KEMP model is a holistic approach to instructional design. The planning phase of the model involves the evaluation of the tools and resources pertinent to effective teaching and learning (Forest, 2016). Implementation of this phase is the target of the Learning Design Meeting. It aims to motivate Course Authors to create significant learning experiences online by aligning student outcomes with learning activities and meaningful assessments. Learning design meetings help to set the tone and expectations for the design process.

Online Course Development Process Flowchart

Purpose:
To assist course authors and instructional facilitators (IF) with a roadmap to effectively develop and deliver quality instruction online.

Timeline:
From the initial meeting until the course launches, plan for a minimum of six months in order to create a quality course that adheres to Andrews University online standards.



Novices can be overwhelmed with new information and experts learn differently than novices. Higher education faculty are typically novices at teaching principles and therefore, may need assistance with the design of learning (Bransford, Brown, & Cocklin, 2000). In 2014, our institution launched a comprehensive system of online course development support that involved the use of an Instructional Designer and Instructional Facilitators (IFs). Each Course Author is assigned an Instructional Facilitator tasked with the following duties: serve as the primary point of contact between the course author and the rest of the development team, introduce storyboarding and its importance in online course development and guide the instructor on the most appropriate storyboard for their instructional approach, provide training in outcomes and alignment, identify various types of online assessments, and determine content delivery style. Based on the experience and knowledge of the instructor, the selection of online instructional tools may be discussed. The IFs work under the supervision of an Instructional Designer.

Our online course development process is informed by the constructivist approach to teaching. It is widely understood in the educational arena that the constructivist approach to teaching involves empowering students to construct their own. Hunter (2015) affirmed that the constructivist perspective of teaching that students construct their own knowledge through mental representations and cognitive organizations of body of knowledge has a long history. Julie Carwile (2007) provided a greater insight into a constructivist approach to teaching online. She stated that constructivists' approaches to teaching online should include encouraging students to create their own questions, providing a variety of avenues for students to express their views, and including collaborative elements. The discussion forum, in her view, is a medium which can be used to accomplish all of these tasks and more. All of the components play an integral role in our online course process.

The Understanding by Design (Wiggins & McTighe, 2005) framework to curriculum, assessment, and instructional design also helped to inform this process. This three-pronged framework includes 1) identifying the desired results, 2) determining assessment evidence, and 3) planning learning experiences and instruction. After an extensive discussion on how to create clear, measurable outcomes, a dialogue on assessment ensues to achieve outcome metrics. Finally, the identification of learning activities which are content- and level-appropriate and conducive for the online learning environment is made.

Implementation

The term Course Author is used because not everyone who designs the course will eventually teach the course. Content experts who are often full-time faculty may author the course, but not have time or be desirous of teaching an online curse. The meeting takes place between the Course Author, Instructional Designers, and the Instructional Facilitator assigned to the course. Determining the storyboard layout and review learning outcomes, formal assessments, student engagement and learning activities, and content delivery are the goals for this meeting. Most instructors are familiar with most of the terminology presented. Even beginning teachers face-to-face or online are knowledgeable about educational jargon such as outcomes, assessments, and learning activities.

After a brief discussion on how on teacher and student introductions, a review of student learning outcomes occurs. Though most teachers are familiar with writing student learning outcomes, our desire is to achieve objectives, a more precise description of the outcomes for the course, and outcome and activity alignment. Though both goals seem easily accessible, they are often a time-consuming, yet meaningful experience for both parties. Once clear-cut outcomes and activity alignment are achieved, we proceed to the next step. Using a backward design also allows us to review assessment items or ideas.

Since backward design admonishes you to begin with the end in mind, assessment is the next topic. Assessment is the significant ways in which one measures outcomes. They include, but are not limited to, exams, research papers, presentations, and projects. Starting with assessments helps Course Authors determine if their preselected assessments are good measures of student learning. Assessment discussion also fosters the much needed discussion on rubric generations and writing clear instructions. Teachers often omit the creation of rubrics, but using rubrics helps both the teacher and the student to understand expectations and evaluation criteria.

The vocabulary which appears to be least familiar to course authors is storyboarding. Storyboarding is the manner in which instructors are guided to organize their course in the LMS. Course Authors are presented with three story board framework options: time-based, conceptual, and project-based. These options include the same elements in different formats. It allows the Course Author to contemplate the overarching approach to course delivery. Time-based, as the name suggests, informs the learner on when items are due. Conceptual layouts highlight the importance of the concepts or topics that will presented. Project-based frameworks help the instructor design courses that assist students in developing the projects in stages, rather than at one particular time. This allows students to submit segments of their projects as part of the learning activities. This approach to project-based learning allows students

to complete their project incrementally and provides opportunities for teacher feedback and mastery of each section of the project.

Time-Based Storyboard Framework

	Dates	Measurable Outcomes	Assessment	Activities & Assignments	Content	Tools
Week 1						
Week 2						

Conceptual Storyboard Framework
Concepts are used where the textbook has 6 to 8 chapters instead of 15-16. Or where there are less than 10 big concepts. Or where there are 20-30 concepts.

	Weeks / Dates	Measurable Outcomes	Assessment	Activities & Assignments	Content	Tools
Concept 1						
Concept 2						

Project-based Storyboard Framework
Project-based courses are organized around one or more big projects or real-world experiences. This Storyboard Framework is partially completed to show how it could be organized.

	Essay #1	Essay #2	Essay #3	Other Supporting Activities
Date(s)				
Measurable Outcomes				Use library resources to support writing.
Assessments				
Activities & Assignments	Draft Essay Peer critiques Final Essay			Library scavenger hunt MLA lesson Evaluate online sources
Content				
Tools				

Online course development at our school contains all of the previously mentioned constructivist elements. Course Authors are guided to create inquiry-based activities, design multiple avenues of student expression, and collaborative assignments. Use of discussion boards or some alternative form of group communication for interactive courses and blogs for self-paced offerings are a required part of our school's online standards for teaching online. Course authors are emboldened to find creative uses for discussion forums. The following are standard suggestions for innovative discussion board use:

Discussions	Case Studies	Faculty Office	Portraits
Role Plays	White Paper Analysis	Student Center	Interviews
Group Work	Class Introductions	Peer Review	Polling
Literature Circles		Jigsaw Teaching	Debates

This conversation regarding discussion forums provides IDs and IFs with another avenue to assess the author's knowledge about assessments, including interaction and collaboration with or without the use of educational technology tools. Once adequate knowledge regarding the Course Authors experience and comfort with using discussion boards has been ascertained informed decisions can be made. These dialogues also engender another chance for IDs and IFs to facilitate gently the reception to new ideas, concepts, and approaches to teaching.

Conclusion and Further Research

Two years of applying this process to online course development at our school has yielded bountiful results. Instructors have a clearly delineated procedure for completing the task. Having a clearly defined process has reduced frustration and increased productivity. The Learning Design meeting is the heart of this process. This meeting lays the foundation for the expectation of excellence in the product. This meeting also helps to reinforce the time-consuming commitment it will take to produce an online course.

Instructors often comment on how the information in this meeting has illuminated their understanding of course design at large, either face-to-face or online. Many of them comment on how the ideas learned in the meeting will not only be added to their online course, but to the face-to-face version, as well. Another benefit of the meeting is the potential for relationship-building. This meeting gives instructors' information and techniques that have immediate applicability. Since the online course development process is often long and arduous, information that contains short-term functional usefulness increases the value of process and can forge an important bond of trust and respect between the IDs, IFs and Course Author.

Pedagogical insights help teachers grow in the art of teaching. These meetings attempt to infuse best practices in pedagogy, andragogy, and online learning. Course authors usually leave the meeting with a spirit of gratitude for the knowledge which they obtained. Comments on how empowered they feel as teachers are not uncommon at the conclusion of the meetings. A running theme throughout the Learning Design and all of the meetings in our procedure is support.

A goal for the IDs and IFs is that every Course Author leaves every meeting with full reassurance of support for achieving every task. From outcomes to assessments, the commitment is to assist the instructor with needed support from beginning to end. This is evidenced by helping to rewrite outcomes and demonstrating how to construct rubrics during the meeting. Follow-up meetings are often scheduled prior to the conclusion of the time together. Observations and experience confirm that these meetings so set the tone for success that intransigence and inflexibility regarding the process are significantly eroded. Though this meeting does not reduce the time-consuming and challenging nature of online course development, it improves receptiveness to it.

Additional research will enhance and validate the Learning Design Meetings contribution to effective online course development and faculty resistance to the process. Quantitative and qualitative data should be collected to get further insight into the value-added to instructors and on the complete development process. Surveys should be distributed and focus groups created to capture the faculty experience and growth

Works Cited

Bransford, J. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.

Carwile, C. (2007). A constructivist approach to online teaching and learning. *Inquiry, 12*(2). 68-73. Retrieved from http://files.eric.ed.gov/fulltext/EJ833907.pdf

Dicks, D., & Ives, C. (2008). Instructional designers at work: A study of how designers design. *Canadian Journal of Learning and Technology*, *34*(2). Retrieved from http://files.eric.ed.gov/fulltext/EJ1073839.pdf

Forest, E. (2016). Educational Technology. Retrieved from http://educationaltechnology.net/kemp-design-model/

Hunter, B. (2015). Teaching for engagement: Part 1--Constructivist principles, case-based teaching, and active learning. *College Quarterly*, *18*(2). Retrieved from http://files.eric.ed.gov/fulltext/EJ1079230.pdf

Kemp, J. E. (1971). *Instructional design: A plan for unit and course development*. Belmont, CA: Fearon. Retrieved from http://www.instructionaldesigncentral.com/htm/IDC_instructionaldesignmodels.htm#addie and http://edutechwiki.unige.ch/en/Kemp_design_model

McNeal, R. B. J. (2015). Institutional environment(s) for online course development and delivery. *Universal Journal of Educational Research*, *3*(1), 46-54.

Wiggins, G. P., & McTighe, J. (2005). *Understanding by design* (Expanded 2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development. Retrieved from http://catdir.loc.gov/catdir/toc/ecip0422/2004021131.html

Wladis, C., Wladis, K., & Hachey, A. C. (2014). The role of enrollment choice in online education: Course selection rationale and course difficulty as factors affecting retention. *Online Learning*, *18*(3). Retrieved from http://files.eric.ed.gov/fulltext/EJ833907.pdf