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From the Editor

This year we celebrate the fifth anniversary of The Excellence in Education Journal! It is exciting to see how the journal has grown and developed since its founding. We have grown to having 15 international reviewers, an increased web presence, two issues per year, and over 10,000 hits per year to our website. Authors week out our journal for their manuscript submissions specifically because of the mission of our journal. I would like to extend a special thanks to the reviewers who faithfully serve the journal and the authors whose work we have published over these past five years.

The Excellence in Education Journal is an open access, refereed, online journal that promotes and disseminates international scholarly writing about excellent practices in all aspects of education. The goal is to share these practices to benefit the education of children and adults worldwide**.** For this reason, there are no publications fees and the journal is available free of charge on the internet. Typeset and graphics are intentionally simple in order that the journal can be more easily accessed worldwide to fulfill the mission of the journal.

We were pleased to have received many submissions for this issue. I would like to thank those who submitted manuscripts for this journal, the review team for their work in reviewing these submissions, and the authors whose writing is published herein. Additionally, I would like to thank Li Cheng, M.Ed., for assisting in the editorial process

This issue focuses on both excellent practices as well as reshaping current practices to attain excellence.

I hope that the excellent practices discussed in this journal will be helpful to those who are involved with education of children and adults worldwide.

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Founder and Editor
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Reviewers

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TABLE OF CONTENTS

A Study of Student Interaction with Online Course Content Provided Through a Learning Management System in a High School Science Classroom: Implications for Educators

Mark Furda and Deb Straka

Abstract

This study investigated student perceptions of a Learning Management System (LMS) and student levels of participation and interaction with course content provided by the LMS in a high school science classroom. A survey was administered to 122 students in a traditional high school, measuring student perceptions of course content provided through the LMS. Statistical data on LMS usage by student participants was compiled from the embedded tracking tools including overall time on the LMS, time of day of student access, and average hourly student use of the LMS. The findings of this study lend support for the benefits of learning management systems and access to online learning content as a means to engage students.

Dr. Mark Furda is an Associate Professor and Director of Graduate Education at the Franciscan University of Steubenville. Prior to taking on his duties at Franciscan, Dr. Furda was a long time school administrator, serving as an assistant principal, principal, assistant superintendent, and superintendent. Dr. Furda continues to be involved in public education through grant writing and consulting.

Deb Straka is a long time public school science teacher with over 20 years' experience in the field in both the private and public school settings. Straka earned her MS Educational Administration degree from Franciscan University of Steubenville in 2014.

The 21st Century classroom has a strikingly different landscape than the traditional classroom setting; technology perhaps the most obvious reason. Education in the current K-12 setting can take on many formats. Traditional models in the face to face setting still dominate. However, technology has been the springboard for a variety of new instructional delivery systems. The prevalence of technology in schools has mirrored that of its emergence in society. In fact, it will account for over half of a district's educational resources over the next three years (Meyer, 2014). Synchronous and asynchronous charter public and non-public schools have grown rapidly. Additionally, hybrid or blended classrooms, where a portion of the instruction is delivered outside the traditional setting, have gained popularity as well. While these new models of education have increased in availability due to the prevalence of technology, traditional K-12 schools have responded in various ways to the availability, demand, and need for instructional technology as well.

Many schools have adopted Learning Management Systems (LMS) to add an online presence to their traditional classroom settings. "An LMS is a robust piece of software that provides an online portal for classrooms, serving administrative functions for educators and allowing students to view assignments, grades, and learning materials" (Ash, 2013). These LMS's can carry a hefty price tag in an era when many school districts are facing serious budget constraints. In the current era of high stakes testing and accountability, the reliance on technology has increased. Educators are looking for the most effective and efficient means to increase student achievement. Thus, it is important to study the impact of learning management systems in order to determine their worthiness. School leaders need to know whether or not the money they pour into technology tools, such as learning management systems, do indeed have the desired impact. Do the costs justify the benefits?

The purpose of this study is to investigate whether the implementation of a learning management system might increase student participation, use of resources, and student time on task for content review and assessment preparation in a high school science class. This study attempts to affirm student activity with class content delivered through a learning management system in a traditional school setting. In addition, the study seeks to identify whether or not students will report a preference for using learning management system tools over traditional assignment and study methods, and whether or not students perceive the LMS as beneficial.

Support for providing learning content online might begin with the notion of recognizing today's students as digital natives. Current students are more knowledgeable than many of their teachers when it comes to technology. Prensky (2001) coined the terms "digital natives" to describe students and "digital immigrants" to describe teachers with this notion in mind. These digital natives have been raised in a digital environment that has shaped how they think, behave, and act. Digital natives have a special skill set related to visually-orientated technologies as well as visual communication (Brumberger, 2011). Therefore, an expectation and acceptance of technology usage in schools among digital natives has emerged (Gu and Guo, 2013). By the time students arrive in middle school, they are competent in information retrieval from the internet, using You Tube to learn new skills, and participate daily in social networking sites to connect to other teens. Traditional curriculum in the classroom does not frequently use these skill sets and many teachers do not possess them as they are digital immigrants, meaning that they are learning these new technologies. Teachers are not always comfortable implementing the new technologies into their lessons. Educators must bridge the gap between students' at-home use of their devices to the use of electronic devices in the classroom (Downes and Bishop, 2012). Teachers should change their methodologies to include less step by step content and increase the

random access of content. Today's students are not the same as those the current educational system was designed to teach. With this in mind, the context for a shift in the traditional educational paradigm is established (Prensky 2001).

The traditional delivery system of curriculum in high school classrooms of the United States is evolving into a system of convenience, personalized instruction, and rapid student assessment. Classroom content placed online provides many benefits for students as well as teachers. The top two student-perceived benefits of using an online learning product are the provision of online tools to supplement classroom learning and to extend the learning beyond the brick and mortar classroom. The top two teacher-perceived benefits of using an online learning product are the provision of online tools to supplement classroom instruction and the ability to individualize instruction (Eduviews, 2009).

Providing an online instructional component to the traditional classroom often is a result of teacher desire to increase student time on task and increase interaction with class content. Most researchers agree that there is a postive relationship between time on task and student achievement. However, the quality of time on task must be optimized. While educators generally agree that time-on-task, or that time an individual student devotes to subject content, is essential to academic success, they will also agree that not all time-on-task is equal. A study of online adult learners and their performance was conducted to determine when the best quality of time-on-task could be achieved. (Romero & Babera, 2011). The authors of this study investigated the impact of quality versus quantity of time-on-task in an adult online course. They also wanted to see if there was a correlation between the time of day and quality of time-on-task. Recommendations from the authors for online institutes who are structuring a new course are to set the class schedule as flexible as possible, and to use as many asynchronous group activities as

possible; allowing participants to work on the project at a convenient time of day to assure quality time-on-task.

Although this study was gathering data for a way to increase the quality of time-on-task for adult online learners, it has value for the teachers and administrators who are considering how to best leverage instructional technology. Some studies suggest that high school students would perform better if school started later in the day (Jacob and Rockoff, 2011). If this is the case, then online learning content can afford students the opportunity to access content at a time that optimizes their opportunity to learn.

Learning management systems (LMS) are becoming an essential tool for providing online learning content and assessments to college and high school students in the United States. Henke (2007) approached the subject of online education from the perspective of students, educators, and parents. The online instruction discussed through the report was provided through a learning management system that offered the students an online site to allow interaction between teacher and student as well as peer interactions. The study revealed a need for different services to be provided as requested by students. Students in middle school focused on receiving extra help from the online components in their classes and the ability to work at their own pace to master the concepts, while high school students preferred specialized online courses and the flexibility to work around their schedules. The option to personalize the pathway to education via a learning management system is one reason for the increased positive attitude toward online options. These valuable experiences provided by an LMS are important to students and parents since these experiences continue in college and in the workplace.

A positive attitude toward any learning, including learning accomplished via the internet, is essential for student success. A study on high school students' views on blended learning focused on attitude changes of students after participating in a blended learning curriculum for a 10 week period (Yapici and Akbayin, 2012). The goal of the study was to see if students had a positive attitude toward the blended learning model and preferred it over the traditional face-to-face model. The conclusions reached in the study were that the test group had a high positive attitude to the blended learning model and the students particularly preferred aspects such as online practice tests, access to lessons and assignments during times that fit their schedule, and an increase in acquiring background of subject matter from watching posted videos and animations.

The focus of a study on Blackboard usage and student achievement (DeNeui and Dodge, 2007) was to find a relationship between frequency of usage and increase in exam scores. Participants in this study included 80 students enrolled in an Introduction to Psychology course at a medium-sized university in northwestern United States. The class was a traditional face-to-face format but with an online component that gave students access to all handouts, assignments, study guides, exam reminders, and email contact with instructor. While use of the online component was not required, it was encourage by the instructor. Data for the study was collected through the tracking options built into the Blackboard interface and accessible to course instructors. To determine student achievement on exams, the scores of three exams were collected and averaged for an overall performance score. The results of the study revealed a small correlation between total amount of Blackboard usage and final grade in the course. These results represented positive statistical evidence for the benefits of Blackboard usage by the students. The authors of the study stated that the experimental group was small and that

differences in student learning style could influence final results. They suggested a study with a larger, more diverse group and a focus on collecting data of long-term retention of content taught in class.

If a relationship between amount of interaction with online course content and student achievement exists, then it is important for educators to encourage such interaction. A survey-based study was initiated for the purpose of investigating the types of factors present that can increase students' willingness to engage in technology-based learning through experiences like Blackboard. (Friedrich and Hron, 2010). The e-learning system used was composed of two parts, one that included the subject matter of math and several language classes and the other component was the learning management system (LMS) used to deliver the class content. Students were more likely to accept new computer related experiences if they had greater computer skills and an overall positive outcome while working with computers. The data did support the idea that student's perception of the usefulness of the e-system's learning components brought about student willingness to engage in learning. Results also revealed that the students' perceived usefulness of the learning management system carried the greatest weight in influencing their willingness to use it to complete their work.

The United States Department of Education (2010) indicated that online learning can be enhanced by giving learners more control of their interactions with the media. However, the same study also concluded that "few rigorous research studies of the effectiveness of online learning for K-12 students have been published" (xiv). This study seeks to extend the range of knowledge regarding the impact of blended learning environments via the utilization of a learning management system on student achievement.

As measured by the results of the questionnaire and the statistics from the learning management system tracking tools, this study hypothesizes that the ability to access LMS online modules on demand will increase student contact time with science subject content. In addition, the hypothesis states that student surveys will indicate a student preference for using LMS tools over traditional assignment and study methods and students will perceive the LMS as beneficial.

Method

Participants

One hundred twenty-two students in an urban Ohio high school science class participated in the survey portion of this study. Permission to conduct the survey was obtained from the high school principal. Permission for student participation was obtained through signed parent permission letters. Students were given the online survey web address and logged in to complete the survey.

Apparatus

The apparatus for this study was a non-experimental survey questionnaire in order to measure students' perceptions of their use of Blackboard Learn online modules to support their science class curriculum. The reliability and internal validity of the survey was verified by three expert judges. Along with the survey, a statistical examination was conducted of student time spent using online modules by reviewing data collected by Blackboard Learn tracking tools.

Procedures

All participating students completed the "Blackboard and Your Science Class" survey. Students answered questions about Blackboard use in their science classes. Statistical data on Blackboard usage by student participants was compiled from the available Blackboard tracking

tools. Data was gathered from the tracking tools embedded in the Blackboard Learn system used by the students of the high school in order to report student interaction with science content. The results reported included overall time on Blackboard, overall time and log in totals per content offerings per class, overall total on time of day for student interaction on Blackboard, and average hourly student use of Blackboard. The data was collected over a period of five months that included a total of 100 actual school days in session.

Results

Survey results demonstrate that students did use the LMS on a regular basis outside the classroom setting. Over 60% of all students reported that they used Blackboard at least one hour per week for test/quiz preparation or to complete other assignments (see Tables 1 and 2).

Table 1
Time spent per week at home on BLACKBOARD for test/quiz preparation:

Answer Choices	% Responses
0 hours	20.83
1-2 hours	61.67
3-4 hours	15
5-6 hours	1.67
6+ hours	0.83

Table 2

Time spent per week at home on BLACKBOARD for science assignments:

Answer Choices	% Responses
0 hours	36.97
1-2 hours	55.46
3-4 hours	5.88
5-6 hours	1.68
6+ hours	0

Table 3 (below) reveals the results of student preference for how the LMS is used in the classroom by the teacher. Clearly the most popular responses were "Class Notes" and "Practice Tests".

Table 3

Which of the items below would you most like your teacher to use on Blackboard? (Put them in order, giving your first choice the number 1 and your last choice a number 7.)

	1	2	3	4	5	6	7
Class Notes	53.39	33.05	6.78	3.39	0.85	1.69	0.85
Practice Tests	31.36	38.98	9.32	11.86	5.08	1.69	1.6
Videos about the subject	6.78	8.47	45.76	11.02	15.25	8.47	4.24
Wikis	1.69	0.85	2.54	33.90	15.25	14.41	31.36
Class Assignments	0	5.93	19.49	18.64	43.22	11.86	0.85
Homework Assignments	5.08	10.17	13.56	12.71	12.71	35.59	10.17
Group Work	1.69	2.54	2.54	8.47	7.63	26.27	50.85

Note: All data reported in percentages

Data was also collected that asked students whether or not they preferred the LMS to traditional classroom resources for certain tasks. Tables 4 and 5 demonstrate that students prefer to use materials from Blackboard to study for tests and quizzes rather than traditional notes and the textbook.

Table 4

I would prefer to use BLACKBOARD PRACTICE TESTS to help me study for tests and quizzes rather than my notes and textbook.

Strongly Disagree	Disagree	Agree	Strongly Agree
2.54%	15.25%	47.46%	34.75%

Table 5

I would prefer to study from my NOTES AND TEXTBOOK rather than using Blackboard practice tests.

Strongly Disagree	Disagree	Agree	Strongly Agree
13.79%	50.86%	29.31%	6.03%

Table 6

Since I have begun using Blackboard for my science class, (Check all that apply.)

Answer Choices	% Response
I am more willing to complete science assignments in class using Blackboard.	56.30
I am more willing to complete science assignments at home using Blackboard	49.58
I am less willing to complete science assignments in class using Blackboard.	6.72
I am less willing to complete science assignments at home using Blackboard.	8.40
I will complete assignments whether they are on Blackboard or not.	61.34
I will not complete assignments whether they are on Blackboard or not.	2.52

Two other survey questions revealed interesting data. When students were asked if they used Blackboard to complete assignments when they were absent from school, 63.87 responded affirmatively. Additionally, 46.22% agreed that their science grade had improved since the class began using Blackboard (1.68% reported their grade worsened), 36.97% said they were more productive in class, and 36.13% responded that they spend more time on task.

Tables 7 and 8 represent data gathered through the Blackboard tracking tool. The data targets the number of hours per day the LMS was used as well as the time of day. The data is displayed each of the 4 science classes that participated.

Table 7

Summary of LMS user activity per day as measured in hours

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Biology	12.72	45.48	44.25	11.45	12.71	15.36	9.31
Chem.	9.01	73.29	69.26	19.35	26.18	17.46	2.41
Phys.	48.33	48.33	28.57	25.92	22.37	32.52	3.47
Sci.							
Chem.	0.57	7.97	2.36	4.13	4.19	0.87	0.00
Total	70.63	175.07	144.44	60.85	65.45	66.21	15.19

Table 8

Number of times students accessed an LMS module by hour of day

	Biology	Chem. A	Phys. Science	Chem. B	Total
Mid	89	16	2	0	107
1:00 AM	163	3	5	0	171
2:00 AM	16	8	47	0	71
3:00 AM	0	0	5	0	5
4:00 AM	0	0	0	0	0
5:00 AM	0	14	0	0	14
6:00 AM	2	80	25	0	107
7:00 AM	173	210	260	4	647
8:00 AM	272	2229	76	26	2603
9:00 AM	603	958	1335	43	2939
10:00AM	700	277	574	405	1956
11:00AM	2120	230	123	79	2552
12 noon	3765	357	248	128	4498
1:00 PM	432	468	1888	47	2835
2:00 PM	280	403	152	65	900
3:00 PM	339	292	225	11	867
4:00 PM	298	767	313	57	1435
5:00 PM	465	634	403	0	1502
6:00 PM	794	689	409	0	1892
7:00 PM	888	962	315	0	2165
8:00 PM	893	504	382	4	1783
9:00 PM	705	890	313	0	1908
10:00 PM	621	469	281	0	1371
11:00 PM	463	224	50	0	737
Totals	14081	10864	7431	869	33065

Discussion

As measured by the results of the survey and the statistics from the Blackboard Learn tracking tools, a portion of the hypothesis is supported, while another is inconclusive. Tables 4 and 5 indicate student preference to study using various instructional materials located online than from traditional means. This supports the portion of the hypothesis that predicted students would report such a preference. It also supports the literature reviewed in this manuscript signaling a positive attitude of students towards online learning content. The ability to access Blackboard modules online resulted in sustained contact time. Thus, students did indeed utilize the instructional and support materials that were available online. This was supported by the student survey responses in Tables 1 and 2 as well as the tracking data displayed in Tables 7 and 8. However, one cannot accurately assess whether or not the total amount of student contact time with science subject content increased due to the availability of the online content. Although the study revealed that students are more willing to complete assignments using Blackboard, it is possible that students would spend the same amount of contact time with science instructional and support materials whether an online component was available or not. The second part of the hypothesis predicted that student contact with instructional materials would increase given the accessibility of online content. This portion of the hypothesis was neither supported nor refuted.

The data reported in the narrative portion of the results section states that 46.22% of students agreed that their science grade had improved since the class began using Blackboard (1.68% reported their grade worsened), 36.97% said they were more productive in class, and 36.13% responded that they spend more time on task. This data also support information from the literature review regarding the positive attitude and perception students have about online

learning.

The data in Table 3 shows student preferences with the type of content they prefer loaded onto the LMS. Clearly they favor access to Class Notes as well as Practice Tests. This does not mean that other content is without value. However, it may suggest a reason why 46.22% of students agreed that their science grade had improved since the class began using Blackboard. Use of class notes and practice tests can play an important role in student learning (and performance) on assessments. If loading class notes and practice tests on an LMS leads to an increase in student contact with such test preparation materials, then this lends support to the value of adopting and implementing an LMS in the classroom setting.

Data displayed in Table 6 supports student preference for Blackboard components, and also supports student perceptions that they are benefiting from Blackboard use in their science classroom. Forty-six percent of students surveyed stated that their science grades have improved since using Blackboard compared to 2% who report that their science grade has declined since using Blackboard in their class. Seventy-three percent report that they believe that they are more productive and spend more time on task since using Blackboard with their science classes. Fifty-six percent of surveyed students state that they are more willing to complete in-class assignments using Blackboard than traditional assignments while 7% say they are less willing to use Blackboard for in-class assignments. When asked about completing assignments at home, 50% of the students surveyed reported that they are more willing to complete the assignments using Blackboard compared to 8% who state they are less willing.

The data in Tables 7 and 8 summarize the number of hours per day students accessed the LMS and the hour of the day in which students were active on the LMS. The data from these tables was compiled through the statistics tracking tools available in Blackboard. The results support the notion that students accessed learning materials on the LMS regularly; suggesting they preferred the online

materials over the traditional study materials. Furthermore, the data indicates the days and times of student access. A substantial number of times the LMS learning materials were accessed occurred on non-school days or during after school hours. This lends additional support to the idea that students preferred access of learning materials through a learning management system.

Students reported in the survey that they spend more time on task since Blackboard is used as a component of their science class and the tracking data supports this survey finding. Student time spent on Blackboard components after class hours was not required since a few students did not have internet access at home. All hits on class components outside of class time were voluntary. The tracking tools report 18,623 hits to various Blackboard components by the high school science students during hours outside of class time. Students were accessing content components that provided them with a variety of instructional methods for each concept. These components included videos, power point notes, web sites, and class resources. Articles in the literature review of this project have reported that by engaging students in technology supported curriculum, students show increased interest and participation. The voluntary access of the Blackboard components by the Steubenville students outside of regular science class time supports these findings.

This study has implications for a variety of stakeholders. Teachers may be alerted to the value of LMS usage to store content for student access. According to the results, many students reported that they preferred access to content provided online rather than traditional access of materials. In addition, many students believed their grades had improved, they were more productive, and they were more willing to complete assignments. This perceived increase in student engagement may benefit both the teacher and the learner. Teachers may see an additional benefit by providing content online to offset the loss of learning time attributed to student absences and calamity days.

Educators might also benefit from the knowledge that using an LMS may help them differentiate instruction and target various subgroups. Students in academic risk can use a learning management system for lesson support or even credit recovery if the school system has classes developed that can be delivered through the district's LMS. Gifted students could access online classes and receive credit for completing some classes outside of the normal school day. Special needs students can have lessons tailored for their strengths.

The results of this study also help to inform school administrators considering the adoption of an LMS. As dollars become scarcer, school leaders must be efficient stewards of district finances. Those considering the adoption of an LMS can take note that the results of this study suggest many benefits of this teaching and learning tool. Administrators in traditional schools looking for ways to develop an online presence can find support in this study for acquisition and implementation of an LMS. In addition to the benefits mentioned previously, school leaders could gain flexibility in scheduling by using a learning management system to develop blended learning and flipped classrooms. Traditional schools aiming to respond to the changing needs of digital natives and their parents may develop an online presence using an LMS as a response. School administrators should also understand that adoption of an LMS alone is not enough. Any integration of new technology tools must be paired with an adequate amount of high quality professional development. School leaders must avoid the one size fits all approach to professional development, and focus on a more personalized approach to meet the needs of individual teachers (Hixon and Buckenmeyer, 2009).

Research suggests the importance of recognizing the evolution of high school classrooms and instructional methods. Today's students are digital natives. They access technology on a regular and consistent basis, and they are comfortable doing so. Parents are provided with a variety of options for their children to acquire a high school education. Traditional, online, and blended-learning schools are

competing for students. The variety of tools, flexibility of scheduling, and the ability to tailor curriculum to meet a student's individual needs can be provided and promoted as an incentive by schools using a learning management system. Instructional methods need to be multimodal and constructed for students with a variety of needs and time constraints. This research project highlights the readiness and willingness of students to work with class content beyond traditional lecture and textbooks, and their preference of online content access over traditional access. An increase in the time the students engage in content is equivalent to an increase in time on task; research shows that increasing time on task is likely to increase student achievement.

Educators are working in an era of high stakes accountability. Student performance on standardized tests has become increasingly important to all stakeholders. Current trends indicate student achievement will factor into the evaluations of an increasing number of school administrators and teachers. These pressures exist under the cloud of reductions in school funding, which make resources scarcer and underscore the importance of fiscal responsibility. The findings of this study lend support for the benefits of learning management systems and access to online learning content as a means to engage students.

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Experiential Learning Informs Classroom Instruction: Teaching Environmental Conservation in a Middle School Spanish Classroom

Lynn Elliott

Abstract

This paper examines the importance of experiential learning for teachers-as-students and its impact on language instruction through personal experience of the author, a middle school Spanish teacher who participated in an International Teachers' Workshop in Belize focusing on environmental science education. The author compares the approaches of Communicative Language Teaching, Content-Based Instruction, and Experiential Learning. She provides concrete examples of classroom practice rooted in the tenets of these three learning approaches, while using environmental science concepts gleaned from her experiential learning to guide language learning. The paper concludes with reflection on current practice and implications for others' implementation of similar curricula.

Lynn Elliott is a Spanish teacher at Oak Glen Middle School in Hancock County, West Virginia. She earned her B.A. in English and Spanish from Westminster College, M.A. in Applied Linguistics from the University of Massachusetts, Boston and graduate certificate in English as a Second Language from Marshall University. She is a National Board Certified Teacher (2013), and I has been teaching since 2009. Her current courses include introductory Spanish for grades 5-8, Digital Storytelling, and English as a Second Language.

Background

Experiential learning is the ideal mode of learning; it moves students from theory to practice in necessarily authentic tasks. Experiential learning can be a source of information for educators that informs their practice, and it can be used in the classroom to facilitate deeper understanding through real-world tasks. For world language teachers, terms like "real-world tasks" and "authenticity" form part of the regular classroom lexicon. In searching for ways to focus on real-world tasks that add authenticity to my classroom, I decided that I wanted to create a multi-disciplinary curriculum in my middle school Spanish classes that included environmental science concepts, but I felt unprepared to teach science. In July 2015, I had the opportunity to participate in a teachers' workshop in Belize that focused on issues in environmental studies through PaxWorks, a 501(c)(3) non-profit organization. This experiential learning led to a complete overhaul of my curriculum and a reexamination of my teaching methods. To fully understand both the experiential learning that I participated in, as well as the context in which I implemented new information and created a completely new, science-based curriculum, background is necessary.

PaxWorks and Belize

PaxWorks is a 501(c)(3) non-profit organization whose mission "is to empower girls and teach them leadership skills, foster analytical thinking inside and outside classrooms" (PaxWorks, 2015). The organization conducts projects in the U.S. and abroad, and it facilitates international collaboration. As part of its mission, PaxWorks organizes and supports an annual International Teacher Workshop to Belize, with the goal of fostering collaboration among teachers of disparate cultural and socioeconomic backgrounds and nationalities to strengthen

their instruction while examining issues in environmental science and experiencing diverse ecosystems first-hand.

The group that participated in the 2015 PaxWorks International Teacher Workshop comprised five educators from the U.S., a U.S. college student, a graduate student from China, and three Belizean teachers. The group was led by a U.S. professor of chemistry and a practicing professor and ecologist who has lived and worked in Belize for over twenty years. Our goal was to design curriculum around the environmental education concepts we explored through our interactions in the rainforests and coral reefs of Belize. Every day, the facilitators presented new information, then took the group into the field to give specific, real-life examples of the concepts discussed. Our evenings were spent in self and group reflection and in collaborative curriculum design.

Oak Glen Middle School

I teach introductory Spanish classes at Oak Glen Middle School in Hancock County, West Virginia. OGMS has 618 students enrolled in grades five through eight. Of those students, 52% are enrolled in the free or reduced lunch program. The county has many rural areas and several small towns. As a point of comparison, New Cumberland, the county seat, had a population of 1,103 as of the 2010 national census (United States Census Bureau, 2015).

My classes

I primarily teach beginning Spanish for students in grades five through eight. Fifth- and sixth-grade classes are held five days a week for forty-five minutes, and the course is nine weeks long. Based on conversations and a formal written survey, the typical student who enters my classroom for the first time has no language-learning experience, and little to no exposure to

Spanish. My goal in these courses is to provide students with the most fundamental language learning skills while engaging them in content they care about to foster lifelong curiosity in language and culture. This is often a daunting goal for a nine-week course given to ten- and eleven-year-olds, but I have found that it is not impossible. I chose to direct my content-based environmental science curriculum to my sixth-grade Spanish classes. These classes typically have between 16 and 28 students in them. Some students have had a nine-week introductory Spanish course in fifth grade; some have had no Spanish exposure or language-learning experience of any kind. Spanish is an elective class at the middle school level. Some students specifically elected to take Spanish class, while others did not. These conditions create a class group of widely varying ability levels, interest levels, and motivations. This kind of diversity presents advantages as well as challenges. The challenge at the forefront for any teacher of such a group is how best to serve every student's needs while maintaining rigorous standards and high expectations for their achievement. This was my goal as I set out to fundamentally change how I teach introductory Spanish classes.

Theoretical Basis

A holistic approach is warranted in order to provide the best possible language instruction to groups that vary considerably in their abilities, interests, experiences, and motivation. There is no single language-learning approach that works universally for every learner of every language. To serve diverse classrooms, language teachers often find it is necessary to borrow ideas from several approaches. For the purpose of my new curriculum, I examined the congruencies of Communicative Language Teaching (CLT), Content-Based Instruction (CBI), and Experiential Learning (EL).

Communicative Language Teaching

Communicative Language Teaching maintains interaction as the focus of its approach. Savignon (2002) provides an excellent explanation of CLT, writing that "CLT is properly seen as an approach, grounded in theory of intercultural communicative competence, that can be used to develop materials and methods appropriate to a given context of learning" (see Hymes, 1992 for an in-depth discussion of the term "communicative competence"). Savignon writes of the eight principles of CLT, including the ideas that "language teaching is based on a view of language as communication," "a learner's competence is considered in relative, not in absolute, terms," "culture is recognized as instrumental in shaping speakers' communicative competence," and, most pertinent to this discussion, "it is essential that learners be engaged in doing things with language—that is, that they use language for a variety of purposes in all phases of learning." Savignon further explains that CLT works to tie together process and outcomes, focuses on meaningful language use, and that "terms sometimes used to refer to features of CLT are 'task-based'…, 'content-based,' 'process-oriented,' 'interactive,' 'inductive,' and 'discovery-oriented.'" This guiding set of principles is attractive to the world language teacher, as it maintains instructional focus while recognizing and valuing the distinct characteristics of each class, and, indeed, of each learner.

Interaction is the key to CLT. Mackey and Abbuhl (2005) write that "there is evidence that interactionally-modified input may be more effective than simple input modifications." "Simple input modifications" here refers to modifications made by the teacher prior to instruction or an activity in order for less advanced learners to comprehend material in the target language. Thus, learners who use language in interactions with other speakers to negotiate meaning get more out of those interactions than learners who only receive simplified input. This

supports the use of native-level texts and materials, instructional conversations, and task-based learning—all of which fit nicely into Content-Based Instruction, discussed below. Interactions in CLT are themselves examples of task-based learning, which give learners the opportunity to receive input in their target language, produce their own work in the target language, pay attention to linguistic form when there is a problem or misunderstanding, and allows learners to receive feedback (Mackey & Abbuhl, 2005). This focus on making meaning, interaction, and an emphasis on task-based learning leads teachers to create real-world tasks that engage students and forge connections among disparate subjects, while presenting authentic materials in the target language.

Content-Based Instruction

Content-Based Instruction is instruction anchored in content. It advocates cooperative learning, development of strategic learners (rather than teaching strategies explicitly), extensive reading in the target language, presenting meaningful information, creating emotional and affective connections, and providing visual and verbal representations of information (Grabe & Stoller, 1997). Eskey (1992) notes that CBI "consciously rejects the common sense notion that the content of a language course should be language. A basic premise of CBI is that people do not learn languages, then use them, but that people learn languages *by* using them." Teaching content in a language classroom is a departure from traditional language teaching methods, such as the Grammar Translation Method, which focuses almost entirely on form over meaning. The role of the language teacher has changed, however. Language teachers now play a crucial role "as practitioners between academic disciplines;" language teachers are mediators who "are called upon to apply their theoretical knowledge to mediate between languages, and between learners and institutions. As experts, they are to be linguistic/cultural mediators, methodological

mediators and professional mediators" (Kramsch 2004). The language teacher cannot be solely a purveyor of grammar, but also of content and context surrounding the language.

Grabe and Stoller (1997) write glowingly of CBI, noting that it is on the rise and rife with context. In addition to its focus on context, Savignon (2002) continues with the theme of using tasks to guide learning. She writes, "task-based curricula are designed to provide learners with the most opportunity to use language for a purpose." Indeed, "purpose" and "context" are two common terms that appear repeatedly in the literature about CBI. By teaching language through content rather than teaching language structures alone, learners have a directed purpose in their learning, context for the language they learn, and opportunities to interact with authentic, native-level materials, using strategic processes. Grabe and Stoller also note the importance of "flow:" "the state of optimal experiences (happiness) brought about when personal skills are matched by high challenge, leading to a narrowed focus of attention, a total absorption in the activity, a sense of timelessness, and a temporary lack of awareness of personal problems. Such optimal experiences lead to increased learning." In the language classroom, flow can be achieved through real-world tasks that require students to make connections between past learning and new input to work toward a specified purpose. The repeated emphasis on purpose, context, and experiences in CBI lends itself well to the implementation of experiential learning.

Experiential Learning

For the purposes of this paper, I refer to experiential learning in which the teacher is learner, as this was my own experience and the catalyst for the classroom practice discussed below. This is not the only kind of experiential learning; the potential combinations of participants and purposes are nearly inexhaustible.

Experiential learning comprises purpose, content, context, interaction, and collaboration in one holistic process. In fact, "process" is the focus of experiential learning, rather than the outcomes of the process, and it is this view of learning as a process that distinguishes it from other approaches to learning (Kolb, 1984). Kolb offers a model for experiential learning that suggests a cycle of concrete experience, observations and reflections, formation of abstract concepts and generalizations, and testing implications of concepts in new situations—which creates new concrete experiences, initiating a new learning cycle. This was my experience in Belize: concrete experiences in the natural environment lead to observations and reflections on ways I could apply those experiences in my new curriculum. I then formed abstract concepts and made generalizations about what I had learned and how I wanted to apply it, and tested those ideas with my colleagues in the natural environment, leading to a new cycle of ideas and experiences.

While I write of experiential learning as a participant, it is important to note that it has limitless applications in the language classroom. Experiential learning is not exclusive to a language learning environment, but it works well as a model for creating highly contextualized, interactive, and authentic learning experiences. Experiential learning may well serve as a means of incorporating the interactional goals of Communicative Language Teaching with the content- and context-heavy goals of Content-Based Instruction, in meaningful, purposeful activities that engage students and work to create flow. The focus on process over outcomes in experiential learning creates the expectation that learning is an adaptive process, and that it is continuous and life-long. This is precisely the hope that educators have for their students: that their engagement and learning carry on outside of the classroom and outside of the school, promoting new knowledge and experiences throughout their lifetime.

By focusing on learning as a process instead of a set of outcomes, we assume that learners change and adapt their ideas through experience. In fact, Kolb writes, "the failure to modify ideas and habits as a result of experience is maladaptive." Experiential learning is not confined to a classroom, either; it assumes interaction between the person and the environment, and it assumes collaboration. Swain (2000) writes that "it is dialogue that constructs linguistic knowledge" and "collaborative dialogue is dialogue in which speakers are engaged in problem solving and knowledge building." Engagement with the environment, with fellow learners, with advanced speakers, and with tasks and problems gives learners the opportunities they need to build new knowledge through collaborative dialogue. It gives learners the opportunity to modify and adapt their prior knowledge as they create new experiences. It is an open-ended, malleable concept that gives teachers freedom to craft activities and projects to fit their learners' needs while guiding practice and ensuring reflection.

My own experiential learning, in which my role was teacher-as-learner, has given me a new perspective on my students' classroom experiences. It has inspired a new curriculum, discussed in more detail below, and it gave me the confidence I needed as a catalyst for change in my classroom.

Implications for practice

Every classroom must, by necessity, be different in its approach to language instruction. The appropriateness of any approach is dependent on the teacher, her background and strengths, the students, and their individual needs in a language-learning setting. In my own classroom, the ideas of content-based instruction, communicative language teaching, and experiential learning are relatively new. Trying new methods as an established teacher is, at best, unnerving, but

reflective teaching practice demands it of us (cf. The National Standards Collaborative Board, 2010). By slowly incorporating new ideas, by selecting the methods best suited to my students' needs and my own instructional goals, and by building on my own experiential learning, I have created an introductory Spanish curriculum for sixth graders that is at once rigorous, engaging, and authentic.

Curriculum Design

Much of my curriculum design began while I participated in the International Teachers' Workshop in Belize with PaxWorks. Participants were expected to reflect on our experiences and work collaboratively with other educators in our group to maximize our experience and offer support to others. This practice is supported by Kolb and Yeganeh (2012), who write that Kolb's Experiential Learning Theory is "an idealized learning cycle or spiral where the learner 'touches all the bases'—experiencing, reflecting, thinking, and acting—in a recursive process that is responsive to the learning situation and what is being learned." The idea of a spiral is mirrored in the National Board for Professional Teaching Standards, which uses "The Architecture of Accomplished Teaching" as a model for good teaching practice, and includes in its Five Core Propositions "Teachers think systematically about their practice and learn from experience" (The National Standards Collaborative Board, 2010). Clearly, experiential learning is a beneficial practice for teachers.

With the support of my colleagues in our Belize workshop, I created an outline for a nine-week course for sixth-grade students in my school. I knew that I wanted to include extensive reading in the target language, which leads to both increased content knowledge and improved language abilities (Grabe & Stoller, 1997). I knew that I wanted to make

environmental issues the content of my curriculum, and I narrowed the content to conservation and natural resources to make concepts more manageable for students.

I also knew that I wanted to include as many elements of Communicative Language Teaching as possible, so I made nearly all projects and activities partner- and small-group-based. This decision was based in principles of interaction (Mackey & Abbuhl, 2005; Gass & Mackey, 2007), as well as Cohen's work on groupwork, which posits that "children learn by talking and working together" and that such opportunities to learn group skills are rare in American culture (1994). I chose to incorporate explicit instruction in dictionary use, model reading strategies with native-level texts about conservation, and finish the course with a student-directed research project.

In doing this, I consulted the 21st Century Foreign Language Content Standards and Objectives for West Virginia Schools (2007) as well as the World-Readiness Standards for Learning Languages (2015), and the National Board for Professional Teaching Standards for World Languages (2010) to ensure a broader basis for my practice. Both the West Virginia Foreign Language Standards and the World-Readiness Standards contain elements of communication, cultures, connections, comparisons, and communities. The National Board for Professional Teaching Standards adds elements of reflective practice and experiences, focusing on teacher performance. All of these facets can be addressed through a curriculum rooted in content-based instruction and communicative language teaching.

Classroom Practice

Translating theory to practice is always the challenge in education, and particularly in language education. Knowing how students acquire language and actually finding age-

appropriate practices that reflect that knowledge are entirely different. Moving from my selected approaches to classroom practice was initially clunky and awkward, but with some adjustments, each successive nine-week course has moved more smoothly and my own comfort level with the content and methods I have chosen has increased dramatically. If at first you don't succeed, tweak your plans and try again.

Pre- and Post-Test Results

I chose to reflect on my new curriculum through a class of 23 sixth grade students in the second quarter of the 2015-2016 school year. In a written pre-test prior to formal instruction, no student was able to define "conservation" in either English or Spanish. In an informal conversation, students said they had studied some environmental science concepts in their science class, but they struggled to give specific examples of what they had learned. Some students were able to offer examples of content-specific language in English, such as "ecosystem," but none was able to define content-specific terms.

Following formal content instruction in Spanish, students completed an 11-point quiz in Spanish about conservation. This formal, summative assessment included questions about the "Three Rs" (reduce, reuse, recycle), the definition of conservation, and asked students to give reasons why conservation is important. The average score for the class of twenty-three students was a 79%.

Examples of Activities Used

To better illustrate the concepts discussed, I offer concrete examples of activities I have conducted in class with sixth-grade students during a nine-week course following my new content-based and communicative language-based curriculum. Since my focus is on students

using language to understand new concepts, I include explicit instruction in dictionary skills. Students then use those skills, along with reading strategies, to work with native-level texts that provided background on topics in conservation. Finally, the course concludes with student-directed research that requires learners to use the information they gleaned from those native-level texts to explore a topic and apply their research to real-world problems in the school environment.

Dictionary skills

By explicitly teaching dictionary skills, students have a fundamental skill that opens up thousands of new words in the target language. They discover through practice that not every word is in the dictionary. For example, conjugated verb forms are not included in Spanish dictionaries; this opens an organic discussion of how verbs change to show who does the action. Students identify all the verb forms they can find in their text, then use inductive reasoning to determine how verbs interact with their subjects. This emphasizes the importance of pattern recognition in language, and while students may not see an example for every possible subject, and they certainly cannot conjugate every verb correctly, they understand the basic concept of verb conjugation in a way that simple rote memorization does not allow. Dictionary use also creates organic conversation about the gender of nouns, how to make nouns plural, multiple word meanings in both languages, root words, spelling changes, syntax, and a host of other linguistic concepts that students identify in context. This means that students learn concepts as they need them, not as a textbook dictates, and students are more likely to form connections among these concepts as they encounter new words in conjunction with known words and forms. See Appendix A for an example of a simple dictionary skills exercise I use with my students.

Native-level texts

Text and non-text materials made for native speakers of the target language are ideal as the basis for a content-based curriculum. I have used PowerPoints, SlideShare presentations, Cloze paragraphs, and, most recently, environmental policy documents from various countries in Latin America as native-level texts that provide background information for my students. Initially, using native-level texts feels like failure—students are frustrated, the teacher becomes frustrated, and the language barrier feels insurmountable. However, with patient referencing back to the dictionary skills and reading strategies already discussed, and with constant teacher modeling of those skills and strategies, students gain confidence and are able to find meaning in even the most complex texts. They do not, of course, understand detail or nuance; this is something that the teacher must learn to overlook in order to achieve the goals of interaction with text and interaction with peers.

The example offered in Appendix B is a text that I wrote for my students. I did not simplify my language, but I did organize the text to make concepts as obvious as possible, and as easy to find as possible. The text in Appendix B is the key for a Cloze paragraph. There are four versions of the text, each with different words and phrases missing. Students must first work together in small groups to fill in the missing phrases before they can read the text and answer the comprehension questions. This exercise, filling in missing words, requires learners to focus in on specific words and phrases, to identify where those words belong in a text, and to transfer them to the same text on a different paper. They must recognize words and their position in the sentence in order to be successful, and they must work with their peers to complete the task. In order to read the text in its entirety, they must call on prior knowledge of words learned in a previous activity, and they must use their dictionary skills and work with partners to understand

the text. They must create meaning together to answer the comprehension questions, as the final two questions require inductive reasoning (i.e., "Why do we need to conserve natural resources?" and "How can we conserve natural resources?," neither of which has an answer that can be directly pulled from the text). This reading and comprehension activity takes several days of class time, and as partners and small groups finish, I sit with them and ask them about their work in Spanish, which supports their listening and speaking domains.

Working with native-level texts unexpectedly lead to discussions about translation. I want students to understand the text, which is different from translating. Students frequently assume that I want them to write out the English meaning of the text as they find the words they need. This provides an opportunity to talk about the difference between reading comprehension and translation, and it leads to discussions of translation versus interpreting, professional translation, and professions that require language fluency—this fits nicely in the West Virginia state language standards, as well as the National Board standards for world language teaching (West Virginia Department of Education, 2007; National Board for Professional Teaching Standards, 2010).

Student-directed research

Every quarter, this research project seems to take on a life of its own. I have ideas for projects that I share with students, I encourage student input and student choice, and the class decides the general direction of their work. Once the class has elected a project to work on as a whole group, I create a set of guidelines and a rubric to help them focus their work. From that point until the deadline, I stand back and the students take on the work of learning. In the last course section I taught, a class of 28 students chose to conduct a plastics use survey entirely in

Spanish. They collected plastic bottles every day during all school lunch periods for a week. They cleaned and sorted the bottles, weighed them, recorded their data, and at the end of the week they compiled their data. They found that our school used 42.8 pounds of plastic in one week, just at lunchtime, and they extrapolated the data and estimated that the school uses about 1,500 pounds of plastic in a year. From this information, students created a display in the front lobby of the school, an informational pamphlet that they handed out during Open House, posters promoting recycling for the hallways, and they wrote two news articles and an interview for the school newspaper about the project. Everything except the articles for the school newspaper was completed entirely in Spanish.

I am currently teaching a new section of students using this same curriculum. My current group of sixth-grade students has elected to do a comparative study of environmental policy in Latin America (see Appendix C: Student-Directed Research). They created three groups to study different countries. I provided them with copies of public policy or environmental reports from Mexico (Galán, et al., 2012), Costa Rica (Ulate Chacón, 2011), and Peru (Ministerio del Ambiente, 2009). I annotated the policies as a modification for students, as each one is at least 45 pages long and in native-level Spanish. The small groups will answer questions about their policy that will lead to a directed class discussion in Spanish. Once each group has shared information about the environmental policy of their country, the class as a whole will design an environmental policy for our school. On the first day they worked in groups, students were so absorbed in the organization of their tasks that they were completely surprised when the bell rang. This is exactly what Grabe and Stoller intended when they discussed the "flow" of a learning activity (1997). Students interact with native-level texts and with each other to make and negotiate meaning, while forging deep personal connections to the content at hand.

Student Response to Practice

The overall student response to the change in curriculum has been positive. In observing students while they work on the activities and projects described above, I have witnessed complex, organic learning conversations. My learners have been engaged with native-level texts and material for entire class periods, checking and double-checking their work before sharing it with their classmates, who then make their own connections to the language and the information with little prompting from me. I have rarely seen such dedication and conscientious work from individual students, much less from an entire class.

In addition to gathering information through observation, I ask students to complete a survey at the mid-point of the course and at the end of the course, providing me with their opinions about the course material, activities, and suggestions for future practice. This is part of the reflective process, and it provides me with candid feedback. I take their ideas and opinions very seriously, and I have made changes and continue to make changes to my teaching that are inspired by student ideas. For example, "Verónica" answered "What suggestions do you have to make the class better?" with "Involve the students in teaching the other students about more Spanish." Her suggestion prompted me to think about ways to create student-led round-table discussions of grammatical structures and word families they discover as they work. I started thinking more seriously about ways to encourage students to recognize patterns, posit their own rules for how grammar works, and resolve issues in peer-to-peer discussions that negotiate and construct meaning. This is my next step in refining my curriculum—thanks to a suggestion from a sixth grader.

Students who were in Spanish in their fifth-grade year were able to make comparisons between the science-based curriculum and a fifth-grade curriculum that focused on descriptions of the self and expressing simple opinions. "María" wrote, "This class challenged me more than last year," and "Graciela" echoed the sentiment with "I have learned a lot. It is a huge difference from last year." These and other comments are both affirming and eye-opening: clearly, I need to implement similar methods in my fifth-grade curriculum next.

Responses to questions about how students felt about learning science in a language class were nearly all positive, including "It made me think harder," "I grew by learning more Spanish words for science," "I learned as much as I did in my actual science class," "I wish we had longer class periods," and "it made learning Spanish easier." Several students wrote that learning about science in Spanish class "prepares you for the 'outside world'." Others commented that "I like it because it is a challenge for me and I always like a challenge," and "I feel it will be helpful in the future for both subjects." "Alberto" commented "I really like learning about science in Spanish class because it's like a mystery, and you have to work with someone to complete it." I can think of no better endorsement for task-based communicative language activities.

Conclusion

It is worth saying again that, while I might have ventured into the world of content-based instruction and communicative language teaching on my own, it was the experiential learning through PaxWorks that has served as the catalyst for my current practice. I am grateful for the opportunities and experiences that PaxWorks has given me, and for the personal and professional support that my newfound colleagues have given me through our shared experiences in that organization. The brief time that I spent conducting hands-on research in environmental

education will have effects for many years on my practice and on my students' ideas of language, the environment, and connections beyond the classroom.

Reflections on Practice

As noted, my next big change will be to create student-led discussions of linguistic structures in the native-level texts they work with in class. This will encourage and model pattern recognition as well as create an environment open to learning conversations about language. In addition, I would like to give more time to student-directed research. In the last two quarters, I have allotted seven to ten class days for the project. In working with students and observing their practice, I believe it would be worthwhile to extend the time given for the project and add more critical thinking elements that require a deeper interaction with the topic. I have found that students engage with the topics they explore on a deeply personal level, and they often comment that the project seemed to take no time at all, even though it accounts for as much as a fifth of the class time in a nine-week course.

I would also like to work more closely with other teachers in my building and perhaps around the world. I have noticed students referring to things in Spanish in the halls, and I have heard stories of students in other classes saying, "We learned about that in Spanish class!" I am confident that a content- and communicative-language-based curriculum has strengthened student and adult support for the Spanish program in my school, and will continue to reinforce the importance of language learning for cognitive development and students' future career objectives.

Implications for Others' Practice

Making the transition to a content-based curriculum from a language-based curriculum has had its challenges, but the benefits far outweigh the difficulties in implementation. I have experienced some pushback from students accustomed to a more traditional language curriculum, as well as skepticism from colleagues who are also accustomed to a more traditional language curriculum. Overall, however, the attitudes of students and teachers who have experienced the new curriculum in action has been positive and encouraging, and the work my students have done in this new model has been outstanding, beyond my expectations.

In considering your own implementation of a content-based, communicative language approach that incorporates elements of experiential learning, it is key to keep in mind the needs of your students, the resources you have available, and your own personal experiences that can lend depth and expertise to the content you choose. You, the language teacher, are the expert—select the best possible sources and learning experiences for your students, collaborate with other teachers in your school or state who support CBI and CLT, and engage in reflective practice.

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APPENDIX A: Dictionary Skills

Nombre: _____ Clase: _____

Destrezas de diccionario: Dictionary Skills

Información

Bilingual dictionaries have two halves. One will be English words with their Spanish equivalents and the other will have Spanish words with their English equivalents. Each side is in alphabetical order. Remember that Spanish has letters that English does not, so you'll see a section for ñ. Some older dictionaries might have separate sections for *ll*, *rr*, or *ch*. If you're looking for a word but can't find it, check to be sure you're in the right side for the language you're looking for.

At the top of the page in your dictionary are the first and last words on the two pages – the catchwords or guidewords. They help you find words faster.

Dictionaries use abbreviations to give you information about words.

f., fem., nf. – feminine pl. – plural adj. – adjective
m., masc., nm. – masculine adv. - adverb
nmf. – the noun can be both masculine and feminine

Dictionaries also provide more than one meaning for many words. You'll need to read all the meanings to decide which one is most appropriate for your situation. Don't assume that the first definition is the right one.

Práctica

Look up these words in your dictionary. Write them in alphabetical order in Spanish, and note whether each is masculine (m.) or feminine (f.).

1. _____*ciudad*_____ __*f.*__ world
2. _____ _____ equator
3. _____ _____ country
4. _____ _____ city
5. _____ _____ continent
6. _____ _____ ocean

Sometimes words have more than one meaning. You'll have to read all the definitions to pick the best one. You may have to cross-check the word you find to be sure it's the right one. Give the best word for each situation.

1. I sat down on the *banco*. _____

2. My cousin is at college, studying *derecho*. _____

3. There are fifteen people in this *cola*. I'm going to have to *esperar* a while. _____
_____

4. Fall is my favorite *estación*. _____

5. I need three *hojas* of paper. _____

6. It's time to go. Are you *listo*? _____

APPENDIX B: Example of a Native-Level Text and Comprehension Activity

Nombre: _____ Fecha: _____

Los Recursos Naturales

Read the following information in your number group. Make sure you understand it. Then, find other students with the information you need to fill in the blanks on your paper. There are many different papers. Some of them will need *your* information!

Un recurso natural es un bien o servicio proporcionado por la naturaleza sin alteraciones por parte del ser humano. Los recursos naturales son valiosos para las sociedades humanas por contribuir a su bienestar y a su desarrollo. Usar recursos naturales tiene un impacto en el medio ambiente.

Tipos de Recursos Naturales

a) **Recursos continuos o inagotables**: fuentes de energía que son inagotables y que no son afectadas por la actividad humana. Por ejemplo: Radiación solar, viento, mareas, energía geotérmica (calor en el interior de la Tierra).

b) **Recursos renovables**: Son los recursos que pueden regenerarse través procesos naturales, de manera que aunque sean utilizados, pueden seguir existiendo siempre que no se sobrepase su capacidad de regeneración. Por ejemplo: los árboles, los especies de animales/insectos/plantas, agua dulce, biomasa (productos de la agricultura).

c) **Recursos no renovables o irrenovables**: una vez consumidos, no pueden regenerarse de forma natural en una escala de tiempo humana. Generan contaminación ambiental. Por ejemplo: combustibles fósiles, el carbón, el petróleo, gas natural, minerales (oro, plata, cobre, hierro).

Usos de Recursos Naturales

Usar los recursos no solo tiene efecto en el lugar donde se usa, pero en todo el mundo. El mundo es un sistema conectado. Cuando usamos un recurso irrenovable, no hay más. Termina. Cuando usamos demasiados recursos renovables, se extinguen. Terminan. Usar los recursos inagotables también tiene efecto; construir turbinas eólicas (de viento) tiene un impacto en el medio ambiente, altera el paisaje, la flora, y la fauna. Es necesario usar los recursos con responsabilidad y con una visión del futuro.

¿Cómo podemos conservar los recursos?

Los Recursos Naturales: Preguntas

After reading about natural resources, answer these questions. Use evidence from the text you read. Answer in Spanish, of course, as completely as possible and with as much detail as possible.

1. ¿Qué tipos de recursos naturales hay? Da ejemplos de cada uno.

2. ¿Por qué son importantes los recursos naturales?

3. ¿Por qué necesitamos conservar los recursos naturales?

4. ¿Cómo podemos conservar los recursos naturales?

APPENDIX C: Student-directed research

Nombre: _____ Fecha: _____

Política Ambiental: Environmental Policy

Your group will receive a government document from a country in Latin America. You will read that document (focusing on the sections your teacher has highlighted or made notes on), and you will use the information you find to answer the following questions. Please answer the questions IN SPANISH. You may use the language of your document to help you. You will be sharing your information with the class, so be thorough.

1. ¿De cuál país es la política? _
2. ¿Cuáles son las fortalezas del país en relación con el medio ambiente?
3. ¿Cuáles son los problemas más grandes en tu país en relación con el medio ambiente?
4. ¿Cuáles recursos naturales tiene el país?
5. ¿Habla la política del calentamiento global? ¿Qué dice?
6. Habla de la biodiversidad del país—plantas, animales, especies, etc. ¿Qué hay?
7. ¿Estás tú de acuerdo con la política ambiental del país? ¿Por qué?
8. ¿Cómo es el país similar a los países de los otros grupos? (¿Qué tienen en común?)
9. ¿Cómo son diferentes los países en su política ambiental?
10. ¿Los países deben formar su política ambiental juntos, o es mejor hacer la política individualmente? ¿Por qué?

Nombre: _____ Fecha: _____

La Política Ambiental de OGMS

Now that you've read about environmental policy from several countries, let's think about environmental policy here at home—at Oak Glen Middle School.

1. ¿Tiene OGMS una política ambiental?

2. ¿Debe OGMS tener una política ambiental? ¿Por qué?

3. ¿Cuáles son los retos ambientales de OGMS? ¿Cuáles problemas hay en la escuela en relación con el medio ambiente?

4. ¿Qué debe incluir la política ambiental de OGMS?

Now, in your small groups, use what you know about environmental policy to write a set of guidelines for Oak Glen Middle School. This can be a rough draft for now, but please write entirely in Spanish.

A Case Study of Teachers' Views on New First Grade Curriculum Implementation in Turkey

Duygu Cetin-Berber and Maria Vasquez-Colina

Abstract

This study investigated teachers' perceptions of the implantation of a new first grade policy based on the new Turkish education standards during the 2012-2013 academic year. The study was based on a phenomenological case study design utilizing a structured interview protocol. Ten teachers discussed opportunities and challenges of implementing the new standards in the first year. Data were collected at the end of June 2013 using a purposeful, snowball sampling technique. To ensure verification of the interpretations, member checking was used. A thematic analysis was performed once interview responses were transcribed. We discovered that differences in implementation at the school-level caused differences in teachers' views of the standards. Further, teachers experienced challenges related to whether students had kindergarten education or not and students' school readiness was a central issue.

Keywords: Teachers' perceptions, first grade curriculum, 4+4+4 educational model, first grade starting age, adoption period, primary education.

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Along with theoretical and technological developments, educational systems and opportunities have evolved over time. However, one area that has remained consistent is the dedication to improve the quality of education. Education is one of the most important factors that profoundly affect the lives of human beings, not only at an individual-level but also at the country-level. Although the approach used in each country may vary, there is a common goal: to improve the quality of education.

In this study, we have investigated the implementation of a new curriculum and standards for first graders in Turkey. This article begins with an introduction of the Turkish educational system, including the new curriculum, a brief review of children's rights and readiness for school, and teachers' perspectives. The methods section details the study design and how we analyzed the data. In the following sections, we present the results, conclusions, and discussion about this new curriculum.

The Turkish Educational System

The focus of this study is the first year of implementing a new policy for first graders in Turkey. To understand the context of this transition, we provide a brief overview of the Turkish Educational System. The system includes optional pre-primary school, primary/elementary school, middle school, high school, and college/university. The pre-primary level includes children between the ages of 3 to 5. Compulsory education begins at the primary/elementary school level and the middle school level, including ages 6-13. Pre-primary education institutions may be established as independent kindergartens, as part of a primary school, or as practice classes affiliated with other education- related institutions. The objective of pre-primary

education is to ensure that children develop physically, mentally, and emotionally and acquire good habits that prepare them for compulsory primary education (MNESDP 2013).

The enrollment of students in compulsory education starts at the end of September when the child is 5 years old, and finishes at the end of the eight grade year when the child turns 13 (MNESDP 2013). In March 2012, the length of compulsory education in Turkey was increased from 8 to 12 years of education by the Ministry of National Education (MONE). Every citizen has the right to free public education for the duration of the compulsory education period. When children turn 5, they are automatically assigned to a primary school in their neighborhood; at this time, their parents check the school assignment their children are assigned to using e-school online system (MONE, n.d.).

Each level of education, primary, middle, and high school, is comprised of four years of schooling, totaling twelve years. As a result of the 2012 change in compulsory education, additional regulations regarding students' age have been put in place, such as the age for starting first grade which was decreased from 72 months (6 years old) to 66 months (5.5 years old) (MONE 2012). This change in the age for starting first grade provoked strong arguments among stakeholders, including scholars who reported that at the new starting age, younger students would not be prepared for the first grade curriculum (METU 2012; Ankara University 2012; Bosporus University 2012); other scholars requested to revoke or amend this age change implementation to enhance the quality of kindergarten education (Hacettepe University 2012; Ankara University 2012; Bosporus University 2012; Ege University 2012; METU 2012). The updated age requirements also brought with them a change in the curriculum which required a transition period. This a few month transition period took place at the beginning of fall semester to help first graders to adjust in the new curriculum.

Children's Readiness

It is widely understood that early childhood education has tremendous impacts on later educational attainment, not only in terms of children's cognitive and intellectual development but also in terms of their social development through collaboration with other children in non-familial activities (Archard, 2015). In addition, there is a moral argument that every child has the right to benefit from modern theoretical and practical approaches to education (Dwyer, 2003). Considering the children's rights, Smeyers and Wringe (2003) noted that education can be seen as a tool that empowers students to live worthwhile lives, rather than being passive recipients of information.

Readiness for school is often defined as aiding children to reach certain levels of mastery in skills or abilities that will help them to attain goals for their grade level, both academically and socially. Therefore, it is assumed that school readiness is not only related to children's experiences, but also to the contexts in which learning occurs.

Several views of school readiness have emerged at different times in the past (Muelle 2010): The maturationist view believes that a child becomes ready for school through his/her maturity alone; the approach holds that waiting is all that is necessary for children to become ready for school. A second view, the empiricist/environmentalist view, posits that the child's experiences in his/her early years influence his/her readiness to begin school. Additionally, the interactionist view sees both the environment and the institution as factors for school readiness. This latter approach has been influenced by Vygotsky's sociocultural theory, which suggests that the child's readiness is strongly associated by the child's environment (e.g., classrooms), as well as the readiness of the other children (Dagli and Jones 2013).

Due to the school eligibility cut-off age and the natural diversity of students' birthdays across the calendar year, classrooms will always have an oldest and youngest child. As such, the

influences, both positive and negative, of mixed ages on children's social and academic outcomes have been of interest to researchers for many years.

Past studies have shown that mixed age classrooms provide positive experiences for children, including more integrated play across ages and genders and more complex forms of group work in the classroom (Kutnick, Ota, and Berdondini 2008; Doherty 2012). Proponents of mixed age classrooms and social learning theorists focus on the benefits of mixed age classrooms, which indicate that younger children benefit from being exposed to older children and model their behaviour after the older children.

Furthermore, Tolmiea, Toppingb, Christiec, Donaldsond, Howee, Jessimanf, Livingstong, and Thurstonh (2010) pointed out that the reasons for mixed age students working efficiently might be attributed to the influence of older students, who might have better inherent group work skills, plus the willingness of younger members of the class to allow their older classmates to control collaborative activity. Therefore, it is not just group-work skills that matter, but the social dynamics of the context in which they are deployed.

In contrast, the advocates of single age classrooms expressed concern about age-appropriate curriculum and staff training for mixed-age classrooms. They also supported the theory offered by Piaget and others that interacting with peers who are close in age and ability will result in optimal learning (Moller, Forbes-Jones, and Hightower 2008). Huang and Invernizzi (2013) showed that young-for-grade students have lower literacy scores and a higher risk of retention compared to the high-end of the age group for a grade level.

At the neutral point, Bell, Greenfield and Bulotsky-Shearer (2013) found out that age mixing was not significantly associated with school readiness after examining associations

between age mixing and children's school readiness,. As can be seen, the body of evidence on school readiness and factors that influence it is less than conclusive.

Teachers' Perceptions

Having discussed children's readiness for school, it is time to view teacher's perceptions of the implantation of a new first grade policy. Central to this article, teachers occupy a vital role in education and the implementation of new curriculum and protocols. If a newly developed curriculum is to be effective, it should keep the teacher in mind, as teachers interpret and implement a curriculum based on their knowledge, beliefs and experiences (Ainsworth, Ortlieb, Cheek Jr, Simnacher Pate and Fetters 2012). Kesküla, Loogma, Kolka and Sau-Ek (2012) stressed that the teachers' adaptation to new policy regulations and curriculum vary from teacher to teacher and that teachers' attitudes toward the new regulations also changes over time. Even when educational reforms aim to change teaching practices for the better, the intertwined nature of teachers' knowledge, beliefs, emotions and cognitions can elicit reactions of resistance (Coenders, Terlouw, and Dijkstra 2008). Correspondingly, Huberman (1989) found that teacher anxiety and insecurity can be misinterpreted as resistance to change when using a new/updated curriculum (as cited in Ainsworth et al. 2012). In a phenomenological study using Van Manen's framework to study lived experiences, Margolis and Nagel (2006) concluded that without teacher buy-in, it would not be possible to have successful educational reform.

Overall, this case study focused on gaining an in-depth understanding of teachers' views regarding a change in the first grade curriculum which required a new transition period during the first three months of the school year in Turkey. The major research question was: how do teachers perceive the transition period of the new first grade curriculum?

Methodology

Research Design

The researchers chose a case study as the research design to study this phenomenon (Merriam 1988). Through this case study, the researchers aim was to determine teachers' reactions to the implementation of first grade curriculum with the new school starting age and transition period. This case analysis describes and interprets the teachers' responses to the new school starting age and transition period applications. One also may consider this case study as an investigation of the new implementation from the teachers' perspective. The researchers focused on understanding the teachers' experiences through the course of implementing the new requirements. This phenomenological approach allowed us to explore what participant teachers have in common as they adapted to the new curriculum. With this approach, the researchers assumed there is some commonality as to how individuals perceive and interpret similar experiences; consequently, we sought to find the shared experiences and explore what the impact of implementing the new curriculum on the teachers actually was.

Research Context

This study was conducted a city in Turkey during a two-week period in June 2013. This city is a growing industrial city in the southwestern part of Turkey, with a population of about 525,497 (Turkish Statistical Institute 2012). There are 76 public elementary schools in the city's central area (DNED, n. d.), all of which adhere to the standardized curriculum.

Participants

For this study, we used purposeful sampling strategy to select the participants because as Creswell (2007, 156) emphasized, by using purposeful sampling we had not only participants who provided diverse and detailed insight consistent with our case, but also participants who

showed maximum variation in terms of their experiences. To gain entry to the research setting, one of the researchers visited the National Education Directorate of the city to request permission to interview teachers and obtain referrals using a snowball technique.

The sample included 10 first grade teachers, 6 males and 4 females, in the aforementioned city. Selection criteria included individuals who taught first grade during the 2012-2013 academic year and taught first grade for more than one academic year. This sample met the essential criteria for a phenomenological study, as the individuals had "experience of the phenomenon being studied" (Creswell 2007, 128). Teaching experiences varied from 16 years to 32 years, and their first grade teaching experiences varied from 4 to 12 academic years.

Data Collection

To capture the lived experiences of the participants as detailed as possible, we conducted semi-structured interviews using an interview protocol; the protocol developed by the researchers consists of thirteen questions and was approved by an institutional review board in the US prior to implementation. Three questions specifically referred to gender, teaching experiences and first grade teaching experiences.

The structured questions were used to gather teachers' views on the implementation. The interviewer asked the same questions to all participants in the same order; in addition, the interviewer followed up the participants' answers with probing questions to obtain more detailed information regarding the teachers' experiences.

At the beginning of each interview, participants were informed verbally that they may terminate the interview at any time and their identity would not be released. Researchers attempted to conduct the interviews at a place where teachers felt comfortable and at ease. In this case, each interview was conducted in a school setting with many taking place in the teacher's

own classroom. While none of the participants consented to a tape-recorded interview, the interviewer attempted to note every word that the participants spoke. Each interview lasted approximately one hour. After each interview, the interviewer reviewed her notes and transcribed each word clearly. All of the interviewer's notes were taken in Turkish.

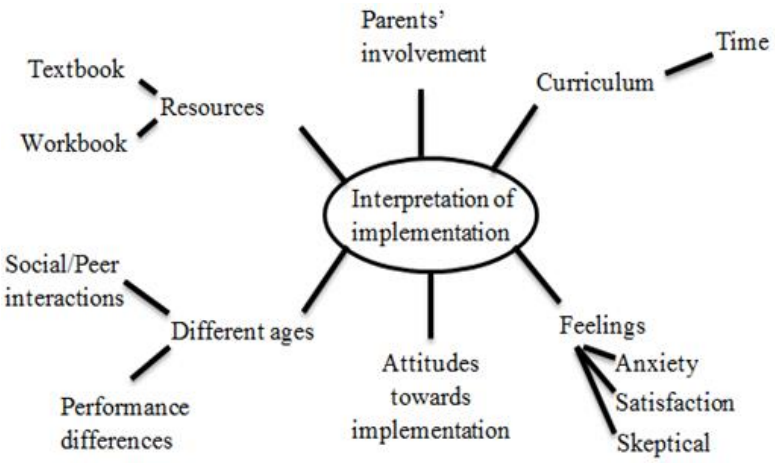
The researchers reviewed all notes after transcribing the interviews to assure accuracy; further, member checking was implemented during the interviews as another measure to assure accuracy.

Data Analysis

Teachers' responses were translated from Turkish to English by one of the researchers. A second translator was given the same transcripts in Turkish to check if the English translations were accurate. Once accuracy was confirmed, data were independently clustered into meaningful codes and themes and a cross analysis technique was used. A total of 72 codes emerged from the data.

Researchers individually and independently clustered all the codes into meaningful themes and compared each individual theme to determine a set of categories using a cross analysis technique. Analysis of the teachers' interviews generated a variety of themes, several of which overlapped. However, researchers discussed each theme until consensus was reached and the themes were integrated into appropriate categories. Seven categories and eight subcategories were identified from common teachers' perceptions, shown in figure 1. Surprisingly, one category (interpretation of implementation) was found to be protruding and changing teachers' perceptions by itself for other categories and subcategories; this category is articulated in the first section under results.

Figure 1. Data categories



Results

As mentioned previously, seven categories were identified from teachers' responses; the findings are summarized below.

Interpretation of Implementation

The teachers at the three schools where this study was conducted each had a different interpretation of implementation. For instance, before the new school year began, one of the three schools' administrators and teachers decided to separate the first grade classes according to the age of registered students. They therefore created three different age-groups in the first grade classrooms: 60-66 month-old students, 66-72 month-old students and 72-80 month-old students. Conversely, the other two schools' administrators and teachers decided to educate mixed age-group students, of 60 to 84 month-old, in the same classrooms; for this reason, teachers who had mixed age groups of 60 to 84 month-old students in the same classroom stated that they followed these implementations differently (T5). The interviews revealed that there was not much consistency in implementation among the teachers, which resulted in varying degrees of ease or difficulty for the teachers during the 2012-2013 school year.

Curriculum

All of the interviewees stated that there was not any curricula change for any course of the first grade with this implementation. Teachers mentioned that they continued to utilize the same first grade curricula that they were using prior to this implementation. However, the time available to implement the curriculum was shortened. The differences between the new and former curricula included a three-month adaptation period and new play and activity subjects in place of a physical activity subject. For the adaptation period, teachers indicated that students generally learned school rules and social norms (through getting to know each other) through practice to improve their skills for class activities and games. As one of the teachers stated: *"There was not any change in the curricula. We had an adaptation period. First three months adaptation period was largely about games and improving students' manipulative skills. …, there were activities to improve students' language skills, friendship skills, understanding school culture and class rules (T10)."*

Teachers acknowledged that the scope of the first grade curricula was appropriate for the older students, while the scope of the adaptation period was appropriate for the younger students. With the three month adaptation period, the time available to carry out the full first-grade curricula was shortened; for this reason, some teachers, who taught younger students, did not carry out all of the adaptation period exercises and compensated by shortening the adaption period.

Resources

According to the participants, aside from the adaptation period and use of an additional workbook, the schools reported no change to apply this implementation. Teachers expressed that schools did not make any accommodations for the younger students in the classrooms or

playgrounds; one teacher mentioned that the lack of physical space in the classroom made it inconvenient to use the workbook for games (T2).

Interviewees were very positive about these adaptation period exercises, stating that it allowed students time to become familiar with the system, especially those students who did not attend kindergarten. Conversely, some teachers stated that this workbook was not attractive for older students, especially those who attended kindergarten as they had studied the same kinds of exercises prior to enrolling in first grade. While the Ministry of National Education had sent the same first grade textbooks that are traditionally used, teachers stated that because of the presence of different age groups, the textbooks became inappropriate for all of the students in the class, especially for younger ones.

Different Ages

Having different ages in the classroom yielded differences in social/peer interactions and the in-class performance of students. For instance, teachers observed that younger students brought a specific cultural etiquette norm into the classroom. In Turkey, cultural etiquette requires younger individuals to address older individuals as ‘abla’ or ‘abi,’ which mean elder sister and elder brother in English, respectively. The terms are added after the names of the older individuals if they are close friends or relatives. Teachers noted that younger students included these cultural custom words when addressing older classmates and these older students became dominant over younger ones in the classrooms (T10). Teachers also explained that students exhibited a tendency of playing with the students of their age.

Furthermore, teachers who had mixed-age students in their classrooms observed that younger students performed poorer than older students. They also noted that while younger students were eager to learn reading and writing, they struggled more to fulfill the requirements

of the first grade curricula and lagged behind the older students in terms of understanding and expressing themselves.

Parents' Involvement

Teachers found parents' involvement in their children's education was either beneficial or detrimental. Some teachers communicated that parents were very supportive and put a lot of effort to help their children learn to read, write, and gain grade-level skills. More specifically, it was determined that if parents were supportive of their children and put in the effort to help the children, the students learned how to read and write despite their age (T4). On the other hand, other teachers felt pressured from parents regarding their students' success; these teachers explained that since parents were aware that schools interpreted the implementations differently, they often intervened profoundly.

Feelings

All of the teachers felt anxious at the beginning of the school year for reasons such as the new school starting age, inadequate in-service training, no curricula change, inadequate time period for the curriculum, number of younger age students in class, the variance in students' age range, and younger students' ability or inability to deal with the first grade requirements. As a specific example, one of the teachers stated that s/he was worried about whether younger students could go to restroom themselves, would listen to the lecture in class or could do their homework (T9).

Although the current study found that the main source of anxiety was whether students would be able to adequately learn how to read and write, teachers were ultimately satisfied with students' achievements because, in the end, students learned how to read and write (T4). It is important to note that the interviews also revealed that teachers were skeptical about students'

future achievements; they indicated a worry that younger students might encounter reading and writing problems at the beginning of the second grade more than older students.

Attitude Towards Implementation

Five teachers out of ten seemed positive about the new implementation; while the others expressed criticism towards the curricula. For teachers, it is very important that the textbooks and contents should be simplified with the new system (T6).

Conclusions

The findings indicated that teachers' experiences of the transition period to the new implementation were related to: (i) school readiness of children entering first grade and (ii) teachers' views of the transition.

Because the Turkish education system is centralized, any change has to be approved by central authorities and then applied in all schools. While the major policy change implemented by the central authorities included a younger starting age for first grade students, our findings determined that the major impact on teachers was the three-month adaptation period. We can infer that the purpose of the adaptation period was to mitigate the challenges of the transition to first grade for younger students as it is highly unlikely that these students attended kindergarten. As a result, some teachers found this period very helpful in improving the physical development of the students who did not attend kindergarten. On the other hand, some teachers indicated that the adaptation period was not helpful for all students as some students had practiced the same kind of activities when they were in the kindergarten.

Teachers reported their expectations of the adaptation period as preparing students to take care of themselves, follow basic rules and routines, sustain attention, and handle the reading, writing, and mathematics practices of first grade.

One of the intriguing questions for future research that arose from this study was: If a child enters school at a younger age, will his/her development be hindered throughout their school career or will s/he catch up with the older classmates? From the study, the researchers discovered that some teachers doubted that their younger age students would be able to catch up with their older classmates, even in higher grades. The reason the teachers pointed out was that older students attended kindergarten and started the first grade with the advantage of having acquired the abilities and knowledge necessary for the next grade. The underlying cause of these teachers' insights may be, as some teachers stated, the younger students performed activities more poorly than older students. To the contrary, some teachers maintained that their students acquired the skills necessary for first grade as expected, even despite their age. This controversy should be investigated further; yet, it is imperative to note that the teachers who were skeptical about students' future success had mixed age group students.

Another reason the teachers' thought that students would not be ready for the next grade might have stemmed from the teachers' discovery that the first grade curricula was not rearranged to flow from December to June. With the three-month adaptation period, the time for completing the curricula had to be shortened. This situation forced teachers to teach reading and writing in a shortened time period and put a great deal of pressure on them. As a consequence, teachers expect some regulations to be made to amend the status quo.

Further, we discovered that schools did not make arrangements to have younger age students in classrooms or play grounds; consequently, there was lack of infrastructure and

materials in schools. As recounted by the teachers, the use of the workbook was appropriate for younger students, whereas the textbooks were more appropriate for older students. Moreover, age differences among students revealed different peer interactions. Younger students brought cultural etiquettes into classrooms by calling older students "elder brother" or "elder sister." Parents also worried about their children's education.

As it is expressed before, due to this new system, some younger students did not attend kindergarten. Teachers were not clear whether the students' age impacted their development and skill attainment or whether it was due to innate ability. The question of whether age makes a difference to a child's development and skill attainment needs to be further studied. Additionally, it is important to note that interviewed teachers strongly emphasized the importance of kindergarten to children's development, not the child's age when they start first grade. As a future direction, the new implementation might be investigated by repeating the study with school administrators.

Limitations

One limitation of the current study was not using a tape recorder during the interviews; as a consequence, the interviewer had to write down everything the teachers said. Another possible limitation was that interviews were conducted in Turkish, but the analysis was completed using the translated English transcripts. It is not the intent of qualitative research to generalize results, but instead to produce a replicable study.

Implications

Some of the implications of the current study include developing a better understanding of this phenomenon through teachers' voices. Concurrent with Ainsworth and colleagues (2012), the effectiveness of a curriculum depends on teacher's input and knowledge since they are the

enablers and facilitators of learning. As teachers revealed in this study, the new school starting age is affecting the teaching and learning environment, as well as students' learning. Teachers' voices, if heard, can add richness to the implementation. If not, the risk may be that without teacher's input, students may not develop skills and knowledge and as a result they may be disadvantaged through higher grades. Understanding teachers' lived experiences is critical to address strengths and challenges and create opportunities to learn from the experiences.

Despite the fact that in our study some teachers remain skeptical about students' future achievements, the results of Black et al. (2011) indicated that the long-term effects of school starting age on in-school tests seem modest. Even though Altwicker and Kollo (2012) found that students generally gain from starting school later, differences between younger and older students were most probably explained by the relative efficiency of families and kindergartens. These other studies are in alignment with the results of the current study, which found that with parents' support students achieved the first grade requirements even if they were younger. In addition, Avraamova (2014) also found out that parents exhibit a high degree of control over their children's academic progress by helping first-grade children complete their homework every day.

After all these disputes regarding the new implementation of students' school starting age, it is imperative to point out the results of Elder and Lubotsky's (2008) research which stated that if the goal of a policy is to raise the student achievement by focusing solely on entrance ages it is likely to fail; however, policy debates also must ask what children will be doing if not in school. In addition, the current study concluded that simply being in school does not improve achievement if there are not any age and grade appropriate settings. Therefore, based on the results of this study, the researchers recommend that it is important to create classrooms for a

cohort of younger students and to provide them appropriate materials and settings to support their successful completion of first grade.

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Review of the Book

Big data: A revolution that will transform how we live, work, and think

Jiahui Wang

Abstract

The paper reviewed the book *Big data: A revolution that will transform how we live, work, and think* written by Viktor Mayer-Schönberger and Kenneth Cukier. The paper first presented the central points in the book: what is big data, how to use big data, how big data has changed our life, and the risks of big data and how to minimized the risk, along with the critique of the book. The paper also discusses the relationship of big data to education domain and how its applications in education could inform teaching and learning.

Jiahui Wang is a second-year doctoral student in Educational Technology program at the University of Florida. She graduated from the University of Virginia in August, 2013 with a M.Ed. degree in Curriculum & Instruction. She is interested in applying EEG and eye-tracking procedures to probe students' attentional and cognitive process when students engage in reading, math problem solving, learning with multimedia, as well as collaborative problem-solving experience. She is also interested in exploring the possibilities of integrating big data into education to provide personalized and adaptive learning experience for students.

I. Summary and Author Information

Many books have been published in recent years on "big data". Unlike mainly focusing on big data's application in the field of business (Deevi, S., 2015), or primarily providing technical know-how of using "big data"(White, 2012), this book provides a more general and accessible introduction of the concept of "big data". The book was written by Viktor Mayer-Schönberger and Kenneth Cukier. Viktor Mayer-Schönberger founded Ikarus Software in 1986, which focuses on data security. Kenneth Cukier is the Data Editor of The Economist. Both authors believe they had a good knowledge basis to talk about big data. The two authors mainly talk about what big data is, how we can utilize big data, the benefits and real life examples of big data, the risk of using big data and what we can do to prevent the risks.

II. Central Points

A. What big data is?

Simply put, big data is about making predictions based on lots of data and make intervention or precaution. Nowadays, almost everything in our life leaves a digital trace and become measurable. For example, what we search for on Google, what we buy everyday, how we drive car, among many other things, have all become datafied and ready to be used and analyzed by companies with various interests. With the "datafication" of many sectors in our society, we have created tons of data and the speed we create data is growing exponentially. Also, with the advancement of technology in the last decade, it has become easier, less intrusive and cheaper to capture a big set of data. Companies and governments now have access to an unprecedented amount of big data. Many big data companies have burgeoned in the recent five years. As big data companies analyze big data and extract meaning from it, they care more about correlation and less

about causation. For example, a company named Farecast can compare ticket prices online and decide when to buy an least expensive air ticket. Usually, knowing correlation is pretty enough and we don't really need to know the reason behind it, just as stated in the book, "if we can save money by knowing the best time to buy a plane ticket without understanding the method behind airfare madness, that is good enough" (Mayer-Schönberger & Cukier, 2014, p. 14). I believe only knowing "what" is no longer enough in future as we rely more on data-driven decisions, since the data-driven decision is not necessarily correct. A wrong data-driven decision is fine for buying an airplane ticket. It is much harder to imagine the consequences of arriving at the wrong data-driven decision on which group may commit crime. So based on the consequences of data-driven decision, I think sometimes it is necessary for us to know the reasons behind the data-driven decision.

B. How to use big data

To use big data, the first and foremost point the authors emphasize is that big messy data outweighs the accurate but small data. As stated in the book, "What we lose in accuracy at the micro level we gain in insight at the macro level" (Mayer-Schönberger & Cukier, 2014, p. 14). I agree with the authors on this point, as looking at the whole picture with tiny errors should allow as to spot more connection between different aspects, as compared to examining a smaller-scale picture with accurate details.

As we have an increasing amount of big data nowadays, we have plenty of what can be analyzed. Besides having the technical skills on how to extract meaning from big data, the most important factor to make a difference is the mindset. Mindset is that people and entrepreneurs should tailor the use of big data to what people needs. As we know, many big data companies have

come into place in the last five years, but not all of them have succeeded. What makes the difference here is the creativity and ingenuity of the CEO. Companies could explore and examine data from different perspectives, subject to their interests and goals. Big data has already has been used in many unexpected ways and will continue to create even more possibilities for our life.

C. How big data changes our life

Before big data came into place, we used to develop a hypothesis, conduct random sampling, in the hope of getting a representative sample of the population, and draw conclusions. The flaw in sampling can be fixed by analyzing big data, which allows us to study the whole population. Big data allows us to use a totally different scientific approach to solve problems. Although directionless, the newer approach could allow us to spot more connections and identify more patterns in the population.

The authors also provide many real-life applications of big data and illustrate how big data has changed our life explicitly. Big data is applied in almost all areas of our life. Big data can help improve health. Doctors can predict a therapy curing disease, if a baby will get a certain kind of disease. Big data can boost sales. Companies analyze the mass of information on purchasing behavior and how people search products online and see patterns of a certain behavior. Big data can also help people take precautions. Fire department looks at a number of complaints about rats in an apartment and correlates it to the chance of fire. Chip and sensor are installed in cars and diagnose theft according to incompliances of how driver sits. Big data can be used for various purposes and can be processed again and again.

D. Risk of big data and how to minimize the risks

Despite the many benefits big data can bring and change our life, big data also has its

problems. In chapter 8-9, the two authors talk about the risk of big data and what we can do to prevent it. Big data has its own risks in privacy and confidentiality issue from collection to use. The more concerning risk of big data is "propensity". Sometimes prediction of the likelihood of behavior based on big data might be inaccurate and unfair to people. We need to be cautious of relying on big data when those things get involved. We will witness more data-driven decisions, as experts' supremacy will ebb. The two authors propose a few ways to prevent us from the risks of big data.

III. Critique of Book

A. The Good

The book is engaging and filled with many real-life examples of big data. Before I read the book, I was afraid I could not understand the book very well since I do not have any expertise in data science. It turned out the book is a good read, and the two authors do a great job in introducing readers to the concept of big data. After seeing many real-life success stories of big data the two authors provide, my view about big data and what it can bring us well expanded. I highly recommend the book to people who are interested in learning more about big data.

B. The Bad

Overall the book is a good read, but it could be improved in a few aspects. First, I feel the book is a little repetitive in some ways. I personally think the authors reinstate the same. For example, a few concepts such as messiness of data, correlation vs. causality are mentioned multiple times in different places of the book. So I believe the organization of the book could be better structured, especially for the first four chapters: Now, More, Messy, Correlation. A fewer examples on how big data change our life could illustrate the point, as well. Although I am

interested in reading what those applications could be, I just feel the two authors provide more than enough examples. Second, the book seems to focus more on the practical aspect of big data. I believe it is more accessible for people without much background knowledge in big data, but someone who already has an idea of how big data can be applied into daily life would look for more technical know-how about how to extract value from a dataset. A little more information on that would be appreciated. Last but not least, I believe the authors could elaborate more on the hazards of big data and what we can do to prevent the risks in more details. I would suggest a little less on the brighter side of big data but a little more on the darker side of big data. The book could be more balanced between the two sides of big data.

C. Relation to Teaching and Learning

Regarding big data in education, three major fields have emerged, and they are learning analytics, educational data mining, and academic analytics. In recent years, learning analytics especially becomes a popular concept in higher education. Learning analytics is focused on the students and their learning behaviors. College students have inevitably produced an incredible amount of online data as many university courses go online in recent years. Learning analytics has been applied in several online learning systems, one of which is the Signals Project developed by Purdue University. The online learning system could predict which students are at risk and give traffic light signaling to students, in order to inform at-risk students to increase students' self-regulation and self-awareness. Also the system would provide help for at-risk in time. Another example of big data in higher education is degree compass, a course recommendation system, which could inform course selection to higher graduation chance.

Besides diagnosing at-risk online students, learning analytics could also be used to provide adaptive instruction and personalized learning. Physiological data such as eye movement, facial expression, EEG, among other measures, can complement traditional outcome measures (accuracy and response time) and contribute to establish a more comprehensive and reliable assessment measure of students' learning performance. Through use of learning analytics, individual profiles of each learner can be constructed and students can be provided with corresponding instruction and assessment to optimize their learning experience. Student profile can also be built from SIS (Student Information System) and other data sources such as social media profile and use of school facilities, such as gym and advising.

With the development of learning analytics, educational data mining and academic analytics, we could witness more applications of big data in the educational domain. The potential of "big data" in education is unlimited. However, potential benefits and unintended consequences come hand in hand. Ethical issues such as privacy, data ownership and learner right need careful planning and consideration.

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