The Benefits of Student Generated Podcasts in the K-12 Classroom

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Abstract

Personal audio players have become and omnipresent component of modern society; as of 2010 There have been nearly as many iPods sold as there are American citizens. These media players have created the unique opportunity for the low cost creation and distribution of custom-made educational media for students. An even more expansive opportunity has been created by this technology; an opportunity for students themselves to become the creators of downloadable, portable and reusable learning materials. These easy to produce, low cost, and portable learning items are known as podcasts. The creation of student generated podcasts allows for opportunities for deep authentic learning, the development of technical skills and gives students a stake in the educational process. The benefits of student generated media projects have been well documented and the benefits made readily apparent to observers. However, podcasting which is a relatively recent innovation has not been thoroughly studied particularly in K-12 environments. Prevailing research on student generated podcasts has been almost exclusively centered on applications in higher education and the results obtained in those settings. The purpose of this mixed methods explanatory study is to collect data supporting the inclusion of student generated podcasts in to K-12 curriculums. Initial quantitative data will be collected via performance assessments and surveys. Quantitative data will be further refined and explored when paired with the data collected as a part of one on one interviews with study participants.

Keywords: *Podcasts, Student generated, Multimedia, Audio, K-12, Engagement and Motivation*

Introduction

Statement of the Problem

The Topic

The intent of this two-fold study is to document how student generated podcasts affect performance in an eighth grade General Science classroom and to explore student attitudes towards podcasting projects.

The Research Problem

During my teaching career I have witnessed explosive growth in portable personal audio technology with a concurrent shrinkage in both the size and cost of the equipment required to generate and distribute audio media. It would be a grievous misstep to not embrace and fully utilize a technology that has become such an ordinary part of the lives of our students. Podcasts represent a viable means to disseminate knowledge on a wide scale. Student generated podcasts represent an opportunity for students to participate in cooperative knowledge creation and develop technical skills that will serve them well in future academic and professional pursuits.

Justification

In October 2011 Apple CEO Tim Cook reported that 300 million iPods have been sold (Williams, 2011) That's an impressive figure alone but when you pair it with the fact that there are (as of 2012) there are only 312 million Americans ("The world factbook," 2011), a quick bit of simple math reveals that there are enough iPods in circulation to supply over 96% of Americans. Apple is quick to repeatedly remind the public that they managed to single handedly revolutionize the way people consume media, which is plausible when you consider that they do hold sway over 74% of the portable media player market. While Apple unquestionably has the hardware end of the market firmly in hand, it does not directly produce any of the content used in its devices. By and large artists, actors, and musicians still provide the media to be played. Educators have also added themselves to the growing pantheon of media generators and the next inevitable step is for learners to begin generating educational content for themselves and others.

In 2004 three years after the introduction of the iPod a new form of media began to attract the attention of the public and more established forms of media (Hammersley, 2004). This new media was dubbed the "podcast" ("A brief history," 2011). Early podcasts were audio only, but as technology and functionality improved podcasts came to include video as well. In retrospect it was almost a given that a form of media designed specifically for portable media players was destined to have a large impact on the world. As of right now Apple boasts that over 100,000 podcasts from around the world are available through the iTunes store. Podcasts range in quality from conversations between friends recorded in a basement to professionally produced conversations between academics and celebrities. Podcasts are well suited for modern media sensibilities. They are downloadable, portable and available on demand. Podcasts don't utilize

streaming so they don't require a constant network connection. Such media almost feels made to order for todays on –the- go multitasking learners. Unlike physical media such as CDs or DVDs a podcast is only as big as the media player it is stored on, most of which slip easily into a pocket. In the world of education podcasts can readily be utilized to enhance the classroom experience, provide information for students who are unable to attend traditional classes, provide resources as part of a distanced learning experience and provide adaptations for students with special needs.

Deficiencies in Existing Knowledge

Since the start of podcasting there has been considerable academic interest in the harnessing of this media for instructional purposes. However, like many technologies their first implementations are instructor centric and materials are produced by teachers for delivery to learners. How much deep authentic learning and mastery of useful technical skills could be fostered by increased student involvement in the development and distribution of podcasts? Podcasts and podcasting (as with most educational technologies) are subject to something akin to the idea of Trickle Down Economics. The adoption and study of new technologies takes place in higher education where curriculums are more fluid and less micromanaged by local, state, and federal mandates of content, context and efficacy. However, these management strictures can hinder the development and adoption of technologies that are already common place in higher education or even the world at large. Some have even argued that there is a lack of appreciation for the increase in teacher workload that may be generated by the use of iPods in the classroom (Blaisdell, 2006.) So as with many technologies the perception of additional difficulties may further hinder adoption. If this is a valid concern then shifting podcast generation from a teacher

responsibility to a student learning task would address these concerns and is a valid topic for further investigation. Researchers in the field have even acknowledged that more investigation is needed. Hew (2008) in an article regarding podcasting methodologies in grades K-12 and higher education indicated that,

> "…additional research is needed to determine whether and how the involvement of students in designing and producing their own podcasts may influence their learning. As previously mentioned, a majority of the previous studies focused on instructor- or lecturer created podcasts with no or very little student involvement (p. 349)."

On a personal level in my own school district iPods and personal media players are banned during the school day (the policy is spelled out emphatically in our student handbook). Students are allowed to carry them but are under no circumstances allowed to use them; ideally administration would prefer they were placed in lockers or better still left at home. Despite the ban and threat of consequences students still carry their much beloved devices. If students are going to provide the equipment in the form of media players why not exploit it on as many education levels as possible? Educational research that proves the feasibility of implementation and the overall benefits of student generated podcasts will only serve to bolster the importance of current technology in the classroom.

Research has largely been centered on the effects of technologies like podcasts in higher education. However, K – 12 learners are developing skills that will last them a lifetime; which is the perfect opportunity to mingle education, technology skills and creativity which are vital to their cognitive development. Podcasts and other Web 2.0 style tools such as blogs and wikis are a part of the overall ecology that drives changes in education (Franklin & van Harmelen, 2007).

Web 2.0 is about participatory development of content and culture. It isn't the technology of the future but is the technology of now, and it is vital to prepare students for the technology they will be expected to be fluent with when they reach higher levels of education or employment. Use of the technology to produce text documents, presentations, and event websites has long been accepted as a necessary part of modern education curriculums. These products have been readily accepted by instructors and parents as an integral part of education. This acceptance may have been rooted in the fact that current technology products are inherently similar to products that were already in use. A handwritten book report and word processed book report are not very different products; they are just generated with different tools. However, a podcast is a very different creation and there are few analogs for it in traditional education. It has long been accepted that presentations designed with slideware programs have moved from teaching aid to learning activity. Podcasts can follow a similar arc of acceptance, with use by instructors and movement into the realm of student created media when more research effort is applied to the topic.

Audiences That Will Benefit From This Study

Research into student podcasting at a K-12 level will help administrators, educators and technology coordinators to make informed decisions about purchasing, policy and curriculum writing. Administrators may be driven to reconsider personal media players as potential learning tools instead of potential distractions or issues subject to disciplinary concerns. Development of this topic will foster informed decisions for instructors and curriculum managers regarding the learning opportunities inherent in student generated podcasts. Technology coordinators who

recognize the benefits and minimal equipment requirements of podcasting might be moved to purchase the materials needed to facilitate these projects.

Purpose and Research Questions

Purpose

The intent of this two part mixed methods explanatory study will be to investigate the potential benefits of student generated podcasts. The first part of the research will be quantitative and focus on the effect of student generated podcasts on achievement in an 8th Grade General Science classroom. Information from this first portion of the research will be explored further with a second qualitative follow up phase. In the second phase, qualitative interviews, observations and student response surveys will be used to elucidate differences in student performance by exploring student attitudes towards and experiences related to creating podcasts in the 8th Grade General Science classroom. The rationale for following up with quantitative data gathering and analysis with qualitative interviews and surveys is to seek explanations for variable student achievement and develop a more total understanding of the benefits of student generated podcasts.

Research Questions

Questions to be addressed in the initial quantitative phase of this study include the following: How do student generated podcasts affect student performance in the 8th Grade General Science classroom? How does student performance compare between experimental and

control groups in the 8th Grade General Science classroom? How engaged in the learning process are the students? How motivated are the participants to complete learning task related to podcasting? It is of vital importance to collect data that reflects the efficacy of student podcasting. Many studies currently in circulation provide limited information about student performance after the introduction of podcasting. In order to fully demonstrate the benefits of this information student performance will be compared with that of students who did not participate in the podcasting activities.

Questions to be addressed in the second qualitative phase of this study include the following: What kinds of technology are the students already conversant in? What types of broad reactions/opinions do students have towards technology based projects in general? What kinds of technical skills did students feel they needed to complete a podcast? What kinds of technical skills did the instructors feel that the students needed to develop to be effective podcasters? Previous studies have highlighted student feelings towards podcasts from educators and even their listening practices. However, in-depth interviews of students participating in podcast creation have not been previously undertaken. Most previous research gauged student attitudes via surveys which can only provide response information in a capacity limited to the scope of the questions asked. Qualitative methodologies including interviews of participants while time intensive will provide a more detailed understanding of how students relate to content creation.

Hypothesis

Students who undertake the creation of podcasts as part of the eighth grade General Science curriculum will demonstrate greater levels of performance on criterion-referenced summative assessments than students who have completed the curriculum in a traditional manner.

Delimitations and Limitations of the Study

Delimitations

The initial quantitative phase of this study will collect post- intervention performance data from a total of eight sections of eighth grade General Science (approximately 240 students, approximately 30 students per section) at a demographically unremarkable middle school in Western Pennsylvania. As the school studied is demographically unremarkable conclusions reached with the collected data may not offer accurate generalizations or conclusions for groups such as low-income or larger populations of students with varied ethnic backgrounds. Data collection does not consider the amount of previous experience that participant teachers or students have with multimedia, specifically audio creation. Teaching methods employed with the participants not taking part in the intervention will not be considered in data collections. Teachers may employ a wide range of strategies and activities. Qualitative data will not be collected from students that did not participate in the intervention group.

Limitations

Integration of student – generated podcasts into the curriculum is largely dependent upon the support offered by the instructor. Instructors with different levels of technical skills will inadvertently impact the results. This study also considers only eighth grade students in the General Science curriculum and its requisite materials. This limited focus study may make it difficult to draw broad generalizations from the general population of K-12 students. The collection of the quantitative data partially relies upon an instructor designed criterion-referenced assessment; this assessment might not reflect the best instrument for assessing student performance. The assessment might reflect inherent instructor biases towards certain cognitive levels and learning styles. However, to minimize disruption of the General Science classroom existing curriculum and assessments will be left in place whenever possible.

Review of Literature

The purpose of this study is to investigate the effect of student generated audio media, referred to herein as podcasts on student performance in a K-12 setting. This study will provide a unique data set as well as an important and seemingly overlooked perspective on this topic of inquiry. As Hew (2008) stated an expansive review, including approximately 30 studies, of the current state of podcasts and podcast methodologies in education, a majority (93.3%) of studies on podcasts were carried out in higher education settings (p. 340). Even nearly 4 years later this figure remains true. A cursory search of the ERIC database for articles including the term "podcast" yields a selection of articles in which more than 9 out 10 continue to be focused on podcasts in education at both the undergraduate and graduate level. This bias towards research at the college level is most likely a matter of ease of access rather than any sort of true eschewing

of concerns for studying podcasting at the K-12 level. After all you can research a problem if you have access to participants and research sites as well as time, resources and skills needed to study the issue (Creswell, 2008). The issues of skills and resources are by and large moot points. However, the issues of access to students and time play a major role in the skewed percentage of studies done at the higher education level. K-12 Educational institutions in the United States have been placed under enormous pressure to provide education that meets standards set forth by the state and federal government. Conducting studies that might not benefit students and forward vital performance goals will continue to be a hard sell in this educational climate. In addition, there is the issue of ease of access to research sites. Most educational researchers are already working professionals in the locus of higher education so it make sense to carry out their research where they already are. As a result of ease of access and governmental demands we are presently limited in our attempt to make further comparison between the use of podcasts in K-12 and higher education because of the current lack of research attention on K – 12 contexts (Hew, 2008.)

In addition to the bulk of extant research being focused on undergraduate and graduate students a considerable portion of podcasting audio research is devoted to student reactions to the use of instructor generated content and not content generated by learners themselves. There have been very few published examples of podcasting being used within the higher education sector to empower students and encourage active learning (Lee et al. 2007). The percentage of studies and materials that address both K-12 learners and the benefits of student generated podcasts are virtually nonexistent. In the reviewed literature all of the research items concerning learner created content were based exclusively on work done by undergraduate and graduate students.

There is a dauntingly large pool of research indicating that student generated multimedia projects can be exciting and meaningful learning activities to integrate into the curriculum (Green & Brown, 2002). The benefits of many varieties of student generated media have been widely documented, as have the benefits of including teacher or professionally constructed multimedia. When learners are afforded the chance to undertake greater interaction materials via multimedia both learner satisfaction and performance can be increased (Zhang, 2005). Student generated podcasts would afford students multiple avenues for interacting with information in both the creation process of their own podcasts and by listening to others' creations. The inclusion of technology in formerly mundane tasks such as prewriting and creating pre organizers can be made more palatable and even desirable. Lorentz et al (2009) described all participants in their study of primary students completing prewriting tasks as eager and displaying enthusiasm towards the task. So, the question of whether student developed multimedia in general is not at issue. However, the benefits of student created Digital Audio Learning Objects, DALO's, so dubbed by Middleton & McCarthy (2005) has been largely left unexamined at the K-12 level. The advocates at the higher education level have quite a bit to say about the potential for student generated podcasts in a variety of subjects most notably writing. In a qualitative study of podcast utilized in an advanced writing class Leigh Jones (2010) had this to report,

> "While I don't make absolute claims about the effects of student-generated podcasting, I have noticed some consistent changes in my advanced writing student's performances both in the classroom and in their writing. I think that these patterns indicate it would be worthwhile for instructors to experiment with podcasting" (p. 86).

While not exactly a ringing endorsement it aptly expresses the state of perception and research on this topic; clearly the need for more in-depth inquiry on multiple levels is indicated. Lee et al. (2008) describe their feelings on learner generated content thusly; [the authors] strongly believe that the true potential of podcasting lies in its knowledge-creation value and its use as a vehicle for disseminating learner generated content (p. 504). Chandra and Chalmers (2010) describe the advantages of student podcasting over other Web 2.0 forms of media and communication; the presentations uploaded as podcasts give the community an additional opportunity to understand the "what was done, how it was done and why it should be done." The podcast allows some fine grained issues which cannot be captured through text or digital images on a wiki (p. 44). A final point in the consideration of podcast research is the methodologies used for data collections. Nearly all the articles reviewed utilized a survey format in collecting information about everything from the participants' podcast listening habits, lecture class attendance rate and even their feelings towards using podcasts. As proposed this study would employ a qualitative interview process with the students instead of merely relying on the usage of surveys and impersonal data gathering tools. This approach, while obviously providing less data overall, will provide deeper and richer insight into student reactions and concerns when coping with the task of creating podcasts.

Methods/Procedure

Mixed Method Quantitative and Qualitative, Explanatory Study

The intent of the first phase of this study is to ascertain the benefits of participating in the creation of student generated podcasts in an eighth grade General Science classroom. Existing research indicates that other forms of student generated multimedia and digital projects have had a positive impact on student performance. The second phase of this study is intended to explore student attitudes towards student-generated podcasts as a learning activity and the frustrations associated with developing the required technology skills through one on one interviews. The qualitative data will be used to further the understanding of the quantitative data (Creswell, 2008.)

Participants (Quantitative)

The participants in phase one quantitative data collection will consist of eight sections of eighth grade General Science with each section containing approximately thirty students (for a total of two hundred-forty students in phase one of the study.) The average individual sections contain the following breakdown of students by ethnicity 24 Caucasian, 4 African American, 1 Hispanic, and 1 Asian. 14 of the class' students are male and 16 of them are female. 2 of the students have learning disabilities. The bulk of the students come from middle class socio-economic backgrounds with a few of the students living in homes near or below the poverty line. General Science at the eighth grade level is not ability grouped the sections are a heterogeneous mix, containing learners of mixed abilities with skills ranging from high, average to below basic skill levels.

Procedure (Quantitative)

Phase one: participants in the eight sections of eighth grade General Science will be divided into two groups of four (each group containing approximately 120 students); one group will complete the curriculum as per normal. This group will serve as a reference group; the second group will cover the same information but unlike the traditional curriculum will participate in the student generated podcast intervention. Students in both groups, reference and intervention, will complete a pre-test to assess prior knowledge and to establish a baseline of performance data for later reference. Upon completion of the curricular unit, students of both groups will complete an identical pre-generated assessment that has previously been incorporated into the curriculum as a source of data to quantify the benefits of student generated podcasts. In addition to completing the curriculum participants will complete a survey instrument at both the beginning and the end of the General Science curricular unit. Prior to initial administration of the survey parent consent forms will be distributed to all participants. Once parental consent has been obtained participants will complete a questionnaire regarding engagement and motivation experienced prior to the General Science unit and again after completion of the unit. Before taking the survey the students will be assured that the survey is confidential, they will not be identified by name and that the completed surveys will not be directly viewed by parents, teachers or administrators.

Instrument (Quantitative)

Quantitative data will be collected in three instances using two different instruments. Data on motivation and engagement will be collected from both the experimental and reference

groups at the beginning and end of the eighth grade General Science curriculum unit. This data will be collected using a modified version of the "Motivation and Engagement Scale" available from the Lifelong Achievement Group. From Lifelong Achievement's *Motivation and Engagement: Summary Documentation* (2011),

> The Motivation and Engagement Scale – Junior School (MES-JS) is an instrument that measures junior (elementary/primary) school students' (9 – 13 years) motivation and engagement. I assesses motivation through three adaptive cognitive dimension (booster thoughts), three adaptive behavioral dimensions (booster behaviors), three impeding maladaptive cognitive dimensions (mufflers), and two maladaptive behavioral dimensions (guzzlers) of motivation and engagement. Each of the eleven factors comprises four items – hence it is a 44 item instrument. To each item, students rate themselves on a scale of 1 ('Strongly Disagree') to 5 ('Strongly Agree) (pg. 9).

The MES-JS is available in several domain specific versions, utilizing the Science-specific version with slight modifications will enable collection of quantitative data about students' feelings pre and post intervention about creating podcasts within the General Science classroom.

The other data gathering device takes the form of a pre-generated, criterion-referenced assessment of understanding of the requisite information, skills and concepts included within the eighth grade General Science curricular unit. The assessment contains a variety of items including multiple choice, short answer and essay questions. This assessment was utilized in the past by the General Science instructors. This assessment will provide performance data for both the reference and experimental groups.

Data Analysis (Quantitative)

The mean, median and mode and standard deviation of the reference group and the intervention group will be calculated from both the data from the criterion referenced assessment and the modified Engagement and Motivation Survey (mEMS). A means analysis will be conducted to assess the significance between the performance data collected from the reference and intervention groups. A means analysis will also be conducted to compare the initial mEMS to the final mEMS data within the two groups and between the reference and experimental groups. Standard deviations of the performance data will be utilized to identify candidates for participation in phase two of the study (further explained in the participants section). An inferential analysis will be conducted using a confidence interval approach. This will allow for a determination as to whether the sample data is an accurate estimate of the overall population (Creswell, 2008.)

Participants (Qualitative)

Phase two qualitative interview participants will be selected as a result of analysis of quantitative data from the podcasting, experimental, group. The total number of phase two participants will be no less than 10% of the experimental group approximately 12 students. 50% of the phase students will have scores that fall within in one standard deviation of the mean performance score of the phase one data. 25% of the phase two participants will be selected on the basis of having scores that fall between one and two standard deviations above the mean

performance score and 25% will be selected on the basis of having scores that fall between one and two standard deviations below the mean score.

Procedure (Qualitative)

Phase two: qualitative interview participants will be selected from the experimental group based on their scores as explained in the prior section (participants). Interviews will occur as one on one session with a single interviewer to be held at the school site in a private room away from outside distractions and intrusions. Interviews will be limited to sessions of 45 minutes or less in order to minimize disruption to the school day. The interviews will be recorded and later transcribed into text documents. Prior to start of the interview participants will reassured that their participation is confidential and any information or responses provided will not be identifiable to them in the final research report.

Instrument (Qualitative)

The data gathering in phase two will take the form of an interview with preselected participants. The interview will be formatted with a series of open ended questions. The questions are intended to probe the participant's thoughts, feelings and possible frustrations related their involvement in the creation of podcasts as part of the General Science curriculum. Opening questions will be general such as; "Do you listen to podcasts?" "Does your family own a computer" "Do you have internet access at home?" "How do you feel about using technology in the classroom?" "Do you own an Mp3 player?" "Did you enjoy the podcasting activities?"

Responses to the basic questions will be further probed by the interviewer. For example, when participants respond about their enjoyment of the activities, the interviewer will follow up with probing questions such as, "Why do you think you did /didn't enjoy podcasting?" Interviewers will probe basic student responses in order to encourage the participants to share in greater detail about feelings and experiences.

Data Analysis (Qualitative)

The text transcripts of participant interviews will be input into either a dedicated program or free web service to generate a "tag cloud." A tag cloud is defined as:

> a visual depiction of the word content of a website, or of user-generated tags attached to online content, typically using colour [sic] and font size to represent the prominence or frequency of the words or tags depicted. (J. Pearsall (Ed.), 2012)

Web based services such as Tagcrowd.com., Wordle.net and Tagcloud-generator are potential means for tag cloud generation. The tag cloud will be configured to display the fifty most common terms, term incidence frequency will determine the word's size and brightness of color. Extremely common words like common articles, nouns, pronouns, common verbs, and terms used by the interviewer will be automatically eliminated from the tag cloud. The tag cloud will allow for important themes to be identified at a glance. The top ten terms will be explored as potential explanations for themes for elucidating the data collected in phase one.

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