

Effects of Video Technology on Student Engagement

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Abstract

This action research examines how video technology can be implemented in the elementary art room to increase student engagement and reduce off-task behaviors. The population for this study consisted of two fifth grade classes in a suburban school setting. Student behaviors were observed and recorded in the art room during live teaching and video instruction. Students had an opportunity to respond to the lessons and provide feedback regarding their participation in the study. Students were enthusiastic about contributing to the study and provided helpful responses. The results of this action research indicate that students are more engaged and off-task behaviors are reduced with the use of video technology in the elementary art room.

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Chapter 1: Introduction

Background

My art teaching career began in the summer of 2006 when overhead projectors were still in use, boxy televisions occupied the corners of classrooms, and texting was quite a task as Apple had not yet released the iPhone. I was fortunate to teach in three different schools for almost three years prior to staying home for six years to raise my children. In those three years, I had a great opportunity to teach and observe hundreds of students/behaviors in diverse classroom settings (three different art rooms and then via art cart visiting homerooms). After six incredible years at home with my family, I was excited to be back in the elementary art room teaching over 500 amazing students who were growing up in a new “digitally enmeshed world” (Straker, et al., p.300) equipped with impressive technology skills/knowledge and exhibiting off-task behaviors I had not noticed as often in my beginning years of teaching.

While I love teaching art each day, I have noticed over the past few years a shift in student behavioral engagement, specifically distractedness, interrupting and impatience in the art room. There has been a noticeable increase in student disruptions, talking while the teacher or peers are talking and numerous off-task behaviors specifically during whole class instruction and demonstrations. In conversation with fellow educators, many agree they are experiencing similar behaviors in their classrooms.

A 2012 study on classroom behavior management strategies by Dr. Barry Parsonson shows that disengagement and off-task behaviors shift the classroom dynamic from focusing on the task at hand to the disruptions. As I reflect on my classes at the end of each day, I am often

concerned as to why these behaviors are occurring with such frequency. As a result, I think about why these behaviors arise and how I can better engage my students by applying more effective classroom management strategies. I consider how I can improve my practices and utilize relevant tools so that I can connect with 21st century “digital natives” (Haughton, Aiken & Cheevers, 2015).

“Action research is a powerful tool for studying and improving one’s practice,” according to Hendricks (2009). I want to do just that. I want to improve my teaching each day. I want my students to get the most out of every class. Creating a more engaging environment with less distractions will enhance the overall art learning experience. The action research project described herein will demonstrate how the incorporation of meaningful video technology into my art lessons helps to meet the diverse needs of my population, thus, improving engagement and behaviors.

Problem Statement

While technology integration is occurring in my school, I feel as though teachers are facing a huge challenge of engaging our youth. In the classroom, the most clear example of this problem that I witness is off-task behaviors. Research indicates that off-task behaviors are problematic because “when a child is not behaviorally engaged then they are unable to achieve academic success.” (Jordan, et al., 2014) Art class typically begins with a group meeting for introductions, demonstrations and discussions. During this time, I notice the most off-task behaviors and interruptions with a number of classes. The behaviors consist of, but are not limited to; talking, calling out, fidgeting, movement and distractedness. Over the past few years, these behaviors have increased which results in loss of instructional and project work time as

expectations need to be reinforced. I have also noticed that off-task actions sometimes influence the behavior of peers and as a result, more students become distracted or disengaged. If these behaviors increase or continue, I speculate that off-task conduct will become more widespread throughout the student population. This could affect students who were fully engaged, may cause students to become disconnected from the arts and possibly impact student behavior in other content areas.

Adrian Lim, Principal of the Ngee Ann Secondary School in Singapore, encourages teachers to embrace familiar and relevant tools to enhance learning and reduce interruptions. Furthermore, Brame's (2016) research indicates that video instruction stimulates and increases engagement within a diverse student population. This study will show how incorporating video technology into instruction/demonstrations may be a necessary tool for enhancing overall behaviors and engagement in the art room.

Purpose

The purpose of this study was to determine the effects of video technology on student behaviors and engagement in the elementary art room. Thirty-three fifth grade students were observed in a traditional art instruction setting comparing live teaching to instructional delivery via teacher created video. Results of this study show that student engagement/behaviors improve with the implementation of video technology and as a result, I will work to incorporate more video instruction in the art room going forward. Videos may provide more options for differentiation, students who miss a lesson can easily catch up by watching the video and videos can allow for maximized work time. Results of this project can significantly impact future

learning across all grade levels in my school. Videos and ideas can also be shared with my art department and colleagues to encourage video implementation in their classrooms.

Research Question:

I am specifically curious how students will respond to video technology and if they will be more or less engaged with instruction being delivered on screen. Therefore, this study is to determine the results of the following question:

What is the relationship between the use of video technology for instruction/demonstrations and student engagement in the elementary art classroom?

Research Design

Action research was conducted to determine the effects of video technology in the art room focusing on a fifth grade population. For this action research project, parents/guardians of every student in two fifth grade classes received a consent form asking for their permission to allow their child to participate in the study. Students received an assent form and were given a choice as to whether or not they wanted to participate. Students were also informed that they had the option to withdraw from the study at any time.

Student behaviors were observed during live and video instruction during 2-3 art classes lasting 45 minutes, once per week. Student behaviors were recorded with the use of a tally sheet to keep track of off-task behaviors throughout instruction. In this mixed-methods study, engagement and content retention were measured as students completed questionnaires and exit tickets in response to both live and video instructional approaches.

Definition of Terms

1. **Engagement-** “the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education.” (The Glossary of Education Reform, 2014).
2. **Off-Task Behaviors-** Baker (2007) defines off-task behavior in learning environments as behaviors where a student disengages from the learning environment and task to engage in an unrelated behavior. In this study specific off-task behaviors include but are not limited to talking during instruction, walking around, changing seats, playing with art materials, interrupting and fidgeting.
3. **Video Instruction/Demonstration:** teacher created video demonstrating skills and ideas related to a lesson.
4. **Exit Ticket:** “a formative assessment tool that gives teachers a way to assess how well students understand the material they are learning in class. This tool can be used daily or weekly, depending on the unit being taught. A good exit ticket can tell whether students have a superficial or in-depth understanding of the material. Teachers can then use this data for adapting instruction to meet students' needs.” (Edutopia, June 2015)

Chapter 2: Literature Review

This literature review will discuss the importance of student engagement and how incorporating video technology as a learning tool can enhance student engagement. In my six years away from the classroom, an influx of major technologies were introduced to the world as the internet, according to the International Telecommunications Union, grew to include 3.2 billion users in 2015 and the inception of iPhones/tablets came into play (Haughton, Aiken, Cheevers, 2015). In 2015, I arrived back in the elementary art room graced with over 500 “digital natives” equipped with tech skills and exhibiting off-task behaviors during instruction. (Haughton, Aiken, Cheevers, 2015). While my intention is not to discount positive behaviors, I find myself concerned with recurring behaviors associated with impatience, distractedness and interrupting. My students were/are growing up in a “digitally enmeshed world” (Straker, et al., p.300) possibly exposed to their first camera screen just seconds after birth and then instantly shared on Facebook, Twitter or Instagram with just a few quick swipes and a tap.

Technology is encouraged in our school district and we are fortunate to have a great technology program and resources. In the art room, our technology consists primarily of a white board/projector for all grades and iPads which are used mostly for grade level specific group projects. My art room is not technology heavy, as I try to encourage play, experimentation and exploration without the use of too much technology. I am curious however, how the surge of technology and omnipresence of screens affect student behaviors and engagement. In my observations both in the classroom and with my own children growing up in a fast paced, constantly evolving technological world, it seems as though the majority of my kindergarten

through sixth grade student population is exposed to technology outside of school on a daily basis(Aiken, 2017). Research supports my theory, as studies show that children as young as 6 months are exposed to two hours or more of screen time outside of school each day and the numbers increase with age (Zimmerman, Christakis & Meltzoff, 2007).

Slomanson stated “*If we are to remain relevant we must embrace change*” (Slomanson, 2014, p. 95). While his thoughts are tied directly to his research on flipped classroom ideas, I feel his words stretch beyond flipped practices. Students have their cell phones in their hands eager to tap, swipe, watch, listen or play the second they step out of our school. My own children reach for my phone to check the latest sports scores or weather first thing in the morning before they even brush their teeth. I awake to the sound of my phone reminding me to start my day. As I sit here typing this, “technoference” (McDaniel, 2017) occurs as my son is watching television, I hear chimes as my daughter texts her friends, my husband is streaming a movie, I have been side tracked by my phone at least ten times and now my dishwasher is playing a song to alert us that the dishes are clean. Technology has become a part of our daily lives and we are connected to screens more than ever.

Outside of school, students are learning and growing accustomed to technology (Henrie, Halverson, Graham 2015). While at school, however, there are far more limitations on devices, screen time, computer applications, and web searching to name a few. While each student has their unique experience with tech outside of school, how are students adjusting to the available technologies at school each day? I recently walked my son to the bus stop and while waiting there, I noticed elementary aged children completely immersed in games on their iPhones, oblivious to the other children skipping down the sidewalk or the blinking bus lights

approaching. Kids are on buses playing games, watching videos, taking photos, listening to music and sharing. Then, students arrive at school, tuck their phones into their backpacks and are expected to disconnect for seven hours. How can we embrace the change as digital immigrants and create engaging classrooms and manage behaviors for our digital natives? This literature review will explore these ideas and how to use technology as a tool to enhance engagement and improve behaviors.

Student Engagement

Over the past few years, I have been considering the evolving technological advancements in our world and the impact it has on my students and teaching. Children are growing up in the front seat of modern technology, pioneering the latest smart phones, tablets, gaming systems and apps (Straker et al., 2018). I often hear students talking about how they acquire art, music, sports, writing and various skills by watching YouTube videos. However, for my demonstrations I tend to use a whiteboard, projector and presentations on a daily basis to assist with my delivery of information, inspiration and big ideas. I consider how the use of relevant technology for lesson introductions and demonstrations might positively impact student engagement.

During whole group instruction, I regularly encounter off-task student behaviors and disruptions. Some of these unexpected behaviors include, but are not limited to: talking out, shouting out, interrupting, fidgeting, distracting peers and lacking patience. As a result, I find myself repeating expectations, procedures and skills often. Similar behaviors were found in a 2014 study conducted by Jordan, Fern, Morris, Cross & Mather where researchers focused on a second through fifth grade male population focusing closely on behaviors and engagement levels

in a science classroom setting. Data was collected on four male students in their study. Their studies conclude that their student population presented off-task behaviors about fifteen minutes into whole group instruction where fidgeting, disinterest and talking out were demonstrated. These behaviors pose an unfavorable impact on the learning environment by hindering engagement, instruction and learning all around. When these behaviors occur, a significant amount of instruction time is lost as the behaviors need to be addressed and expectations reinforced. Consequently, student engagement levels often decrease, impatience escalates and the flow of teaching and learning are disrupted for myself and the whole group.

Research conducted by Godwin, Almeda, Petroccia, Baker and Fisher (2013) included a kindergarten through fourth grade student population (22 classrooms total). Behaviors were examined in a variety of instructional formats (whole/small group and individual) while considering transitions and timing of lessons/activities. Their study explains that off-task behaviors negatively impact student learning/performance in the regular classroom setting as it inhibits learning and instructional time is lost. These behaviors are impacted by instructional design, activities and the duration of instruction. Their findings show that off-task behaviors are a result of self, peer, environmental, supply, walking and other distractions (Godwin et al., Table 2, p. 2432). Their research indicated that the format of instruction may have a significant impact on behavior and engagement. For example, individual and whole group instruction while students were seated at desks increased off-task behaviors, whereas group instruction on the carpet, testing and interactive instruction(dancing) encouraged on-task behaviors. Instructional timing is also mentioned as a factor as they speculate that activities with a shorter time-span bring about positive engagement as opposed to a longer activity period.

In effort to help all my students to grow and achieve successfully in art, I was curious to see how students would respond to a YouTube type of delivery instead of live teacher delivery. I hypothesized that students might be less apt to interject, talk about off topic ideas or distract their peers if content was delivered via video. As far as our world turning digital over the past decade, it might be more engaging and natural (as screen time begins as early as five months old according to Zimmerman, Christakis et al. (2007)) for kids to respond to a screen than live teacher delivery.

Why Student Engagement Matters

Student engagement is paramount in a successful classroom and it begins with careful planning by the teacher. Jordan et al., (2014) explains that “When a child is not behaviorally engaged then they are unable to achieve academic success.” Their study suggests that disengagement leads to lack of attention, focus, withdrawal, fidgeting, giving up and unexpected behaviors. On the positive end, their study reveals that students were most engaged in small group settings using a Five Es(engagement, exploration, explanation, elaboration and evaluation)approach to improve learning. Their study focused on an elementary(male) population and they conclude that these students benefit from movement opportunities and making social/emotional connections. Klem and Connell (2004) suggested that learning environments that are structured with clear and fair expectations increase engagement levels. On the flip side, studies show that low levels of engagement yield unfavorable long-term results such as poor conduct, low school attendance and an increased risk of drop-outs. Parsonson’s research states that stress levels increase for both students and teachers when challenging

behaviors occur - which can have a significant impact on engagement and taking away from instructional time.

Before students arrive on the first day of school, it is crucial that teachers prepare a safe learning environment and educate themselves on the incoming student population and their needs. It is of utmost importance to create a learning environment that welcomes all learners and that the teacher lays a solid foundation of connectedness from day one (Jordan et al., 2014). Jordan et al (2014) highlights that three areas of engagement (cognitive, emotional and behavioral) must be achieved to avoid student disengagement. Examples of cognitive engagement that Jordan et al. highlighted in their study was class response and participation. Their emotional/behavioral engagement observations focused on body language, facial expressions and overall interest in the lessons. If a classroom is built on positive teacher/peer relationships(emotional engagement), when students are motivated and connected to ideas and their environment (cognitive engagement), the path for achievement is forged. The article concluded that overall student engagement is unique to each learner and the key to successful learning is providing multiple forms of engagement and making connections (Jordan et al., p.677).

Godwin et al (2013) discuss how successful learners require a classroom environment conducive of positive learning outcomes. Their studies found that learning environments must be well designed while considering visuals, lighting, sound, furniture, climate, etc. All of these are important factors to consider to minimize off-task student behaviors. Research also discovered that classrooms cluttered with too many visuals impaired student focus (Godwin et al., p. 2429).

Following behavioral classroom studies, Jordan et al.(2014) and Godwin et al. (2013) both discuss successful approaches to positively impact student engagement by providing small group opportunities, changing classroom environment/seating, removing materials from tables until discussions/demonstrations conclude, allowing opportunities for physical activity/movement, building student confidence and making real world connections. Jordan et al. (2014) highlights the idea of building positive relationships among teachers, students and peers to positively impact successful learning and promote positive behaviors. Student engagement is contagious. If students are engaged and they feel a sense of belonging, it is likely that enhanced behavioral engagement will occur amongst peers, thus, improving the overall engagement of the classroom. (Jordan et al, p. 674)

Klem and Connell (2004) focus on the importance of relationships and how crucial it is for students to feel cared for and a sense of connectedness. Engagement, positive attitudes and behaviors increase when students feel valued, respected and when they actively participate in their own decision making.

Looking at engagement from a 21st century, technological point of view, Adrian Lim (2012), Principal of the Ngee Ann Secondary School in Singapore, suggested that “real learning takes place when kids are engaged.” In effort to enhance learning and engagement, an impactful approach suggested by Lim, would be to embrace familiar tools, adapt to new technologies and continue to develop professionally. Students at Ngee Ann demonstrated high levels of engagement while working with modern technology facilitated by teachers who utilized relevant tools to enhance learning. Teachers used familiar tools to formatively assess students as they navigated their way through learning. Teachers at Ngee Ann discussed how embracing tech tools

that are sometimes considered a distraction can be used to fuel excitement in learning. This study investigates the hypothesis that technology, when used as a relevant tool, will spark excitement and increase engagement in my diverse learners. I am confident that the incorporation of familiar tools such as video and providing access to more technology based lesson formats will positively impact student engagement and behaviors in my classroom. I feel that technology will spark excitement and interest with my diverse digital learners.

Video to Increase Engagement

Videos have been shown to positively increase engagement in the classroom. “In the 1990’s, televisions are just about everywhere: at home, school, waiting rooms, and other familiar places. Thus, video viewing has strong associations with the children’s natural environments and may serve as common stimuli (Charlop & Freeman, 2016).” Fast forward to 2019 and we are walking around with televisions in the palms of our hands. Brame’s (2016) research on video implementation in the classroom explains how video can be used to enhance learning and provides a clear breakdown on how to successfully put it into practice. She states that video technology has become the “cornerstone” (Brame) of blended/flipped courses in higher education and that many studies have shown that video is a “highly effective educational tool (Brame).” Three elements that Brame suggests considering when creating a video are cognitive load (what will students take from the lesson utilizing audio/visual memory?), engagement(how will students connect to the lesson?) and active learning (how are students responsible for their learning?).

Brame provides strategies that have proven to be particularly successful in designing video content.

Table 1 (Brame, p.3)

Process	Effect on cognitive load	Examples
Signaling: Highlighting important information	Can reduce extraneous load Can enhance germane load	Keywords on screen highlighting important elements Changes in color or contrast to emphasize organization of information Changes in color or contrast to emphasize relationships within information Brief out-of-video text explaining purpose and context for video (e.g., learning objective for video)
Segmenting: Chunking the information	Manages intrinsic load Can enhance germane load	Short videos (6 minutes or less) Chapters or click-forward questions within videos
Weeding: Eliminating extraneous information	Reduces extraneous load	Eliminating music Eliminating complex backgrounds
Matching modality: Using the auditory and visual channels to convey complementary information	Can enhance germane load	Khan-style tutorial videos that illustrate and explain phenomena Narrated animations

Table 1(Brame, p.3) provides a detailed explanation of how to successfully implement these strategies into student learning while highlighting the three above mentioned elements. Brame explains how to engage learners with the use of signaling (using graphics, text and chunking) to attract the viewer to key points and ideas. Information that does not enhance learning (extraneous load) or relate to specific learning goals should be eliminated. Brame's study states that videos that fall under six minutes produce more favorable outcomes with 100% of her population watching the entire video, while longer videos produced lower engagement results. She recommends speaking with enthusiasm and in a quick, conversational manner to increase engagement.

Charlop and Freeman's (2000) journal article compares video modeling vs. live teacher modeling for students with autism. Careful consideration was put into the study to create reliable research using trained, unbiased therapists in controlled environments. Videos were pre-viewed and rated prior to the study with the use of a rater/checklist. Student behaviors and learning were

carefully observed using live and video delivered modeling. Their study found that most of their student population acquired skills faster while watching video modeling compared to live modeling of skills. Charlop & Freeman also suggest that video instruction is both efficient and effective as it can present as a stimulating novelty/change from the usual classroom learning structure.

Brame (2016) and Charlop & Freeman's (2000) literature concludes that delivering content via video increases engagement and provide favorable student responses. While Charlop and Freeman (2000) focused on students with autism, it also mentions that video modeling can also be effective with a diverse population, not necessarily limited to individuals with autism. Charlop and Freeman (2000) hypothesize that video modeling is effective/stimulating because video delivery is a change from the traditional live teaching model.

The Flipped Classroom

A modern use of video technology that educators have been exploring and implementing are flipped classroom practices. The flipped classroom is a 21st century teaching strategy that allows students to explore new information via readings, video, presentations, etc. prior to class at their own pace. When students arrive in class, they are prepared and ready to engage in learning activities based on their retained knowledge (Schmidt & Ralph, 2016). According to veteran law professor, William Slomanson (2014), educators are "hunters and gatherers" always searching for tools that will enhance their teaching. In Slomanson's article, Blended Learning: A Flipped Classroom Experiment, the professor explains how he embraced change in his successful transition from a traditional lecture-based teaching model to a flipped college classroom. Slomanson taught in a lecture format for thirty-six years before completely diving into a flipped

model. His experiment proved favorable as most of his millennials responded positively to flipped practices. His students were required to watch video lectures and create outlines prior to class which, in turn, allowed Sloanson to see results including enhanced learning activities (debates, questioning, conversation), increased teacher to student interactions, and collaboration during face to face class meetings. This change helped Slomanson to discover that his students were more engaged, class time was maximized, he was able to make personal connections and discussions were fruitful. Slomanson surveyed his students early semester and mid-semester to gather feedback on their experience with the flipped approach and the consensus was that his pupils responded in favor of the new teaching model. The flipped model enhanced the learning experience for both Slomanson and his students and however, he concluded that it is too early in his study to determine if it is the best practice.

Schmidt and Ralph (2016) further provide a comprehensive explanation of the flipped model and effective practice while sharing strategies and tools that can be implemented. They conducted a study that polled a K-12 teacher population with various years of teaching experience. Those that used the flipped model reported that they would continue to use the model as they observed improvements in student engagement and performance. While Schmidt and Ralph (2016) focus on an elementary through high school population, their research is similar to Slomanson in that both studies agree that the flipped model allows for enhanced learning and increased engagement during class time. Schmidt and Ralph's (2016) study explains that the flipped model allows time for more teacher assistance, problem solving and hands on activities during class time. Furthermore, Slomanson (2014) and Schmidt & Ralph (2016) discuss that a flipped classroom does not have to be completely on video. Rather, the teacher should create a

model that works best for themselves and their students using relevant tools. Creating a flipped classroom requires careful thought for successful implementation. Short videos are recommended as well as creating recordings that feature different people in effort to increase engagement. Schmidt and Ralph, along with Slomanson also provide helpful resources to assist with flipped practices (i.e. – Khan Academy, YouTube) suggesting that one does not have to necessarily reinvent the wheel. The idea of creating videos with people other than myself has me thinking of how interesting it would be to create introductory and demonstration videos featuring guest artists, other teachers, peers, high school art majors, our principal, etc. Our art department could perhaps work together to create a variety of curriculum related videos that we can share/access when covering a specific topic or skill. My goal is to use video technology as a tool to further engage and limit distractions during class time. Having recorded introductions/ demonstrations will benefit my classroom environment as the tools can be used as a reinforcement option and to catch up students who may have missed out on class time while meeting the needs of diverse learners. My goal in this action research project is to incorporate flipped classroom ideas into my teaching, however, all the videos will be presented during class time (not at home). Students will watch the videos in the art room with the teacher present for introduction and demonstration purposes.

Brame (2016) and Charlop and Freeman (2000) provide insightful information on how teaching via video positively impacts diverse learners. I teach a kindergarten through sixth grade population including a significant number of students with autism and special needs. It is important to me that I find the best way to reach my diverse student population. It is my intention to make adjustments as suggested in this literature review to create an engaging

learning environment with the use of relevant and modified flipped practices in my action research. It is time to embrace familiar video technologies to improve student behaviors and enhance student engagement in the art room.

Chapter 3: Methodology

Introduction & Action Research

The purpose of this study was to determine the relationship between the use of video technology for instruction/demonstrations and student engagement in the elementary art classroom. I was specifically curious how students would respond to video technology and if they would be more or less engaged with instruction being delivered on screen. I felt that action research was the best approach for discovering how to find a solution to improve behaviors and increase engagement in my art classes. Conducting this research allowed me to understand ideas related to off-task behaviors, classroom engagement and how to implement video technology successfully. I acquired knowledge from relevant research discoveries provided in literature and then put my plan into action. Results of my action research show that incorporation of video technology can improve student engagement.

Participants / Selection:

While I teach 31 different art classes per week ranging from kindergarten through sixth grade, for this research, I chose to concentrate on two fifth grade classes for my student population. I felt this population would provide useful data as I have had a unique opportunity to watch these students grow since second grade. This group was primarily exposed to live teaching/demonstrations, teacher-presented slideshows and various presentation technologies in art class over the past 4 years. I have noticed a shift in behavior and engagement with this grade level and would like to make necessary changes to improve our learning environment to benefit all students.

Students who participated in this study consisted of fifth grade elementary level children in a suburban public school setting. Every student from two fifth grade homerooms were invited to participate in the study. Students ranged between 10 and 12 years old. The students were grouped by their school assigned homerooms. Class A had 20 out of 24 student participants and Class B had 13 out of 22 student participants. This student population visits the art room once per week for 45 minutes.

Materials

Data for this study was collected through direct teacher observation (with the use of a tally chart), exit tickets(See Appendices D&E) and a questionnaire(See Appendix F). Exit tickets are formative assessment tools that can assess how well students understand the material they are learning in class. In this study, students were asked to fill out two short questionnaire exit tickets that checked for knowledge retention. I observed and record tallies during direct instruction and video instruction (See Appendix C). I kept track of off-task behaviors throughout instruction and demonstrations.

Ethical Considerations

My research proposal was submitted to the IRB on January 26, 2019. I collaborated with my research advisor throughout the course of the project and completed the approved IRB trainings. I prepared consent and assent forms for students, parents and guardians. Students participated in a classroom discussion to assure they were comfortable participating in the study. Students, parents and guardians received written notice documenting their option to withdraw from the study at any time. Students also discussed withdraw procedures during class time.

All student documentation throughout this study was kept and will remain confidential. Students were assigned a code number that is only be accessible by myself, the investigator. Data collected for this research project will be kept secure in a locked drawer in my locked classroom for 6 years. The data will be shredded after 6 years. All electronic data will be stored in my password protected laptop.

The risk level for this study was very low. At most, students may have felt uncomfortable knowing their behaviors were being observed. Potential benefits from this study may allow for increased student engagement, improved behaviors and maximized class time which can extend beyond this select population. There were no incentives for participating in this study.

Procedures

Following selection of the population, I, the researcher informed parents of the action research project by sending home a letter and consent form explaining the project (See Appendix A). Details of the study were fully explained and discussed with students once parent consent forms were collected. Students then had the option to fill out an assent form (See Appendix B) indicating whether or not they wanted to participate. Students were informed that they could withdraw from the study at any time and were encouraged to ask questions throughout the study. Each student was assigned with an identification code number for data collection purposes. This number appears on all worksheets throughout the study.

The design chosen for this study is a mixed approach collecting both qualitative and quantitative data. The qualitative data collected for this study consists of teacher observation notes and written student response. The quantitative data collected for this study includes student response from exit tickets, survey and teacher collected observation tallies.

Session 1: Live Teacher Instruction

Students were introduced to a new clay art unit with myself/teacher delivering content through live instruction in the first 10-15 minutes of class time. Instruction was delivered using a projected self-made Emaze gallery tour <https://app.emaze.com/@ATTLIQCT/untitled#1> (I did not play the embedded video) and teacher/student dialog occurred throughout the slideshow. Disruptive/off-task behaviors were recorded by me (the researcher/teacher) during this time on the behavior tally sheet (Appendix C). The behavioral observation categories were selected based on pilot data collected throughout my K-6 art classes. The behavior chart categories included: talking during instruction, walking around the classroom, changing seats, playing with art materials, fidgeting, interrupting and other unexpected off-task behaviors. Student behaviors and response throughout the study had no impact on grades. Students were introduced to a new artist and we discussed his artistic style. For this project, students are creating a clay cupcake inspired by American realist painter, Wayne Thiebaud. During this class period, students created a drawn plan/design for their cupcake. At the conclusion of class, students completed an exit ticket review sheet that indicated information retention of the lesson introduction. Students were reminded at the conclusion of class that their next class demonstration would be delivered via video.

Session 1 - Class A: Student participants present: 19/20

19 students were present out of 20 participants. Data collected during this class period consisted of behavior tallies (See Appendix C) and an exit ticket review sheet (see Appendix D).

Session 1 - Class B: Student participants present: 11/13

11 students were present out of 13 participants. Data collected during this class period consisted of behavior tallies (See Appendix C) and an exit ticket review sheet (see Appendix D).

Session 2: Video Instruction

Session 2 began with a review of the new clay cupcake sculpture unit, we revisited content from our previous class to assure all students were clear on ideas and to catch students up who were absent from previous class. Students then viewed a 3 minute teacher created clay demonstration video. The video was pre-recorded by myself using an iPad, edited in the iMovie app and shared via projection on whiteboard in the art room. The video reinforced the artist name, presented imagery to inspire sculpting realistically and demonstrated appropriate clay hand-building techniques/ ideas. Student behaviors were tallied during this time through direct observation. Following the video, students had an opportunity to ask questions and review skills as needed. Students who did not feel comfortable to begin sculpting had an option to view the video again or have ideas reinforced by the teacher. Teacher observed and formatively assessed student skills and sculpting procedures as they began working on their clay project.

Session 2 - Class A: Student participants present: 19/20

19 students were present out of 20 participants. Data collected during this class period consisted of behavior tallies (See Appendix C).

Session 2 - Class B: Student participants present: 11/13

11 students were present out of 13 participants. Data collected during this class period consisted of behavior tallies (See Appendix C).

Session 3: Video Instruction

This session began with a review of the new clay cupcake sculpture unit, we revisited content from our previous classes to assure all students were clear on ideas and to catch students up who were absent from previous class(es). Students then viewed a 13 minute teacher created clay demonstration video. The video was pre-recorded by myself using an iPad, edited in the iMovie app and shared via projection on whiteboard in the art room. Students watched a 13 minute teacher created video demonstrating clay processes/skills for the top of their cupcake sculpture. Student behaviors were tallied during this time through direct observation. Following the video, students had an opportunity to ask questions and review skills. Students who did not feel comfortable to begin sculpting had an option to view the video again or have ideas reinforced by the teacher. Teacher observed student skills and procedures as they continued working on their clay project. Students completed an exit ticket review sheet that assessed information retention of lesson/demonstration skills.

Session 3 - Class A: Due to an unexpected change in our school building schedule, this class was not able to complete this session. As a result, data was not collected for Class A, Session 3.

Session 3 - Class B: Student participants present: 11/13

11 students were present out of 13 participants. Data collected during this class period consisted of behavior tallies (See Appendix C).

Following the video lessons, students were asked to complete a questionnaire (see Appendix F) in response to the new instructional delivery using video technology. Students also discussed their observations in a group setting throughout the sessions.

Chapter 4: Data Analysis and Results

Quantitative Data

The quantitative data collected consisted of teacher observation tallies of student behaviors, exit ticket review sheets, and a student response survey. Tallies were recorded throughout live and video instruction (2 tally charts for Class A and 3 Tally charts for Class B).

Class Session 1: Off-task Behavior Observations/Tallies & Exit Ticket Scores **Instructional Delivery: Live**

Student behaviors were observed and tallied during a new unit introduction lesson. Students learned about and will create a cupcake based on American realist artist, Wayne Thiebaud. During session 1, both classes received instruction through live teaching. Student off-task tallies were recorded on the Off-Task Behavior Observation Chart throughout the 15-20 minute introduction. During session 1, live teaching, Class A recorded 28 off-task behaviors. During session 1, live teaching, Class B recorded 32 off-task behaviors. Talking and interrupting during instruction were the most frequent behaviors tallied in session 1 (See Figure 1).

Figure 1

Session1: Off-Task Behavior Tallies - Live Teaching (Approx. 20 minutes)	Class A Tallies	Class B Tallies
Talking During Instruction	16	13
Walking Around	0	0
Changing Seats	3	2
Playing with Art Materials	2	1
Fidgeting	2	6
Interrupting	5	5
Other Off-Task Behaviors	0	5
Total Tallies:	28	32

As students completed their class work during session 1, they were asked to complete an exit ticket to review what they learned. Question #5 on Exit Ticket 1 (Appendix D) (*The Elements of Art the artist used to create the above painting...*) was not included in the exit ticket scoring. Students in Class A and Class B were not required to answer the fifth question as we did not fully cover the material during the introduction.

Class A completed Exit Review ticket 1 to check for understanding following live teaching instruction. 19 student participants out of 20 were present during this class session. 19 students responded to the exit ticket with a class average of 67%. 28 off-task behaviors were tallied during instruction (See Figure 2).

Figure 2

Session 1 Student Response: Exit Ticket (Live Teaching - Thiebaud Intro)	
Class Group: A	
Student Responses: 19/20	
Off-Task Behavior Tally Total: 28	
Score	# of Students
100%	2
75%	9
50%	8
25%	0
Class A - Average Score: 67%	

Class B completed Exit Review ticket 1 to check for understanding following live teaching instruction. 11 student participants out of 13 were present during this class session. 11

students responded to the exit ticket with a class average of 82%. 32 off-task behaviors were tallied during instruction (See Figure 3).

Figure 3

Session 1 Student Response: Exit Ticket (Live Teaching - Lesson Introduction)	
Class Group: B	
Student Responses: 11/13	
Off-Task Behavior Tally Total: 32	
Score	# of Students
100%	5
75%	5
50%	0
25%	1
Class B - Average Score: 82%	

The combined average score for Exit Ticket 1 (Class A & B): 74.5%

Class Session 2: Off-task Behavior Observations/Tallies & Exit Ticket Scores **Instructional Delivery: Video**

Student behaviors were observed and tallied during a video demonstration. The video was about 3 minutes long and students watched a demonstration on how to create a pinch pot base for their cupcake sculpture. During session 2, both classes received instruction through a teacher/self created video demonstration. Student off-task tallies were recorded on the Off-Task Behavior Observation Chart throughout the 3 minute video. During session 2, video teaching, Class A recorded a total of 5 off-task behaviors compared to 28 off-task behaviors in session 1 with live teaching. During session 2, video teaching, Class B recorded 2 off-task behaviors

compared to 32 during session 1 with live teaching. Talking and interrupting during the videos were tallied most in session 2 (See Figure 4).

Figure 4

Session 2: Off-Task Behavior Tallies - Video Teaching (3 Minute Video)	Class A Tallies (19/20 Students)	Class B Tallies (11/13 Students)
Talking During Instruction	4	2
Walking Around	0	0
Changing Seats	0	0
Playing with Art Materials	0	0
Fidgeting	0	0
Interrupting	1	0
Other Off-Task Behaviors	0	0
Total Tallies:	5	2

An exit ticket was not used following the Session 2 video lesson. However, students had an opportunity to ask questions and have ideas reinforced as needed. All participants were asked if they felt comfortable to begin sculpting. All student participants agreed they were ready and created successful cupcake bases demonstrating understanding and proper sculpting skills. Students who were not comfortable to sculpt had the option to watch the video again or have ideas reinforced if needed. No students asked to watch the video again.

Class Session 3: Off-task Behavior Observations/Tallies & Exit Ticket Scores **Instructional Delivery: 13 Minute Video**

Student behaviors were observed and tallied during a video demonstration. The video was approximately 13 minutes long and students watched a demonstration on how to create the

top portion of their cupcake sculpture. Various skills were demonstrated throughout the video. During session 3, Class B received instruction through a teacher created video demonstration. Student off-task tallies were recorded on the Off-Task Behavior Observation Chart throughout the 13 minute video. Due to a schedule conflict, Class A did not watch video 2, therefore, data was not collected for Class A this session. Class B recorded a total of 4 off-task behaviors (compared to 32 in live teaching, session 1) during the video demonstration with 10/13 students participating. Talking during the videos were tallied most in session 3 (See Figure 5). The number of tallies doubled from session 2 to 3, while the second video was 10 minutes longer than the session 2 video.

Figure 5

Session 3: Off-Task Behavior Tallies - Live Teaching (13 Minute Video)	Class A Tallies * (0/0 Students)	Class B Tallies (10/13 Students)
Talking During Instruction	*	3
Walking Around	*	0
Changing Seats	*	0
Playing with Art Materials	*	0
Fidgeting	*	1
Interrupting	*	0
Other Off-Task Behaviors	*	0
Total Tallies:	*	4
*Note- Due to schedule change for Class A, data was not collected during this class session.		

Figure 6

Overall Off-Task Behavior Tallies

Class A : Off-Task Behavior Observations	Total Tallies
Session 1 - Live Teaching - 19/20 Students	28
Session 2- Video - 19/20 Students	5
Session 3 - Due to schedule change for Class A, data was not	

collected during this class session.	
Class B: Off-Task Behavior Observations	Total Tallies
Session 1- Live Teaching - 11/13 Students	32
Session 2- Video - Students 11/13	2
Session 3 - Video - 10 /13	4

Class B completed Exit Review ticket 2 to check for understanding following video teaching instruction/demonstration. 10 student participants out of 13 were present during this class session. 10 students responded to the exit ticket with a class average of 95% . 4 off-task behaviors were tallied during instruction.

* Due to a schedule conflict, Class A did not watch video 2, therefore, exit ticket data was not collected for Class A this session (See Figure 7).

Figure 7

Session 3 Student Response: Exit Ticket #2 (Video 2)	
Class Group: B	
Student Responses: 10/13 (*1 student was not able to complete the ticket at the end of class)	
Off-Task Behavior Tally Total: 4	
Score	# of students
100%	8
75%	2
50%	0
25%	0
Average Score : 95%	

Student Response to Video Technology

Student participants in Class A and Class B had an opportunity to complete a survey in response to their video lessons (See Appendix F). Figure 8, below, shows results/student response.

Figure 8

Class B: Total Students: 11/13	yes	no	both	no response
I like watching video lessons in art class.	11	0	0	0
I would like art classes to stay the same, with no video lessons.	2	9	0	0
I focus better watching video lessons compared to live teaching in art class.	9	2	0	0
I feel distracted when I watch video lessons in art class.	0	10	1	0
I would like to watch video lessons taught by students in art class.	4	6	1	0
I would like to watch more video lessons in art class	11	0	0	0
Class A: Total Students: 19 /20	yes	no	both	no response
I like watching video lessons in art class.	17	1	1	0
I would like art classes to stay the same, with no video lessons.	3	13	2	1
I focus better watching video lessons compared to live teaching in art class.	17	1	1	0
I feel distracted when I watch video lessons in art class.	2	16	1	0
I would like to watch video lessons taught by students in art class.	9	5	4	1
I would like to watch more video lessons in art class	14	2	3	0

*Figure 9***Combined Student Response Totals: Class A & B**

Student Response Totals (Total Students: 30 - Class A&B)	yes	no	both	no response
I like watching video lessons in art class.	28	1	1	0
I would like art classes to stay the same, with no video lessons.	5	22	2	1
I focus better watching video lessons compared to live teaching in art class.	26	3	1	0
I feel distracted when I watch video lessons in art class.	2	26	2	0
I would like to watch video lessons taught by students in art class.	13	11	5	0
I would like to watch more video lessons in art class	25	2	3	0

Overall, students participating in this study responded in favor of the use of video technology in art class. 95% of the student population liked watching art video lessons/demonstrations and the majority of participants would like to have more video technology incorporated into art lessons. The majority of the students in this population felt as though they focus better when watching the video(s) compared to live teacher instruction and did not feel distracted watching the video(s).

Qualitative Data

Throughout this study, I encouraged students to ask questions and make observations. As I introduced the action research project to my students, most were excited to participate and were curious about how the videos would work. I asked a whole group question asking how many students watch YouTube type videos for learning. More than half the student participants in

Class A and Class B raised their hands. Students also requested that I share the results upon project completion.

During the videos, I observed and recorded tallies as both classes were mostly silent, still and engaged. The minimal talking that occurred was a quick whisper, and went unnoticed by most other students due to the class engagement in the video. During the second video (13 minutes) with Class B, I was concerned how students would respond with a longer video as Brame's (2016) research suggested keeping videos under 6 minutes to maintain focus. At about the five minute mark during video 2 with Class B, I noticed student movement, off screen glances and whispering occurred. It was minimal as students quickly directed and maintained focus on the video demonstration. Following both videos, students felt they were able to successfully put their skills to practice. I observed the student participants and their skills were successfully implemented resulting in wonderful sculptures. Along with the videos, key ideas and directions were posted on the white board for reference throughout each session and were not visible to the students as they filled out their exit tickets. Students had an opportunity to ask questions and watch the video again if needed. One student in Class B was absent for a video lesson and was able to watch the video on their own in the next class to catch up. The student was able to fast forward through a portion of the video that was irrelevant to their work.

Following the videos, students reflected and discussed their observations with the following dialog:

- "we were so quiet!"
- "Nobody was talking or calling out."
- "We didn't interrupt."

- “Wow, that was fast, now we will have more work time.”
- “If someone comes in late or is absent, they can watch the video to catch up.”
- “No offense, but sometimes demonstrations take a really long time. The video is much shorter.”
- “That was really fun!”
- “Can we keep watching videos?”
- “You should have a YouTube channel.”

Chapter 5: Discussion and Conclusions

Interpretation of Results

Sir Ken Robinson (2017) stated that technology has always “intimately engaged with human innovation and creativity.” He shared that tools, in general, have the ability to “extend our reach and our minds.” The results of this action research study show how technology was successfully implemented as a tool to enhance learning and engagement in the elementary art classroom. Overall, The results of this study show that students are more engaged while watching video lessons compared to live teaching instruction.

Research Question: What is the relationship between the use of video technology for instruction/demonstrations and student engagement in the elementary art classroom?

I was specifically curious if students would be more or less engaged with instruction being delivered on screen as opposed to live instruction. The use of video technology in the art room had a positive impact on student engagement and behaviors. During live teaching, student off-task behaviors occurred throughout instruction, whereas student off-task behaviors observed during video instruction were substantially lower. Students responded in favor of the technology and would like have frequent incorporation of video technology in their future lessons.

Generalizations

While I feel that further exploration of the use of video technology in my art classes will be necessary and beneficial, the outcome of these preliminary research discoveries have proven beneficial to my students and overall classroom environment. Student response during and

following live introductions/ demonstrations exhibited numerous off-task behaviors. A sizeable number of disruptions similar to the behaviors discussed in Jordan et al's (2014) study, occurred during instruction which led to a longer introduction, the need for ideas and expectations to be reinforced, impatience from students who were on task and low scores on exit tickets. As previously mentioned, Adrian Lim (2012) suggested that "real learning takes place when kids are engaged." His teachers, he explains utilized technological tools to fuel excitement and engagement in their students. Student response during and following video lessons fueled excitement in my students as they exhibited on-task behaviors and high engagement levels throughout. Students were incredibly quiet, still and engaged as shown in Figure 6 during the videos. Observing the engagement level of my students during video instruction and then watching them put the ideas and skills into practice seamlessly, was quite incredible.

Limitations

There were quite a few limitations in this study particularly with observing and tallying student behaviors while teaching live. It was particularly challenging with the smaller population of Class B as I had to make observations on student participants while excluding the non-participants. Some of the non-participants may have encouraged off-task behaviors in participants which would impact data in the study. Ideally, it would have been helpful to have another person assist with the observations/tallying during the live teaching sessions as my calculations were accounted for while I was multitasking/delivering content. Having someone assist with observations may have resulted in viewing more off-task behaviors that I likely missed in session 1. While observing student behaviors during the video sessions, I was positioned in the back of the room while students sat on the floor in the front of the class. My

positioning may have impacted behaviors which is something that can be focused on during future video instruction. Students may have been more engaged with the video implementation as it was something new to their learning. During future instruction, I will use video as a strategic tool to maintain high engagement levels. I am eager to utilize video during lesson introductions as this is mostly delivered in a whole group format and off-task behaviors are elevated.

Another limitation for this study is overall collected data and time. Due to my class schedule and only teaching each class once per week for 45 minutes, it was difficult to gather a large/significant amount of data - especially not being able to have Class A for my second video and exit ticket response due to a schedule change.

Student attendance was also a factor throughout the study as I was not able to collect data on the entire population. Also, students were informed at the beginning of the study that they would not be graded on their participation in this study. Therefore, this may have impacted some student answers on the exit tickets.

Implications

This action research study has determined that my fifth grade art students are more engaged learners with the incorporation of video technology in art lessons. Using a familiar tool to increase engagement promotes a positive learning environment and as a result, I will continue to use this technology as a positive learning tool in my art room. I will share my study with colleagues so they can implement similar ideas into their practice for the benefit of their students. I will collaborate with my art department colleagues to create videos that can be shared.

I have gained an enormous amount of respect for researchers around the world as I never fully grasped the amount of time, care and effort that is required to conduct a study, simple or complex. This project has helped me grow as an educator, student and life long learner. I look forward to sharing the results of this study with my fifth graders. Perhaps I will share them via video delivery to enhance engagement. :)

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Appendices

Appendix A

March 2019

Dear Parents/Guardians,

I am currently pursuing my Master of Educational Technology degree from the University of the Arts, in Philadelphia. In the next few months, as part of my final Capstone project, I will be conducting an action research study to examine the effects of video technology on student engagement in the art room. The instructional videos will be presented during class and your child will not be filmed at any time. With your permission, I would like to invite your child to participate in this study. Please see the attached permission form for further details.

I ask that you please sign the attached form and return it to my attention by March 6, 2019. Thank you for your attention.

Sincerely,

Mrs. Krista Zollers
Art Teacher



PARENT CONSENT FORM

Title: Effects of Video Technology on Student Engagement

Principal Investigator: Krista A. Zollers, Art Teacher, [REDACTED]

Capstone Research Project Advisor: Sarah A. Eckert, PhD, Instructor, University of the Arts

Key Information About This Study

I am happy to invite your child to take part in a research project that will study how video technology impacts student engagement in the art room. To help with this graduate assignment, I ask your permission to have your child participate in my research project. The study will take place during your child's art classes from March 2019 through April 2019.

This study will consist of approximately 50 fifth grade students. All students from your child's homeroom are being asked to participate.

Description of Study

In March 2019, students will begin a clay unit where instruction and demonstrations will be delivered through both live teaching and video delivery. Student engagement will be observed with a focus on how students respond to both live teaching and video delivery. Students will participate in discussions and complete questionnaires in response to their learning experiences. This study will take place in art class throughout the months of March-April 2019 and will not impact any other part of your child's schedule. Your child will NOT be filmed for this study. The collected data will be shared in my Capstone report.

Risks and Benefits:

This study will NOT impact your child's grade. Students who are uncomfortable with being observed/the study, may withdraw at any time. Data collected throughout this study will be used to evaluate how video technology impacts student engagement in the art room. If I find that students are more engaged using video delivery, I will work to incorporate more video technology into my lessons.

Confidentiality

Your child's participation throughout this study will remain confidential. Each student will be assigned a number and names will not be shared. The key linking your child to their number will be stored in a locked drawer in my classroom. The collected data will not be used or distributed for future research, even if de-identified.

Voluntary Participation

Participation in this study is completely voluntary. If your child does not want to participate, there will be no consequences. Please contact Mrs. Krista Zollers if you would like to stop your child's participation in the study at any time.

Contact Information

Please contact Mrs. Krista Zollers at [REDACTED] should you have any questions or concerns about this research project. You may also contact my Capstone Advisor, Sarah Eckert, PhD. at seckert@uarts.edu, 215-717-6432 or [REDACTED] If you have any questions about your rights as a research subject, please contact the IRB Administrator at IRB@uscience.edu or at 267-295-3295.

Parent/Guardian Permission:

Please indicate below if you permit your child to participate in this research study. A copy of this form will be provided upon request.

- ☐ Yes, I grant permission for my child to participate in this research study.
- ☐ No, I do not grant permission for my child to participate in this research study.

Parent/Guardian Name (printed)

Parent/Guardian Signature

Date

Appendix B**STUDENT ASSENT FORM**

March 2019

Dear Fifth Grade Student,

I am taking a college class and for my final homework assignment, I am working on a research project to see how you and your classmates react to watching videos in art class. I am asking for your help with this study because I think it is important to discover different ways to make learning exciting for you and all [REDACTED] students.

Here is how the study will work:

- The project will take place in art class and all students in your homeroom are being asked to participate.
- You will NOT be filmed at any time for this project.
- I will take notes during three classes while you are learning and watching art videos.
- I will ask you to fill out a worksheet at the end of each class. The worksheets are not tests and will not be graded. Your answers will only be used to help me gather information for my project.

Please ask me questions about the project at any time. Please let me know if you would like to stop participating in the project at any time. Please fill out the form below and return it to Mrs. Zollers by March TBD, 2019.

Sincerely,

Mrs. Krista Zollers
Art Teacher
[REDACTED]

☐ **YES**, I would like to participate in this research study.

☐ **NO**, I do not wish to participate in this research study.

Student Signature: _____

Printed Student Name: _____

Date: _____

Appendix C

Off-Task Behavior Observation Chart

Class Code:

Date:

Number of Students:

Instructional Delivery (circle one): **Live/Video/Student Video**

Off-Task Behavior	(mark a tally for each off-task behavior)
Talking During Instruction	
Walking Around	
Changing Seats	
Playing With Art Materials	
Fidgeting	
Interrupting	
Other Off-Task Behaviors	

Appendix D

1. Name the artist who created this artwork:
2. Where is the artist from?
3. The painting above is a: ☐ still life ☐ portrait ☐ landscape
4. This artist liked to be called a “Pop Artist.” ☐ True ☐ False
5. The Elements of Art the artist used to create the above painting are (check all that apply):

<input type="checkbox"/> line	<input type="checkbox"/> color	<input type="checkbox"/> form
<input type="checkbox"/> shape	<input type="checkbox"/> value	<input type="checkbox"/> texture

Student #: _____

Date: _____

Class Code: _____

Appendix E

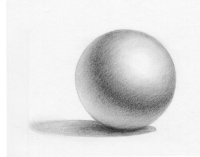
CLAY REVIEW Ticket

1. A **sculpture** is a 3 dimensional work of art and has **form**.

- ☐ True
- ☐ False

2. We begin our **pinch pots** by shaping our clay into this 3d shape:

- ☐ cube
- ☐ sphere
- ☐ cylinder



3. If I want to attach one piece of clay to another, I need to do the following:

- ☐ score the clay
- ☐ add slip to the clay
- ☐ both score and slip

4. When my clay sculpture is air dry (bone dry), it is ready to be bisque fired in the:

- ☐ sunshine
- ☐ kiln
- ☐ oven

Student #: _____

Date: _____

Class Code: _____

Clay Review

https://docs.google.com/document/d/1k81qUWrQeudJ_cDTKvdq-ApmZCxI8Sc8yOBSxjDF1xo/edit?usp=sharing

Appendix F: Student Survey

<https://docs.google.com/document/d/1r7lve77T3vCdpqCqLSrZIA0Vmtew34yrHO8Vk-ZA2e0/edit?usp=sharing>

Appendix G: Student Responses to Video Technology: Class A

https://docs.google.com/document/d/1RkiR_yYqAAJr6P_J41YM2MJ_OXsdDKt8teM6HS--bdg/edit?usp=sharing

Appendix H: Student Responses to Video Technology: Class B

<https://docs.google.com/document/d/1fRTA4HvI0yiIRryyQJTtLtKfWJ5yzQWh3-bBmdVdCwQ/edit?usp=sharing>