AGENCY AND IDENTITY: A COLLECTIVE CASE STUDY OF THE LEARNING EXPERIENCES OF HIGH SCHOOL STUDENTS IN A MUSIC TECHNOLOGY COURSE

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts

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CASE WESTERN RESERVE UNIVERSITY

August, 2015
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Agency and Identity: A Collective Case Study of the Learning Experiences of High School Students in a Music Technology Course

Abstract

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The purpose of this collective case study was to examine the learning experiences of high school students enrolled in a music technology course. Focused on the unique perspectives of eight students, data were generated through interviews, observations, student journals, audiovisual materials, and field notes. Within-case and cross-case analysis of the data established the themes of (a) building on technological experiences, (b) prior music knowledge, (c) approval of project-based learning, (d) musical dreams for the future, and (e) social categorization through individual musical pursuits. The findings indicated that, while students did not perceive a social identity related to specific characteristics in the music technology class, they were united in their pursuits toward musical autonomy and motivated by their own agency. Potential implications from this study suggest that music pedagogy and curriculum development might be considered as they relate to the knowledge and skills required of contemporary musicians.
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Acknowledgements

First and foremost, I would like to thank everyone at Jasper Hill High School who helped to make this study possible. Thank you to the eight students who generously offered their time and allowed me a glimpse into their classroom experiences. Your unique perspectives taught me a great deal about student experiences in music technology settings and music education in general. Thank you, Mr. Decker, for welcoming me into your classroom and providing me the opportunity to perform this study.

My heartfelt thanks go to my advisor, Dr. Nathan Kruse, for your encouragement, advice, and abundant wisdom. Your mentorship has opened my eyes to a world of opportunities within music education that I did not know existed. Thank you for helping me realize my potential and for your unfailing guidance as I navigated many new educational pathways.

I would also like to thank Dr. Lisa Koops and Dr. Matthew Garrett for their support as members of my thesis committee. Your time and consideration bolstered the quality of this document. Thank you for your encouragement and for challenging me to think critically.

Finally, thank you to my family whose unending support has sustained me throughout all of my endeavors. To my wife, Kelsey, thank you for your love, support, inspiration, and understanding along this journey. My accomplishments would not have been possible without you by my side.
Chapter 1

Introduction

The landscape of music education is gradually shifting as music educators and music researchers find new and meaningful ways to engage with students. Some of the greatest changes appear in the wide variety of approaches taken to provide educational opportunities to nontraditional music students (Green, 2006; Jaffurs, 2004; Seddon & O’Neil, 2003). Not only have new music classes been developed, but students have been given new sets of skills that help to bridge the connection between in-school and out-of-school music (Rodriguez, 2004). These skills, such as playing by ear and exhibiting self-directedness in learning, are vital to making music more relevant to students’ lives; a connection that is largely absent in Western European classical tradition of music education (Green, 2002). This is a particularly important endeavor as music educators continue to navigate the directions in which music education might be heading (Jorgensen, 2003; Kratus, 2007; Reimer, 2009).

As music educators continue to evaluate spaces in which music can be made more inclusive, they might consider music technology classes. The music technology classroom is one pathway that has received a great deal of attention for reaching nontraditional music students (Bauer, 2014; Dammers, 2012; Williams, 2011). Being a relatively new field to school music offerings, this avenue for music education extends from composition (Manzo, 2010) to performance (Randles, 2013) in ways that have not previously existed in band, chorus, and orchestra courses. Music technology emerges at a pace relative to those advances occurring in general technology and as educators connect technology to the national standards for music education (Meltzer, 2001).
Participation in music technology classes typically entails composing, recording, or audio processing (Leong, 2011, p. 241). These classes usually employ tools such as computers, musical instrument digital interface (MIDI) controllers, and recording equipment (Tobias, 2010), which help students accomplish compositional tasks that use “sequencing, sample and loop-based, and graphic-based software,” frequently through informal learning processes (Barrett, 2007, p. 66). While music technology teaching techniques and learning tools are gaining increased exposure in music education, students’ experiences within those technology settings have not yet achieved an equal level of coverage in music education research.

The present study is an exploration of high school students’ experiences in a music technology program. The students in this program created music using a variety of hardware and software tools and covered a wide range of musical styles within the electronic music genre. They completed assignments through project-based lessons and were often given the autonomy to contribute their own musical ideas to their work. While the details of student experiences may be limited to the specific location, the goal of this research was to bring forth any salient features related to students’ perceptions of their learning experiences in the music technology setting that may be useful to educators as they consider innovative methods for teaching music.

**Need for the Study**

Music technology is an open-ended and evolving field. Compared with traditional music ensembles, this relatively new music offering varies greatly considering the educational objectives and curricular goals. Music technology classes in the United States cover a broad range of musical concepts (e.g., music production, sound synthesis,
electronic music composition). In the process of designing and introducing a new music
course, educators might benefit from the knowledge of previously established models.
Thus, music educators should identify the advantages and dilemmas encountered in those
existing classes and contemplate the curricular goals that they hope to impart.

In order to deepen the profession’s understanding of students’ learning
experiences within the music technology context, researchers might provide descriptive
research, through providing narratives and drawing on observations, to add to this
growing field of research. As Allsup (2008) noted, “the paradigm has shifted from
descriptive research…to heuristic investigations into the *whys* and *hows* of popular music
and informal learning” (p. 3). There is a plethora of information describing the various
types of music technology classes that have been instituted (Dammers, 2012; Dammers &
Williams, 2011; Ruthmann, 2013; Williams, 2007, 2011; Wise, Greenwood, & Davis,
2011). Many of these researchers have moved scholarship toward specific forms of
technology-based music instruction and the ways students interact with those specific
tools (Bolton, 2008; Manzo, 2010; Ruthmann, 2006), which are discussed more
thoroughly in chapter two of this thesis. The concept of providing a label to types of
music technology students – identifying how they perceive their learning and the impact
that music technology has on their sense of identity – is still a relatively unknown
component of music technology research. Therefore, the aim of this study was not to
highlight a specific music technology program, but rather to move toward an
understanding of the student perceptions of their various learning experiences.
Purpose of the Study

The purpose of this collective case study was to examine the learning experiences of high school students enrolled in a music technology course. This research provides insight to interactions that students had with one another in the music technology program while utilizing a variety of hardware and software tools. There are three broad goals related to the research questions that were used in this study. First, this research offers several accounts of students’ opinions of their experiences in the music technology program. Their voices might help to widen the lens with which educators and researchers conceptualize the underpinnings of school music technology courses. Second, it is important to gain an awareness of students’ ownership of the materials learned in class and how students’ musical independence might extend beyond school. Students were encouraged to describe the construction of relationships between prior knowledge with those skills being learned. Third, by gaining an understanding of the social identity that might exist among the students in the music technology program, educators might be able to make connections with their students and more accurately relate teaching and learning to developing cultural structures.

Research Questions

The foundation of this thesis is a study of students’ learning experiences while enrolled in a music technology course. Four research questions were devised to investigate this research purpose and are described in further detail below:

1. How do students draw on prior experiences with technology in the music technology classroom?
2. How do students exhibit agency in the development of their musical skills through a project-based learning environment?

3. What are students’ perceptions regarding the longevity of musical skills learned in the music technology classroom?

4. How do students perceive their social identity within the school music technology setting?

**Research question 1: How do students draw on prior experiences with technology in the music technology course?** This research question explores the developmental concept of assimilation. The term “digital native” has been assigned to generations of individuals born at times that correspond with the introduction of different technologies (Prensky, 2013). This identifier has been revised as different levels of technological exposure have been considered; the term has likewise been met with an equal amount of discourse as to the existence of digital natives at all (Helsper & Eynon, 2010). Regardless of the terminology, many forms of technology have become ubiquitous now more than ever before, and the capabilities of those devices exceed previous forms in both performance and usability. Students’ enculturation with the technologies that they use as part of their everyday activities may have some bearing on their capacity to use music technology tools.

**Research question 2: How do students exhibit agency in the development of their musical skills through a project-based learning environment?** There are two important elements in this question that were considered both separately and together. First, a learner-centric approach to education can provide students with a foundation for autonomy in their future learning. Ruthmann (2008) defined agency as students’ desires
to feel understood as they negotiate learning in a manner in which they believe their ideas are valued. The amount of ownership that students feel over their learning in the music technology class might impact the way educators approach the balance between teaching and allowing students to self-govern.

Second, the current music technology course under examination, which focused primarily on composition and sound synthesis techniques with Ableton Live (a digital audio workstation used for sequencing music), lends itself to a project-based learning format. The methods that teachers use, in presenting a concept and letting the students experiment with their own ideas, represents a constructivist approach to learning. The intersection between student construction of knowledge and the agency that they have over their learning is where this research question is concerned.

Research question 3: What are students’ perceptions regarding the longevity of musical skills learned in the music technology course? The concept of lifelong learning has been explored in many facets of music education research (Aróstegui & Louro, 2009; Koops, Hankins, Scalise, & Schatt, 2014; Rodriguez, 2004). If students are able to take control of their learning in the classroom, they might be able to remain self-sufficient in using those techniques beyond school. Additionally, the use of popular and electronic music as the subject matter may be relatable to the students’ cultural environments (Green, 2004), and they may learn to internalize concepts as a result. Finally, it is the students’ perceptions of how well they consider themselves to retain musical concepts that are important in the context of this study. Their ideas about the salient features that they can recall and that they might use beyond school are crucial as teachers continue to develop curricula in music technology.
Research question 4: How do students perceive their social identity within the school music technology setting? Previous studies have provided educators with ideas as to students’ sense of identity as it relates to several musical contexts (Adderley, Kennedy, & Berz, 2003; Morrison, 2001). Students have embraced the music classroom “for its fulfillment of their emotional and social needs” (Campbell, Connell, & Beegle, 2007). There are no known studies regarding the social identity that students may assume as a result of their participation in a music technology program. The aim of this research question was to ascertain whether students could describe any features of identity development stemming from their involvement with the music technology program. Students’ ideas about how they categorize themselves or other groups may be useful in determining whether a music technology culture exists within this setting and how those student-defined attributes compare to other groups.

Definitions of Terms

Agency – The capability to exert influence over one’s functioning and the course of events by one’s actions. (Bandura, 2009, pg. 8)

Nontraditional music student – Students who are interested in music but non-participants in traditional music ensembles (Williams, 2011). Williams stated that these students typically (p. 137):

1. Are in the sixth through twelfth grades
2. Do not participate in traditional performing ensembles
3. Have a music life independent of school music
4. May sing or play an instrument
5. May not read music notation
6. May be unmotivated academically or have a history of discipline problems
7. May be a special needs student
8. May aspire to a career in music recording or music industry

Project-based learning – Thomas (2000) suggests that in order for something to be considered project-based learning (PBL), five criteria must be met:

1. PBL projects are central, not peripheral to the curriculum
2. PBL projects are focused on questions or problems that “drive” students to encounter (and struggle with) the central concepts and principles of a discipline.
3. Projects involve students in a constructive investigation.
4. Projects are student-driven to some significant degree.
5. Projects are realistic, not school-like. (pp. 3-4)

Self-directed learning – A study form in which individuals have primary responsibility for planning, implementing, and evaluating the effort. (Hiemstra, 1994, p. 9)

Self-efficacy – An individual’s belief in his or her capacity to execute behaviors necessary to achieve desired goals. (Bandura, 1997)

Social identity – The social categories to which people belong, aspire to belong, or share important values. (Crozier, 1997, p. 71)

Technology Based Music Classes – Music classes in which technology is the primary medium for instruction. (Dammers, 2012, p. 73) These classes might use a variety of hardware or software tools to achieve class objectives (Dammers, 2012) related to:

1. Performance
2. Creating/composing

3. Listening

4. Vocational Skills (recording)

**Traditional music ensembles** – In American schools, these are typically band, choir, and orchestra ensembles (Williams, 2011, p. 133) which “usually reach only a small population of either select or self-selected students.” (Regelski, 2006, p. 5)
Chapter 2

Review of Related Literature

Students’ learning experiences within the music technology class were diverse and individualized. Therefore, three principal categories of research provided direction to this study. First, an overview regarding nontraditional music students serves as an introduction to the participants and identifies their status within music education research. Second, learner agency is explored both as a construct and as it pertains to learning in the music technology setting. Third, the body of literature surrounding the concept of identity formation is discussed as it relates to music education. A summary of these three areas is presented at the conclusion of this chapter in order to connect the related research to the framework of the present study.

Nontraditional Music Students

Nontraditional music students comprise those students who do not participate in traditional music ensembles such as band, choir, or orchestra (Williams, 2011). As popular music genres continue to expand, so does the disparity between students’ musical interests and the musical offerings provided in schools (Abramo, 2009; Green, 2002, 2004, 2006; Rodriguez, 2004). Leonhard (1991) noted that the focus on performance in many traditional music ensembles led to decreases over time in overall music enrollment, and he recommended broadening the scope of music education to allow for more comprehensive participation.

Curricular Reform

Music education reform is a concept that has dwelled in the minds of many music educators and researchers since the original Tanglewood Symposium in 1967 (Mark,
The purpose of this symposium was to reevaluate the purpose of music education as it pertained to an evolving American society (Choate, 1968). As a result, the profession gained insight into critical issues that would require music teaching and learning to become transformed.

Some of those transformative ideas were directed toward undergraduate music majors (Campbell et al., 2014). Campbell appointed music educators to a task force with the intention of improving “undergraduate preparation of music majors” (p. 1). The task force found that additive means such as “providing more courses, more requirements and more elective opportunities” (p. 2) provided minimal change, and that “significant change [was] essential [to] bridge the divide between academic music study and the musical world into which…students will graduate” (p. 11). Campbell’s task force concluded that music students would need to become familiar with current and emerging musical tools and technologies if they were to be successful as 21st century musicians.

Similarly, music educators have been urged to make comparable advancements to their program offerings as technology and culture develop (Spearman, 2000). As music educators have continued to grapple with the possibilities of curricular change, many options have been considered. Williams (2007) addressed the turbulent nature of music education reform by asking music educators to identify the musicians in their schools according to their intended musical pursuits as “listener[s], performer[s], and composer[s]” (p.21). Nonetheless, there has been little curricular change. Since the original Tanglewood Symposium, the status of music education offerings in secondary schools has remained largely unchanged (Abril & Gault, 2008; Leonhard, 1991; Reimer, 2004).
In a report on the current state of music education and a call to action, Kratus (2007) noted a decline in enrollment numbers for traditional music students. He suggested that students may be finding avenues outside of the school setting in which to develop their musicality or find musical enjoyment. In this respect, Kratus claimed that “music education has become disconnected from the prevailing culture” (p. 44). He concluded his appeal with guidance toward the establishment of new curricular offerings. Kratus offered ideas, based the work of Malcolm Gladwell, to affect change in music education through “identifying the mavens to initiate the change, connectors to transmit the change to a broader populations, and salesmen (and women) to translate the change into each school’s particular context” (p. 46).

**Secondary Music Offerings**

In his presentation for the Tanglewood II Technology and Music Education Symposium, Williams (2007) referred to the current state of teacher preparation being a “teach as one was taught” (p. 1) system. He used this notion to emphasize the lack of progress toward new approaches in music education. Since the first Tanglewood symposium, Williams found that nonperformance music opportunities have not been as actively engaged as other topics in research or practice. He called the current model of music education an “inverted pyramid of music experiences” (p. 1) in describing the all-inclusive music education opportunities for elementary students that begin to diminish as music offerings become more specialized in later grades. Williams suggested that music technology has few obstructions that would prohibit nontraditional music students from becoming engaged in music learning due to its accessibility to “non-reader(s) of traditional music notation” (p. 2).
In the last decade of his life, Reimer contributed a considerable amount of philosophical work that offered predictions of the future of music education and alternative routes to secondary music education (Reimer, 2003, 2004, 2009, 2012). To provide a positive approach in the continual effort of making music available to all secondary students, Reimer (2012) suggested that a variety of musical offerings would afford students “immersion within one of the many musical pleasures our students in those grades pursue so eagerly outside of school and would pursue in school if we made them available” (p. 27). Reimer’s (2003) vision for a comprehensive secondary general music curriculum supported the pursuit of a diversity of musical experiences that reflected students’ cultures. Somekh (2008) also urged researchers and educators to bear in mind socio-cultural theory when considering the establishment of new classes so that teachers’ and students’ interests could be aligned. This suggests that schools could institute exploratory or pilot secondary music electives until those classes that most closely suit the students’ needs could be identified.

**Music Technology**

Music technology classes have garnered a tremendous amount of attention in recent years (Dammers, 2012). Dammers surveyed high school principals and music technology teachers to investigate the status of technology-based music classes (TBMC) in the United States. He found that an average of 28 percent of those students in TBMCs were traditional music students. Of those schools surveyed, a majority of administrators believed that TBMCs would be valuable addition to their school’s offerings and that it would be possible to offer those classes in their schools. With such support of music
technology in schools, the addition of music technology to the core music curriculum might be a plausible adoption.

There are several types of TBMCs in existence. Dammers and Williams (2011) grouped these classes into the following four categories: music production, arts technology, comprehensive musicianship, and hybrid variations of the previous three types. As an area of music less concerned with traditional notation, music production classes or sound synthesis courses might be best suited for nontraditional music students. Nontraditional music students have been found to value traditional music notation as a supplement to aural practices and not as a central component (Dammers, 2009; Green, 2002). Music production classes, however, are heavily influenced by professional tools, and hardware and software options vary considerably among TBMCs (Dammers, 2012). Therefore, research on music production programs has previously been highly specialized and generalizability from those studies may be low.

In an example of a specialized music technology class, Randles (2013) described his experiences as an iPadist in an iPad performance ensemble in South Florida. He recalled being told that an iPad ensemble was not considered a “serious enough” ensemble to be given consideration in his university’s school of music. The ensemble primarily used the apps GarageBand and ThumbJam in their music performances. Randles and his fellow iPadists had to educate their colleagues and peers that the iPad was not meant to be used in place of another instrument; the iPad was to be given its own distinction as a musical instrument. Randles’ project offered another opportunity to eliminate barriers for students that might not have access to traditional music instruments. Although still a subset of the world population, many more people have access to
smartphone and tablet technologies that typically have inexpensive music producing applications.

Developments in technology have come with considerable gains in accessibility. From more affordable computers to faster Internet speeds, the advancements of technology “have allowed people who previously would not have considered themselves musicians to handle, create and communicate music via their computers” (Wise, Greenwood, & Davis, 2011, p. 119). The availability of several new types of technology in a TBMC has presented nontraditional music students, who may have musical interests related to popular music genres (Green, 2002), with opportunities to create music that is a part of their cultures.

As a notable music technology program in the Midwest, the Jasper Hill High School (pseudonym given to remove identifiable information) music technology program in the current study has attracted the attention of researchers who have an interest in schools that have successfully provided musical opportunities to nontraditional music students. Ritchie (2013) studied the Jasper Hill High School music technology program because of her regard for it as “an exemplary phenomenon of a TBMC” (p. 58). She completed a mixed-methods study in which she compared the characteristics of students in the TBMC with previously defined qualities of traditional music students (Stewart, 1991) and nontraditional music students (Williams, 2011). In her thesis concerning the characteristics of nontraditional music students in this TBMC, Ritchie found that students who learn music that is “nested in popular genres” (p. 57) were likely to transfer those skills outside of school. Ritchie noted the students’ active musical involvement beyond school and credited the TBMC teacher with designing a curriculum that has applicability
to their interests. She also clarified that this TBMC was able to reach a large majority of nontraditional music students without detracting from the enrollment of the traditional music programs in the school. The school’s music technology program provides the desired musical diversity to meet the needs of the 80% of music students that Williams (2007) identified as not typically served by traditional music classes.

Regardless of the music technology class-type, Williams (2011) credited TBMCs for their inherent “constructivist approach promoting hands-on creative activities” and consistency in “keeping music creativity and music understanding at the forefront of the learning objectives” (p. 137). Wise, Greenwood, and Davis (2011) reaffirmed that opinion and added that TBMCs have transformed music pedagogy to include more “student-centred [sic] learning activities” which has afforded students with “an increased complexity of tasks and use of multimodal information” (p. 120). These studies provide implications for school music technology classes, particularly those based on compositional processes.

**Learner Agency**

Agency is a concept that has maintained the interest of educators for several years (Bowman, 2002; Ruthmann, 2006, 2008). This concept relates to the process by which learners believe that they possess responsibility for their learning. Autonomy in education, or the ability for learners to manage their own learning independently, is the goal of agentic action.

**Agency and Autonomy**

Bandura (2008) stipulated four central characteristics of human agency: intentionality, forethought, self-reactiveness, and self-reflectiveness. Intentionality
directs individuals toward goals. Those goals or plans can predict future outcomes and provide motivation. As a matter of forethought, individuals are then able to regulate their plans for action in an “effort to translate vision into reality” (p. 16). Finally, self-aware individuals can reflect on their efficacy, or the ability to achieve their goals. In the school setting these characteristics may present themselves in student-centered learning.

Student autonomy is often viewed as a crucial goal in education. By placing the responsibility for learning on students, they can make decisions about how they are learning rather than having teachers direct all aspects of that process (Boud, 2012).

Dearden defines autonomy as the following:

A person is autonomous to the degree, and it is very much a matter of degree, that what he thinks and does, at least in important areas of his life, are determined by himself… This determination of what one is to think and do is made possible by the bringing to bear of relevant considerations in such activities of mind as those of choosing, deciding, deliberating, reflecting, planning and judging (1972, p. 461).

Autonomy consists of more than self-directed action; the ability to remain flexible in responding to context-specific situations is also necessary. Flexibility when encountering unforeseen musical challenges resonates with Bowman’s (2002) thoughts on agency as being a part of experiential knowledge in that it allows “the educated person comfortable with the unforeseen and open to change, confident that the resources at hand can somehow be made adequate to the challenges presented” (p. 75).

Another view of autonomy can be seen through a project-centered approach. Project-based learning, or project-orientation, was derived from the model of problem-
based learning (Thomas, 2000). Without taking attention away from the individual, project-based learning can provide “the initial impetus for learning, [and] these problems shape the entire educational experience for an extended period of time” (Boud, 2012, p. 28) within a variety of contexts. By providing a model with which students must either replicate an idea or work to create something new, students become agents of their learning in project-based models. Music technology classes have commonly used elements of project-based learning in their curricula (Bolton, 2008; Ruthmann, 2006; Tobias, 2010).

Another facet of project-based learning is the situated cognition component that is achieved when “the context for learning resembles the real-life context in which the to-be-learned material will be used” (p. 7). Real-life skills may be preserved and applied to situations beyond school as situations become present. Over the course of developing agency in project-based learning environments, it is assumed that those skills will transfer into organizing principles that will guide learners throughout their lives (Faure, 1972).

**Lifelong Learning**

There is a gap in the transfer of musical skills and knowledge between school and home (Aróstegui & Louro, 2009; Green, 2002; Rodriguez, 2004) as students tend to glean a considerable amount of knowledge about music informally outside of school (Campbell, 1995; Green, 2004; Jaffurs, 2004). Generally, this particular discourse in music education research has focused on informal learning within the popular music, or rock, genre (Tobias, 2010). As an objection to the inclusion of the popular music genre in school music, Herbert and Campbell (2000) supported educators’ arguments that “rock music is aesthetically inferior” and that “school time cannot be spent on the vernacular”
(p. 14). To contend with this argument, many educators have formulated popular music courses that exist separately from traditional music courses (Isbell, 2007; Tobias, 2010).

Regelski (2006) stated that students involved in traditional music ensembles “do not in any great numbers seek out (or create) such musicking in adult life” (p. 6) and that community traditions or cultures predict amateur musical involvement more frequently than traditional music preparation in schools. Regelski further suggested that the issue of lifelong musicianship was attributed to the lack of student autonomy in traditional music ensembles and he specified that the method for teaching should be tied to the content being taught. Regelski noted the cycle in music teacher preparation in which educators teach as they were taught. He concluded his thoughts about this dilemma in music education by writing the following statement regarding current teaching practices in music education:

This rarely involves any attention to “authentic” music learning and assessment and, thus, little if any attention to whether or to what degree what is taught or learned can or does actually “transfer” to life as the praxis of musicking. Only when music teachers are concerned to make a tangible musical difference in the lives of their students, a difference that students can and do take with them into life and that adds important musical value to their lives, will music education make a contribution to general education that is notable (pp. 11-12)

As one form of authentic musical experience, a TBMC may provide students with the agency to transfer classroom musical experiences into their lives beyond school.
Agency in TBMCs

Ruthmann (2008) referred to “agency” as students’ desires to feel understood as they negotiate learning while believing that their ideas are valued. He observed a music technology class for several weeks to focus on one student’s experiences narrating the student’s journey of interactions between her teacher and peers as the class completed a movie soundtrack project. The participant demonstrated techniques of musical impersonation as she developed her own sounds to fit the soundtrack according to the standard model that was given. The teacher was able to use elements of traditional music structure (e.g., returning to tonic at the end of a piece) in a mostly non-notation based class. Ruthmann noted the important interplay between the student’s agency (being able to incorporate her own musical decisions) and the teacher’s role in balancing feedback. The student was resistant to the teacher’s ideas because, even though she had not quite developed the skills to truly reflect her intentions, she was able to distinguish her ideas from the models provided by her teacher.

In a project-based learning environment such as Ruthmann’s (2008), there is evidence to suggest that agentic skills may have a lasting impact on individuals. Additionally, the role of the learner is expressed through their actions while traversing through the goals that they have set for themselves. Within the context of a specific setting, however, the conditions regarding what will be learned are confined to the larger objectives designed by the teacher. In essence, as students cultivate their skills as autonomous learners, that component of their identity development can be attributed to the educational framework established in the environment in which they are situated.
Identity Formation

As individuals develop over the course of their lives, they encounter crises and conflicts that, in the process of dealing with those issues, lead to their sense of identity (Erikson, 1968). Erikson noted that individuals form perceptions of their self-identities as they determine the values of those interactions. As students gain an awareness of their overall self-concept (Erikson, 1968), they might identify groups with whom they share values. Affiliation among groups with shared qualities often leads to a sense of social identity (Tajfel, 1981). In the music technology setting, students’ identity development might be tied to their learning experiences and previous technology use.

Identity Development

The presence of an identity extends beyond an individual’s existence (Erikson, 1980). To provide a description of a human being is as germane to the topic of music education so far as it is to any field of study. While the concept of identity was something that Erikson labored to define throughout his life (Josselson & Flum, 2014), he generally described identity as a complex psychosocial process rather than a rigid structure. In one of his most comprehensive descriptions, Erikson defined identity as:

In psychological terms, the process of identity formation employs a process of simultaneous reflection and observation, a process taking place on all levels of mental functioning, by which the individual judges himself in the light of what he perceives to be the way in which others judge him in comparison to themselves and to a typology significant to them; while he judges their way of judging him in the light of how he perceives
himself in comparison to them and to types that have become relevant to him. (1968, pp. 22-23)

It is clear from the previous statement that Erikson did not intend for identity to be something measured. Rather, identity is a process that will always change and develop. For many people, the process of developing an identity has been rather uncomplicated. Individuals might follow the path set in front of them and assume the same type of character as their parents. A macro perspective of identity would eventually lead one to become aware that everyone is “limited by restrictive social customs and the narrow range of roles available” (Côté & Levine, 2014). The social setting of the school is not exempt from the status of a restrictive environment dependent on social customs. As students interact within contexts bounded by the school, they may develop a social identity related to their interests in or out of school. Identity is frequently explored in music education research regarding students’ musical interests and the relationships they form with others with particular music genres as the central focus (North & Hargreaves, 1999; Zillmann & Gan, 1997).

**Social Identity**

The complex concept of identity is composed of several elements. Among them is the part of self-concept that is cultivated as an individual explores social groups and begins to attach emotional significance to an affiliation with them (Tajfel, 1982). Tajfel provided the assumption that:

However rich and complex may be the individuals’ view of themselves in relation to the surrounding world, social and physical, some aspects of that view are contributed by the membership of certain social groups or
categories. Some of these memberships are more salient than others; and some may vary in salience in time and as a function of a variety of social situations. (Tajfel, 1981, p. 255)

To continue with the definition with relation to social groups, Turner (1982) proposed that individuals form social groups when they share similar social identifications or when they perceive themselves to be in the same social categories (p. 15). Social identity therefore requires a cognitive process of self-categorization. When a social identity has been assumed to any degree, “social identity monitors and construes social stimuli and provides a basis for regulating behavior” (p. 21). As individuals develop their social identity, their behavior synchronizes to an extent that matches their role within the social group.

It is clear that social identity is a broad concept. Apropos of the present study, a more narrow view of those social groups that have been researched in school settings are of primary concern to this thesis. Music education researchers have examined students’ social identities and the subsequent behaviors that stem from membership within certain music groups. Morrison (2001) investigated the experiences of students beyond their curricular involvements. He examined the cultural theme of identity related to the participatory requirements of school ensembles. The students who identified with these kinds of musical social groups do so though their membership that “may continue for the better part of an entire primary and secondary school education” (p. 25). Morrison identified the school ensemble as a social unit that has influence beyond the school day. Many of the members in school ensembles had shared experiences that occurred as a result of concerts, trips, or rehearsals, all of which often required prolonged time
commitments (p. 26). The experience of learning within a culture such as a school music ensemble may heavily influence a student’s identity.

Music has existed in recent history as a constant, omnipresent source for adolescents to satisfy emotional needs, entertain, and relieve stress (Campbell, Connell, & Beegle, 2007). In their study of adolescents’ expressed meanings of music, the authors collected students’ ruminations about the importance of music in their lives. Often times these values occurred socially and in context-dependent circumstances:

Our town is small so we don’t have much to do. Many of us pick up guitars and drum sticks and start learning on our own. Kids my age give free lessons to other kids and make new friends. Music has connected this town together. (Student reflection, p. 230)

The previous quote indicated the transmission of musical traditions, another cultural theme from Morrison (2001). In informal learning situations, members of musical social groups often pass on knowledge and traditions according to their level in either teacher or student-designated hierarchical structures (pp. 25-27). As Campbell (1995) and Green (2002) highlighted in their research of adolescent popular music involvement outside of school, informal learning situations can produce musical knowledge and skill development as well as further ascribe musical identities that are not dependent on school music ensembles.

In their investigation of the motivations to join and remain in music ensembles at one school, Adderley, Kennedy, and Berz (2003) pinpointed four psychological themes for student musical involvement: “personal qualities, personal growth, emotional outlet, and atmosphere” (p. 199). Shared experiences impacted students’ lives in varying levels
and according to certain requirements (e.g., time spent in musical involvement, amount of friends in music classes).

The aforementioned themes regarding context-specific individual and group experiences align with Tajfel’s (1982) characteristics of social identity development within social groups. Research concerning school music involvement has identified the development of self-concept and behavior-regulating characteristics (Adderley, Kennedy, & Berz, 2003; Campbell, Connell, & Beegle, 2007; Morrison, 2001). This further supports the presence of specific social groups within music classrooms and provides a foundation for the investigation of music participation beyond traditional music classes. There may be certain qualities of participation in music technology courses that could describe a currently unidentified social group structure.

Digital Natives

A commonly held belief is that as technology continues to develop, children will change along with it. The notion of digital natives (Prensky, 2013) refers to the generation of students that grew up with certain technologies. That definition, however, does not provide a specific description to which generation digital natives might be referring. In their argument against the label of digital natives, Helsper and Eynon (2010) critiqued Prensky’s hypothesis that students born in the last two decades have experienced unique changes in brain structure due to their immersion in current technology. They found that, while the current generation of students has more access to information and communication technology (ICT), there are many similarities across generations as well regarding use of technology (p. 515).
The characteristics of digital natives that are supported, though, emphasize that the students currently enrolled in school “have a greater range of ICTs in their household, tend to use the Internet as a first port of call, have higher levels of Internet self-efficacy, multi-task more and use the Internet for fact checking and formal learning activities” (p. 515). The presence of so many technology-related characteristics in students points to two ideas relevant to the current study. First, as identity development entails experiences within a cultural context, the predominance of technology in students’ lives must be considered as a component of their identities, and second, there is no known research regarding the effects of music students’ previous technology experiences on their coursework in TBMCs.

When music students’ learning capacities are understood, music teachers can develop lessons that are directed toward student preferences. Ruthmann (2013) cited various popular forms of media engagement and how they could be used in music education. He referenced the crowdsourcing technique that the composer Eric Whitacre employed in which a YouTube choir perform his choral composition. Ruthmann stated that children have many “web-based and mobile tools” (p. 86) at their disposal at virtually all times due to the relative affordability of these tools. Typically, music production software has come with a hefty price tag, but Ruthmann noticed that yet another barrier has been lifted from potential music creators with the introduction of many web-based and freeware options.

It is be possible that the general usage of music technology to teach music might be preferable to nontraditional music students instead of traditional music options. Airy and Parr (2001) interviewed university students upon the completion of a 10-week Music
Instrument Digital Interface (MIDI) sequencing program. Most of the participants had not previously received formal music education instruction. Many of those students referred to music education in their secondary school experience as not being attractive to their musical styles. Additionally, none of the participants had the availability of MIDI as a course or project in a music course in their secondary schools. Students began the training program with the idea that MIDI was best suited for “techno and dance music” (p. 44). This knowledge highlighted the importance of educating students about the uses for technology prior to their enrollment in a music technology course. Perhaps students would not enroll in a class that was tailored toward those interested in “techno and dance music.” It may have been more beneficial to name the course, “Music Production” or simply, “Music Technology” in an effort to eliminate any misconceptions that could have been potential barriers to enrollment. In discussing the authenticity of MIDI-generated sounds in general, one student said, “The sounds are not that important. They aren’t real so we shouldn’t attach too much importance to them” (p. 47). Simply providing access to nontraditional music students in the context of TBMCs may be a step in the direction of reaching Williams’ “80 percent” (2011).

Research related to students currently enrolled in TBMCs has suggested that participants view themselves as musicians when they have opportunities to engage with music in meaningful and relevant ways in their lives (Bolton, 2008). Bolton found that students valued the establishment of an environment in which they could develop their skills regardless of their previous music education experiences. It is at this junction that ideas of agency and identity converge within the music technology setting.
Summary

The current research study is concerned with secondary school students’ self-guided learning experiences as they relate prior technology experiences to current project-based assignments in the social setting of their TBMC and the extent to which they believe those skills might last beyond school. This review of literature has presented evidence related to nontraditional music students within the context of secondary school music offerings, with specific applications to music technology settings. Now more than ever, there are promising opportunities for nontraditional music students to experience musical creativity in schools. Teachers must identify the cultural context of their students and develop curricular offerings based on that knowledge (Kratus, 2007; Reimer, 2003, 2009, 2012). One of the possible offerings that has shown considerable success in many schools is the music technology class (Dammers 2009, 2012; Williams, 2007, 2011).

Students involved in music technology courses typically experience opportunities to work autonomously in project-based learning scenarios (Ruthmann, 2006, 2008; Tobias, 2010). As agents of their own learning (Bandura, 2008), these students tend to internalize many aspects of musical knowledge as it relates to their lives. Students who experience music in this way can make connections to how they use that information beyond school because their learning is more personalized (Regelski, 2006; Rodriguez, 2004).

Identity development for students, and all people, encompasses more than can be expressed at any given moment (Erikson, 1980). The social identity that students may develop as they participate in a music technology course may be but one facet of their identities (Tajfel, 1982). Research shows that music students may self-identify according
to their shared experiences in traditional music classes (Adderley, Kennedy, & Berz, 2003; Campbell, Connell, & Beegle, 2007; Morrison, 2001). Drawing on any of their lived experiences as digital natives, students’ experiences in a music technology course may hold special meaning in their social identities (Helsper & Eynon, 2010; Prensky, 2005), specifically as they use technology in ways that are valuable to their lives (Airy & Parr, 2001; Bolton, 2008; Ruthmann, 2013).
Chapter 3

Methodology

This chapter outlines the methodology and design that was used over the course of this study. The researcher’s lens is included first as an acknowledgment of my genuine interest in this topic as well as any preconceptions that might color my interpretation of the research findings. Next, the research overview provides a broad perspective of the methodological decisions made in formulating this study. Following this overview, an explanation of the chosen research design, a collective case study model, is provided. Next, the sampling procedures are discussed with regard to identifying the participating school and selecting the participants. A description of the data collection method provides information regarding research techniques and tools that were used. Finally, analysis procedures consisting of within-case and cross-case analysis are described as well as strategies that were used to support the findings.

Researcher Lens

The majority of my graduate school experience has involved a steady transformation of ideas and values concerning music education. As a music educator and a researcher, I have an interest in musical opportunities that are original and innovative in their design, and I am exceedingly supportive of music courses that successfully reach nontraditional music students. I became aware of the participating school’s music technology program by observing the teacher’s presentations at a state music education conference. I was intrigued by the modern technology that was incorporated into the course, the engagement of the students, and how closely elements of the curriculum mirrored professional techniques for composition within various popular music genres.
As the author of this thesis, I have autonomy over the content that appears throughout the document. It is imperative, however, for me to disclose that my experiences as a music teacher and subsequent educational involvement in graduate school may influence my research to some extent. My interest in this music technology program did not affect the application of appropriate qualitative techniques that were used in the research process. While I have an interest in nontraditional approaches, it is not my intention to appraise the status of music education, nor will I set music offerings in opposition. It is also important to note that my analysis of students’ experiences in no way serves as an evaluation of the students, their teacher, the music technology program, the school, or any other related entities; the goal of this research is to present a representation from which music educators might benefit.

**Research Overview**

This study provides an examination of student perspectives in a high school music technology program, which is located in a large metropolitan area in Ohio. The program offers students opportunities to compose, record, and perform music using the same tools that many professionals use. Students also are given opportunities to engage in extracurricular activities with career-oriented applications, such as recording student rock bands and creating a daily news television show. To explore the variety of musical experiences of students involved in a nontraditional music program this study displays the music technology program as a collective case (Creswell, 2012). The participants were comprised of students enrolled in one of two levels (Level 1 and Level 2, respectively) of music technology courses offered some of whom additionally engaged in the extracurricular activities offered through the music technology program. Students
were invited to share their perceptions related to their learning experiences throughout their involvement in the music technology course. As music educators continue to consider curricular options in school music programs, the diversity of student experiences as found in this study could contribute, in part, to the growing body of research surrounding music technology.

**Design**

This study employed a collective case study design. Case studies allow researchers to develop in-depth understandings of specific settings (Creswell, 2012) and differ from ethnographic research due to the intent behind the methodology. A collective case study design was used so that multiple student perspectives could be considered separately. In this instance, the research was focused on a bounded system (Creswell, 2012; Stake, 2005; Yin, 2009) rather than the entire culture of a group. Yin (2009) described case studies as a way to investigate “a contemporary phenomenon in depth and within its real-life context,” relying on “multiple sources of evidence, with data needing to converge in a triangulating fashion” (p. 18).

Creswell’s (2012) view of case study research is “as a methodology…as well as a product of the inquiry” (p. 97). His approach is further explained in the following statement:

Case study research is a qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports), and reports a case description and case themes. (p. 97)
Furthermore, a collective or multiple case study is characterized by using “multiple cases to show different perspectives on the issue” (p. 99). Thus, a researcher may choose multiple research sites to study as a collective case. Stake (1995) acknowledged that collective case studies “may be designed with more concern for representation” (p. 5) in order to illustrate a more accurate picture of the setting.

**Case Study Research in the Current Context**

As the scope of school music offerings widens, the need for descriptive research that reflects such growth expands with it. The quantity of research regarding nontraditional music students is increasing as is experimentation with school music curricular offerings. While researchers are building a foundation for the types of interactions students have with music in these new courses (Ruthmann, 2013; Tobias 2010), there is a lack of case study research specifically relating to students’ experiences as they navigate learning and identity development in the music technology classroom. A consideration of student perspectives will reveal the naturalistic data embedded in the setting that might not be readily obtainable through surveys or questionnaires.

As mentioned above, this research is a collective case study of student experiences in a music technology setting. A collective case study design (Creswell, 2012) allows multiple perspectives to provide an in-depth look at the learning environment, which, in this case, embodies a high school music technology program at Jasper Hill High School. The collective case was bounded using two conditions that provided reasonable starting and ending dates as well as a population of participants with diverse perspectives. The study took place in the Spring, 2015 semester over the course
of a 4-week period with eight students. Data collection took place two to four times per week during this period for a total of 12 visits.

Establishing a bounded design is a necessary aspect of collective case studies, in that it provides a limitation to the amount of cases and separates it from an ethnographic design. Creswell stipulates that bounded cases are “bounded by time and place” (p. 97). The music technology classes examined in this study were all located within one school to provide a bounded facet to the design. The specific timeline of the study was decided according to the class projects the participants were completing. The research timeline (a) began at the commencement of the first project, (b) continued through the introduction and completion of two to three additional projects, and (c) ended before the completion of a final project. The observation of several projects from beginning to end provided a logical and balanced arc to the timeline. The eight individuals who were selected and ultimately chose to be involved in the study provided the most important aspect to the research through their diverse perspectives in the music technology class.

**Participants**

**The Setting**

The setting of this research was situated at Jasper Hill High School in an exurban Ohio town of approximately 20,000 residents. Exurban communities are typically commuter towns that have high levels of education or wealth. The high school student body comprises over 1,500 students while the total student population in the school district is about 6,000. The music technology teacher at Jasper Hill High School, Mr. Decker, estimated that student participation in music at the secondary level was 67% of the student population and with an equal gender distribution. Mr. Decker attributed the
student music enrollment to students’ abilities to pursue more than the traditional music curricular opportunities that many schools offer.

Students are offered two levels of music technology at Jasper Hill High School. The Music Technology 1 class is intended for beginners. Mr. Decker described this course in his Music Technology curriculum document with the following information:

Music Tech 1 can be described as a tour of what is possible with music technology…this course covers the basics of electronic music, audio and MIDI manipulation, and puts a high premium on students beginning to think of a computer as an expressive tool for making music. The course is designed so musicians and non-musicians are on equal footing, and that all students can achieve a level of competency in these basic areas.

The Level 2 course involves the use of the same hardware and software tools from the Level 1 course. Mr. Decker describes this class as the following:

Music Tech 2 is a more career-oriented class, diving deep into specific areas of interest to audio professionals, such as recording, electronic styles, sound for film and video games, multimedia programming/art installations, and studio design. Students will apply their skills not only to music created on computer, but extend their production capabilities into real-world situations.

The participants in this study comprised a blend of eight students from grades nine to twelve. I read a recruitment script to all students (see Appendix B) to provide an overview of the study to the students. Participants were chosen through purposive sampling that occurred in two phases. In the first phase, participant selection was contingent on the receipt of student assent and parental consent forms (see Institutional
Review Board section below and Appendices C & D). Next, each class of consenting and assenting students participated in one focus group interview. Students answered semi-structured interview questions during these focus group sessions. Finally, their responses, along with their unique perspectives, were considered when selecting students for the second phase of the study, which included eight students.

The eight students selected for the second phase of the study were considered according to the following criteria: (a) participants represented diverse musical views determined through the researcher’s initial observations and interactions with students; and (b) conversations with Mr. Decker provide information concerning potentially beneficial participants to the study. The participants were divided based on gender and enrollment in either the Level 1 or Level 2 music technology class offerings. The decision to include three to four students per class offering was determined due to the ability of the researcher to reasonably collect data within a class period. Additionally, participants were divided among five class periods; one period was the Level 2 offering and the remaining four were the Level 1. All participants were given pseudonyms to protect their identities.

The following students participated in this study:

Max. Max was a freshman enrolled in the music technology class for the first time. She enjoyed working with her good friend, Natalie, which is why they sat at adjoining workstations. Max enjoyed expressing her emotions through music inside and outside school. In her personal time, Max participated in and managed her rock band.

Natalie. Natalie was also a freshman in her first year of taking the music technology class. She played violin in the orchestra and cherished the opportunities she
had to put personal touches on her compositions. Natalie had a strong desire to achieve perfection in her music.

Kyle. Kyle was a freshman with a wide range of musical interests. He played different instruments in jazz band, concert band, and marching band. He wanted to be a film composer or jazz pianist after graduating. Kyle was appreciative of his time spent collaborating musically with other students in class.

Penelope. Penelope was a sophomore with a passion for musicals. In her past, she had participated in choir and dance, but musicals were the medium through which she continually chose to express herself. Penelope enjoyed the process of working independently.

Robert. Robert was a senior in the Level 1 class. He maintained an equal passion for athletics and music. Although he would be attending college on an athletic scholarship next year, Robert had no desire to put down his guitar.

Jimmy. Jimmy was in the Level 2 class as a senior. He described himself as a budding rapper, and he liked to make beats with his friends during his free time. Jimmy chose his workstation next to his friend, Tim. The two frequently worked together to troubleshoot problems and brainstorm ideas.

Willa. Willa was a sophomore in the Level 2 class. She had never taken a music class before the music technology class. Willa liked the electronic music genre because she always thought it would be neat to be a DJ. She liked that she could share her musical ideas with others through her electronic music compositions.

Tim. Tim was a senior who was perceptive of the impact that music technology had on his school. He spoke frequently about the learning processes that led him to
devise a set of music technology skills. Tim’s experiences in the music technology program transcended musical concepts; he learned skills that he hoped to carry with him throughout life.

The Level 1 course was designed to be an introductory course to using music technology. Students taking this course used Ableton Live, a digital audio workstation and sound synthesizer, to write songs, explore electronic music styles, and record audio. The Level 2 course was available as an advanced option to students who had successfully completed Level 1. Students in the advanced course learned audio mastering and sound engineering, remixing, and advanced Musical Instrument Digital Interface (MIDI) techniques.

All students had access to their own workstations, each consisting of a Mac computer, MIDI keyboard, headphones, and a microphone. Students were positioned around the perimeter of the room with a few workstations located in pods at the center of the room. Students had enough space to work without distraction and they were given the freedom to move around the room as necessary. Mr. Decker’s desk was situated centrally along one side of the room. He had an identical workstation arrangement to the students as well as a projector that he used to perform demonstrations.

Jasper Hill High School was selected as a research site through purposive sampling (Patton, 1990) because of the reputation of the school’s music technology program in the Midwest. E-mail correspondence with Mr. Decker led to an invitation to visit the school and learn more about the program. My initial observation served as an opportunity to speak with Mr. Decker in person and observe students’ interactions with the music technology tools available to them. Following the initial observation, I
selected the school as the research site because of its perceived relevance to the study and previous success as a location for similar research (Ritchie, 2013).

Ritchie (2013) sought “to describe the characteristics of nontraditional music students with a singular TBMC” (p. 19) and selected the Jasper Hill High School music technology program as the exemplar in her study. Although a large portion of Ritchie’s study was concerned with making connections between traditional music and nontraditional music student experiences in the TBMC, the use of the same educational and cultural setting had the potential to generate similar research experiences. Ritchie’s research question regarding student use of TBMC concepts outside of school shared several relationships with a current research question concerning salient factors that could show longevity beyond a student’s time in school. As a closely-related study, it was essential to identify any relationships between Ritchie’s research and the present study, and it is imperative to express my gratitude to her for providing an initial, successful study that revealed this location to further researchers. The similarities between Ritchie’s research and the present study, however, do not overlap beyond interacting with students in the nontraditional music program at Jasper Hill High School.

Access and Rapport

Creswell (2012) suggests strategies for gaining rapport with participants. All participants were made aware of my research purpose and motivation for participant selection. My status as an outsider was an initial hindrance in gaining rapport with the students. Over the course of data collection, however, students gained a level of comfort with my presence and seemed to feel free to express themselves as though I was not there. My schedule of frequent visits was a procedural design element to counteract any
early-stage issues that might have occurred in gaining rapport with students. My extended presence in the classroom enhanced students’ willingness to share their experiences with me. Additionally, I maintained a positive relationship with the gatekeeper, Mr. Decker, through regular e-mail correspondence. As Creswell (2012) writes, “Approaching this gatekeeper and the cultural system slowly is wise advice for ‘strangers’ studying the culture” (p. 154).

**Role of the Researcher**

Although I have experience working with children as a music educator, the approach I took in this thesis was guided by qualitative fieldwork techniques regarding research with adolescents (Creswell, 2012; Ruthmann, 2006; Tobias, 2010). Data collection techniques remained as unobtrusive as possible. Nonetheless, I also recognized that, although I had full consent, assent, and teacher support, students did not always feel willing to participate at certain times. Depending on their moods or classwork timeline considerations, I was mindful of maintaining an awareness of students’ personal space and responsibilities throughout data collection.

**Procedures**

The specific procedures for data collection are described below. This section begins with an overview of the Institutional Review Board process, followed by the methods for collecting data through interviews, observations, student journals, and audiovisual materials. Finally, the analysis procedures are detailed with consideration given to trustworthiness, generalizability, and the limitations of the study.
Institutional Review Board

Following a successful thesis proposal with my advisory committee, I submitted another proposal to the Case Western Reserve University Institutional Review Board (IRB). In accordance with university guidelines, all of the details about the proposed research procedures were outlined for the IRB committee, including information regarding the research location, participants, data collection, and the process for protecting participants’ identities (see Appendices A, B, C, & D). Data collection began immediately following approval by the review board.

Interviews

As stated previously, interviews took place in two phases. In the first phase, students were assembled in focus group settings to answer semi-structured interview questions (see Appendix F). While those interviews were designed to serve a sampling purpose, participants’ answers helped to shape the nature of interview questions for phase two. Participants answered questions related to their general technology use at home and in school, their learning experiences in the music technology class, and their perceptions regarding their musical identities. Participants’ responses to interview questions were considered in conjunction with preliminary observations and conversations with Mr. Decker in order to select the eight participants for phase two of the study. A further description of this process is outlined in Chapter 4.

In phase two of the study, the eight students regularly participated in semi-structured and unstructured interview formats in an open space in the classroom away from other students (see Appendix E). The semi-structured interview sessions took place in the beginning, middle, and end of the research to track participants’ development over
the fixed timeline. The unstructured interviews took place frequently throughout the study to obtain an understanding of the students’ thought processes at specific moments. The unstructured interviews allowed students to reflect on their decision-making processes rather than interrupt their focus to describe task-oriented processes as they were completing them (e.g., think-aloud protocol). Secondary factors, such as the speaking about the perceived impact of previous technology knowledge on current projects, were best suited in a reflective approach and did not require students to halt their learning processes (Ruthmann, 2006).

All semi-structured interviews were scheduled for up to 45 minutes, although adhering to a specified timeframe was not always conducive to some conversations; some interviews lasted longer and many interviews were rescheduled due to weather-related issues and testing schedules. Focus group interviews were originally scheduled after school, but in order to allow for optimal participation, Mr. Decker provided time for those interviews to occur during class. The focus group interviews were semi-structured to allow participants opportunities to respond to questions and to the ideas of others, and were scheduled for the full class period. I recorded interviews as described below in the “Audiovisual Materials” section.

Observations

Observations took place throughout all phases of the study at the nonparticipant level of engagement (Creswell, 2012; see Appendix G). In this position, “the researcher is an outsider of the group under study, watching and taking field notes from a distance” (p. 167). Creswell also noted that researcher roles can change throughout the study. A “participant as observer” (p. 166) role was to be taken if meaningful additions to data
collection are assumed from doing so. Observations were divided as evenly as possible among the participants in each class period; however, I maintained flexibility in student observation times depending on my perceived potential of importance for observing a participant at a given time. In the cases of observation sessions with imbalanced time distributions, efforts were made to divide time equally in subsequent observations so that no students were underrepresented. Recording procedures for observations are detailed below in the “Audiovisual Materials” section.

**Documents**

Student journaling was a continuous, semi-guided element of the data collection. Students were prompted by the researcher to write weekly entries about their learning experiences in the music technology classroom (see Appendix H). Participants were encouraged to reflect on their involvement in class and to provide any other information that they believed might be relevant to the study. Additionally, students were invited to share their reflections about specific instances in classes if any such moments were noticed in observations. Student journals were uploaded through e-mail as they were completed, and they were saved into Microsoft Word documents allocated into labeled, individual computer folders on an external hard drive.

**Audiovisual Materials**

I operated the Q2HD Handy Video Recorder and iPad Air 2 as I positioned myself in various locations around the room to collect audio and video data during observations and unstructured interviews. The cameras were sometimes placed in stationary positions to record the actions of one participant while I used a handheld recorder (Nexus 5 smartphone) to collect data from another participant at the same time.
All interviews were recorded with the video camera placed in a fixed location and focused on the participant. The Nexus 5 smartphone was used as a secondary recording tool to record audio in the focus group session to ensure that no audio was lost from the participants.

As outlined above, data were collected in a variety of forms. Field notes, researcher memos, video recordings, audio from semi-structured and unstructured interviews, and student journals functioned as five sources of data. A wide variety of data sources such as this provided sufficient depth to the study according to Creswell’s (2012) four categories of qualitative data forms: “Interviews, observations, documents, and audiovisual materials” (p. 159).

The following list details the critical components of equipment that were used in data collection:

- Q2HD Handy Video Recorder – used for video and audio recording
- Q2HD Tripod – used for maneuvering the camera
- iPad Air 2 – used for video and audio recording
- Dell laptop – used for data storage, data analysis, and written reports
- Western Digital 1TB hard drive – an external hard drive used to backup all forms of data
- NVivo – a software program used to assist in transcription methods
- QDA Miner – a software program used for coding and developing themes from participant transcripts
- Nexus 5 Smartphone – a backup device for audiovisual recording and voice memo tool for researcher field notes
• Smart Voice Recorder Smartphone Application – a phone application to be used as backup for interviews

• Legal pad for field notes – the primary form of researcher field notes and researcher memos

Analysis

All data sources were analyzed using within-case and cross-case analysis techniques (Yin, 2009, p. 52). Data analysis was approached in four layers according to Creswell's (2012) data analysis spiral (p. 182), which is listed below. The classification of data in several layers such as this allowed for examination from multiple perspectives. This analysis served to synthesize participants’ emic, insider perspectives with etic, outsider perspectives from the researcher (Creswell, 2012, p. 92). Analysis from several methodical angles allowed for more accurate themes to emerge from the data. The four stages of analysis occurred in the following progression (p. 183):

Layer 1 - Data managing

Layer 2 – Reading and memoing

Layer 3 – Describing, classifying, and interpreting

Layer 4 – Representing and visualizing

Data Managing

The organization and grouping of all data occurred in this stage. I converted participant journal documents and audiovisual files into relevant file-types to facilitate working with transcription software and for ease of access. I separated researcher memos into descriptive and reflective categories according to recording procedures provided by Creswell (2012, p. 168). Field notes were converted from written documents into a
digital format and archived. I transcribed and archived all interview audio data using the NVivo software. The same techniques were used in transcribing audiovisual data from classroom observations.

**Reading and Memoing**

Agar (1980) suggested the following to a researcher: “read the transcripts in their entirety several times. Immerse yourself in the details, trying to get a sense of the interview as a whole before breaking it into parts” (p. 103). Any brief thoughts or seemingly important concepts during the process of immersing myself in the data were notated in the margins of interview transcripts or observational data as researcher memos. This step served as the initial stage of categorization that eventually led to codes and themes. These preliminary codes and themes became essential in the following step.

**Describing, Classifying, and Interpreting**

The preliminary data categorizations were reviewed at a greater level of detail. All preliminary codes (see Appendix J) were considered for their importance as more broad classifications of data were identified. The catalog of information was ultimately reduced to any codes that were present in the data. The process of identifying emergent themes involved the greatest level of reduction and specification. Those themes were considered at the time they occurred and as they related to the research questions. Any salient themes from the analysis processes conclusively underwent a stage of identifying “the larger meaning of the data” (Creswell, 2012, p. 187) in which “the researcher would link his or her interpretation to the larger research literature developed by others” (p. 187).
Representing and Visualizing

The final stage of analysis involved creating a visual representation of the themes and constituent codes (p. 187). Analysis at this stage involved linking direct quotes or codes to the themes in an effort to produce a hierarchical visual structure. At this point, all forms of data were represented in one format within the QDA Miner software: the words or phrases that characterized specific themes and codes (see Appendix I). Although discussed in further detail in the trustworthiness section below, it is in this stage that member checking occurred as a form of validation.

Analysis Considerations

All cases were analyzed and considered within-case and cross-case (Yin, 2009). Within-case analysis provided individualized narratives to each participant. Cross-case analysis among the participants was used to synthesize the findings from the within-case analyses so that a thick description could be established. The thoroughness of the data categorizations and descriptions of any emergent themes in the final layer of Creswell’s (2012) data analysis spiral, detailed above, made Geertz’ (1973) idea of “thick description” possible. The analysis at the within-case and cross-case levels added another layer to the process. The detailed examination used in the analysis of individual cases improved the thick description. Individual cases were examined as direct interpretations (Creswell, 2012) to draw multiple meanings from distinct data sources. Stake (2005) postulated that cross-case analysis offers a different perspective from thick description by providing a more holistic interpretation of the setting. All data are represented in within-case and cross-case formats in the findings in chapters 4 and 5 respectively.
Trustworthiness

Several methods were used to establish trustworthiness in the analysis of data. Three forms of validation were present from the design of the study. First, data triangulation was a trustworthiness strategy inherent in the research; the multiple sources of data procurement and sources of information provided one layer of triangulation. Second, the process of analysis at multiple levels, in which data were thoroughly reviewed according to multiple layers of inquiry, ensured that the analysis procedure was thoroughly exhaustive and comprehensive. Creswell (2012) stated that “building trust with participants, learning the culture, and checking for misinformation that stems from distortions introduced by the research or informants” (pp. 250-251) comes from persistent observation and will guide the researcher in making decisions throughout the study. Third, the final level of inherent validation came from the thick description mentioned above. Thick description arose from “interconnecting the details, using strong action verbs, and quotes” (Creswell, 2012, p. 252).

I utilized member checking techniques with each of the participants during the final layer of analysis. All participants were given their interview transcripts, a summary of the emergent themes, and a cursory explanation of the analysis techniques used to identify those themes. They had the opportunity to provide any feedback as to the interpretations of data in relation to their contributions.

Two graduate student peer reviewers read the interview transcripts and provided their opinions regarding the appropriateness of the coding and theme development that resulted from the data analysis. Both of the peer reviewers were selected according to their levels of familiarity with and experience in qualitative research techniques. The
peer reviewers provided another level of external validation to the research. They were given access to all transcripts with the participants’ names replaced by pseudonyms as well as the researcher’s representations of codes and themes that stemmed from the data collection process. Their recommendations and suggestions regarding theme categories resulted in several revisions to the naming considerations in this study.

**Limitations of the Study**

The bounded nature of this collective case study offered only a glimpse of the learning experiences of students at a given time. It is likely that students’ perceptions might change throughout their involvement in the TBMC, and as adolescents develop in general. The factors outside of my control (e.g., snow days, testing schedules, absences) added a layer of difficulty to the study, which due to its bounded timeline, called for frequent flexibility. While the sample size was chosen in order to use time effectively, the limited number of participants may not have provided sufficient data saturation in the research time allotted, but this was beyond the scope of the current study. It is presumed, however, that the efforts taken to identify a diverse sample and employ a variety of data collection techniques provided an adequate distribution of data from which conclusions could be considered. Additionally, the illustrations of these students’ experiences at a moment in time were substantiated with related research. In designing this study, one of my goals was to provide a contribution to the growing body of research surrounding technology use in music education.

**Generalizability**

This study provided a snapshot of student learning in a TBMC. As stated earlier, the TBMC environment in the United States is diverse and is constantly transforming.
By creating research questions that were centered on students’ experiences in using technology rather than on the specific tools themselves, the findings related to the broader research goals of social identity and agency and might endure as more lasting elements compared to technological tools that can become obsolete and replaceable over time. Additionally, through focusing on students’ participation in common creative musical activities such as composing and recording, portions of the research findings might be relevant to other TBMCs. Generalizability and transferability of the findings from this study to other settings, however, are limited. Given the complex nature of students’ musical interests combined with elements such as socioeconomic status and location, music educators must consider how the broader findings of this study may relate to their students, rather than attempting to replicate the Jasper Hill High School music technology program in their own setting.
Chapter 4

Within-Case Analysis

This chapter presents an analysis of the participants as they created and composed music using a variety of techniques while autonomously managing their projects. After a brief restatement of the analysis process that led to the eventual codes and themes for the study, the structure of the music technology class is explored to provide a context for understanding students’ experiences within that classroom environment. The themes that arose from the multiple data sources were considered for their importance within two analytical contexts. A within-case analysis compares the individual participants’ experiences within the framework of the research questions. The second analytical context will be discussed in Chapter 5. Findings from the within-case analysis are presented and examined throughout this chapter.

Analysis Process

The interview transcripts, field notes from observations, journal entries, and audiovisual materials were organized and examined methodically according to Creswell’s (2012) stages of analysis. All forms of data were compiled into digital formats and initially categorized to develop codes and themes (see Appendix J). These codes and themes were further considered with regard to the purpose of this study and the research questions. By arranging this information into hierarchical structures, the relationships between the emergent themes could be visualized (see Appendix I). As detailed in the following paragraph, I obtained curriculum documents for the music technology classes to gain an understanding of the participants’ learning environments.
Music Technology Class Structure

During the 4-week data collection period the participants in Mr. Decker’s Level 1 course completed two projects and were halfway to completion on their third. The first project consisted of creating house music, a genre of electronic dance music characterized by repetitive rhythms and low-pitched bass grooves. Mr. Decker introduced this project with a lesson about the history of house music and connected several key elements, such as the “four on the floor” kick drum pattern, before allowing students to begin on their own house music projects using Ableton Live as the software music sequencing program and digital audio workstation. Mr. Decker described the second project as a soundscape. Students were instructed to select a picture file of a landscape through an online image search. They were then tasked with creating an ambient soundtrack with a supporting drone pitch to characterize that image. The final project during the observation period required a complete creation of sound for a movie scene. Students were given several movie scenes from which to make their selection. They were then required to provide voiceovers for all speaking characters, relevant sound effects, and a soundtrack to fit the mood of the scene.

The students in the Level 2 course were in the final stages of an electronic dance music project when the data collection period began. Mr. Decker was completing the final phase of this project in which students listened to each other’s compositions. The second project involved a chiptune synthesizer that Mr. Decker programmed for use with the Ableton Live software. Students used this synthesizer to create music similar to the 8-bit music from early video games. The third project introduced the concept of audio mixing. Students experimented with editing a multi-track recording of a Jasper Hill
student rock group. In addition to layering the tracks as they saw fit, the students modified the audio to achieve pitch and rhythmic accuracy. The final project that took place during the data collection period was presented similarly to the house music project in the Level 1 course. Mr. Decker introduced the genre of dubstep music, a musical style characterized by syncopated rhythms and low-frequency oscillation. He provided a brief history regarding the formation of dubstep before demonstrating the techniques for achieving the requisite musical sounds and styles of the genre. The following section will explore each participant’s experiences within either the Level 1 or 2 courses as individual cases. The eight individual participant cases provided a thick description when considering their individual experiences within the music technology course. The following eight cases are ordered with the five Level 1 participants first followed by the three Level 2 participants.

Within-Case Analysis

Max. Max is a shy, quiet, but opinionated freshman in the Music Technology Level 1 course. She cares deeply about the music that she makes in school and with her rock band outside of school. She ended up in the Music Technology class by coincidence. As she recalls, “I actually didn’t have a choice. I had to drop out of choir and this was the only class available, so…” She wants to continue singing and making music with her rock band beyond school with her friend, Natalie, who is also in the Level 1 class.

Using music to express herself. Max enjoys the atmosphere of the music technology class. “I’m able to make my own projects and be around music. It’s kind of what I want to do.” When I observed her working on her house music project, however,
she portrayed a different type of character. While the class was working on adding vocals to the music after a build-up in the intensity of the drum beat, Max was nervous to perform this task within earshot of her peers. Regarding the performance of music in front of others Max told me, “I’m pretty shy so performing’s hard unless I have someone with me…they can help me think”

Outside of school Max described herself as having leadership qualities that she finds necessary to keep her personal pursuit of music active. She plays guitar when there are no others to play it, she is learning to play piano, and she writes lyrics, but when I asked if she was also the lead singer in her rock band, she replied, “My friend is. I let her choose.” Max felt that she was able to express herself somewhat while working on her house music project. “I put all of that [emotions] in there, and it seemed to turn out fine.” There was a noticeable difference between how Max described school and home when considering the amount of ideas that she wants to express. In describing those feelings, Max explained:

There are a lot of things I do have to say…and music just helps to get it out. It’s not like lecturing somebody, you know? It’s saying how you feel and how other people should. I write about the kids around here and the bullying and stuff. I don’t think that’s right, so I write about that.

Max’s ability to utilize music as an emotional outlet (Adderley, Kennedy, & Berz, 2003) provided her with a personal connection to music that she could explore individually or with others.

Solving problems through cooperation. Max and Natalie are seated at workstations next to each other. They frequently can be seen rolling their chairs next to
each other to ask for help or to listen to the progress of a project. There is a noteworthy occurrence that comes from working in stations such as this. By wearing headphones and maintaining an intense focus on a computer screen, students frequently miss instructions given by Mr. Decker. In my first observation of Natalie and Max, they demonstrated an instance in which one student (Max) missed instructions, but they were able to solve that problem through collaboration. Max called Natalie over for help, and the following conversation occurred:

Max: This is my first time so…see? (she points to the computer monitor)

Natalie: What did you do?

Max: I didn’t do anything.

Natalie: Did you record?

Max: Wait, we’re supposed to record it first before we did this?

This scenario was not the only time that I observed students missing important instructions because they were working on their projects. While working on the soundscape project, Max returned the favor by walking Natalie through the steps of transferring a picture file into Ableton when Natalie failed to see the demonstration. Together with the help of her friend and bandmate, the two were able to maintain focus on their projects while having an additional pair of ears available to pick up any additional information coming from Mr. Decker as he circulated around the room.

**Natalie.** As an aspiring orchestral conductor, Natalie does not hesitate to share her opinions about the state of the music industry and her experiences with music as a ninth-grader at Jasper Hill High School. Natalie is easily tired of unoriginal music or songs that are “obsessively repeated on the radio over a million times…like the Cup
Song, which is already starting to get on America’s nerves.” Perceptive and analytical, Natalie conveyed several of her opinions about her learning process as she navigated new territories of electronic music and using computers to compose and create music.

**Perfecting music.** Natalie has developed an appreciation for creating music with computers during her time as a student in the Level 1 class. She often compared the work that she does to Mr. Decker’s work. Through her practice of comparison Natalie was able to deconstruct the underpinnings of her recent remix project. When I asked her to describe her feelings toward the remix project, Natalie first led me through the process of creating a suitable audio track:

- We don’t know how to mess with the words without completely messing up the song. We actually did do this recently and we just added on music…like the loops onto the words. Mr. Decker stripped the music of all the audio except for the singer’s voice which is actually very hard from what I heard. Actually, it seems very hard.

Natalie was motivated to make her music “sound right” when she realized the difficulty of the process through which Mr. Decker worked to create projects for the class. Natalie’s desire to continue improving her compositional skills was evident by the intense scrutiny of projects that she showed and by her goal of obtaining Ableton Live on her laptop so she could use it at home. Natalie’s enjoyment throughout the compositional process was similar to the central participant in Bolton’s (2008) study in her desire to continue creating music at home.

Though her ambitions are to become a professional musician, Natalie had a realistic understanding of the amount of work required to reach that point in her career.
Regarding the impact that her experiences with music technology might have on her overall musicianship, Natalie stated that, “Even though people say they’re professional musicians or professional vocalists, you’re never truly a professional. There’s always something you can do better.” Her opinions concerning musical values and her ideas about achieving goals provide information regarding Max’s developing musical identity (Campbell, Connell, & Beegle, 2007; North & Hargreaves, 1999).

Throughout Natalie’s experiences working with Ableton Live, she ran into several obstacles related to her familiarity with the software. Natalie recalled an incident in which she thought that she saved her project file, but she used the incorrect save feature resulting in the loss of her video from the project. The tedious process of fixing this technical issue and reproducing previous compositional ideas required the remainder of Natalie’s time during that observation period. When asked about her process for solving problems like this, Natalie responded, “Sometimes I don’t know how to undo something in Ableton, so I just forget about what I’m doing and I come up with a brand new idea.”

The process of spending time on issues such as this corresponds with certain criteria for project-based learning while it conflicts with others (Thomas, 2000). By using her time to deal with issues of saving documents or her lack of knowledge about the “undo” button, Natalie was struggling with problems that were not related to the central goal of the lesson. Conversely, she engaged with authentic problem-solving issues that arise in similar compositional situations outside of school in taking on the role of “technology troubleshooter and repairman” (Ruthmann, 2006, p. 9).

Natalie was willing to try new things in order to fulfill the requirements of her projects. She realized that, in order to complete assignments to the best of her ability,
sometimes she would have to get “out of the anti-social box” in which she felt comfortable. When the students were instructed to record their voices, Natalie would typically record at a soft volume and adjust the dynamic with software tools later to maintain her feeling of remoteness. At other times Natalie would deliberately forego “putting any real emotions” into her music when she had opportunities to make music that would be entertaining for others. In these ways, Natalie was performing various musical roles (Tobias, 2010) in her creation of music for self and others while maintaining an awareness of her responsibilities to create music that fulfilled the requirements set forth by Mr. Decker.

**Learning in music technology.** Natalie shared her ideas about the skills that students would need in order to be successful in the music technology class. She supposed that “knowing your way around instruments, and knowing what instruments sound better with others” might be the only skills that students who have experience in traditional music ensembles might carry with them into the music technology class. Later she added that her experiences in other music classes gave her the knowledge that “you don’t put a certain key loop with another key loop. A B-flat loop with a C-sharp…you don’t do that.” Her established musical expectancies (Bigand & Poulin-Charronnat, 2006) and acumen for these types of musical discrimination separated Natalie from many of the other participants who frequently needed more time for exploration and exposure before reaching similar conclusions.

Natalie described her perceived relationship with the other members of the class through a shared connection to music:
Do you know about learning styles? Some people learn through music, some people learn through writing, and some people learn through visually seeing stuff. I think that people in here are dominantly musical in learning, and that’s why they decided to join this class.

She expanded on this viewpoint by describing the supportive and nurturing environment of the music technology class with the statement, “We want to make music and we want to share that music.” Natalie believed she has not received the attention that she desires in the Jasper Hill orchestra and seeks out opportunities to collaborate with others and receive feedback as part of her overall musical experience. Although her musical interests are not directly connected to the electronic music genres covered in the music technology class, Natalie uses the music technology class as a “badge” (North & Hargreaves, 1999) to display her musical lifestyle to others.

**Kyle.** Kyle’s interest in music has led him to participate in a variety of musical activities both in and out of school. He plays tuba in concert band, percussion in the marching band, piano in the jazz band, and takes pleasure in composing music for all genres of music in his free time. Kyle’s amusement in music has given him career aspirations to become either a jazz pianist or a film composer.

Kyle’s enthusiasm in the music technology class was equally clear to see. He was consistently the first student to arrive to class and begin tinkering with his previous projects. He maintains a tremendous amount of concentration to his work while completing projects. Kyle’s excitement, though, often leads him toward extended periods of experimentation. On one notable occasion, Mr. Decker instructed the class to
investigate different methods of reverberation, a task that Kyle quickly completed before experimenting with arpeggios on the MIDI keyboard.

**Collaboration and exploration.** Kratus (1990) described the exploratory process of instrumental musicianship as a period in which students “begin to audiate the sounds they are playing, and the musical choices they make while exploring become less random and more intentional” (p. 35). His time spent experimenting with the varieties of sounds and instruments available in Ableton Live far outweighed the time that he spent completing the requirements of the projects. Kyle explained how he uses his time after completing a project by stating, “I grab some audio clips from the computer and I play some pieces on the computer with them…and that can give me ideas for projects.”

Kyle valued the opportunities he had to experiment through collaborative approaches. He recalled a project in which he and a partner created a radio advertisement. “It was fun to work with somebody. You can bounce ideas off of other people so it’s more than just music. You can do anything with this class.” Kyle’s collaborative experiences with his peers – giving and receiving frequent feedback – reflect the creative outcomes that come from working with computer tools “as a common ‘technical’ language to discuss their choices” (Gall & Breeze, 2008, p. 38) which help shape the process of negotiating a cooperative effort.

Kyle further justified his feelings about collaboration by expressing his views about music currently being produced in the recording industry. “I think a bunch of music today has a lot of collaborators in it. Collaborating can really be a key point to this career.” As a prospective professional musician, Kyle has displayed knowledge of the links between his classroom experiences and those of the “real world.” His act of testing
various musical roles similar to the participants in Tobias’ (2010) study has allowed him
to engage in a diverse set of creative processes essential to those roles.

Kyle’s determination to complete projects that fit his own standards typically
involved several minor modifications. His time spent refining the final details prevailed
over the amount of time in which Kyle completed the majority of the assignment. I
noticed Kyle’s persistence particularly when he was dubbing vocal lines into a movie clip
project. He had returned to the first line of the movie clip and rehearsed his recording
several times before beginning the recording. After a dissatisfied self-evaluation of his
initial product, Kyle decided to experiment with recording the line repeatedly with
nuanced techniques. When I asked Kyle to tell me how he knew a musical project was
completed, he replied that “if it feels like someone can put it on and say, ‘hey, this sounds
really good’…if they can just listen to it and be satisfied then that is what I’m mainly
looking for.”

His purposeful creation of music for others paralleled several other students’
feelings toward their compositions. As Kyle explored sounds and effects to perfect his
projects, he could not consider a musical creation finished until another individual
provided their approval or until he could draw sufficient comparisons of his composition
to existing popular music. Kyle’s search for his ideal musical voice allowed him to
explore freely a context in which learning could originate through discovery (Allsup,
2002).

*Building on previous experiences.* Kyle’s diverse musical background, along
with his interest in computers, has contributed greatly to his experiences in the music
technology program. In addition to his previous musical involvements in school, Kyle
writes music with GarageBand and uploads music to YouTube. He described the overlapping nature of these hobbies to be “like the many ingredients of a delicious chocolate cake.” Kyle maintains a continued level of confidence while working on projects because he believes that his skills will allow him to “layer musical segments together.”

Kyle describes himself as a “huge movie buff,” and his understanding of the processes behind creating audio for film have enhanced his interest in pursuing music as a future career. He attempted to create soundtracks to accompany films prior to taking the music technology class, but he was missing key elements to attain the quality of compositions that he desired. “This class is more than just making music on a computer,” Kyle explained to me. “We learn all sorts of things…not only about music technology, but music in general.” As described in the following quote, the combination of technical skills with Ableton Live and the knowledge Kyle has gained about electronic music genres and composing for film are only a fraction of the experiences that Kyle finds valuable.

I think I’ve learned about how to function with some of the technology that’s around [me]. I know all the buttons to press on each of these MIDI controllers. I’ve learned how to blend pitches. I’ve learned how to do recordings and how to put sound effects into a project. I’ve learned how close you have to be toward a mic, how far away you have to be, and where you have to put the sound effects. Kyle followed this statement by telling me that he did not learn the relevant musical skills in band class that he knew would be valuable to him as a future film composer or jazz pianist. He gained an appreciation and understanding for those various elements while
experimenting as a composer, but he felt that he did not truly have the tools that would lead him toward success until he took the music technology class.

**Penelope.** Penelope has a passion for performing in musicals at Jasper Hill High School. She has taken voice lessons, participated in band and choir, and been a member of dance ensembles throughout her life. Penelope had been interested in taking the music technology Level 1 class for a couple of years, but she had to drop the class last year due to a scheduling conflict. She had so much fun during her limited time in the class that she decided to sign up for Level 1 again this year.

Despite her variety of experiences in the arts, Penelope described her current musical involvement as temporary. She is certain that her future personal or professional goals will have no connection to music. Additionally, Penelope does not believe that her previous musical experiences have defined her, but rather, that her musical interests express a portion of her identity to others.

**Working independently.** Penelope spoke frequently about the importance of freedom during her experiences within the music technology class. She encapsulated the concept of freedom in two contexts. The first was related to her ability to create sounds that appealed to her musical sensitivities. The second element of freedom was derived from her opportunity to take ownership of complete projects.

Penelope relished the process of starting a project from scratch with no preconceived notions of the musical choices she would make. When asked about her approach to beginning new musical compositions, Penelope remarked, “I’m always open. I like starting a new project not knowing what I’m going to do at all.” She viewed each new composition as an opportunity to express her feelings or mood at a particular time.
Penelope also mentioned that the musical genre could impact the direction she would take in her compositional process, stating, “Depending on the genre, I have a different style of what I like in that genre.”

She valued the time that she could take to let musical ideas ruminate. Penelope conveyed the importance of having time to think in her compositional process on several occasions. I observed one notable instance in which Penelope saved her project and closed Ableton Live with several minutes left in the class. She spun around in her chair and began looking at materials for another class. After a few minutes, Penelope sat up straight in her chair, turned back toward the computer, and reopened Ableton Live. With only a couple of minutes left in the class, Penelope made several major revisions to her project. When I asked her to reflect on her thought process during this particular occasion in a subsequent interview, the following exchange occurred:

DG: When you were working on your house music project, you finished, started working on something else, and then immediately went back to working on your project. What was going through your head at that point?

Penelope: Oh I actually remember what it was. When the bass dropped, I didn’t like the sound it was making. So I went back and tried to fix that. It wasn’t fast enough for me. I didn’t like the tempo.

DG: So you were thinking about it the whole time…even while working on something completely different?

Penelope: Yeah.

The time that Penelope had to deliberate and reflect suggests that she maintained a high level of autonomy throughout her learning process (Dearden, 1972).
Her ability to go through the process of solving problems while using Ableton Live or in searching for musical ideas was also important. Regarding how frequently she asked Mr. Decker for help, Penelope replied, “If he does anything to change it, I’ll just get really annoyed.” Penelope felt that any intervention by her teacher would make her feel as if the music was no longer her own. Tobias (2010) described this as a process wherein the students could take “ownership of their decisions and the intentionality was based on the processes in which they were engaged” (p. 497). Penelope’s experiences with ownership and intentionality shifted throughout the process of informal learning in the music technology class depending on the stage of the project (Folkestad, 2006).

Penelope thought that the relaxed teaching style that Mr. Decker used was beneficial to her learning process in the music technology class. She mentioned, “I feel like if it was stricter, the class wouldn’t be as fun. I feel like if it had more of a set way, it wouldn’t give people enough freedom to express themselves.” She also believed that the structure of the class made “music less serious.” In comparison to other music classes that Penelope has taken, the music technology class increased her interest in music because of the flexibility she had in managing her projects and expressing herself.

**Improved technology skills.** Penelope referred to several instances in which she knew that her familiarity and comfort with technology was improving. The way in which she described these incidents made them seem like unintended, beneficial consequences of the composition projects. The multifaceted requirements of the projects typically required students to move among Ableton Live, Internet searches, other software tools, and hardware tools such as microphones or the MIDI keyboard.
Even though Penelope did not anticipate that her music skills would transfer into her life beyond school, she suggested several potential applications for the technical skills that she learned in the music technology class. She enjoyed working within the platform of the Mac operating system and predicted that her future would involve a great deal of computer use. She also welcomed the opportunities to solve computer problems as they arose because she thought it was an important skill to have.

**Robert.** Robert was a senior at Jasper Hill High School who will be attending college next year on an athletic scholarship. He described himself as “outgoing, not high-strung, and energetic,” and carried his competitive mindset into everything he does. “I try to be the best. Why do something if you’re not trying to be the best?”

Robert had a diverse musical background. He played trumpet in band until 8th grade, and he took piano lessons for several years. Outside of school, Robert took pleasure in playing guitar and jamming with his friends. He was introduced to the music technology class by a friend who had taken it the previous year and recommended it to him.

**Creative musicianship.** Robert’s affection for music helped him to think creatively to maintain an active participation. During the observational period, he mentioned having a core group of friends who would regularly assemble to write songs and jam together. In thinking ahead, Robert took the music technology class to learn the skills that he might need to continue similar musical experiences outside of school without the presence of those friends. He explained that, “I’ve thought about making rhythm sections. If I wanted to play lead guitar or something and I don’t have a backing band, I can make a rhythm section using Ableton-type software.” Robert expressed his
confidence in being able to perform that task: “If you have the loop library that we have here, I could do that.”

Robert valued the creative process above the technical aspects of the music technology class. He expressed his fondness toward the class by stating that, “sometimes if [Mr. Decker] is going over something and I feel like I’ve got it, I’ll go through and pull up loops and stuff…make rhythm sections to a band or something.” Robert’s perception regarding his ability to fulfill the requirements of the projects gauged whether he could find time to explore his personal music interests with Ableton Live.

He viewed composition projects as belonging to two categories: those that had strict requirements and those that allowed for creative freedom. Robert recalled some instances in which he was able to make creative decisions. While many students were experimenting with sounds related to electronic music genres, Robert claimed to “do more of getting a rhythm section going on guitar and progress through different chord progressions.” When I asked how he felt about being able to add a personal touch to music, Robert replied, “I think that’s part of the process of making music. It’s different for every person.”

*Separating music technology from traditional music.* A recurring subject that Robert broached during interviews was his feeling that music technology was far removed from traditional school music classes such as band, choir, and orchestra. He remembered his experiences in band classes in which he would become frustrated when others were not playing at his level. “We have to slow down class for the teacher to work on this person. With something like this music technology class, I’m doing my own project, and I can go at my own pace.”
Robert also did not care for the types of music that he performed in his band classes. He thought that band ensembles did not play enough popular music to keep him interested. Additionally, he did not appreciate feeling as though his voice was not being heard in the class. When asked for clarification, Robert replied, “You just sit there and you play the sheet music that the band teacher gives you.” Although his desire to form a personal connection to music was not found in band, Robert was able to find what he was looking for in the music technology class, in what Allsup (2004) described as “opportunities for young musicians to make sense of their immediate world through sound so that they enjoy the kind of aesthetic understanding that music provides” (p. 214).

**Jimmy.** Jimmy was a senior in the Music Technology Level 2 class. His engagement in music was generally through social means; he had fun using the musical tools on his smartphone with his group of friends and enjoyed singing in church. In addition to his musical participation, Jimmy maintained an active lifestyle full of outdoor activities such as longboarding, surfing, and playing lacrosse. Jimmy intended to enter a medical career after graduating from high school and serving in the military.

When asked to contemplate how he might continue to experience music after graduating, Jimmy said that he would probably “just listen to it rather than create it” as he does currently. He holds the arts in high regard as expressive participatory outlets. Although he obtains a great deal of delight from freestyle rapping with friends or creating art with spray paint, Jimmy’s self-image and future career goals do not support his continued creative involvement after graduating from Jasper Hill High School.
**Self-concept.** Jimmy hesitated to detail the gratification that he receives while making beats to go with the raps that he and his friends create outside of school. “It’s fun. I suck at it, but it’s fun.” Jimmy frequently expressed in interviews similar feelings concerning his musical abilities. He was consistently positive when describing the musical compositions that he created in class, but when reflecting on his rapping or ability to analyze music outside of school, Jimmy felt inferior to the music technology students who had extensive training in traditional music classes. In terms of his self-theory (Dweck, 2000), Jimmy displayed a type of negative entity view in which he believed his abilities were unchangeable.

Jimmy began playing an instrument in his elementary school band. He explained his reason for discontinuing participation in band after sixth grade. “I knew the notes, but I guess I wasn’t musically talented enough for the instrument…so I just stopped.” Jimmy expanded on this statement, indicating that “if you are taking band right now, you’ll know the difference between major and minor and what sounds good together.”

Although Jimmy spoke positively about his recreational music activities, the separation between his ensemble experiences and personal musical interests influenced his musical confidence. Stainback, Stainback, and Stefanich (1996) stated, “Some students exhibit learned helplessness when there is not a good match between learning objectives and student attributes” (p. 14). His sense of learned helplessness was compounded by the unsubstantiated belief that traditional music students had an advantage in the music technology class:
We do some synth projects in class and we use the keyboard for synths. They know the different beats to type in, and they know the difference between majors and minors and the different notes. I don’t know any of that.

**Musical involvement beyond school.** Jimmy’s feelings concerning traditional music students’ skills might have led him to the belief that he will become a non-participant (Williams, 2011) in music following high school graduation. This mindset reflects Blacking’s (1973) observation that music in our society is “restricted to a chosen few in societies supposed to be culturally more advanced” (p. 4). Jimmy has relegated his enjoyment in music to a lesser participatory state by comparing himself to his peers with traditional music backgrounds. Regardless of his future participation with musical experiences, Jimmy’s current involvement in music is unique among his peers.

Jimmy’s personal interests in music were not shared by the other participants. He has access to the Ableton Live software at home and uses it with his friends to create remixes of songs. Jimmy produces his own beats to accompany his freestyle raps. His motivation to create all of the elements required to enjoy personal musical pursuits clearly demonstrates his ample musical skills. Jimmy expressed that he enjoys performing music more than writing it. After leaving Jasper Hill High School, Jimmy intends to “keep listening to different genres and really exploring music.”

**Willa.** Willa was a sophomore in the music technology Level 2 class. She signed up for the continuation of the music technology class after she took the Level 1 course last year and had a nice experience. Willa cherished coming to class because “it just [made] the school day more interesting.” Willa was continually excited to learn how to create new music from both the musical genres to which she listened and the styles of
music that were new to her. Willa considered the possibility of becoming a club DJ at some point in her life because of her love for the various styles in the electronic music genre.

Even though Willa does not have much in the way of a formal music background, she spoke about growing up in a musical family. “My grandpa was in a band. My dad ended up playing the guitar and drums.” Willa also revealed that the Level 1 music technology course was her first music class. She did not hesitate to add, however, that “if Mr. Decker comes out with a Level 3, I’ll take it in a heartbeat.”

Considerably independent in the completion of her tasks, Willa had a knack for using music technology tools. Willa made it known that she learned the lesson requirements quickly, and depending on her mood, she may have chosen to either complete projects with a high degree of creativity or simply fulfill the conditions of the assignment. As detailed in the following section, her methods for composing music were considerably different from her peers. Willa maintained a great deal of organization, concentration, and efficiency while composing.

**Organization.** Willa began every new project with the same plan in mind. She spent a substantial amount of time exploring the new tools and techniques that Mr. Decker introduced in his demonstrations and lectures. Willa experimented with several combinations and variations until she felt that she has achieved mastery and has “figured out what does what.”

Once she had established a firm understanding of the project and tools at her disposal, Willa began to organize assiduously her audio into color-coded, ordered tracks. She explained that she worked best when she could easily manipulate all of the elements
on the screen; the highly-organized Ableton Live arrangement was her “comfort zone.” She believed in the rigor of her work as a useful skill because soon, “no one is going to want to use the old pen and paper way,” and Willa’s ability to use computers efficiently will be advantageous as she navigates her future.

Willa was another student who had not yet learned the location of the undo feature in Ableton Live. She would rather delete portions of her music and start again than risk losing the foundation of her musical composition. Regarding her overall organization while managing her projects, Willa believed that managing her projects unaided by Mr. Decker was going to be beneficial to her. She felt that “if people are raised with their hand held up their whole life, they don’t know how to function unless someone is right there telling them exactly what to do.”

**“Performing” through composition.** Willa liked to make live modifications to her compositions. She starts playing her tracks and edits beats in response to what she hears. Willa preferred this method of having everything available in the beginning and slowly subtracting information as necessary. In this way she served as a “sculptor instead of a painter” in the creation of her compositions.

Willa’s ability to work with loops aided in her final revisions. She told me that she spent a great deal of time in the Level 1 class learning to use all of the functions on the MIDI keyboard and working with drum beats so she could “work a lot faster on her projects.” She was able to hear musical samples played repeatedly in quick succession. Willa felt that she was able to use her time in class most effectively when editing in this manner. She made either intentioned or speculative modifications to her tracks at the rate of about two changes per looped sample. Her trial and error process for composition
indicated that she developed compositional goals during the process of experimenting with ideas (Manzo, 2010).

Similar to live instrumental performances, Willa addressed issues of tempo, dynamics, balance, and rhythmic accuracy in the “performance” of her piece. The final recording process for one project involved triggering several musical “scenes” each consisting of multiple tracks. Willa maintained an increased level of concentration during the recording process because, as she explained, live changes needed to be made quickly and without interrupting the overall feel of the music. Willa demonstrated an instance of making these split-second decisions when she reflected on her most recent recording. She noticed that her final scene did not sound the way she wanted, so she quickly triggered a previous, but similar scene to fix the issue without having to stop. Dissimilar from instrumental performance, Willa’s live editing techniques provided her flexibility to make large-scale revisions to live performances instantaneously.

Tim. As a senior in the Level 2 class, Tim was looking forward to leaving school and entering a college program to major in business and marketing. Tim played saxophone in band during his 7th grade year, but he stopped soon after because “it just wasn’t something [he] could get into.” He also took singing lessons when he was young because his “parents always wanted [him] to be well-rounded.” Tim mentioned that, ultimately, he did not enjoy performing in front of other people and always knew that music was not something he wanted to pursue professionally. Tim expanded on his feelings regarding whether he enjoyed writing or performing music in the following statement:
Definitely writing. I’d much rather write something and have someone else perform it. I feel like, if I’m performing it, it’s not nearly as telling. If I wrote something, then all of my emotion is in the piece, and it’s not nearly in the performance I would have. All of my emotion would have already been shown through the writing of the piece.

As one of the most contemplative students I came to know, Tim provided many insights into the events of the music technology classroom. Similar to Penelope, Tim took pleasure in frequently using computers to complete class assignments. He valued that experience because he noticed a trend toward more computer use in school and society in general. Tim spoke to this sentiment:

Computers are going to be my life. There’s nothing that’s going to be pencil and paper anymore very soon. I mean, they’re taking tests on computers now. They’re doing everything computerized. So this class is just ahead of everything else.

Tim compared his learning process in the music technology class to other classes that he has taken. He found gratification in having a product at the conclusion of his assignments. Tim stated, “When you read a book, you can tell people that you read the book. With the music tech class, your mom can ask you what you did in class today, and you can show her.” Tim holds the music technology class in high regard because he “love[s] being able to show people ‘that’s what I am, that’s what I did.’”

**Practicing patience.** Tim addressed the concept of patience frequently regarding different aspects of the music technology program. In consideration of the types of skills that Tim thought students should have before enrolling in the music technology class, he
expressed his feeling that patience was among the most important. “It just takes getting the right mixture of sounds and having the patience to do it.” Tim viewed the music technology class as a completely unrelated music class from traditional music ensembles. He did not believe that students with a background in music had any sort of advantage or relevant transfer of musical skills to the music technology class.

Tim regarded every project as a new set of skills to be used as a foundation for creating music from the beginning. In his second year of the music technology course of study, Tim knew that the creation of quality projects took time. He enjoyed the gratification that came with spending a week or more working on a project to the best of his ability. Tim perceived a direct connection between his compositional process and that of professionals. He expanded on that thought by stating:

You feel good about it because you made it from nothing. So it’s cool to take sounds and push them together and say, ‘Yeah, that’s exactly like something that Kanye or Jay Z did.’ They started out with nothing too.

Tim also framed patience through the lens of a learner in the class. He was thankful to Mr. Decker for teaching concepts at a slow pace. He supposed that it might be “hard to convey the amount that he knows to us who have maybe never done it before.” Tim believed that the technical nature of the class could feel overwhelming at times, but by practicing patience, students would eventually be successful. He recalled one instance in which “it wasn’t wanting to record for [him]. But sometimes you just have to stop and be calm just like you would in actual life.”

**Owning the process.** Tim thoroughly enjoyed the entire process of managing projects from beginning to end. He viewed a larger goal of the class as nonmusical: “It’s
not only about music to me. It’s about learning how to do something on your own.” The project-based learning model was ideal for Tim because it allowed him to feel satisfaction after completing a project.

Tim’s opinions concerning project-based learning in music technology reflected his general opinion for ownership in creating products. His fondness for projects corresponds with Hargreaves and Marshall’s (2003) research finding that “what pupils seem to like most about music in or out of school is to develop the skills and confidence to ‘do it for themselves’: to gain ownership of and autonomy in their own music-making” (p. 269). Tim found satisfaction in his ability to personalize his compositions. He felt equally interested in listening to the variety of music generated by his peers because “everybody’s got a beat.”

Tim experienced a sense of responsibility when composing that was unlike the projects he completed in other classes. He had a desire to satisfy Mr. Decker, and explained this his awareness by telling himself, “Okay, I’ve got to do something. I want to make something that’s meaningful to Mr. Decker.” Tim appreciated being evaluated on both the process and product because, “You can fail a test because you had a bad day, but in here it’s different.”

Dealing with unpredictable events was not a concern to Tim. He found importance in the authenticity of dealing with problems just as he would outside of school. Tim stated, “I’ve learned… that sometimes things aren’t exactly what you want them to be, and with this class, it’s taught me that they don’t have to be.” Tim also maintained a realistic outlook about the quality of his compositions in a class where Ableton Live is a complex tool that students frequently use to complete assignments. He
conveyed his idea that, “They’re not all going to be good, and I can guarantee you that not all of mine are good.”

Tim received a greater level of appreciation for different styles of music after spending time working on them. While composing his video game music project, Tim did not think much of the genre at first. He later realized, “Wow, somebody did this and somebody made this.” Tim discussed his impression that, after developing an understanding of the essential characteristics of a style of music, he felt more connected to it.

**Summary**

Students within the music technology program encompassed a wide variety of social, personal, and musical characteristics. The notable qualities from interviews with and observations of students were presented as sub-themes throughout this chapter. Participants were situated within the framework of their classroom involvement and their engagement with music technology to provide thick description. While the participants shared several qualities (e.g., an appreciation of music, fondness for using technology, and opinions of project-based learning) but differed in others (e.g., future musical involvement, perceptions of musical advantages, musical preferences), their individual experiences highlight the distinctive manners in which students learn within this context. Chapter 5 will address larger, cross-case themes as they relate to the research questions, as well as my interpretation of the data, in order to provide a deeper understanding of the participants’ learning experiences.
Chapter 5

Cross-Case Analysis

This chapter presents an analysis of the larger themes that emerged from the individual cases. Cross-case analysis has the potential to provide a more holistic understanding of the cases and can yield new theoretical contexts related to the participants’ learning experiences. Participants’ broader conceptualizations concerning their involvement in the music technology class were condensed into five themes. These themes encompass (a) building on technological experiences, (b) prior music knowledge, (c) approval of project-based learning, (d) musical dreams for the future, and (e) social categorization through individual musical pursuits.

Building on Technology Experiences

Participants expressed their awareness of the impact that prior experiences with technology had on their abilities to learn in the music technology class. They recollected a variety of interactions with digital tools. No matter how menial the task (e.g., dragging files into applications or manipulating items on the Mac Operating System), students believed that their previous interactions using hardware and software tools gave them foundational skillsets to compose, record, mix, and produce music.

Technological assimilation. Students in the music technology program underwent various processes of assimilation as they adapted new skills to fit their existing understandings of technology. They were able to recall specific musical details from the past and compare those items with the events taking place in their current learning environment. Students spoke about their previous technical skills and their perceptions of the competences that would be necessary to be successful learners.
Participants talked nonchalantly about their discernment of previous experiences with technology as having an impact on their learning within the music technology class. The consensus among students could be distilled into the comment that Willa dryly put forth: “We know how to work a computer.” Their feelings were apparent with regard to the ubiquity of technology in modern society. Students’ conversations about how frequently they use devices at home or school and my observations of them interacting with technology in class demonstrated their level of comfort and acceptance of technology in their lives.

Students divided their technical abilities into two general categories. First, the proficiencies that they transferred between personal and academic use (e.g., Internet searches, e-mail, certain social media applications) granted them a command of several rudimentary computer functions that extended into their time spent using music technology applications. Second, students discussed their interactions with the Ableton Live software. The participants’ successes and setbacks in the music technology class came out of an amalgamation of these two technical groupings, and each is discussed in greater detail below.

Recreational technology use. When prompted about previous technology use, participants generally recalled events unrelated to academic purposes. Students specified that social media, streaming services such as Netflix, and music applications such as GarageBand were tools that they used frequently. They did not conceptualize many relevant connections between their recreational activities with technology and the utilizations required in the music technology class. Before considering GarageBand, participants regarded their previous experiences with computers affording them only
rudimentary computer capabilities with which to function in the music technology classroom.

Many students had prior experiences with GarageBand software, a digital audio workstation and music sequencer that is similar to Ableton Live in many ways but with fewer capabilities. Jimmy recalled using GarageBand often in his free time, to gain access to the loop library capabilities for his rap compositions, while Kyle liked to compose larger works with the various instruments in GarageBand. Willa and Tim also indicated familiarities with the resources available in GarageBand. Those previous experiences with software similar to Ableton Live transferred into the music technology class.

**Ableton Live.** As students grew accustomed to the complicated digital audio workstation, Ableton Live, they communicated their methods for integrating both their previous knowledge about computers into their classroom activities and their techniques for dealing with common issues. The majority of students seemed comfortable working through the usual functions of navigating menus, dragging items, and clicking through features such as the recording or playback buttons. Students also were comfortable enough in their knowledge of similar programs to identify the issues that they had rather than being left without any idea as to the problems to troubleshoot.

The most common issue with which students came into contact was related to the user interface of Ableton Live. Many students simply did not know where to find features that they were accustomed to using such as the undo button. Natalie and Willa both mentioned instances in which they had to completely reconstruct projects because they did not know where the undo feature resided within Ableton Live. Tim recalled a
similar issue in which he did not know how to fix a tempo issue and resorted to restarting his entire project, downloading the various sound packs and synthesizers, and reorganizing his audio. While some of those functions may seem elementary in nature, there were similarly uncomplicated issues that students did not understand how to manage.

**Digital explorers.** As participants navigated the technological landscapes in their personal lives and at school, they did not exhibit the characteristics of digital natives that Prensky (2013) described. There was no evidence that they valued “instant gratification and rewards” (p. 47) or that they were more technologically savvy than their teacher, Mr. Decker. For example, I observed a shared trait among all participants on the day that students were working on their soundscape projects. The first step in the project involved saving a photograph from an Internet image search. The number of students that could not complete the first step of the task was unexpected. This issue was not related to Ableton Live, music technology, or any sort of computer use with which the students were unfamiliar. Most of the students needed Mr. Decker to walk them through the process of saving a picture. According to Prensky’s digital natives concept (p. 3), students’ enculturation in the present, digital world would assume that certain fundamental concepts, such as saving a file from the internet, would be understood by the time students had reached high school.

Helsper and Eynon (2010) recognized that generation alone was not enough to predict technological prowess. They added that “gender, education, experience, and breadth of use” (p. 515) were contributing factors to a person’s engagement with technology. The students at Jasper Hill High School certainly were representative of
those levels of technological diversity. Instead of a generational predisposition to excel with computers, it was more accurate to conclude that students’ levels of immersion with technology could predict their aptitude with computers and digital tools.

**Reflecting on Prior Music Knowledge**

Students encompassed a wide variety of opinions concerning the impact of prior musical experiences on success in the music technology class. Some students perceived that previous participation in traditional music ensembles would provide an advantage in the class while others felt there was no benefit. Additionally, there was a tendency to separate music technology from other music classes depending on a participant’s understanding of the learning that typically takes place in traditional music ensembles.

**Nontraditional music students.** All of the students, except for one, had participated in traditional music ensembles at some point in their educational experience. The majority of the students, however, had ended their membership in those ensembles before enrolling in the music technology class. The most common reason that participants referenced for ceasing to participate in traditional music ensembles was due to a disparity in goals. Students expressed that they believed traditional music classes were centered on goals and objectives that were unrelated to their personal music interests.

These views were common among nontraditional music students (Williams, 2011) who generally involved themselves in “a music life independent of school music” (p. 139). In the current study, Robert and Max were extremely adamant about their musical pursuits outside of school. Max composed music and sang in her rock band, and she was learning to play piano to expand the instrumentation of her band. Robert met frequently
with friends to jam, and he intended to continue those collaborative music sessions in the future.

By removing themselves from the traditional music student context, many of the participants could only guess at the types of skills that they believed could be gained in those ensemble classes. Those presumptions regarding the transfer of musical knowledge typically coincided with the length of time that a participant had spent participating in traditional music ensembles prior to taking the music technology class. The range of responses varied tremendously, particularly when making comparisons to Kyle and Natalie, the two participants who were involved in traditional music classes at the same time that they were involved in the music technology class.

**Transferring musical knowledge.** Participants articulated the idea that musical knowledge varied in importance. Willa believed that, in order to become part of the mainstream music industry, individuals must have participated in formal instrumental music instruction for “more than a full year.” Likewise, Jimmy supposed that students with substantial music training in traditional music ensembles would have success while composing because of their abilities to discern and utilize tonalities in addition to having a general knack for composition. He suggested that those types of students would “know what sounds good together and where to put it,” and that their experiences in traditional music ensembles must have included frequent opportunities to make those types of aesthetic decisions.

In contrast, Kyle did not think that prior experience in music was necessary to be successful in the music technology class, provided that students knew “how to layer parts…and how to stay in key.” He perceived few similarities between the music
technology class and traditional music ensembles. Additionally, Kyle believed that almost all of the necessary skills required to be successful with music technology were learned in the class and not obtained by recalling previous musical experiences.

Natalie further diminished the necessity of prior musical knowledge in the music technology class by highlighting some of the features in Ableton Live that made her work easier. She appreciated the manner in which rhythms and counting did not require much thought when composing, and she conveyed this thought by saying, “It does most of the counting for us…It counts for us and triggers it on the next reasonable measure.” Natalie shared Kyle’s sentiment that students would not “need to be able to read music or even understand music or know notes from music or beats” in order to be successful in the class.

**Approval of Project-Based Learning**

Students generally valued the sense of autonomy that they retained while completing class projects. They linked their motivation while completing projects to their perceptions of ownership and personalization throughout the compositional process. As they worked individually on assignments, students did not worry that Mr. Decker would deliver value judgments or intrude on their creative development. Students also suggested that there were several nonmusical benefits that could originate from their project-based learning procedures, such as Tim’s propensity for basing his successes on the amount of growth that he could observe over time.

Participants’ ideas on the subject of agency aligned with previous research (Bandura, 2008; Mercer, 2012) pertaining to the ability of individuals to practice self-regulation and determine their own behaviors. The degree to which students understood
that they were able to exercise control over their learning process indicated a belief that their approach to learning would be meaningful to their lives. Additionally, participants’ agency was contextually situated; they did not relate their interest in completing assignments to other classes. For example, Robert resonated with the structure of the music technology class through his ability to practice “hands-on” learning while in other classes, he did not “have enough time to experiment and learn it the way [he wanted] to learn it.”

**Personalization as an agential motivator.** Participants’ reactions were consistently positive concerning the process of project-based learning. They liked being able to personalize both the process and product. Jimmy cherished the amount of control that he possessed in his ability to schedule tasks to fit his needs. He expressed his fondness for the clear expectations that arose from that ability: “You’re going to know what to do the next day, and it’s just a lot easier that way.” Tim supported that notion with, “nobody feels like they’re doing pointless, busy-work.”

Students spoke regularly about their opportunities to add personal touches that would make their compositions more individualized. As a member of the school orchestra, Natalie took pleasure in the times that she could “throw a little bit of an orchestra piece into it” and align music with her interests. Jimmy’s feeling that he could “make it into [his] own style of music” also motivated him to continue composing. Penelope referred to personalization in music technology with her opportunities to start from the foundational set of guidelines put forth by Mr. Decker and then “go outside the lines a little bit.”
Freedom of choice. Mr. Decker’s typical procedure for introducing composition projects involved lecturing for a couple of days, providing demonstrations, and placing the project into the overall context of electronic music. He would then allow students several days to manage their projects from beginning to end and would shift into a facilitator-troubleshooter role. His nonintrusive presence in the classroom demonstrated his knowledge of the informal learning processes (Tobias, 2008) taking place within his specific classroom environment. Students felt that they had the freedom to manage their projects and experiment within Ableton Live, but they knew they had a support structure available if needed.

The concept of freedom was well-regarded among students in the music technology class. Kyle appreciated the amount of freedom afforded by Ableton Live. Throughout his experiences composing music for various purposes, Kyle recalled using an assortment of tools to aid him. He liked the flexibility that he had in being able to “layer it [his] own way.”

Natalie appreciated the time that she was allowed to spend engaging in musical expression. She believed that she had ample time to add emotion to her music and “not play it by the conductor’s rules.” As she considered her dual role as a member of the Jasper Hill High School orchestra and the music technology class, she ascertained that her engagement through the process of discovery brought her closer to music.

Musical Dreams for the Future

All of the students expressed that they had positive experiences during their time in the music technology class. Their decisions as to whether they would continue participating in music beyond school, therefore, were not due to any damaging events or
deficiencies in instruction encountered in the class. Instead, participants communicated an assortment of ideas in relation to their future intentions with music technology, and many of those thoughts were founded on their experiences within the music technology class at Jasper Hill High School.

**Longevity of musical skills.** Students suggested that the musical skills learned in the music technology class were worthwhile and might carry into their future musical involvements should they have any. Kyle presumed that his knowledge of digital audio workstations and ability to navigate music production techniques would serve him well as a film composer. He looked forward to playing musical ideas on piano and combining those with functions on a program such as Ableton Live to create compositions.

Robert was interested in continuing his casual jam band gatherings with friends after graduating. He was confident that his ability to use loops and samples would allow him to participate in this hobby even if he could not account for his usual friends to join him in playing music. Robert also expressed an interest in recording audio. He was certain that the projects that he completed in the music technology class have prepared him to continue recording his music or his friends’ music.

**Future musical participation.** Participants’ thoughts regarding their future participation in music comprised a range of options related to career ambitions, hobbies, and uncertainty. The reasons students gave as to whether they might pursue music beyond school were based one of three trajectories: First, some students already had career goals that they were working toward and did not foresee the opportunity to fit music into their lives, while others hoped to enter the music industry at some point. Second, some students were interested in beginning or continuing their current musical
activities in the future. Third, there were students who had an interest in music, but were not confident in their abilities to continue with those interests after graduating.

Kyle, Natalie, and Max had aspirations to make a career out of music. Kyle wanted to be a film composer; Natalie, an orchestra conductor; and Max, the lead singer for her rock band. They all cited a combination of qualities (e.g., learning musical instruments, a command of music technology, a yearning for emotional expression) with their choice to pursue those paths. Jimmy, Penelope, and Tim felt that their career paths would prohibit them from participating in music in a manner similar to their current engagement in the music technology class. They mentioned that, although they enjoyed composing music and creating audio to fit a variety of projects, they would most likely continue to engage with music as listeners after leaving school. Jimmy indicated his sense of finality with his statement that he would “keep listening to different types of genres and really exploring music while [he] can.”

Natalie mentioned that she was interested in writing songs and uploading them to YouTube for others to enjoy. She thought about beginning this hobby when she began to learn about the capabilities of Ableton Live and similar types of music technology. Even though she could not afford Ableton Live, she was positive that she would find similar applications on her smartphone or as free downloads. In contrast, Robert knew that he could separate future recreational interactions with music in his personal life from his professional ambitions. His musical enjoyment would not be impeded by a lack of resources or collaborating musicians. Robert had gained the skills that he deemed necessary to replace musicians with samples and loops. He also experimented with
programs similar to Ableton Live in his free time to find a replacement program that was both within his budget and could perform all of the functions that he required.

Willa and Jimmy both hinted at dreams of becoming professional musicians. They did not believe that those paths would be viable because of their perceived lack of musical ability. Jimmy enjoyed rapping, and he expressed an interest in gaining notoriety through uploading videos to YouTube. However, he did not believe that he knew enough about the fundamental elements of music (e.g., keys, rhythms, instruments) to realistically make a career out of it. Willa shared that thought. While she thoroughly enjoyed the electronic music genre and thought that a career as a DJ would be fun, Willa did not believe that someone could become a DJ without instrumental music training.

**Social Categorization through Individual Musical Pursuits**

Overall, there was no apparent sense among participants of a social identity surrounding music technology. Observations and interviews revealed that students chose to enroll in the music technology class out of interest or by chance, as they did not speak about deciding to take the class in order to gain inclusion into a music technology social group. This was an unexpected finding. Although the class could, in a sense, represent a social category, the individualized nature of the projects engendered a class climate that was not reliant on group cohesiveness or social identity. Students were linked, however, by their interests in various matters that occurred within the context of the music technology class.

**Reasons for enrolling in music technology.** Students recalled various reasons for taking the music technology class. Their interests in electronic music genres, composing, popular music, or recording techniques generally led them to sign up for the
class initially. Additionally, some participants signed up for the music technology class because of recommendations from friends or because they needed to fulfill a Fine Arts requirement in order to graduate.

Max was one of the students who entered the music technology class by chance. She dropped her choir class for a study hall, but a scheduling conflict caused her to sign up for the Level 1 class with no other options. Before registering for the class, Robert frequently helped his friends with the recordings that they were making for their music technology projects. When he decided to enroll in the class, he initially was interested in learning the techniques that recording studios used for live music production, but he did not anticipate the appreciation he would gain for composition or exploring various electronic music genres once he enrolled.

The most common reasons that students expressed for taking the music technology class were similar to the attributes of nontraditional music students that Williams (2011) discussed. As previously stated, one of these shared attributes stemmed from some students’ aspirations to pursue careers in the music industry. Some participants believed that they did not belong in traditional music ensembles because of their interest in playing common popular music instruments such as guitar. Others were seeking a means to express themselves musically but did not feel confident in their abilities to read music notation or make musical decisions that they believed would require previous music training.

**The musical link.** The underlying quality that students shared was their pursuit of personal music engagement. All participants wanted to create music that was related to their individual musical interests. Students generally embraced the music technology
class in their search to maintain an active participation in music. They found satisfaction from being offered opportunities to express themselves musically and to learn within a curriculum that covered a variety of popular music genres.

Participants worked individually and with others while experimenting with Ableton Live to expand their repertoire of music production skills. They found methods to connect those skills to their recreational interests through the tools that they had available at home whether those tools came in the form of music sequencing software or smartphone applications. As students learned in the music technology class, they gained confidence in their capacity to become independent musicians.

Summary

The themes that emerged from within-case analysis with individuals covered a wide range of student perceptions and philosophies. Cross-case analysis served as a comprehensive examination of the participants’ perceptions regarding their music experiences within the music technology class to investigate the main themes. Students differed on their feelings toward drawing on prior musical and technological knowledge to complete composition assignments. They were, however, favorable toward working autonomously in a project-based learning environment. Students’ experiences in the music technology class gave them the confidence and skills required to work toward their musical pursuits in the future, whether those pursuits were recreational or related to career aspirations. While they did not perceive or exhibit characteristics of a social identity in music technology, participants were united in their appreciation for being able to pursue music in a manner that was meaningful to their personal goals.
Chapter 6

Discussion

This study highlighted the characteristics of nontraditional music students (Constantine, 2011; Ritchie, 2013; Williams, 2007, 2011) as portrayed by students in a high school music technology class. Examined through the lens of eight high school participants, students’ perceptions were explored regarding their learning experiences while using a variety of hardware and software tools germane to electronic music production. While the methodology was designed to extract a variety of data from numerous sources and analyze them in a nuanced, iterative manner, participants’ levels of engagement were not addressed longitudinally; however, student perceptions toward their learning experiences most likely would transform throughout their development as students. Findings from the study indicated further the complexities of nontraditional music students’ motivations and interests through considering their interactions with music at school and home.

The following section includes an examination of the findings as they relate to the research questions. Data were analyzed through within-case analyses of participants’ individual learning experiences and cross-case analyses investigating the larger themes that emerged through interviews, observations, field notes, and students’ written responses to journal prompts. First, a restatement of the research questions, which served as foundations for the analysis procedures, is presented below. Second, I discuss the findings according to multiple perspectives consisting of related research, emergent themes, and my interpretations of the data. Third, implications are provided for music educators as well as suggestions for further research. Finally, the conclusions of this
research provide ideas for adapting music education to fit the changing needs of students in contemporary society.

**Revisiting the Research Questions**

1. How do students draw on prior experiences with technology in the music technology classroom?
2. How do students exhibit agency in the development of their musical skills through a project-based learning environment?
3. What are students’ perceptions regarding the longevity of musical skills learned in the music technology classroom?
4. How do students perceive their social identity within the school music technology setting?

**Drawing on prior experiences.** The first research question addressed students’ prior experiences with technology. Students in the music technology class approached their opportunities to recall previous knowledge in various ways. They related to prior musical and technological interactions when completing projects in class. Most participants were confident that they would learn all of the skills in class that would be necessary for success. These students believed that the music technology class was completely separate from traditional music ensembles, and that there was no crossover of musical skills. They also drew on their earlier experiences with technology as they navigated learning through new and uncertain concepts within the Ableton Live software.

Participants’ levels of confidence in their abilities to learn new skills were attributed to their admiration for Mr. Decker. Students viewed him as someone who “lives his class,” and there was never any indication of disagreement with his instructions
or decisions. While participants valued their own agency in the completion of their projects, they appreciated the option of calling on Mr. Decker as necessary. Tim summed up the students’ thoughts regarding their teacher with his statement:

I feel like, without a teacher like him, though, it wouldn’t work. With somebody that shuts music off when they leave school…he doesn’t. I mean, everything he does is music. So it seems like you learn more from somebody who knows what they’re talking about.

In addition to assimilation through the learning process, the first research question addressed the concept of digital natives (Prensky, 2013). Having grown up surrounded with digital devices, students in this study were aware of their immersion in current technologies. Most participants exhibited a high level of comfort using a wide assortment of computer tools, like smartphones and word processing programs. Although their status as digital natives was questionable due to the witnessing of certain events, such as their difficulties in downloading files from the Internet, their varied approach to interacting with technology, or “breadth of use” (Helsper & Eynon, 2010, p. 506), was apparent in the techniques that they used to approach solving problems while working on their composition projects.

Perhaps the digital native concept was not applicable in this instance because the teacher was not a digital immigrant who needed to “adapt to [his] environment” (Prensky, 2013, p. 2). He was a first generation digital native, who had more time to familiarize himself with the tools that have existed in various forms and iterations throughout his life. Students could be regarded as second or third generation digital natives (Helsper & Eynon, 2010) who did not have the same amount of exposure to the tools as Mr. Decker.
While calling into question the accuracy of the term digital natives is beyond the focus of this study, it does bring to light the possibility that people should not be assumed to have a higher degree of technological prowess based on age alone (International Telecommunication Union, 2013). There are clearly several other factors to consider in the development of those skills, with exposure and interest being two of the recurring elements that appeared among participants in this study.

Specific classroom instances that demonstrated student familiarity with technology differed among students. Many students discussed the iterative and recursive process of building a skillset with which they could approach new problems in the music technology class. Students frequently referred to their existing knowledge (Seddon & O’Neill, 2003) as they navigated the user interface of Ableton Live, performed basic computer functions (e.g., saving documents, typing), and completed composition projects. The characteristic that all participants shared was their use of the Internet as the “first port of call” (Helsper & Eynon, 2010, p.506) for solving problems related to Ableton Live or general technological issues. It served as the last bastion of hope, a standby resource, in the problem-solving process. In students’ pursuits of agency as they created music, they frequently drew on their abilities to navigate the Internet and to search various online references before calling on Mr. Decker to assist them.

**Exhibiting agency.** The intent behind this research question was to discover participants’ feelings of agency while completing projects in the music technology class. Students expressed a great deal of appreciation for being given the autonomy to manage their entire projects from beginning to completion. They took pleasure in the freedom that they maintained while making decisions related to components such as: devising
their own schedule for completing events, choosing instrumentation, organizing their workspace, and personalizing music to achieve creative expression. Participants’ feelings of agency motivated them throughout the learning process.

Students’ motivation to complete projects was the most apparent outcome stemming from their abilities to take responsibility for their own learning. Willa’s feeling that, “You kind of get lost in there. You forget about everything around” paralleled Nakamura and Csikszentmihalyi’s (2002) concept of flow, in that she lost awareness of her self-consciousness while engaging in activities at levels appropriate to her capacity (p. 90). The intrinsically rewarding nature of completing projects according to students’ self-governed optimal learning conditions motivated them further toward productivity.

This positive trend continued to extend into students’ feelings of self-efficacy (Bandura, 2008). Regardless of the varied musical and technological backgrounds from which students originated, they did not express doubt in their capacities to achieve the goals that they desired. Participants appeared to be intrinsically motivated, which compelled them to search for perfection in their compositions. As Willa stated,

It makes you just want to put your everything into it and make it good because…You want to make something that you would listen to on your phone or that someone else would listen to.

The project-based learning environment of the music technology class served as a constructivist setting in which students could work autonomously (Boud, 2012; Ruthmann, 2006; Tobias, 2010). Participants believed that their ideas were valued due to the productive and positive setting that Mr. Decker established in the classroom. As agentic learners, students perceived a stronger relationship to their projects and to music,
which they sensed might help them to continue with similar forms of musical engagement beyond school.

**Longevity of musical skills.** The third research question presented a range of perceptions as participants shared their viewpoints on the longevity of musical skills learned in the music technology class through the lens of their individual experiences. First, students who regarded the compositional activities as amusing or in line with their musical interests presumed that they would continue to engage with music beyond graduation. Participant accounts revealed that the opportunities in electronic music production using MIDI instruments were attainable avocations. Second, some of the students were interested in professional careers in music, and they believed that many of the skills that they learned in the music technology class would serve them in those future musical professions. Participants held the beliefs that skills such as composing film music and operating audio recording tools would serve their career goals. Third, participants’ perceptions concerning the quality of their musical abilities or their amounts of musical knowledge contributed to their feelings regarding whether they might continue participating in music. Findings from student interviews indicated that students’ decisions to continue musical engagement beyond school were related to the likelihood that they believed they might be successful according to their perceptions of personal musical expertise and how their work might compare with others.

Students referred frequently to their levels of gratification while learning and composing. They appreciated the exposure that they received to new forms of music. There were several instances of unexpected enjoyment that developed throughout the class, such as Natalie’s feelings:
I have been affected in my musical interests mostly because, when a project is assigned, I look up music in that genre to get a feel of what it is supposed to sound like, and I sometimes get to a song that catches my interest. My music interest has been expanded because of that.

Some participants, like Robert, related their intentions to continue participation in music to the similarities of composition projects to their established musical interests. His ability to use “Ableton-type software to create an entire backing section” would allow him to continue to make the music that he likes beyond school.

For students who had career aspirations in the music industry, there was a deep appreciation for the musical skills that they learned. Mr. Decker provided clear understandings and overviews of common recording industry techniques. Students could envision correlations between the concepts learned in class and how they might affect their futures working in the music industry. Kyle’s path to become a film composer was supported through his experiences completing projects such as the one in which students were instructed to add all sound effects and voiceovers to accompany the actions portrayed in a movie clip and to compose a soundtrack to go with it.

In contrast, some participants were neither confident in their musical backgrounds nor secure in the quality of their work. These students did not foresee a continued musical involvement beyond school, since they believed that a substantial amount of training would be necessary to fully understand and make use of the opportunities afforded by the music technology class. Additionally, they extended that belief into their thoughts regarding the skills necessary to maintain an active musical involvement beyond school. Students who held these beliefs typically attributed them to their discontinuation
or lack of involvement in traditional music ensembles. Participants who had relatively little experience in music ensembles maintained contradictory assumptions about those who were in ensembles. They purported that those students in ensembles held advantages over the students who did not have similar musical experiences. Contrarily, the students with the most ensemble experience neither displayed nor perceived any advantages with regard to creativity or musical knowledge in the music technology class.

These results align with previous research (Kennedy, 2002; Stauffer, 2002), which highlighted the possibility that previous musical experience could hamper compositional processes. The findings in the present study differed slightly in the depth with which they portrayed that phenomenon. Students who had limited prior involvement in traditional music ensembles cited their inability to transfer musical skills to the music technology class when speaking about the quality of their compositions or their disinterest in continuing musical involvement beyond school, while students with either no experience or ample experience in traditional music ensembles did not perceive an overlap in musical skills.

**Social identity.** The fourth research question was designed with the intent to explore social categories that might have existed among or between participants. Students did not express a sense of belonging to any specific social groups within the context of the music technology class, however. While some participants decided to enroll because of friends or due to an interest in the activities involved in the class, there was no explicit group categorization or unifying component that students attributed to the class. It would be unfair, then, to continue using the nonspecific label, “nontraditional music student” to categorize these students, because the participants displayed complex
characteristics that encompassed a wide variety of attributes and interests related to music.

While ideas regarding social categories have been explored in separate musical contexts (Adderley, Kennedy, & Berz, 2003; Campbell, Connell, & Beegle, 2007; Morrison, 2001), there were no evident parallels to the music technology classroom with which the students unanimously identified. Instead, student participants perceived the class as being individualized; their focus was on completing compositions and projects to the best of their abilities, but in an independent manner. They worked within a supportive environment, however, fully understanding the strenuous process of composing a piece of music, and in that knowledge, were empathetic toward one another.

The conceptual foundation of the fourth research question, regarding students’ perceptions of social identity within the music technology setting, displayed an instance of outgroup homogeneity (Stangor, 2011). My status as a music technology outsider led to what would later become an unconfirmed hypothesis that students in the music technology class might share certain social characteristics due to their membership in that group. Nonetheless, data analysis revealed that participants did not categorize themselves as members of a collective music technology social group. This result contrasted with ideas from research concerned with the formation of subcultures among music students (Adderley, Kennedy, & Berz, 2003; Morrison, 2001). Students did not perceive the presence of a music technology subculture or feel a sense of belonging to a certain group due to their enrollment in the class. Furthermore, students in the musical technology classes did not feel the need to compare themselves with nonparticipants because they did not feel as though they were identified separately from others in the
school. The music technology class was a setting in which all social stratifications (Kinney, 1999) were present.

Despite this unanticipated finding, students’ lack of social identity in class did not diminish their sense of pride or self-esteem while working in the music technology setting. Participants’ impressions regarding the freedom and inclusiveness of the class strengthened their self-concepts. The positive environment in which students composed and completed projects provided them the confidence to express themselves artistically, explore music through methods that were meaningful to their personal interests, and create compositions in a variety of musical styles.

The findings of this study demonstrate several of the intricacies of the participants’ learning experiences while creating and composing music in the music technology class at Jasper Hill High School. Students exhibited ingenuity as they drew on prior technological knowledge to resolve computer issues and misunderstandings that occurred while creating music with the Ableton Live software. Furthermore, they maintained feelings of self-efficacy and intrinsic motivation while autonomously managing their projects. Students’ perceptions varied considerably regarding the longevity of musical skills learned in the music technology class according to their levels of confidence and dependent on future musical goals. While participants did not express a sense of social identity, they highlighted the socially inclusive qualities of the music technology class environment. In order to provide a greater understanding of these characteristics, several implications can be made for extending the boundaries of music pedagogy, reconceptualizing curricula, and designing opportunities for nontraditional music students.
Implications for Music Education

Based on the findings of this study, music educators might consider implications for teaching and learning music, revising curricula, and creating new music offerings. Music educators should be aware of the successful strategies that have been explored in the creation of classes for nontraditional music students. Compared with traditional music ensembles, such as band, choir, or orchestra, there is a relatively limited history of music classes that have explored musical topics such as popular music, music technology, or world music. Equally notable is the amount of variation that exists within classes of the same category. For example, technology-based music classes (Dammers, 2012) across the United States might use music notation or might be based entirely on loops and samples. Such classes might focus on composing in a variety of styles within the electronic dance music genre or recording techniques for popular music groups.

This amount of variation emphasizes, therefore, the need to contextualize music to fit the musical interests of the student population (Reimer, 2003). The music technology students featured in this study demonstrated a multiplicity of perspectives and goals for music education that do not typically fit within traditional music ensemble classes. Maintaining an awareness of the transformative nature of the music industry is of special interest for those who teach or plan to teach music technology classes, particularly as it relates to changing content within the curriculum. As endorsed by the participants in this study, it is of utmost importance that teachers are knowledgeable and passionate about teaching a noncompulsory class, like music technology, as gaining initial student interest and enrollment might be difficult without those discernible qualities.
Another aspect of learning that music educators of any context could consider is that of student autonomy. Student autonomy might exist through project-based learning in nonperformance music classes. Music teachers in the performance-based classes could implement opportunities for students to express their learning interests in an effort to personalize their education, including allowing students to form small ensembles, choose their own music, and collaborate among themselves to raise students’ self-efficacies. By providing chances for students to act as agents of their own learning, as in the previous examples, teachers have a strong likelihood of empowering students to achieve goals that reflect real-life contexts (Bolton, 2008; Jaffurs, 2004; Ruthmann, 2006; Tobias, 2010).

By acknowledging and taking advantage of the intrinsic motivation that students receive from taking control over aspects of their learning (Green, 2002; Tobias, 2010), teachers might better frame pedagogy to maximize teaching and learning potential.

Additionally, educators could experiment with adopting the role of facilitator at times rather than providing only direct instruction. Participants in this study enjoyed the process of managing projects with minimal teacher intervention. Through recognition of the importance of democratic action (Allsup, 2002), teachers might allow students the freedom to express their voices. At the university level, preservice music teachers should be afforded opportunities to practice facilitative roles within various contexts, such as composition, performance, and critical thinking. By maintaining an emphasis on learning how to direct instruction or lead a classroom full of students, preservice music teachers might be missing an opportunity to learn, instead, when to lead. As demonstrated by the students in this study, music education can occur with the student in the driver’s seat.
Preservice music teachers should be given opportunities to teach students with diverse musical interests. An understanding of the recording and production skills used in popular music production might be just as valuable as the skills learned through instrumental methods courses. As exhibited by the participants in this study, students may learn best when they are taught in a manner that relates to their perceptions of modern society. It is possible that technological advancements and the expansion of musical offerings will continue to expand the divide between popular music and traditional music ensembles. If this is true, contemporary music education might consist of the musical skills and knowledge necessary to interact within a variety of contexts. Preservice music educators should have experiences using digital audio workstations, such as Ableton Live or Pro Tools, in order to connect to students through digital media. Knowledge of these tools provides a framework for pedagogy with 21st century skills in the same way that Western classical music theory knowledge might be an important element for music teachers to instruct traditional music students.

Finally, music teacher preparation programs should consider creating space for potential nontraditional music educators. School music programs could have much to gain from having several music offerings, specifically at the secondary level, although this possibility resides with a reimagining of how preservice teachers are prepared at the university level (Campbell et al., 2014). Specialized music classes could be taught by music educators who are experts in their fields, and who have received specialized preparation, as is the case with band, choir, orchestra, and elementary music educators. That preparation might be obtained by requiring preservice music teachers to seek opportunities to perform in vernacular or world music ensembles; they might also learn to
use music production, synthesis, and recording tools. Nontraditional music educators might design courses dedicated to their specific musical interests (e.g., popular music, steel drum ensembles, electronic music composition). By offering a variety of musical opportunities, each class might represent “a specialized immersion within one of the many musical pleasures our students in those grades pursue so eagerly outside of school and would pursue in school if we made them available” (Reimer, 2012, p. 27).

Suggestions for Further Research

Music education scholarship might benefit from continued descriptive research in similar music technology settings that focus on composition, music production, and sound synthesis. While the participants in this study revealed various perceptions regarding their learning experiences with music technology, future researchers might seek to study larger samples of students or provide comparisons groups. The present study might have garnered distinctive, unique perspectives if specific factors were controlled (e.g., socioeconomic status, race).

Researchers may seek to identify specifically the processes involved in transferring musical knowledge between traditional music ensembles and composition classes. Special consideration should be given to the amount of time that students have maintained involvement in traditional music ensembles. The results of such a study may corroborate the findings of the present study in which students’ perceptions regarding the quality of their work and their intentions to continue musical involvement beyond school were heavily influenced by their thoughts regarding skill-acquisition in traditional music ensembles.
Further research with music students from varied musical backgrounds might broaden an understanding of their perceptions about music education in general. The students in this study displayed conflicting thoughts related to the transfer of knowledge and skills among musical content areas. Participants in this study were chosen, in part, due to their varied backgrounds and perspectives. This selection of participants, however, does not fully encompass the diversity of opinions that exist regarding students’ musical interests or feelings toward the longevity of musical skills and knowledge learned in nontraditional music classes. These two areas should be studied further in a variety of nontraditional music class contexts.

Data collection procedures should be considered when performing similar studies in future research. Students in this setting worked in isolated manners. With headphones on and eyes transfixed upon a computer monitor, it can be difficult to ask students to break their concentration. Therefore, unstructured interviews might be problematic when attempting to gain an understanding of students’ thought processes without interrupting their immersion. Researchers might consider using screen capture software when asking students to recall certain moments while working on their projects. Another option could come through the think-aloud protocol for assessing thought-processes during tasks.

**Conclusion**

To provide an all-encompassing categorization to “The Other 80%” (Williams, 2011, p. 133) is a failure to fully describe the complexity of students’ musical interests. By putting an end to the term, nontraditional music student, but continuing to recognize the importance of finding spaces within schools for students to take part in musical activities aside from band, choir, and orchestra, music educators and researchers might
create more direct pathways for understanding student populations. When music educators can find those connections, based on the musical skills that students might believe to be important (e.g., studio recording, songwriting, jamming with a rock band), the concept of a nontraditional music student may one day be forgotten due to the multifaceted musical interests that students possess and the possibility that school music offerings might change over time to fit those varying musical demands.

As the findings of this study provided, new musical traditions can be formed by creating opportunities for all students to experiment with roles that are representative and necessary in contemporary music participation. While Reimer (2003) warned against teaching with the mindset of producing professionals, curricular considerations must be made regarding skills that will be necessary to musicians in the future. Students’ experiences in music education should seek to inform the future, while continually reflecting on the state of music in modern society, and preserving the important details from the past.

If students are to have opportunities to compose, listen, analyze, read, create, play, collaborate, and experiment, providing them the tools with which they can pursue their musical interests could allow students to act autonomously as agents of their own learning. Thus, creating spaces in schools that allow this type of learning to occur is paramount. If music education is to broaden its scope to allow for further inclusiveness of students, it behooves music educators and researchers to anticipate the future learners they will encounter by staying current with musical trends.

Educators who reflect on and consistently reevaluate the concepts that are prevalent in music education might find opportunities to differentiate curricula and
instruction to meet the wider interests present in student populations. Music teacher educators might consider the importance of reading notation in relation to interpreting a digital audio workstation or introducing new systems for visualizing musical time and rhythm. When designing curricula, music educators might ask themselves one question: Whom are we serving? If the common answer among all music offerings in schools cannot be expanded to include “the other 80%” (Williams, 2007), then music educators might consider new directions that provide musical opportunities for all students.

What can music educators do to inspire the next great musical idea? Music educators should continually seek opportunities to collaborate with and learn from the complex and interesting individuals who are shaping the future musical landscape through their own determination. If a comprehensive music education is to include all of the skills that might be necessary in order to interact with the musical world, the idea of comprehensive musicianship should be expanded to include all students.

This study explored the perspectives of eight students: Max, Natalie, Kyle, Jimmy, Penelope, Willa, Tim, and Robert, as they described their learning experiences within the music technology class. They expressed their desires to interact with music according to their own guidelines and with future intentions that spanned from the budding professional, to the recreational hobbyist, to the casual listener. All forms of musical engagement were equally important and recognized among the students. As music education continues to evaluate these ontologies, an awareness of student perceptions remains a cornerstone. An education is only beneficial to the degree that students are able to learn from it and apply it to other settings. Providing welcoming
musical environments for all students may be one avenue toward reimagining music education.
Appendix A

IRB Approval Notice

CWRU IRB Protocol Number: IRB 2014-1006

Protocol Title: Agency and Identity: A Collective Case Study of the Learning Experiences of High School Students in a Music Technology Course

Responsible Investigator (RI): Nathan Kunze

Co-Investigator (CI): Dennis Giotta

RI Department: Case Western Reserve University IBC and SBER IRB - CAS - Music Education

Type of Review: Expedited

Risk Level: Minimal

Vulnerable Population(s): Children

Approval Date: 01/30/2015

CONTINUING REVIEW DEADLINE: 01/15/2016

EXPIRATION DATE: 01/29/2016

The CWRU Institutional Review Board (IRB) has approved the above new protocol through the EXPEDITED review process.

When conducting Human Subjects’ Research, your responsibilities include the following:

1. Report all adverse events and unanticipated problems involving human subjects to the IRB Office, located in the Office of Research Administration (ORA), within three (3) business days of your knowledge of the occurrence.

2. Provide the IRB with a complete Continuing Review form (available in our electronic application system at http://cwrurecapp.case.edu, or from the ORA) by the continuing review deadline noted above, and when the study is to be terminated.

3. Submit all proposed changes to the protocol to the IRB and wait for IRB approval before implementing any protocol change or modification.

4. Keep all research data and original consent documents in your possession for at least three (3) years after the study is terminated.

5. Note that completely de-identified data can be kept and used for research indefinitely. The IRB is primarily concerned about identifiers/identifiable data. If you want to terminate your study, identifiers/identifiable data must be destroyed. This includes paper or electronic master lists, contact lists, codes/codebooks, transcripts containing identifiers and video and audio recordings.

6. If applicable, please use the most current IRB-approved consent forms. Feel free to use copies of these forms as long as they are identical to what was originally IRB approved. If you wish to change the forms or any other part of the study, you must submit an addendum request/protocol modification with revised copy(ies) of the relevant document(s) and wait for IRB approval before a modification can be implemented.

7. Discontinue all work pertaining to this protocol if a continuing review approval is NOT finalized by the expiration date noted above. Neither work on this protocol is allowed until the proper continuing review materials or required revisions are approved by the IRB.

   a. Please note that, if the continuing review materials or required revisions are not received by the expiration date, the R1 and this study would be automatically placed on Administrative Hold for 30 days. This means that the R1 loses their IRB privileges and research from this study must cease.

   b. If after 30 days, the CWRU IRB still does not have the protocol for processing, this protocol will be administratively terminated and your IRB privileges will be revoked for all your protocols.

Thank you for your attention to this matter. Please contact the IRB office at 216-368-6993 if we can be of further assistance.
Appendix B

Participant Recruitment Script

Hello everyone. My name is Dennis Giotta and I am a graduate student from Case Western Reserve University in Cleveland, OH. I am here today to invite you to be a part of a new study I am launching that focuses on your experiences with music technology.

Because of your involvement in this music technology course, I am most interested in your opinions about your learning experiences in this course, how much you feel ownership over your learning, and learning about the culture of music technology students. Should you choose to participate, you would be asked to participate in a recorded group interview, which might last up to an hour. After that, you may be invited to participate in a four week individual study in which you would be observed as you participate in class, answer interview questions about your experiences, and complete a weekly journal.

Additionally, your identity would be maintained throughout the research study and beyond, as you would be assigned a pseudonym to protect your anonymity. You would also have an opportunity to view and edit the interview transcripts prior to the completion of the study, to ensure that your words are being used correctly. All data, including audio and video recordings, will be erased following the study.

If participating in this new research is of interest to you, please let me know by completing the student assent form and having a parent or guardian complete the parental consent form. Forms can be turned in to the sealed box on your teacher’s desk. In the meantime, I am happy to answer any questions that you might have about the study.

Thank you for considering this, and I hope to hear from you soon!
Appendix C

Informed Consent Document

Version: 1/2015

CASE WESTERN RESERVE UNIVERSITY
INFORMED CONSENT DOCUMENT
Agency and Identity: A Collective Case Study of the Learning Experiences of
High School Students in a Music Technology Course

You are being asked to give your consent for your child to participate in a research study about learning experiences in a music technology course. Your child has been asked to consider participating in this study to provide insight into how students learn music. Please read this form and ask any questions that you may have before agreeing to allow your child to participate in the research.

Researchers from Case Western Reserve University in Cleveland, Ohio are conducting this study. Mr. Giotta is a licensed educator in the state of Ohio and Dr. Kruse is a professor of music education at Case Western Reserve University in Cleveland, Ohio.

Purpose
The purpose of this research is to examine the learning experiences of high school students enrolled in a music technology course.

Procedures
Participation in this research would occur in two phases. In the first phase, a small group of students would meet with a researcher for up to one hour. During this audio-visual recorded group interview, students will be asked about their learning experiences in the music technology course. We will try to schedule meetings at times that are convenient for all participating students. Students may need to arrange for transportation for the group interview if the meeting is held after school. If students cannot meet in a group interview after school, the researchers will attempt to schedule additional group interviews during the school day at lunch or during a study hall.

If students are asked to participate in phase two of the research, that would involve being observed by the researcher in class 2-3 times each week as they complete assignments, participating in 3 individual interviews for up to 45 minutes, and completing 4 weekly journal entries. Participating students can choose to stop participating for any reason at any time. If a student does decide to stop participating in the study, we encourage them to tell the researchers.

Risks and Discomforts
There are no known risks, harms, or discomforts associated with this study beyond those encountered in normal daily life. Throughout the discussion, your child will always be able to decide whether or not to respond to any particular question or engage in the discussion of a particular topic. Students may refuse to answer any of the questions, take a break, or stop participation in this study at any time. The interviews, observations, and journal will be focused on how students learn in a music technology course. Though it is unlikely that any of the topics discussed will be of a sensitive nature, it is always possible that a student may be uncomfortable or reticent to discuss a particular topic. The information shared in these meetings will be combined with information provided by other students in the school’s music technology program and your child will not be identified in the subsequent report of the study’s findings. All participating individuals and institutions will be given pseudonyms and all identifiable information will be removed to protect your child’s anonymity.

Anticipated Benefits
There are no direct benefits from anticipated from participation in this study. It is reasonable to expect that participating students might gain a better understanding of how they learn in music technology. It is also likely that other music educators will gain valuable insights by learning about how students learn in a music technology setting.
Compensation
There will be no costs to students for participation in this study. Students will not be compensated for participation in this study.

Alternative(s) to Participation
Students have the option to not participate.

Voluntary Nature of the Study
Student participation is voluntary. If your child chooses not to participate, it will not affect your current or future relations with the University or their school. There is no penalty or loss of benefits for not participating or for discontinuing your participation.

Students are free to withdraw from this study at any time. If you decide to withdraw your child from this study you should notify the research team immediately. The research team may also end a student’s participation in this study if they do not follow instructions, miss scheduled visits, or if their safety or welfare are at risk.

If your child withdraws or is removed from the study, the researcher may ask him or her to complete an exit interview. If your child elects to withdraw or is withdrawn from this research study, the researchers will discuss with him or her what they intend to do with his or her study data. Researchers may choose to analyze the study data already collected or they may choose to exclude your child’s data from the analysis of study data and destroy it, as per your request.

Confidentiality
The records of this research will be kept confidential. The only information collected will be your child’s name, grade in school, the music technology class level in which they are enrolled, interview and observation audiovisual data, and student journal entries. Any time information is collected, there is a potential risk for loss of confidentiality. Every effort will be made to keep your child’s information confidential, however, this cannot be guaranteed.

In any sort of report we might publish, we will not include any information that will make it possible to identify a participant. Research records will be kept in a locked file and access will be limited to the researchers, the University review board responsible for protecting human participants, and regulatory agencies

Subject Identifiable Data
All information that identifies your child will be removed and replaced with a code. A list linking the code and student’s identifiable information will be kept separate from the research data. Coded identifiers will be used to facilitate within-case and cross-case qualitative analysis.

Data Storage
Research data will be maintained in a secure location at CWRU. Only authorized individuals will have access to it.

The audiovisual recordings that can identify students will be:
• Stored in a secure location;
• The recordings will be retained with the other research data for two (2) years.
Contacts and Questions
The researchers conducting this study are Dr. Nathan Kruse and Dennis Giotta. You may ask any questions you have now. If you have any additional questions, concerns, or complaints about the study, you may contact Dr. Kruse at [redacted] or [redacted]. You may also contact Mr. Giotta at [redacted] or [redacted].

If the researchers cannot be reached, or if you would like to talk to someone other than the researcher(s) about: (1) questions, concerns, or complaints regarding this study, (2) research participant rights, (3) research-related injuries, or (4) other human subjects issues, please contact Case Western Reserve University’s Institutional Review Board at (216) 368-6925 or write: Case Western Reserve University, Institutional Review Board, 10900 Euclid Ave., Cleveland, OH 44106-7230.

You will be given a copy of this form for your records.

Permission to Record
Audio and visual recordings to aid in creating transcripts of all interviews will be an integral part of this research. If you do not wish to have your child recorded, you should not consent to participating in this study and do not need to return this form. Please check YES below to indicate your consent to your child being recorded during interviews.

☐ YES, I CONSENT to my child being audio/video recorded. I also understand that my child or I can change our minds.

☐ NO, I DO NOT CONSENT to my child being audio/video recorded.

Statement of Consent
Your signature below certifies the following:
• You are the parent or legal guardian of the participating student.
• You have read (or been read) the information provided above.
• You have received answers to all of your questions and have been told who to call if you have any more questions.
• You have freely decided to allow your child to participate in this research.
• You understand that you and your child are not giving up any of your legal rights.

Printed Name of Parent or Legal Guardian:

________________________________________

Date: ____________

Signature of Parent or Legal Guardian:

________________________________________

Date: ____________

Signature of Person Obtaining Consent:
Appendix D

Informed Assent Document

Version: 1/2015

CASE WESTERN RESERVE UNIVERSITY
INFORMED ASSENT DOCUMENT

Agency and Identity: A Collective Case Study of the Learning Experiences of
High School Students in a Music Technology Course

Participating in this study is totally voluntary. Please read about the study below. Feel free to ask questions about anything that you do not understand before deciding if you want to be in the study. The researcher listed below will be around to answer your questions.

WHAT ARE WE ASKING?
The researchers want to tell you about a research study looking at students’ learning experiences in a music technology course. They want to see if you would like to be in this study.

WHY ARE THEY DOING THIS STUDY?
Dr. Nathan Kruse and Mr. Dennis Gotta are doing this study to learn more about how students use technology and how they identify within the music technology classroom.

WHAT DOES PARTICIPATION INVOLVE?
These things will happen if you want to be in the study:
1. Participate in an audio and video recorded group interview for up to an hour.
2. Participate in 3 audio and video recorded individual interviews over a four week period; one at the beginning, one in the middle, and one at the end of the observation period. Each interview will last for up to 45 minutes.
3. Answer questions about assignments as you are working on them.
4. Complete 4 student journal entries. Journal entries will be completed once per week.

ARE THERE RISKS INVOLVED?
There are no risks or discomforts involved in participation in this study beyond those of everyday life at school. We will try to schedule meetings at times that are convenient for all participating students. You may need to arrange for transportation for the group interview if the meeting is held after school. If you cannot meet in a group interview after school, the researchers will attempt to schedule additional group interviews during the school day at lunch or during a study hall. There will be no effect on your grades or an impact on your class standing for not participating or for discontinuing your participation in this study.

ARE THERE BENEFITS TO PARTICIPATION IN THIS STUDY?
There are no direct benefits or compensation for participation in this study. You might learn something about how you and your classmates learn in music technology. The information you share will contribute to music educators and music researchers interested in studying how students learn in a music technology course.

WHAT IF YOU HAVE ANY QUESTIONS?
You can ask questions any time. You can ask now or you can ask later. You can talk to the researchers, your mom and dad, or you can talk to someone else. You may ask any questions...
you have now. If you have any additional questions, concerns or complaints about the study, you may contact Dr. Kruse at [redacted] or Mr. Giotta at [redacted].

If the researchers cannot be reached, or if you would like to talk to someone other than the researcher(s) about: (1) questions, concerns or complaints, (2) your rights, (3) research-related injuries, or (4) other issues, please contact Case Western Reserve University’s Institutional Review Board at (216) 368-6925 or write: Case Western Reserve University; Institutional Review Board; 10900 Euclid Ave.; Cleveland, OH 44106-7230.

**DO YOU HAVE TO BE IN THE STUDY?**
You do not have to be in the study. No one will be mad at you if you don’t want to do this. If you don’t want to be in this study, you don’t have to do anything. You can say yes now and change your mind later. It is up to you to decide.

Printed Name of Participant

Age: ____________

Signature of Participant

Date: ____________

Printed Name of Researcher/Person Obtaining Assent

Date: ____________

Signature of Researcher/Person Obtaining Assent

IRB NUMBER: IRB-2014-1006
IRB APPROVAL DATE: 01/30/2015
IRB EXPIRATION DATE: 01/29/2016
Appendix E

Semi-Structured Interview Questions

General

1. Can you tell me about what you learn in this class?
2. What kinds of skills do you need to be successful with music technology?
3. How do you like the styles of music that you listen to and create in this class?
4. Are your friends involved in the music technology class?
5. If you could share an important feature of the music technology class with people outside of this school, what would it be?
6. How would you describe your compositions?
7. Do you have anything else to share about your experiences in this class?

Expression

1. How do your compositions let you express yourself?
2. Besides listening, are there any other ways you engage with music outside of class?
3. Do you like performing music, writing music, or a mix of both?
4. Where else do you feel like you are able to express yourself?

Project-Based Learning

1. How do you like the process of managing an entire project from begining to end?
2. What is your process for solving problems with in the music technology class?
Background

1. Why did you sign up for this class?
2. What do you like about this class?
3. How would you describe yourself?
4. How would your friends describe you?

Future Use

3. What do you think you might use music technology for outside of this class?
4. Do you have plans to enter a career in music?
5. How likely are you to enter a career that involves using computers?
6. Fast forward 5 years. What will you be doing with music technology?
Appendix F

Focus Group Questions

1. How do you use technology in your life at home or in school?

2. How do you think those skills might affect what you do in the music technology course?

3. How much do you feel that you have control in your learning while completing assignments?

4. How do you think the skills that you learn from this course might transfer into your personal life?

5. What, if any, are the qualities of music technology students that may be unique?

6. Do you have anything else to share about your experiences in the music technology course?
Appendix G

Observation Summary Template

Date: 

Time: 

Place: 

Group: 

Events: 

Post-observation summary:

1. What salient themes/incidences emerged during this observation?

2. What was unexpected or interesting during this observation?

3. What new, remaining, or follow-up questions emerged as a result of this observation?
Appendix H

Student Journal Prompts

1. What did you learn this week that you did not know before?

2. How did your previously experiences with technology help you with your music technology assignment?

3. Describe your thought processes in your most recent composition.

4. What effect does the music technology class have on your musical interests?
Appendix I

Sample from Participant Transcript

[00:00:02.09] Me: Tell me why you signed up for this class.

[00:00:07.11] Jimmy: I just enjoy making music. It's a lot of fun. I like the way Mr. Decker teaches too. I took music tech 1 and he was pretty upbeat, exciting, and you never know what's gonna happen each day, so it's kind of cool. I like that. It's a laid-back class, and I feel like it's a good way to end senior year...taking this class.

[00:00:35.20] Me: Tell me a little bit about what you learn in this class.

[00:00:40.24] Jimmy: Pretty much we learn how to listen and hear different parts of the music. So you create rap beats or learn the different samples that they use from older periods that you wouldn't think they sampled. We can tell the difference between the drums, bass, and guitars a lot easier than before so just listening to music in general...and how to take everything from that. It's hard to explain, but like...we can hear music differently now. We can tell what they use and we're learning how to create that based on listening...but make it our own way.

[00:01:30.13] Me: So what kinds of skills do you think someone might need in order to be successful in this class?

[00:01:37.26] Jimmy: I don't know. Just basic computer skills.

[00:01:43.00] Me: Like what?

[00:01:43.18] Jimmy: Being able to search up things when you need to. You don't even have to...I don't know...it would help if you had music talents like on the piano or something like that, but I'm not musically talented. I just enjoy music and I think if you enjoy music, this class will be easy.
Appendix J

Preliminary Codes and Themes

- Lifelong Engagement
  - Future use
  - Using music technology at home

- Identity
  - Appreciation of music
  - Did not expect to take the class
  - Enjoyment in music
  - Musical confidence
  - Importance of music
  - Making music for others
  - Musical taste/preference
  - Music technology class community
  - Unexpected enjoyment
  - Working with others

- Music technology knowledge
  - Enjoyment with music technology
  - Knowledge of programs similar to Ableton Live
  - Learned skills
  - Prior technology knowledge
  - Prior technology skills required
  - Professional comparisons
• Music technology and traditional music classes
  o Amount of work/difficulty
  o Music technology feels more relevant
  o Separating music technology and traditional music
  o Differences in environment

• Project-based learning
  o Connections to real world
  o Exploration
  o Feelings toward PBL
  o Freedom
  o Minimal supervision
  o Motivation
  o Personalization
  o Problem-solving
  o Searching for perfection
  o Time constraints
  o Valuing individual projects

• Musical knowledge
  o Analyzing music
  o Composing/creating
  o Prior music skills
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