

UNIVERSITÉ DE SHERBROOKE

La musique, une invitation à la créativité
Music, an Invitation for Creativity

par
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SUMMARY

The purpose of this study was to investigate if a relationship exists between playing background music and students' creativity while drawing in the classroom. The study also examined the relationships between music being played in the background and classifications of the multiple intelligences of students. Finally the study investigated whether music in the background contributed to the students' flow experience. The optimal flow experience is a state of mind, in which an overall meaningful activity might emerge.

A quasi-experimental study was done in a Typography & Design course on 47 English Collège d'enseignement général et professionnel (CEGEP) students at John Abbott College who were enrolled in the course and taught by the researcher. One group did not listen to background music and the other group listened to background music while drawing in the classroom. The music that was played in the classroom was determined by students' choices.

Using a parametric *t* test for independence to assess if a significant difference between the means of two independent samples might exist between listening to music and creativity scores, it was found that after four weeks of drawing in the classroom, there was no statistically significant relationship between listening to music and its impact on creativity. However, the creativity levels of students, measured by the mean scores, in the second group (with music) were higher than for students who did not listen to music.

A cross-sectional on-line questionnaire on the Overall Meaningfulness of the Drawing Activity with Likert-type questions was used to obtain the opinions and feelings of students on the optimal flow experience while listening to background music at the same time as they were drawing in the classroom. The results brought out some important and interesting associations between certain variables in both

groups of students. In the music group, the variables that showed an association with music playing in the background were students feeling relaxed in the classroom with their ability to concentrate, and with their ability to draw to their fullest potential.

A standardized instrument named Multiple Intelligences Birmingham Grid for Learning was used to measure students' multiple intelligences. A cross tabulation with the variables of musical intelligence and creativity showed that medium and high creativity levels seemed to be associated with medium and high musical intelligence levels in both groups.

The findings suggest that the instruction in the course that was accompanied by playing music in the background was effective in raising students' optimal flow experience while drawing in the classroom, however it did not significantly affect students' creativity scores and it was seen that musical intelligence scores were usually linked with high creativity scores. Although this research paper did not break new ground, it did contribute in showing that music does have an effect on students' concentration and stress levels.

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RÉSUMÉ

L'objectif de ce travail de recherche était de déterminer si une relation existe entre faire jouer de la musique de fond et la créativité des étudiants pendant qu'ils dessinent en classe. Ce travail de recherche a également examiné les liens entre la musique de fond et les classifications des intelligences multiples des étudiants. Finalement, ce travail a cherché à savoir si la musique de fond contribue à l'expérience optimale des étudiants. L'expérience optimale est un état d'esprit dans lequel une activité de signification globale peut émerger.

Une recherche quasi-expérimentale a été faite dans le cadre d'un cours de Typographie & Design sur 47 étudiants anglophones du Collège d'enseignement général et professionnel (CÉGEP) au Collège John Abbott inscrits à ce cours donné par la chercheuse. Deux groupes dessinaient en classe : un groupe n'écoutait pas la musique de fond et l'autre l'écoutait. La musique qui jouait en classe était choisie par les étudiants.

Par l'utilisation d'un test de t paramétrique pour l'indépendance afin d'évaluer si une différence significative existe entre les moyennes de deux échantillons indépendants en ce qui touche à l'écoute de la musique et les résultats sur la créativité, il a été déterminé qu'après quatre semaines de dessin en classe, il n'existe aucun rapport statistiquement significatif entre l'écoute de la musique et ses effets sur la créativité. Par contre, le niveau de créativité des étudiants du second groupe (avec la musique), mesuré par leurs notes moyennes, est supérieur à celui des étudiants qui n'ont pas écouté la musique.

Un questionnaire transversal en ligne sur la *Overall Meaningfulness of the Drawing Activity* « Signification globale de l'activité de dessin » comprenant des questions de type Likert a été utilisé pour obtenir les opinions et les impressions des étudiants sur leur expérience optimale alors qu'ils dessinaient en écoutant la musique de fond. Les résultats ont démontré des liens importants et intéressants entre certaines variables dans les deux groupes d'étudiants. Dans le groupe qui écoutait la musique de fond, les variables qui ont montré un lien avec cette musique de fond sont les étudiants détendus en classe et leur capacité de concentration, et aussi leur aptitude à réaliser leur plein potentiel en dessin.

Un tableau normalisé appelé *Multiple Intelligences Birmingham Grid for Learning* « Grille des intelligences multiples de Birmingham pour l'apprentissage » a été utilisé pour mesurer les intelligences multiples des étudiants. Un recoupement des variables de l'intelligence musicale et de la créativité a montré que les niveaux moyen et élevé de créativité semblent associés aux niveaux moyen et élevé de l'intelligence musicale dans les deux groupes.

Les résultats suggèrent que l'enseignement dans le cours qui était accompagné par la musique de fond a été efficace pour rehausser l'expérience optimale des étudiants pendant qu'ils dessinaient en classe ; cependant, il n'a pas eu un effet significatif sur les résultats des étudiants concernant leur créativité et il a été établi que les résultats pour l'intelligence musicale sont habituellement associés à des résultats élevés pour la créativité. Bien que ce travail de recherche innove peu, il a contribué à démontrer que la musique a un effet réel sur les niveaux de concentration et de stress des étudiants.

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INTRODUCTION

“It is not the hearing (of music) that improves life, it is the listening” wrote Mihaly Csikszentmihalyi in 1991. This paper has attempted to show that by introducing music in the classroom, activities such as freehand drawing were enhanced by triggering an increase in creativity levels and perhaps contribute to a state of flow.

The author of this study has observed over many years that when music is present in the classroom, combined with specific activities such as freehand drawing, students stop chatting and start working on their assigned projects. Because of this effect, concentration levels seem to increase and may help to contribute in attaining an optimal flow experience.

“Music, an Invitation for Creativity” was explored to see whether there was an association between creativity and listening to meaningful music. The primary intention of this study was to investigate the role that meaningful music had on creativity, as such the research has tested the hypothesis that the act of bestowing background music into the classroom enhanced students’ motivation levels, diminished stress levels and increased students’ creativity.

CHAPTER ONE: STATEMENT OF PURPOSE

The purpose of this study was to look at different creativity theories and attempt to find the links that exist between music and creativity, using music as a catalyst and drawing as the creative product. After reviewing the literature on these subjects, certain explanations were developed that connect creativity with the optimal flow experience, the meaningfulness of an activity and the theory of Multiple Intelligences (MI). It is the researcher's point of view that drawing for creativity might become a meaningful activity and induce an optimal state of flow, if music is being played in the background. The optimal flow experience is a state of mind, in which an overall meaningful activity might emerge.

By bringing music into the classroom, the author poses the question whether the students' intrinsic motivation will grow and that perhaps a different type of learning might emerge to make this experience develop into a meaningful activity and guide their way to become long-life learners. To foster intrinsic motivation, students need to have a sense that the activity that they are doing is meaningful, thus making it pertinent for them (Craig, 2007). So by bringing music into the classroom, a state of optimal flow experience might emerge (Csikszentmihalyi, 1991). By looking at the music that students enjoy nowadays, it is hoped that a deeper understanding of our students' culture, wants, values and needs will emerge, creating bridges for a better communication between teachers and students and by the same token, produce more meaningful activities as teachers' comprehension of the students' needs are increased.

Very little research has been done to date on the impact of music as a tool in a graphic arts classroom, but there is sufficient research that exists in different domains such as psychology, music therapy, music and education to indicate that music often has a positive effect on students' learning, attitudes and behavior. Music and drawing are linked by this proposed study by various observations that have been done by the author throughout the years.

The Typography & Design course at CEGEP John Abbott College is a cross-disciplinary course, given by the same teacher, spanning over the domains of typography and freehand drawing. By adding music playing in the background as a tool to create a meaningful environment to help foster students' sense of ownership and help the drawing activity, it is thought that creativity scores could be enhanced. Even if the introduction of music is not part of the curriculum, the positive might outnumber the negative effect. The negative effects of music being played in the classroom might be that for some students, any type of music is extremely irritating as they perhaps prefer working in silence or with their own music, and not have to listen to a compilation of different musical styles being played in the background as this study proposed.

It is hoped that this research might help teachers, students, and our department as a whole in improving students' success rates. If students find the courses more interesting and pertinent because of the music, and even experience meaningful activities because of it, then why not add it to the curriculum?

CHAPTER TWO: CONCEPTUAL FRAMEWORK

By examining different creativity theories, links were found that bind music and drawing to creativity, using music as the catalyst and drawing as the creative product. This study is based on three important sets of theoretical frameworks that apply to learning and teaching: the constructivist theory, the presence of a meaningful activity and the theory of Multiple Intelligences.

1. CONSTRUCTIVIST APPROACH

1.1 Student Ownership in the Learning Process

As the field of graphic design is exploratory and experiential in nature, one of the theories that is at the heart of the creative field is the constructivist approach, under Vygotsky, where learning should be active, (Lave and Wenger, 1999) as opposed to passive or teacher-centered. If learning is experiential and active in the classroom, this implies that when students are permitted to have a sense of ownership in the classroom (personal attachment, involvement in creating an artifact that anchors the classroom) then students' willingness to take risks (trust) might be demonstrated by their increased creativity. As corroborated by a recent study, (Killeen, 2003) states: "Sense of ownership is hypothesized to play an important role in learning engagement and ultimately may enhance a student's higher order thinking skills, specifically, creative problem solving."

Csikszentmihalyi (1991) has described a collective effervescence, or the sense of belonging to a group that creates the awareness of real existence. According to Vygotsky, cited in Cheong-Clinch, (2009, p. 52), he believed that students learn through social interaction, as this is what makes students aware that they have some power to exert a certain control over their environment. Cheong-Clinch (2009) mentions that self-esteem and self-expression are a direct result of integrating music

into the classroom, therefore these constructs can arouse students' creativity and motivation levels.

2. CREATIVITY AND MEANINGFUL ACTIVITIES

Creativity concepts abound in the literature, and many of them relate to the positive and relaxed aspects that seem to generate creative ideas. As Vernon (1970), cited in Amabile (2005, p. 367) Mozart claimed that enjoyable moods were most favourable for his creative thoughts:

“When I am, as it were, completely myself, entirely alone, and of good cheer-say, traveling in a carriage, or walking after a good meal, or during the night when I cannot sleep; it is on such occasions that my ideas flow best and most abundantly”

Key concepts that are linked to creativity are intrinsic motivation, achieving the optimal state of flow and enabling someone to experience a meaningful activity. One of the factors that permits creativity is that it should be a self-contained activity, one that is done without the expectation of some future benefit, but simply because the act of doing the activity becomes the reward. As supported by many studies, Csikszentmihalyi (1997) stated that “Creative people all love what they do. It is not the hope of achieving fame or making money that drives them; rather, it is the opportunity to do the work that they enjoy doing” (p. 8).

Boden (1992), cited in Ward, Thompson-Lake, Ely & Kaminski, (2007, p. 138) states that creativity is defined as imagining beyond the limits of existing associative knowledge, to look beyond the limits of a field, to position oneself so that another dimension emerges, to look beyond the evident. Another definition is that creativity is the ability to generate novel associations that are adapted in some way (Ward, Thompson-Lake, Ely & Kaminski, 2007). He also mentions that creativity is psychomenic, meaning that creativity is divergent in its thinking. Craig (2007)

observed that the meaningfulness of music is based on the constructs of security, purpose, worthiness and importance.

2.1 Intrinsic Motivation

Intrinsic motivation is defined as the motivation to do something for its own sake, for the sheer pleasure and enjoyment of the task itself (Csikszentmihalyi, 1991; Hennessey, 2003). The theories that have emerged on creativity have shown that meaningful activities, in conjunction with the use of music as a tool, can be at the heart of intrinsic motivation, as intrinsic motivation is at the heart of creativity. Achilles (1992) and Trombly (1995), cited in Craig (2007, p. 4) stated "...an activity's meaningfulness dwells at the center of intrinsic motivation." As attested, (Gardner, 1993) explains that intrinsic motivation is the motivation to learn or achieve independently of grades or external rewards for the sheer pleasure of doing the work that is necessary. He mentions Amabile's (1984) definition of intrinsic motivation, in which she states that those individuals who take part in an activity for the sheer pleasure of immersing themselves in that activity, are intrinsically motivated. She defines intrinsic motivation as also being termed intrinsic interest as people who engage in an activity because of their own interest or self-fulfillment are intrinsically motivated or intrinsically interested. The differences in motivation levels are proportional to significant differences in the levels of creative performance.

Csikszentmihalyi (1991) states that some people are more prone to experiencing intrinsic motivation because they have autotelic personalities: *auto* meaning self, and *telos* meaning goal. "...it refers to a self-contained activity, one that is done not with the expectation of some future benefit, but simply because the doing itself is the reward" (Csikszentmihalyi, 1991, p. 67).

Hennessey (2003, p. 253): "In order for students to reach their creative potential, they must approach a task with intrinsic motivation; they must

engage in that task for the sheer pleasure and enjoyment of the activity itself rather than for some external goal.”

2.2 Music for Flow

Plato believed that teaching music to young children should come first, before any other discipline, because he believed that by paying attention to harmonies and rhythms their whole awareness would enter a certain state of orderliness.

Csikszentmihalyi's (1999, p. 109) definition of music: Is that music is organized auditory information, [which] helps organize the mind that attends to it, and therefore reduces psychic entropy, or the disorder we experience when random information interferes with goals. Listening to music wards off boredom and anxiety, and when seriously attended to it can induce flow experiences. It is not the hearing that improves life it is the listening.

The optimal flow experience is defined by an overall meaningful activity and is based on the following constructs of arousal/boredom, flow/apathy, control/worry and relaxation/anxiety factors (Csikszentmihalyi, 1991).

Csikszentmihalyi's (1999) theory is that happiness or satisfaction can be obtained when people are doing an activity that is enjoyable and meaningful, and only then can they experience the state of flow. The flow experience is a state of mind in which someone decides to put himself into, and some individuals have a natural tendency to experience it more often than others. Flow and music have shown that they can act as motivators for student engagement and help create meaningful activities (Cheong, 2009; Craig, 2007; Csikszentmihalyi, 1999; Gardner, 1993; Ward, 2007). Craig (2007) points out that music has the ability to move students in helping them become more engaged and motivated in their activities. He attempts to provide insights as to the meaningfulness of music and how it has a profound effect on students. Some activities that are conducive for achieving the experience of flow are creative activities such as making music, painting, drawing, gardening, sports, games

and religious rituals, as these activities stem from an intrinsic motivation as opposed to an extrinsic one. In his studies on the state of flow experience, Csikszentmihalyi's (1999) states that "...happiness is the only intrinsic goal that people seek for its own sake, the bottom line of all desire". He also explains that the flow experience lies within a fine balance between challenges and skills as seen in the figure below. As we can see, there are several factors that permit or inhibit the state of flow. The inhibitors are anxiety, worry, apathy, with apathy being at the opposite end of the spectrum to the state of flow. The factors that permit or enhance the state of flow are elements such as control, relaxation and arousal.

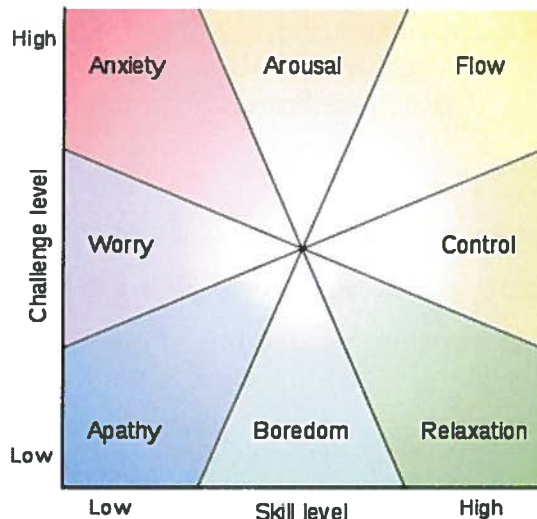


Figure 1: Csikszentmihalyi's Optimal Flow Chart

Source: http://en.wikipedia.org/wiki/Mihaly_Csikszentmihalyi Wikipedia Mental state in terms of challenge level and skill level, according to Csikszentmihalyi.[1]

Craig's (2007) sense of security and purpose can be connected to Csikszentmihalyi's (1991) sense of flow and control by stating that creativity levels might be enhanced (arousal) when one feels in control, relaxed and secure. Creating meaning involves conveying order in one's mind and bringing one's actions into a unified experience and this, Csikszentmihalyi (1991) defines as achieving purpose. In order to pave the way for meaningful activities to happen, there are a few factors that need to be in place. The person needs to experience flow while doing an activity.

Csikszentmihalyi (1999) defines flow as “...a meaningful state of being is not merely through pleasurable activities but activities that are complex and fulfilling for the individual, an activity that has a deep sense, it describes a sought-after affective state.”

2.3 Moved by Music

Craig's (2007) explanation that students should be moved by music in order for them to attain a meaningful experience is very similar to Csíkszentmihályi's (1991) optimal state of flow, as he explains that activities should be profoundly meaningful and fulfilling for the individual, and not merely pleasurable.

Trombly (1995), cited in Craig (2007, p. 4) states that the ability to successfully understand an activity, like listening to music, is by relating it to past experiences, by bringing back memories, only then does the activity become meaningful. Similarly, Sommer & Baumeister (1998), cited in Craig (2007, p.4) state that having positive memories of a previous activity, like listening to music, contributes to feelings of efficacy and helps define a meaningful activity.

2.4 Drawing for the Brain

The role of drawing, especially in the graphic design field, has been somewhat neglected in the literature, but there is evidence that indicates that the conceptualization of ideas by drawing is present throughout the creative decision making process (Schenk, 1997). Drawing is present in graphic design for creating visual notes, instructions, schematic ideas, projections, plans, impositions, story boards, sketches, copies, doodles, scribbles, visualizations, indications, layouts, computer visual renderings, trail illustrations, trial letterings, dummies, specifications, demonstrations, drafts, refinements, etc. Schenk (1991) denotes that the role of drawing in supporting innovation and creative efforts is well established

and also notes that the presence of a specific creative ‘behavior’ is necessary in fostering an appropriate and conducive climate for creativity to happen.

Schenk (1991, p. 178): It was found that many designers appeared to be very casual in their initial uses of drawing in a job and exhibited a reluctance to impose any sort of judgmental criteria on the drawings produced, thereby implicitly fostering a non-judgmental climate to support creative thinking.

She also notes that the importance of the role of drawing is essential for designers in developing their visual memories as these memories, or as she aptly names these ‘stores of analogies’, is related to the designers’ ability to create links between clusters of visual memories. As mentioned in a recent study (Logan, 2006), communicating key concepts by using metaphors is key to helping students create links.

Schenk (1991, p. 178): The role of drawing aids in processing the synthesis of new concepts through the juxtaposition and combination of remembered images by visualization.

So in a graphic design classroom, where creating links with visual memories is key, will our students be more apt to excel if they have specific types of intelligences, such as spatial intelligence? How will the music influence their drawings and creative levels if they have musical intelligence or spatial intelligence? All of these questions suggest another line of inquiry.

3. CREATIVITY AND MULTIPLE INTELLIGENCE

In order to understand creativity we must first look at Gardner’s theory of multiple intelligences (Gardner, 1993) in which he states that the human intellect is made up of seven multiple types of intelligences. The theory of Multiple Intelligences is defined as having seven spheres of intelligences, such as linguistic, logical, musical, bodily-kinesthetic, visual-spatial, interpersonal and intrapersonal sensitivities (Gardner, 1993).

Throughout the years, research on creativity has been closely linked to research on intelligence. Certain mental processes must be involved with domain-relevant knowledge in order to obtain pertinent creative levels (Amabile, 1984). The relationship between intelligence and creativity has strong links, as creativity training is part of the graphic arts education field. Studies show that a minimum of intelligence is required to develop creative problem-solving skills such as brainstorming techniques, creativity and different forms of divergent thinking.

Howard Gardner's (1993) theory on Multiple Intelligences promotes the notion that the brain is made up of seven different spheres of intelligences, each having their own specific specialty, such as linguistic, logical, musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligences on how to problem-solve, therefore learn. His book is a comparative study of a small number of individuals in which he looks at the links that exist between the creative person's discipline and possible patterns that might emerge. Gardner proposes certain defining terms such as creative phenomena in which an individual will develop his creativity within a specific field such as physics, painting, dancing, music, mathematics and in which Gardner states that an individual works and focuses his attention in a particular domain, which he names the symbol system.

With this theory in mind, we will look at the multiple intelligences of students and examine different types of intelligences, such as musical intelligence, logical intelligence, spatial intelligence, and look at the relationship that music and drawing have on students' creative processes and if music interferes or enhances their creativity levels. The researcher is questioning whether linguistic intelligence might have an effect on lyrical sensitivities, a link might exist between logical intelligence with mathematical thinking sensitivities, musical intelligence with melodious sensibilities, bodily-kinesthetic with rhythmic sensitivities, visual-spatial with color sensitivities (kinaesthesia), interpersonal intelligence with one's need for

introspection and questioning, and intrapersonal with the motive to share musical pieces and genres. It is hoped that by bringing music into the classroom, the seven forms of intelligences might be solicited.

4. CREATIVITY AND THE CROSS-POLLINATION OF DISCIPLINES

Human creativity has often been involved in a cross-disciplinary approach, where the intertwining of disciplines has forged new ways of looking at a subject or problem. The genius of Leonardo Da Vinci has been documented in painting and sculpting but he is also known as an architect, inventor, engineer and an astronomer.

There seems to be an underlying facet to music that could make it act as a stimulator for creativity. Or is it simply the very nature of cross-disciplines that enhances creativity? In Gardner's book, Pablo Picasso represents spatial intelligence and Igor Stravinsky represents musical intelligence. Musical intelligence is attuned to certain sound sensitivities and spatial intelligence gives the individual the ability to visualize spaces with the mind. Human creativity is not something that is specific to one type of brain—as a brilliant musician may not be a brilliant painter. As Culpan (2008, p. 3) stated in her work, "... creativity is not a special attribute with which some children are endowed and others are not. It is a form of intelligence that can be nurtured like any other mode of thinking...". Now, let's take a look at some definitions for the word creativity.

Creators have common attributes on how they learn, think and function. Keeping notebooks or logbooks seemed to be a common practice for Picasso and Stravinsky (Gardner, 1993). Logan (2006) mentions that teachers use journals and note-taking for teaching and learning. Highly creative individuals and graphic designers extensively use sketching and thumbnail techniques to achieve creative output (Schenk, 1991).

As Tovey indicates: The existence of drawing permits the designer to consider several alternative design ideas simultaneously. One design director referred to this phase as ‘the thinking bit’ and likened the quick, spontaneous kind of drawing used as being almost like handwriting, or like ‘a musician’s score’. Your hand is part of your brain. It’s as though your brain is drawing. (Cited in Schenk, 1991, p. 170).

Another common trait in highly creative individuals is the willingness to take chances, to take risks. Culpan (2008) relates that creativity is, according to Eisner’s (1998), cited in Culpan, (2008, p. 38) theories that the Arts nurtures imagination and creativity and that the willingness to take a chance to explore new venues comes back in the literature, as also seen in Gardner (2005), cited in Culpan (2008, p. 40). “The willingness to take risks is perhaps the aspect of creativity most consistently cited in the literature.” Highly creative minds have the urge to experiment, as seen with Picasso, Stravinsky and Einstein, they had the urge to take risks (Gardner, 1993, p. 143) and in Logan’s article she mentions that tutors would ask students to try out “new ways” of solving problems (Logan, 2006).

Music is one creative discipline to which art is related. Gardner (1993) has mentioned the parallels that exist between the musical and painting art forms, as Stravinsky’s *Petrouchka* had the feeling of a collage at precisely the same moment in time that Picasso was experimenting with visual collages, as if they were living in the same timeline and experimenting similar venues, even though they were geographically far from each other. Picasso’s *Guernica* and Eliot’s *The Waste Land*, Stravinsky’s *The King of the Stars* and Picasso’s *Les demoiselles d’Avignon* are all some examples of close mental proximities and parallels between different art forms.

CHAPTER THREE: LITERATURE REVIEW

The present literature review explores through empirical studies the ties that bond the creative process. More specifically, it examines the links that bind two disciplines together, music and art, and how these two disciplines affect the creative process. The literature provides suggestions that music can act as a stimulator for intrinsic motivation, which is at the foundation of all creative processes. Studies have shown that music affects emotions and behaviour. Music has been used in many learning environments to create desired behaviours in students. In order to help students feel relaxed, in control and part of a meaningful activity, music will be introduced into the classroom by soliciting these sensitivities and experiences and hone into their different forms of intelligences. These factors combined together establish the groundwork for experiencing a meaningful activity as “music has the ability to move” students (Craig, 2007) as well as laying the foundation for experiencing a state of flow (Csikszentmihalyi, 1991, 1999).

Three themes emerged from the literature review when looking at the effects of playing music in the background on learning, behaviour and creativity. First, that the flow experience also known as Csikszentmihalyi’s (1991) optimal experience must be present in order for creativity to occur. The next theme is that music can act as an inducer for obtaining a meaningful creative activity (Craig, 2007). Finally, Gardner’s theory of multiple intelligences can be used to analyze whether or not the introduction of background music is a valuable tool for incorporating a musical intelligence component in the classroom.

1. MUSIC AND EMOTIONS

In his study, (Drowns, 2002) analyzed that “... music has an effect on the behaviour and emotions of people...”. In a study done by Giles (1991), cited in Drowns (2002, p. 4), by having music playing in the background, Giles found that

music was successful in alleviating stress by helping students relax. Gunter (1995), cited in Drowns (2002, p. 4) mentions that music that has 60 beats per minute (the resting heart rate for humans) caused children to unwind and relax. Hodges (1980), cited in Sigman (2005, p. 7) "... music can alter brain waves, heart and pulse rate, blood pressure, respiration rate, and muscular responses". In Drowns' (2002) case study, she used a quantitative data method to study 25 fourth-grade participants' silent reading comprehension, with and without classical music being played in the background. She used a questionnaire to find out what type of music that students preferred and find out students' opinions about listening to music in academic situations using Likert-type questions. Her results show that the reading comprehension average scores were higher when classical background music was being played.

Cheong-Clinch (2009) mentions that the meaning and importance of music seems to be correlated to students' psychosocial development and expresses that popular music has the greatest relevance for young people, especially teenagers. Cheong-Clinch looked at music as a tool for engaging young people in two very different learning environments. The first group, which had a sample size of seven students that were looked at was from an English as Second Language (ESL) program for newly arrived immigrants and the other group was in a residential care centre for adolescent boys. The aim of the study was to see if self-esteem and self-expression were achieved by selecting songs with the group, listening to music and singing known songs, discussing the music and the lyrics, and finally writing the lyrics of the song. The results from the observations indicated that music was beneficial in increasing self-esteem, self-expression, building peer relationships, and language skills.

Sigman (2005) observed high school students' concentration levels as they were listening to background music while completing an in-class assignment. She conducted a true experimental design which consisted of a series of tests, including a

pre-test, a post-test and then a control to assess the effect of music on science students' concentration levels. The research was conducted in two science classrooms in Ohio and the subjects were junior and senior year Integrated Science students. The students were given a regular assignment and once this assignment was completed, a pre-test survey with a Likert-type scale was given. Then another assignment was given with Mozart's music playing in the background, followed by a post-test survey, with a Likert-type scale. The same procedure was conducted with the control group with no background music. The researcher expected the data to show that students perceived background music as a positive influence in the classroom, but the results demonstrated that the music did not increase the students' ability to concentrate.

The importance of music can be viewed in relation to its effect, one of a meaningful experience on students. In order for students to enjoy the music being played, they must have had a meaningful experience with it as seen in Craig (2007). Many studies have shown the relationship of music and musical preference, such as LeBlanc's (1991), as cited in Schafer & Sedlmeier, (2010, p. 223) hierarchal model of musical preference or Hargreaves, Miell and McDonald's (2005) as cited in Schafer & Sedlmeier, (2010, p. 224) reciprocal response model on the importance of liking a style of music. Music acts as a link in communication between peers and a tool for self-reflection, especially for adolescents. "... eliciting emotions is one of the most important reasons why we listen to music at all." Schafer & Sedlmeier (2010). Research in psychology has shown that music creates strong physiological responses, has a role in cultural and social functions. Holbrook & Schindler (1989), as cited in Schafer & Sedlmeier, (2010, p. 225) state that the importance of music decreases over a life span, while studies made on the influence of gender on music preference, made by Staum & Brotons, (2000), cited in Schafer & Sedlmeier, (2010, p. 225) revealed that males tend to prefer louder music while a study by Christensen & Peterson (1988), cited in Schafer & Sedlmeier, (2010, p. 225) shows that females prefer softer, more romantic, and dance-oriented types of music.

Schafer, T. & Sedlmeier, P. (2010) present results from two empirical studies where data was collected in a lab study and afterwards in an online survey (N = 263). The participants listened to six pieces of distinct musical styles, as well as one favourite musical piece. The musical genres were found by factor analysis: classical, rock, pop, electro, rap and beat music. After listening to each piece they filled in a questionnaire with responses on a 10-point Likert-type scale. The means of the six musical genres indicated the results for the musical preferences and a multiple regression analysis was done. The communicative functions of music appeared to be the most important predictor of music preference, followed by self-reflection. Afterwards another analysis was done on the participants' favourite piece of music using a correlation between age and gender and the strength of preference of the participants' favourite music. The results showed that there was a substantial negative correlation between age and the strength of preference.

The second study by Schafer, T. & Sedlmeier, P. (2010) was conducted to validate the above findings outside of a laboratory setting. By means of emailing lists to German universities, 210 participants were recruited. The same questionnaire was used as in the first study, and participants were instructed to listen to different musical genres and then to answer a questionnaire on that piece of music. The musical pieces were provided by means of flash files that were included in a 6 page web page, with each page having one questionnaire and one musical flash file residing in it. Musical preferences across different musical genres showed a similar pattern as in the first study. The means were used to determine the strength of music preference as predictors in a multiple regression analysis, after z-standardization of respondents' ratings. The predictors accounted for a huge amount of the variance in music preference (88%). The two main aspects that were found were that communication and self-reflection remain important variables in determining music preference, however arousal and activation as well as repetition and familiarity were higher in the second study.

In another study (Chou & Tze, 2010), looked at two research questions, the first being whether listening to music affects learner's reading comprehension. The second research question was whether different types of music distract students' reading comprehension tasks. The different types of music that were used were light classical music, hip-hop music and no music in the background. Chou & Tze used a quantitative data method of research; his sample population was 133 participants, ages between 20 to mid 50's, from a medium-size college in Taiwan. The assessment tool for the reading comprehension was called *30 Days to the TOEFL CB*. Two CDs were also used, a CD mix of various types and styles of music by Mozart. The second CD was called *Hip Hop Best – The Collection*, produced in 2006. In this study there were two experimental groups and a control group, where the control group performed the reading comprehension task without any background music. The first experimental group performed the reading task with classical music being played in the background and the second experimental group performed the task with the Hip Hop music being played in the background. The analysis used for this study was a one-way factorial ANOVA. The results yielded a statistical significance $p < 0.05$, thus a difference was found in the performance of the reading comprehension tasks due to the different types of music in the background. The hip-hop music had a greater negative effect on the concentration levels, than the classical music or no background music. The control group (no background music) fared better than the classical music experimental group. These results contradict Drowns' (2002) results.

Djivic's (2011) found that music has the potential to influence how people view themselves and affect their personality traits. A comparative approach was pursued and three groups were constructed, the first group listening to classical music by Franz Schubert (1779—1828) while reading the original German lyrics, the second group listening to the translation of the German lyrics in English while at the same time reading the English lyrics while listening to the music and the third group reading the English lyrics while listening to the original score in German. The participants were then asked to answer the John, Donahue & Kentle (1999), as cited

in Djikic, (2011, p. 2), *Big Five Inventory* questionnaire which is a 44-item scale measuring different dimensions of personality, such as extraversion, conscientiousness, agreeableness, emotional stability/neuroticism, and openness. The responses were scored on a 5-point Likert scale. To test the main hypothesis that music has a unique, additive effect on personality change, a one-way ANOVA was compiled. The results showed that participants found the music-and-lyrics condition significantly more artistic than the lyrics-only condition ($p < .05$). To test that music has an effect on personality change, a one-way ANOVA was completed. Fisher's LSD post hoc analysis showed that the music-only condition had a significantly larger personality change index than the lyrics-only conditions ($p < .05$). The study concluded that while music appears to enhance self-reported variability in personality trait, lyrics seem to suppress it, meaning that lyrics can cement our visions of ourselves while music has the potential to open up one's personality.

2. MUSIC AND DRAWING

Brooks (2005), cited in Gur, (2009, p. 253) suggests that drawings function on the cognitive content and acts as a unique mental tool. Gur's (2009) study, examines how music affects the cognitive content of a drawing task as he studied 84 6-year old students. The sample was divided into three groups, the first group was freehand drawing with classical music, the second group was freehand drawing only and the third group was the control group. The assessment tool used for his pre-tests and post-tests was the *Silver Drawing Test (Cognitive Content)*. The results were analyzed with a univariate one-way ANOVA to investigate the effects of music on the groups. The results showed that listening to classical music while drawing improved children's cognitive drawing skills.

Schenk (1991) states that drawing is an intrinsic procedural instrument for graphic designers to assist them in carrying out their daily tasks. Schenk used a qualitative data method of research analysis and her sample population was 70

participants as she conducted 50 interviews, 20 focused interviews and extensive periods of observation of studio practices. The results show that the most effective method was with group one, which had the classical music being played in the background. She looked at the difference between means of total post-test and pre-test scores, and group 1 had the highest scores so classical music had a positive effect on children's cognitive drawing skills.

3. MUSIC AND MEANINGFULNESS

As we have seen in the conceptual framework, creativity and meaningful activities are closely linked. Hallam (2011) suggests that for a true engagement with music to occur, the experience of listening to music must be an enjoyable and rewarding one. Looking at *Guildford's Test on Creativity*, Simpson (1969), cited in Hallam (2011, p. 277), found that music students scored higher as opposed to students who did not study music. She found that music seems to improve spatial reasoning, one multiple intelligence that is related to art and mathematics.

Craig's (2007) construct of meaningfulness considers an individual's disposition to find the factors such as security and efficacy, purpose, worthiness and self-worth, value and importance through their engagement in everyday activities. This study demonstrated how the effect of music listening has become a meaningful activity and how the students' intrinsic motivation has been increased in their everyday activities. If the music is related to their very own experience, then the experience becomes a meaningful experience. He also states that the effect of music listening as a meaningful activity has become evident, but only if students are permitted to choose their own music in order for them to live through their own experiences, memories, develop their own sense of self-identity through a socio-cultural meaning. If a music piece is important for an individual, it will be meaningful. If the person is moved by the music, if it triggers past memories or associations, if the expression of their own individuality is possible, then it will

become meaningful. Craig's study drew from research in music and he developed a questionnaire to identify factors that might influence the meaningfulness of music. Participants were selected from undergraduate music and non-music classes based on a voluntary basis, and 16 males and 17 females volunteered for this study. He used a quantitative method of measurement drawing from the constructs of a meaningful activity. He then developed 10 statements that were rated on a 10-point Likert-type scale. The statements were designed to illustrate each specific construct (efficacy, security, etc.) and each participant was then asked to select musical pieces that were especially important in his or her life and other musical pieces that were not important in his or her life. A listening session with the researcher was scheduled and after listening to each musical piece, the participant would respond by answering with the 10-point Likert type scale.

Gardner (1993) argues that musical intelligence is one of seven types of different forms of intelligences. He states that music might help students learn more effectively. Researchers have been looking into the creative process and the cross-pollination of disciplines, and this new facet is emerging as one of the factors that permits, or helps, creativity to occur. The use of music to induce an optimal flow experience has been studied (Csikszentmihalyi, 1999), Cheong-Clinch's (2009) study that music elicits emotions and engages relaxation and Drowns' (2002) explanation as to why students relax with music playing in the background were looked at. Djikic (2011) showed that music could have an effect on personality traits and emotion and Schafer & Sedlmeier (2010) showed people's determinants on musical preferences. Linking musical periods and art periods with creativity and flow were pondered (Gardner, 1993), and showing a relationship of synaesthesia between music and art has been researched (Ward, 2007). The act of drawing and the formulation of ideas are intrinsically linked together as well as the synthesis of bringing together the various elements of a design solution (Schenk, 1991). Gur (2009) showed that children's cognitive drawing skills were enhanced while listening to music and Sigman (2005) concluded that concentration levels were indeed enhanced when

music was playing in the background. However, Chou and Tze (2010) showed that participants's reading comprehension levels were hindered by music playing in the background, so this contradicts Sigman's and Gur's research.

Most of the evidence seems to support that playing background music, if it is properly chosen, will have a positive influence on students' learning as it has a relaxing effect, thus might induce an optimal state of flow and enhances students' concentration levels as well as provide a positive environment for creativity to emerge.

4. PROPOSED RESEARCH STUDY

As we have seen, music plays a special role in various areas, it is an artistic form that has the capability of moulding itself, blending itself onto another domain in order to create very meaningful associations, and could be used in many classrooms. Music can be used to encourage positive behaviour and emotions and should be used in the classroom to create more dynamic and meaningful activities.

The literature review has shown that creativity needs an environment in which meaningful activities can take place... if we provide this in our classrooms for our students, we could well hold one of the keys to creativity.

5. RESEARCH QUESTION

After the review of the literature, the general research question is "How does listening to music, while freehand drawing, impact students' creativity in a first-year Typography & Design course at CEGEP level in the province of Quebec?" The following specific questions will be explored.

1. Is there a relationship between achieving higher levels of creativity in students' work if students were to listen to meaningful music while drawing?
2. Will students who listen to music, while freehand drawing in class, be moved by the music, and even perhaps experience a state of flow?
3. Is there a relationship between musical intelligence and levels of creativity?

For the purposes of this paper, creativity has been defined with the following constructs that involve qualities such as uniqueness, divergent in its thinking and problem solving for aesthetic values. The state of flow is defined as experiencing a meaningful activity based on the constructs of arousal/boredom, flow/apathy, control/worry and relaxation/anxiety factors. Musical intelligence construct is defined as a person having a marked sensitivity to music, pitch, rhythm and sounds.

CHAPTER FOUR: METHODOLOGY

An empirical study was designed to examine the impact of background music being played in the classroom (a quasi experiment). A traditional freehand drawing assignment, using a creativity rubric, assessed the creativity levels of students' drawings. The quasi experiment and assessment contributed to answer the first research question. A short on-line questionnaire surveyed students' opinions on the flow experience and the overall meaningfulness of the activity. The responses to the questionnaire helped answer the second research question. Finally, a standardized multiple intelligence aptitude test "Birmingham Grid for Learning" was administered to students on the internet during class time and contained a checklist of 40 items that were divided into Gardner's seven intelligences. The results from this test provided answers to the third research question.

A very preliminary investigation during the Fall 2010 semester was conducted in class and in front of colleagues, on playing and using music in the classroom setting, when it became quickly apparent that the musical playlists that were to be used were very important for this study. Careful mixing of the playlists was required to ensure a pleasing and non-aggressive musical environment. In the preliminary study, a survey of favourite music was conducted in the Typography & Design course in which the study was conducted, and the researcher asked students to send by email their three most favourite songs. Out of 52 students, only 20 students answered. Therefore, the author decided to conduct this part of the study in the classroom, instead of by email, and have an on-line questionnaire ready for students on the second day of class. This ensured that all students could hand in their responses on the same day. Paper copies were available for students who preferred to work with paper instead of on-line. The researcher ensured that students had ample time to answer and ponder the questions.

1. DESIGN & PROCEDURE

For this study, the researcher was teaching two sections of the same Typography & Design course. The same method of instruction was used for both groups, except that for one group the teacher had music being played on speakers in the classroom while students were freehand drawing, while for the other group there was no music.

Table 1
Control Group versus Experimental Group

		Control Group 01: NO MUSIC Typography & Design Course	Experimental Group 02 Meaningful Music of Students Typography & Design course
Explanation of Research	Day 1	Yes	Yes
Giving out Consent Forms (under 18 years of age)	Day 1	Yes	Yes
Meaningful Music Questionnaire Assignment	Day 2 30 min.	Online questionnaire using Google Docs administered to students on “Meaningful Music” (a hard copy questionnaire will be available for students who desire it).	Online questionnaire using Google Docs administered to students on “Meaningful Music” (a hard copy questionnaire will be available for students who desire it).
Creativity Assessment Instrument #1	Day 4 2 hours	Doodle project given to students with NO MUSIC	Doodle project given to students while listening to musical playlists #1 chosen by students
	Day 5 2 hours	Doodle project given to students with NO MUSIC	Doodle project given to students while listening to musical playlists #2 chosen by students
	Day 6 2 hours	Doodle project given to students with NO MUSIC	Doodle project given to students while listening to musical playlists #3 chosen by students
	Day 7 2 hours	Doodle project given to students with NO MUSIC	Doodle project given to students while listening to musical playlists #4 chosen by students
Overall Meaningfulness of the Drawing Activity Instrument #2	Day 9 10 min.	Online “Overall Meaningfulness of the Drawing Activity” questionnaire administered to students via Google Docs	Online “Overall Meaningfulness of the Drawing Activity” questionnaire administered to students via Google Docs
MI Test Instrument #3	Day 10 10 min.	Online Multiple Intelligences Test “Birmingham Grid for Learning”	Online Multiple Intelligences Test “Birmingham Grid for Learning”

1.1 The Role of Music and It's Meaningfulness

On the second day of class in the semester, a simple on-line questionnaire named Meaningful Music (Appendix E) was given to students in order to generate a list of students' three most meaningful songs. It was important to mention to students that these musical pieces were to be played in class, so the music should be appropriate for the learning environment and even though the results were not part of the overall data collection, the music was integral to the underlying success of the whole project.

The researcher compiled all of the musical pieces in *iTunes* and categorized them by musical genre (hip-hop, classical, folk, etc.). Then one song out of three was picked so that a continuous flow of musical pieces were played for one class of two hours, and special care and attention was given to the musical pieces' rhythm so that the musical playlists flowed seamlessly into the other. Approximately 23 musical pieces were played in a loop during one class, as there were 23 students.

On the first day of class, a Consent Form (Appendix G) was given to students that fully informed them in writing of privacy issues and asked their consent for using their drawings for research purposes. If the students were minors (17 years old and under), their parents would have to sign the Consent Form (Appendix G).

1.2 Drawing for Creativity

For the first sub-question: "Is there a relationship between achieving higher levels of creativity (defined by originality, divergent in its thinking, problem solving for aesthetic values) and listening to music while freehand drawing in class?" a parametric *t* test for independence research method was used to assess the strength of the relationship that might exist between listening to music and creativity.

There was four days of music playing in the classroom. For the experimental group (with music), the music was picked from students' own musical choices and for the control group (no music), there was no music being played in the background. The musical playlists were played while students were completing their Doodle Project as this project required specific input from the teacher and peers all along the creative process. This correlation design involved collecting data for three different constructs; creativity, flow and multiple intelligences in order to see if there might exist a relationship between these variables while music was being played, or not. (The operationalization and measurement of these constructs is shown in some detail in section 3).

From the literature review and the theories examined in the conceptual framework, the hypothesis was that as meaningful music was being played in a continuous loop in the classroom, creativity levels might be influenced and perhaps even increase. The expectation was that there might be a positive relationship between these variables.

1.3 Music for Flow

For the second sub-question: "Will students who listen to music while drawing in class be moved by the music, and perhaps experience a state of flow?" a sample, cross-sectional study questionnaire research method was used to obtain the opinions and feelings of students.

Midway through the completion of the Doodle Project, students were given an on-line survey with Likert-type questions (ratings 1 through 5) using Google docs on the internet. By embedding the survey in the researcher's own website, the students did not have to use their email addresses and the researcher was able to analyze the data and keep students' anonymity intact. It is understood that measuring the state of flow might be difficult as this study is much too limited. A questionnaire

on the Overall Meaningfulness of the Drawing Activity was given to the students (See appendix F).

From the literature review, the hypothesis was that as music was being played in the classroom, students would be moved by the music and that some might even experience a state of flow.

1.4 Multiple Intelligence Test

A standardized instrument, the Multiple Intelligences Birmingham Grid for Learning (Appendix D) was used at the end of the research project, right after the Overall Meaningfulness of the Drawing Activity questionnaire. This enabled the researcher to examine whether an association exists between musical intelligence, creativity and the flow experience.

The hypothesis, based on the literature review and the theories, was that for the third sub-question: “Is there a relationship between musical intelligence and levels of creativity?” was that for students who scored high on the musical intelligence test will have a positive association with creativity and will be more receptive to experiencing a state of flow. This hypothesis was tested from the data that were gathered.

2. PARTICIPANTS & SAMPLES

The target population for this study was CEGEP students who were studying in an art domain, such as PDHT, Graphic Arts, Fine Arts or Illustration and Design.

The sample was students in a first-year English CEGEP studying in the Typography & Design course in the PDHT program at CEGEP John Abbott College, in the province of Québec. The expected sample size was approximately 47 students,

or 100% of first-year students in the PDHT program that were enrolled in the Typography & Design course that took place during the Fall 2011 semester only. These students were already placed into two sub-groups by the Registrar's Office, and both groups were made up of approximately 24 students, as each group represented a different section of the same course, making this a quasi-experimental design because it was not a random assignation of subjects to the control group and to the experimental group.

3. INSTRUMENTS

Table 2
Timeline of the Instruments (in chronological order)

INSTRUMENTS	
1.	Creativity Rubric from freehand drawing <i>Doodle Project</i> ;
2.	Overall <i>Meaningfulness of the Drawing Activity</i> Survey;
3.	Multiple Intelligence (MI) Questionnaire

3.1 Creativity Rubric

The Doodle Drawing Project assignment (Appendix A) was the instrument that was used to assess the creativity levels of students' freehand drawings. The first set of data came from the Doodle Rubric for Assessing Creativity (Appendix B) and was used to assess students' creativity levels. The researcher is the author of this assessment. The Doodle Project constructs (Appendix C) are made up of the following variables: creativity, the quality of the composition, craftsmanship, detail, mastery of the drawing, and the deadline requirements.

This assignment evaluated the creativity constructs that were made up of three variables (uniqueness, divergent thinking, problem solving for aesthetic values) and rated and measured with Likert-type responses using an ordinal scale measurement

rating from 1 to 5. This assignment spanned over four class days. It was the researcher that created the assignment and rubric for this project (Appendices A, B and C). It is to be noted that the grade that was given for the creativity construct was (20%) of the total mark, a small part of the total grade value for this assignment.

3.2 Meaningfulness of Music and the Optimal Flow Experience

The second set of data emerged from an on-line survey on the Overall Meaningfulness of the Drawing Activity (Appendix F) using a few closed questions on demographics (age, sex, mother tongue), and Likert-type responses with a scale measuring from 1 to 5. A short questionnaire was used to survey students' opinions on the meaningfulness of music and the state of flow that was developed by the researcher, using Google Docs on the web. This survey was given on the day after the completion of the Doodle Project assignment, on the fifth day. The measurement scale was ordinal, as the answers were Likert-type (ratings from 1 to 5) and there were a few open-ended questions.

Finally, the data obtained from these instruments were used to answer the main question "How does listening to music, while freehand drawing, impact students' creativity in a first-year graphic design course at CEGEP level in the province of Quebec?" The relationships between several variables were analyzed using inferential statistics and correlational research methods for examining musical intelligence, creativity and the flow experience.

3.3 Multiple Intelligences

This first instrument was an aptitude test that measured general cognitive abilities on multiple intelligences "Birmingham Grid for Learning" (Appendix D). This instrument was administered to students on the internet during class time and contained a checklist of 40 items that were divided into the seven intelligences. Each

item had Likert-type responses (1 to 6) to choose from (rating 'This is not like me at all' to 'I am always like this) and students were given approximately 15 minutes to complete the test. At completion of the test, students were asked to print out the last page and write their student number on the page.

4. ETHICAL AND CONFIDENTIALITY CONSIDERATIONS

In order to eliminate possible ethical issues, the researcher made sure that the subjects' responses remained anonymous, and students who were under the age of 18 years old obtain parental permission (Appendix G) and that the usual classroom environment was not sacrificed for the sake of the study. Some of the steps that were taken to ensure the anonymity of students' responses were the following.

- The research study was conducted as an exercise by attributing the least amount of marks possible.
- All documents were seen and analyzed after the final grades of the Freehand part of the course had been submitted.
- To eliminate the possibility of the teacher being biased, another teacher was present during the exercise to administer the survey and was not aware of which group was listening to the music.
- Arrangements were made for another teacher to distribute and collect all the consent forms and seal the envelopes. As a result, the teacher/researcher did not know who consented to the use of the data, or not. After the final grades were submitted, the teacher just "removed" the data from those who did not consent. The student had the right to not participate in a voluntary study and have her/his data considered.

This quasi-experiment treated all students in both groups equally and fairly. The principles of respect for human dignity, of minimum risk, of free and informed consent, of privacy and confidentiality, of inclusion, of avoiding conflicts of interest

were respected. Permission for the study was also obtained from the *Innovation, Research & Development Committee* (IRDC) at John Abbott College.

CHAPTER FIVE: PRESENTATION & INTERPRETATION OF RESULTS

1. INTRODUCTION

In the PDHT program at CEGEP John Abbot College students are enrolled for a total of 3 years. This research project only applied to first year, first semester students, as they had just arrived from high school, and were following the Typography & Design course that was offered in Fall 2011 and was one of four mandatory courses in the PDHT program.

In this course, the students were asked to follow a creative process while drawing in class spanning a period of four days of class time. Group 1 had no music being played in the background (control group) and Group 2 (experimental group) listened to their most meaningful music being played in the background.

2. DEMOGRAPHIC FEATURES OF THE SAMPLE

When the students were accepted into the PDHT program, they were enrolled in either Group 1 or Group 2 and the students could not choose in which group that they would study in. Group 1 had their Typography & Design course from 12:30 to 14:30 while Group 2 started at 14:30 and ended at 16:30. A random assignment of study participants in the two groups was not possible for this quasi-experimental research study, and the researcher picked from a hat which group would listen to music and which group would not listen to music. The result was that Group 1 did not listen to music while they were drawing in class while Group 2 listened to music. It should be noted that both groups of students were asked to hand in their most meaningful songs as Group 1 (no music) did listen to music at the end of the semester when the research was finished and were working on another project.

A total of 47 students in a course taught by this researcher participated in this study and completed the questionnaires and creativity assignments that were involved in the study. The sample was thus a convenience sample. Group 1 had 24 students and Group 2 had 23 students. Group 1 had 10 males (41.6%) and 14 females (58.3%) while Group 2 had 8 males (34.7%) and 15 females (65.2%). The overall number of males in both groups was 18 males (38.3%) compared to 29 females (61.7%). Whereas students in the Typography & Design course are evenly distributed as to the groups, there are significantly more females than males in both groups.

2.1 Age Distribution

Figure 2 shows the age of the students: for the 17 years and younger age group, there was no difference in the groups as they have 45.8% and 43.5% students in that age range. Interestingly, a marked difference appears in the 18-19 year old age group as Group 1 had 20.8% who were 18-19 years old while 43.5% for Group 2. There were twice as many 18-19 year old students in Group 2 than in Group 1. If we look at the overall 18 years and older numbers, we find that both groups have the same with 13 students in both groups being older than 18 years old.

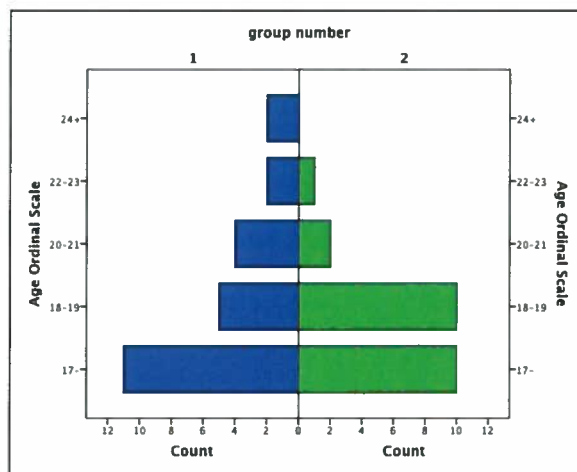


Figure 2: Age Information of Students

3. DATA ANALYSIS IN RELATION TO THE RESEARCH QUESTIONS

3.1 Research Question 1

Is there a relationship between achieving higher levels of creativity in students' work if students were to listen to meaningful music while working?

3.1.1 *The Role of Music and its Meaningfulness*

Students were asked to name their three most meaningful songs. The genres of music that students submitted were as follow (Table 3) from highest incidence to lowest.

Table 3
List of Musical Genres Handed In by Students in Group 1 & Group 2

Rock (9)	Dance (2)	Folk (1)
Ballad (3)	Electronic Rock (2)	Heavy Metal (1)
Hip Hop (3)	Grunge (2)	Movie Soundtrack (1)
Pop (3)	Indie Rock (2)	Pop Jazz (1)
Pop Rock (3)	Alternative Pop (1)	Post Rock (1)
Soft Rock (3)	Dubstep (1)	Reggae (1)

Students' meaningful music preferences were represented mostly by rock music, as this genre of music came up 9 times compared to three times for ballads, hip hop, pop and soft rock. Dance music, electronic rock, grunge, indie rock came up two times and alternative pop, dubstep, folk, heavy metal, movie soundtracks, pop

jazz, post rock and reggae each came up only once. As there is a very wide range of musical genres, 18 in total, these different musical genres probably affected some of the students, positively or negatively, as some musical genres were at the opposite end of the spectrum... ranging from heavy metal to reggae to folk music.

The researcher compiled all of the music and created two musical playlists, regrouping specific genres together, which were played in a loop during the four days of drawing classes.

3.1.2 *Creativity Scores Between Groups*

Two statistical analyses were used to compare the distribution of the creativity grades Doodle Rubric for Assessing Creativity (Appendix B) and also compare the overall Doodle projects' mark (Appendix C) to see if there were any marked differences. In order to see if a relationship exists between creativity scores and listening to music, an independent-samples t-test was used to analyze the mean scores of the creativity marks for both groups.

The creativity marks were also compared with the total overall grades that students received on the Doodle project. It is to be noted that the creativity grade counted for 20 marks out of a possible 100 marks for the Doodle Project, which had technical requirements such as composition, craftsmanship, detail and mastery. (Appendix C).

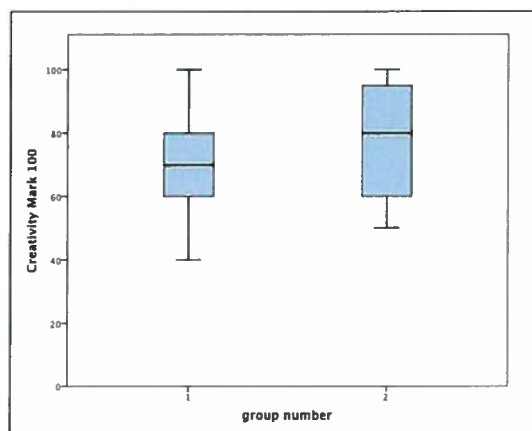


Figure 3: Creativity Score on 100%

When the creativity grades were compiled, as shown in Figure 3, the distribution of the marks (from 0 to 100%) show a far larger percentage of students in Group 2 (with music) who received higher creativity scores compared to Group 1 (no music). The distribution of the scores for both groups was reasonably symmetric.

For Group 1 (no music), 50% of the students' marks ranged from 60% to 80% out of a possible 100 marks. However, for Group 2 (with music), 50% of the students' mark ranged from 60% to 95% out of a possible 100 marks, showing that the range was higher for Group 2. Figure 3 graphic shows the distribution of scores on the creativity score variable between the two groups and clearly demonstrates that Group 2 had higher creativity levels than in Group 1. An independent samples t-test was conducted to examine whether there was a significant difference between the participants' averages of the creativity scores for Group 1 and Group 2. Although the mean for Group 2 (78.7) was higher than that of Group 1 (71.7), the *t* test showed that this difference was not statistically significant.

3.1.3 Overall Project Scores Between Groups

By looking at the overall grade for the Doodle Project we can see the following results (Figure 4) compared to the Creativity grade (Figure 5).

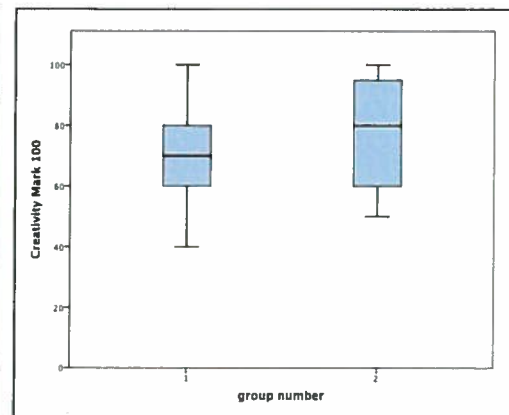
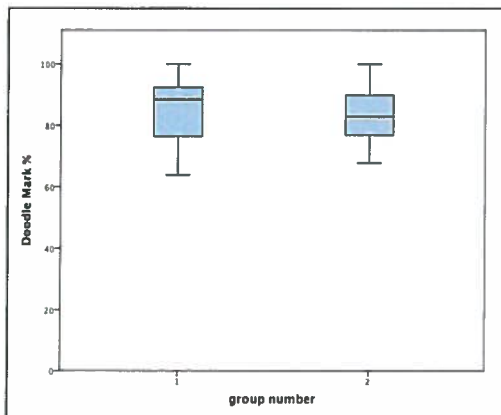


Figure 4: Overall Doodle Project on 100% Figure 5: Creativity Score on 100%

It is very interesting to note that when looking at the overall grade for the Doodle Project as seen in Figure 4, compared to the Creativity Score (Figure 5), the median value is higher for Group 1 (no music) than for Group 2 (with music) perhaps explained by the technical requirements that were stipulated for the project such as composition, craftsmanship, detail, mastery, deadline requirements, layout, etc. Even though students in Group 2 (with music) had higher levels of creativity, they did not necessarily receive higher marks for the overall score of the Doodle Project. This can also be explained by the fact that the creativity portion is small, only 20% of the total grade went to creativity.

3.1.4 Summary of the Results of Findings for the First Research Question

The overall results show that there is no statistically significant relationship between listening to music and its impact on creativity when students were drawing in the classroom. However, the creativity levels of students in the second group (with music) were higher than for students who did not listen to any music. Given that the participants were not randomly assigned to the two groups several other factors could have accounted for the second group having attained higher scores for creativity besides listening to music in the background.

3.2 Research Question 2

Will students who listen to music, while freehand drawing in class, be moved by the music, and even perhaps experience a state of flow? (Appendix E).

The optimal flow answers were tabulated on a scale of 1 to 5 (1 indicating ‘Strongly Disagree’ to 4 indicating ‘Strongly Agree’, 5 indicating ‘Undecided’). These results were then collapsed into more usable data, by tabulating them on a scale of 1 to 3 (1 indicating ‘Disagree’, 2 indicating ‘Agree’ and 3 indicating ‘Do Not Know’).

3.2.1 Students’ Concentration Levels With or Without Background Music

In order to find out if students’ ability to concentrate were affected by the presence of background music (or the lack of it) the researcher analyzed the data by looking at Bar Charts. The graphs correspond to three questions regarding concentration questions that were asked.

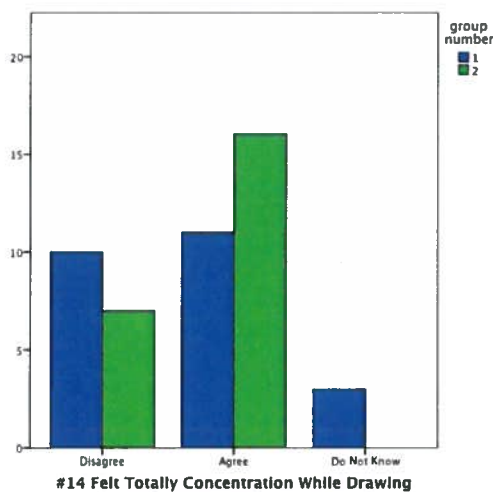


Figure 6: Students Concentration Levels in Group 1 and Group 2

As we can see in Figure 6, students’ concentration abilities were much higher for Group 2 (with music) than for Group 1 (no music).

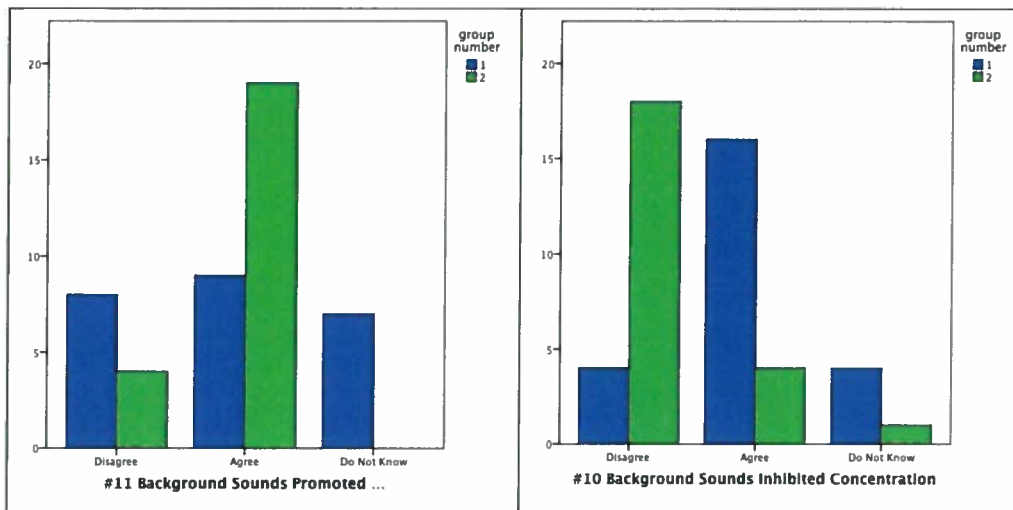


Figure 7: Background Sounds Promoted or Inhibited Concentration Levels

When looking at Figure 7, the background sounds seem to have either “interfered” or “promoted” students’ concentration levels in different ways. When students were asked if the background sounds had promoted their concentration levels, Group 2 (with music) strongly agreed with that statement. However, when students from Group 1 (no music) were asked if the background sounds promoted their concentration levels, only about half agreed with the statement. Consequently, when students in Group 1 (no music) were asked if the background sounds had inhibited their concentration levels, most students strongly agreed with that statement. One wonders whether it was the presence of background noises (students talking, shuffling of chairs, coughs, etc.) that made students answer in this way.

3.2.2 Group 1 Optimal Flow

In order to explore the relationship between music playing in the background, or not, a correlation analysis using Spearman Rho was computed and the following data were compiled.

Table 4
Spearman Rho Matrix on the Optimal Flow Questionnaire
Questions 6, 7, 9, 12, 13, 14
Group 1

	Q6	Q7	Q9	Q12	Q13	Q14
Q6 – I was able to draw to my fullest potential	1					
Q7 – I felt relaxed in the classroom while I was drawing		1				
Q9 – I found the current classroom atmosphere ideal for drawing			1			
Q12 – The drawing activity was very meaningful to me				1		
Q13 – I lost track of time while I was drawing				.602**	1	
Q14 – I felt totally concentrated while I was drawing			.543**			1
** correlation > .01 level						
* correlation > .05 level						

As seen in Table 4, Group 1 (no music) had two significant relationships. The first relationship was with students' finding that the classroom atmosphere was ideal for drawing and their sense of feeling totally concentrated while they were drawing. There was a moderate association between the two variables [$r=.543$, $n=24$, $p<.01$], with a higher number of students finding that the classroom atmosphere was ideal for drawing associated with a high degree of feeling totally concentrated. The second significant relationship was between the meaningfulness of the drawing activity and the students' sense of losing track of time. There was a moderately strong, positive association between the two variables [$r=.602$, $n=24$, $p<.01$], with high levels of the meaningfulness of the drawing activity associated with a high degree of losing track of time.

3.2.3 Group 2 Optimal Flow

In order to explore the relationship between music playing in the background, or not, a correlation analysis using Spearman Rho was computed and the following data were compiled (Table 5). Three significant relationships were found for group 2 (with music) students on the optimal flow experience.

The first significant relationship was that students felt that they were able to draw to their fullest potential with feelings of relaxation in the classroom while they were drawing. There was a somewhat strong, positive correlation between the two variables [$r=.511$, $n=23$, $p<.05$], with a high degree of students finding that their ability to draw to their full potential was associated with a high degree of relaxation in the classroom. The following is a quote from one of the participants:

Music should be played all the time in class. I find it really relaxing.
I love having good music play in the background. :D (student #42).

Table 5
Spearman Rho Matrix on the Optimal Flow Questionnaire
Questions 6, 7, 9, 12, 13, 14
Group 2

	Q6	Q7	Q9	Q12	Q13	Q14
Q6 – I was able to draw to my fullest potential	1					
Q7 – I felt relaxed in the classroom while I was drawing	.511*	1				
Q9 – I found the current classroom atmosphere ideal for drawing			1			
Q12 – The drawing activity was very meaningful to me				1		
Q13 – I lost track of time while I was drawing					1	
Q14 – I felt totally concentrated while I was drawing	.645**	.656**				1
** correlation > .01 level						
* correlation > .05 level						

The second significant relationship was between students feeling that they were able to draw to their fullest potential with students' feeling that they were totally concentrated while they were drawing. There was a strong, positive correlation between the two variables [$r=.645$, $n=23$, $p<.01$], with a high degree of students finding that they were totally concentrated was associated with a feeling of being able to draw to their fullest potential. The following are some of the impressions and comments of students:

I much preferred having music playing while I was drawing. I found it easier to draw and I felt more creative (student #15).

I find there is much less frustration in drawing while listening to music (student #18).

The third observed relationship was with students' feeling relaxed in the classroom and their sense of being totally concentrated while they were drawing. This is the strongest relationship with a positive correlation between the two variables [$r=.656$, $n=23$, $p<.05$], with a high degree of students feeling relaxed associated with a students' ability to totally concentrate. A few quotations from student comments illustrate this point:

I loved listening to music while drawing. I find it expands my creativity and allows me to really get into my doodle!! Love the music! (student #32).

I really enjoyed the music, it helped my creativity (student #39).

3.2.4 *Summary of the Results of Findings for the Second Research Question*

When asked if the background sounds had interfered or promoted students' concentration levels, students in group 2 (with music) said that the music had promoted their concentration levels, while in group 1 (no music) only half of the students mentioned that it had promoted their concentration levels, therefore we can assume that there were half of the students that found that the background noise had

interfered with their concentration levels. As the operationalization of the optimal flow experience is comprised of relaxing, losing track of time, the meaningfulness of the activity and concentration levels, it is interesting to see from the above analysis some interesting results that emerged. The following are some of the comments from students regarding music in the background:

Bring back music background please (student #5).

Music is always helpful (student #31).

I like music in the background. Keep it. (student #9).

The music was great to have but it is sometimes good to have no music also. It depends on what mood I'm in. (student #23).

The music definitely increased the interaction within the group. It gave a very good ambiance and made it fun. Time passed by so quickly. (student #46).

3.3 Research Question 3

Is there a relationship between musical intelligence and levels of creativity?

The multiple intelligence scores were tabulated on a scale of 1 to 3 (1 indicating a low score of 0-7, 2 indicating a medium score of 8-15 and 3 indicating high score 16-24). The multiple intelligence tests are presented in Table 6. Out of 47 students who responded for both groups combined, 41 (87%) had musical intelligence, while 29 (61.7%) had logical intelligence and 35 (47%) had visual intelligence. However, when looking at the differences between the two groups, the data were different, as seen in Table 6.

Table 6
Multiple Intelligence Frequencies:
Musical, Logical & Visual Intelligences Between the Two Groups

	Musical Intelligence			Logical Intelligence			Visual Intelligence		
	Low	Med.	High	Low	Med.	High	Low	Med.	High
Group 1	0 0%	5 21%	19 79%	3 13%	15 63%	6 25%	10 42%	10 42%	4 17%
Group 2	0 0%	6 26%	17 74%	0 0%	10 44%	13 57%	0 0%	8 35%	15 65%

As seen in Table 6, none of the groups had low levels of musical intelligence. Students in Group 2 had no low logical or visual intelligences. Marked differences appear between the groups in the section of “high logical” and “high visual” intelligences where Group 2 clearly had greater numbers, sometimes twice (6 compared to 13) or four times as much (4 compared to 15) as in Group 1.

3.3.1 *Students with Musical Intelligence and Creativity*

In order to investigate if there was an association between creativity scores, (low, medium and high) and multiple intelligence scores (low, medium and high), a cross tabulation was computed (Table 7). We are interested in whether the pattern (the distribution across creativity levels) for group 1 is different than the pattern for group 2, and on first inspection, it does not appear to be so.

By looking at the data, we can see that for both groups, none of the students had low musical intelligence. Furthermore, both groups seem to have an association between low musical intelligence and low creativity, as only 4.2% of all of the participants had low creativity, and this only in Group 1. Therefore, at this stage, we might argue that high and medium creativity levels should be associated with high and medium musical intelligences.

Table 7
Cross Tabulation between Musical Intelligence & Creativity Scores
Group 1 & Group 2

	Group 1			
	Creativity Low	Creativity Medium	Creativity High	Total Musical Intelligence
Musical Intelligence Low	0	0	0	0
Musical Intelligence Medium	1 4.2%	1 4.2%	3 12.5%	5 20.8%
Musical Intelligence High	0 0%	12 50%	7 29.2%	19 79.2%
Total Creativity	1 4.2%	13 54.2%	10 41.7%	24 100%
	Group 2			
	Creativity Low	Creativity Medium	Creativity High	Total Musical Intelligence
Musical Intelligence Low	0	0	0	0
Musical Intelligence Medium	0	2 8.7%	4 17.4%	6 26.1%
Musical Intelligence High	0	8 34.8%	9 39.1%	17 73.9%
Total Creativity	0	10 43.5%	13 56.5%	23 100%

For Group 1 (no music) the strongest association that exists is between medium creativity and high musical intelligence (50%), while for Group 2 it is with high creativity and high musical intelligence (39.1%).

3.3.2 *Students with Logical Intelligence and Creativity*

For students who did have logical intelligence, the creativity levels were higher in Group 2 (with music) than for Group 1 (no music). It is too early to conclude anything at this point, but the creativity scores might be affected by the logical intelligence aptitudes, and we will look at this by using a statistical analysis chi-square computation. By looking at the data, both groups seem to have an

association between low logical intelligence and low creativity, as only 4.2% of the participants in Group 1 had low creativity. Therefore, at this stage, we might presume that high and medium creativity levels should be associated with high and medium logical intelligences.

Table 8
Cross Tabulation between Logical Intelligence & Creativity Scores
Group 1 & Group 2

	Group 1			
	Creativity Low	Creativity Medium	Creativity High	Total Logical Intelligence
Logical Intelligence Low	1 4.2%	6 25%	3 12.5%	10 41.7%
Logical Intelligence Medium	0	4 16.7%	6 25%	10 41.7%
Logical Intelligence High	0	3 23.1%	1 4.2%	4 16.7%
Total Creativity	1 4.2%	13 54.2%	10 41.7%	24 100%
	Group 2			
	Creativity Low	Creativity Medium	Creativity High	Total Logical Intelligence
Logical Intelligence Low	0	0	0	0
Logical Intelligence Medium	0	4 17.4%	4 17.4%	8
Logical Intelligence High	0	6 26.1%	9 39.1%	15 65.2%
Total Creativity	0	10 43.5%	13 56.5%	23 100%

For group 1 the strongest association that exists is between medium and high creativity levels and low and medium logical intelligence (25%), while for Group 2 it is with high creativity and high logical intelligence (39.1%). This can be partly explained by the fact that Group 1 students did not have strong logical intelligence, however, students in Group 2 had very high scores on logical intelligence. Our data suggests differences in creativity (25% for Group 1 and 39.1% for Group 2).

3.3.3 *Students with Visual Intelligence and Creativity*

By looking at the data, we can see that for Group 2, none of the students had low visual intelligence and low creativity scores, and this has been true for all three types of intelligences that were studied.

Table 9
Cross Tabulation between Visual Intelligence & Creativity Scores
Group 1 & Group 2

	Group 1			
	Creativity Low	Creativity Medium	Creativity High	Total Visual Intelligence
Visual Intelligence Low	1 4.2%	6 25%	3 12.5%	10 41.7%
Visual Intelligence Medium	0	4 16.7%	6 25%	10 41.7%
Visual Intelligence High	0	3 12.5%	1 4.2%	4 16.7%
Total Creativity	1 4.2%	13 54.2%	10 41.7%	24 100%
	Group 2			
	Creativity Low	Creativity Medium	Creativity High	Total Visual Intelligence
Visual Intelligence Low	0	0	0	0
Visual Intelligence Medium	0	4 17.4%	4 17.4%	8 34.8%
Visual Intelligence High	0	6 26.1%	9 39.1%	15 65.2%
Total Creativity	0	10 43.5%	13 56.5%	23 100%

For Group 1 the strongest association that exists is between medium and high creativity and medium logical intelligence (25%), while for Group 2 it is with high creativity and high logical intelligence (39.1%).

Chi square tests were conducted for all of the above associations to see whether the observed associations in tables 7, 8, and 9 had any statistical significance, but due to the fact that a large number of cells had very low expected counts the chi square tests were not relevant.

3.3.4 *Summary of the Results of Findings for the Third Research Question*

The data show that the association between high creativity scores and high multiple intelligence scores were stronger for Group 2. Interestingly, the musical, logical and visual intelligences showed similar relationships with 39.1% of the strongest association between high creativity score and high intelligence for Group 2. For Group 1, the associations were weaker and ranged from low to medium creativity. However, all of the observed associations did not have any statistical significance.

CHAPTER SIX

DISCUSSION AND CONCLUSION

The sample used in this study was from a Typography & Design course, though there were some difficulties as two students dropped out of the course, three students did not fully answer the questionnaires, leaving some answers blank. Although all students took the Multiple Intelligence test during class time, two students forgot to print out the result sheets and hand them in. Overall, the students were very responsive and seemed eager to participate in the study. The students seemed very excited by the fact that they were going to listen to music while drawing in class.

The time factor was important as group 1 (no music) had an earlier timeslot than for group 2 (with music) students. Group 2's course took place at the end of the day and students were usually very tired, as their first course started at 8:30 in the morning and they had been in class since then, with no lunch hour.

It is important to note that the admission requirements for entering the PDHT program are high school grades only with a secondary IV math prerequisite. As there are no portfolio requirements, nor interviews, the students that are coming into the program may not all be coming in with high levels of enthusiasm or ambition. We must also note that students that are coming into the program are not necessarily creative or artistic from the start, as there is no fine arts or media prerequisite.

1. DISCUSSION OF THE RESULTS

The major purpose of this study was to determine if a relationship existed between playing background music and students' creativity while they were freehand drawing, and to examine the associations between music in the background in relation to the optimal flow experience and multiple intelligences. The results of the study

suggest that playing background music promoted students' optimal flow experience in three areas - those of concentration levels, relaxation levels and having the sense of drawing to their fullest potential. However, there was no significant relationship between listening to music and its impact on creativity nor was it shown that high creativity scores were related to high multiple intelligence scores. Interestingly the data showed that the association between high creativity scores and high logical and high musical intelligence were stronger for Group 2 (with music), although these were not statistically significant. There are several possible explanations for the results found in this study.

The first research question addressed whether students could achieve higher levels of creativity while listening to meaningful music. This study has shown some interesting results. As it was found that group 2 (with music) had higher creativity scores, even though not statistically significant, than for group 1 (no music), this could be explained by stating that students in group 2 (with music) were probably more creative than students in group 1 (no music). However, we could also link this to the fact that music created an ambiance that students delved in, creating a collaborative learning space as well as a meaningful activity. Apart from bursts of sing-alongs, students were quiet in class and were on task, showing perhaps deeper concentration levels and experiencing a sense of flow as seen in the literature.

However, when looking at the overall Doodle project grade (Appendix C), we saw that the median value was higher for group 1 (no music) than for group 2 (with music). This might be explained by the technical requirements that were stipulated for the project such as composition, craftsmanship, detail, mastery, and that the creativity portion was small, only 20% of the total grade. Some of the other factors might be due to the fact that students in group 1 (no music) were less tired than students in group 2 (with music) as this class was held at the end of the day. The researcher found that group 1 (no music) students were academically stronger than group 2 (with

music) students and were more motivated and task-driven. However, their creative ability was weaker.

The second research question addressed whether students would be moved by the music, and perhaps even experience a state of flow, while listening to background music and drawing. As we have seen in the literature, the operationalization of the optimal flow experience is comprised of relaxing, losing track of time, the meaningfulness of the activity and high concentration levels Csikszentmihalyi (1991, 1997, 1999).

By looking at the relationships in this study, we saw that the concentration levels of students in group 2 (with music) were linked with their ability to relax and that they felt that they were able to draw to their fullest potential. The researcher believes that this is important and this is where there might be a link between music playing in the background with the optimal state of flow. This might suggest that students had a sense of self-esteem, of accomplishment as seen in the constructivist theories (Vygotsky, 1978) and seen in Cheong-Clinch's (2009) sense of engaging young students with music. Further research is clearly needed to investigate these relationships.

As students' meaningful music preferences were played in the classroom while students were drawing there was a very wide range of musical genres, 18 in total, and these genres probably affected, positively or negatively, some of the students as some musical genres were at the opposite end of the spectrum... ranging from rock to reggae to folk music. The possible effects of uncontrolled variables on the results need to be discussed here as the background noises for group 1 (no music) could perhaps have also hindered students' concentration levels and their ability to reach an optimal flow experience. As there was no background music playing, the sounds or noises from students' talking in class, coughing, shuffling of chairs could have enhanced students' inability to concentrate. The researcher observed that

students were fidgeting much more in group 1 (no music) than in group 2 (with music). For group 2, as music was playing in the background, the ambient noises were not heard as much as in the other group, therefore did not distract students. They seemed to focus on the music and their drawing instead of focusing on the background noises.

The third research question that was addressed aimed to see if a relationship existed between musical intelligence and levels of creativity. It was found that high and medium creativity levels were associated with high and medium musical intelligences as none of the students (in both groups) had low musical intelligence and no students in group 2 (with music) had low creativity scores and only 4.2% of students in group 1 (no music) had low creativity scores. It was also found that high and medium logical and spatial intelligences were associated with high and medium creativity scores and group 2 (with music) had very high incidences of high logical and high spatial intelligences. Could this be the reason why the students in group 2 (with music) had higher creativity scores?

2. LIMITATIONS OF THE STUDY

A random assignment of study participants in the two groups was not possible for this quasi-experimental research study and the researcher picked from a hat which group would listen to music playing in the background while the other group did not. Therefore, the results of this study cannot be generalized as they only apply to the course in Typography & Design.

In interpreting the results of this study several limitations must be acknowledged and addressed. Firstly, the data came from a very small sample of students (n=47) and the results cannot be generalized since the sample was a convenience sample. The results are only appropriate for the Typography & Design course in the PDHT program. Ideally the participants should have been exposed to

the background music for a longer period of time to assess its effectiveness more accurately. Also, when students chose their meaningful music, some students chose very different styles of music and this might have affected the results also as some of the music seemed to clash with some of the students' musical tastes as there were sometimes remarks in class showing a distaste for a particular type of music. However, the researcher believes that by playing the students' most meaningful songs, the positive effects outweighed the negative effects.

As creativity has many facets, by testing creativity the research was limited because the efforts to assess creativity have been limited largely to the artistic-thinking view of creativity. Little attention has been given to the assessment of creativity that goes beyond the rational nor towards the scientific forms of creativity. The creativity construct in this paper was created for artistic evaluations, and none other.

3 RECOMMENDATIONS FOR FUTURE STUDIES

The researcher recommends that further studies be done on the possible associations between music, drawing and creativity. Further to that, as it was difficult to measure students' creativity in such a short time frame, with only one project it would be ideal to lengthen the timeframe for future studies. Further investigation could be carried out throughout the length of the entire PDHT program, over the six semesters and through several creative projects. This research study could also be carried out within any type of artistic program at CEGEP level, and also at the secondary level or university level. The researcher further recommends that a random assignment into two groups if possible be done, and that an appropriate classroom, with big tables be used for the drawing activity as opposed to individual drawing tables so that students get their inspiration by being able to look at other students' work, and that an adequate sound system be installed. The researcher suggests that the instructor might limit the type of musical genres that students choose from so that

the musical playlists flow seamlessly from one musical genre to the next. Also, if possible, that a software such as *Audacity* be used that would permit the instructor to cut very long pieces of musical pieces or even merge some very short musical pieces together. It is also important that each student hears at least one of their musical pieces, so by asking students to choose 3 or their most meaningful songs is adequate. It is also to be noted that the researcher believes that some funding to pay for the musical pieces is required if further research on a grander scale were to be done.

For future research, it would be recommended to use a qualitative approach employing in-depth interviews to really understand how music interacts with students' sense of flow as well as students' creativity. Because of the students' age group in this study, it was deemed inappropriate to ask students to come in after their course was completed to undertake in-depth interviews.

Nowhere is it written that the sole purpose of music is to enhance the creative process, but there are a few existing links that should be pursued indicating that further studies are needed to understand students' relationship with music and creativity.

The results of the study indicate that the use of music as a tool for engaging students in a creative music-facilitated learning environment was effective but that because of lack of funding and time, further research would be needed in another field of study.

4. CONCLUDING REMARKS

The overall results show that there was no statistically significant relationship between listening to music and its impact on creativity when students were drawing in a classroom. The students who had music in the background did however show more creative ability. For the optimal sense of flow, moderately strong associations

were seen between students in Group 2 (with music) finding that their ability to draw to their full potential was associated with a high degree of relaxation in the classroom. However, no such association could be argued for Group 1 (no music). To be noted that 83% of students in Group 2 (with music) felt that the background sounds had helped in promoting their concentration levels while 67% of students in group 1 (no music) said that the background sounds had inhibited their concentration levels. Given the research design, quasi experimental, and that no random assignment was possible, other factors besides the presence of music in the background could have resulted in these associations. Group 2 students may, for various reasons, have had more of the “creative” ability.

The results of this study should help to determine how to revise future Typography & Design courses in the PDHT program at CEGEP John Abbott College in order to improve students’ creativity in the course. As Craig (2007) claimed, students should be moved by the music in order for them to attain a meaningful experience, and Csiksentmihalyi’s (1991) state of flow as he explains that activities should be profoundly meaningful and fulfilling for the individual, the results of this study show that playing music in the background helped students reach their full potential in their drawing activity, helped their concentration levels and made them relax in the classroom. Since no significant results were found in the Multiple Intelligence tests, there is no necessity to include any type of tests to assess these. The research results pointed to good evidence in answering the research hypothesis and points out that further research is needed to study the external validity of the results, and test it on different types of population, such as education.

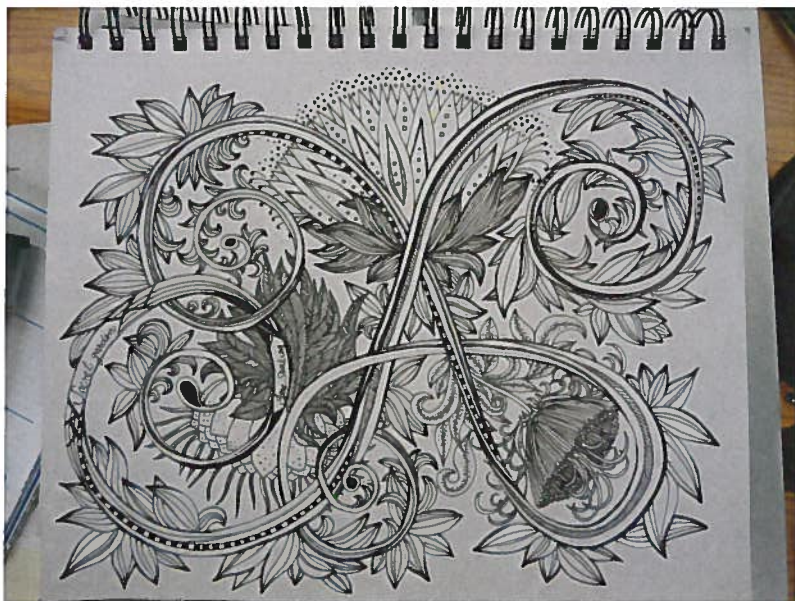
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APPENDIX A:
Samples of Students' Artwork

Samples of Students' Artwork



APPENDIX B:
Doodle Rubric for Assessing Creativity

DOODLE DRAWING PROJECT FOR CREATIVITY CRITERIA		Scale
November 15, 2010	Student's Number:	1 2 3 4 5
<p>Uniqueness / Originality Uniqueness, individuality in interpreting the work required. The students' creative voice can be heard. The artwork and idea is unique, has never been seen before and avoids the expected. Creative experiments are polished to a professional level (or abandoned).</p>		_____/4
<p>Divergent Thinking There is evidence of divergent thinking and a willingness to take risks – challenges oneself and is willing to experiment with ideas. Student produces work that is thought provoking.</p>		_____/1 or 0
<p>Problem solving for aesthetic values There is evidence of problem solving solutions in order to balance the composition and to arrive to a finished product. The organization, arrangement and combination of objects within the borders of the layout are aesthetically pleasing to the eye, drawing the viewer towards the center of interest. The rules of focal point, overlapping, negative and positive space, balance, contrast and proportion have been respected. Student produces work that is aesthetically pleasing.</p>		_____/5
Overall Evaluation KEY:		
5 = Exceeds expectations (imaginative, creative, thoughtful use of techniques and styles. Student is working to the best of his/her ability. Student pushes him/herself to learn new techniques and integrate new information into his/her sense of art.		5
4 = Meets expectations (integrated, thoughtful, thorough use of the techniques, artwork). Student is working to the best of his/her ability.		4
3 = Adequate (the tasks requested have been done, lack of thoroughness, lack of creativity, lack of work consistency, artwork lifted from another persons idea, not original. Student is not working to the best of his/her ability.		3
2 = Inadequate (elementary grasp of elements, simple or unfinished, does not satisfy client's requests, design is confusing and difficult to grasp, unprofessional, childish, lack of effort does not seem familiar with the techniques being studied).		2
1 = Minimal, incorrect, or no grasp of basic elements... disconnected or fragmented. Student does not seem familiar with course content. Incomplete.		1

APPENDIX C:
Doodle Rubric

DOODLING PROJECT Student's Name:	Excellent 10	Good 8-9	Average 7	Needs Improvement 5-6	Inadequate 1-4	None
Mastery Student has produced a line-stroke quality that is seen in its regularity and lines are uniform (slowly done). Every line is drawn deliberately, has a clean beginning and a clean end. There are no lumps, no smudges, no tick marks left by the pen as it goes back to produce the next stroke. Where the lines are meant to be parallel, they are parallel. Where meant to be curved, they are all curved with regularity.						
Composition The composition is well balanced.						
Craftmanship The medium that is used is of sufficient quality and the work is free of creases, smudges. Is neat and clean.						
Detail/Effort Took time to develop idea and complete project. The lines are tightly woven, intricate detail. Patterns are unique and do not repeat themselves. Shows a pleasing flow in the art techniques of controlled line, balanced composition, grade value of dark to light. The amount of detail in the artwork is exceptional and merges with the overall theme of the artwork and gives life to the artwork.						
CREATIVITY	Excellent 5	Good 4	Average 3	Needs Improvement 2	Inadequate 1	None
Problem solving for aesthetic values :: total 5 marks There is evidence of problem solving solutions in order to balance the composition and to arrive to a finished product. The organization, arrangement and combination of objects within the borders of the layout are aesthetically pleasing to the eye, drawing the viewer towards the center of interest. The rules of focal point, overlapping, negative and positive space, balance, contrast and proportion have been respected. Student produces work that is aesthetically pleasing.						
Uniqueness :: total 4 marks Uniqueness, individuality in interpreting the work required. The students' creative voice can be heard. The artwork and idea is unique, has never been seen before and avoids the expected. Creative experiments are polished to a professional level (or abandoned).						
Divergent Thinking :: 1 or 0 There is evidence of divergent thinking and a willingness to take risks – challenges oneself and is willing to experiment with ideas. Student produces work that is thought provoking.						
Deadline Requirements • Deadline respected (-10%/day late)						
Ink • Has been done in ink, not in pencil <input type="checkbox"/> Yes <input type="checkbox"/> No _____/10						
Layout • The drawing respects the minimum requirements of the page (36 sq. in.). <input type="checkbox"/> Yes <input type="checkbox"/> No _____/5						
Title • Title is present <input type="checkbox"/> Yes <input type="checkbox"/> No _____/5						
Signature • Signature is present <input type="checkbox"/> Yes <input type="checkbox"/> No _____/5						
TOTAL _____/75						

APPENDIX D:
Multiple Intelligences Birmingham Grid For Learning


Multiple Intelligences Birmingham Grid For Learning

Section 1: Tell us a little bit about yourself What are Multiple Intelligences? | Take a Test | Results | Note

Are you male or female? Male Female

What is your age? 11 or under 12 - 14 15 - 16 17 - 18 19 or over

Where do you live?



Section 2 - Multiple Intelligences

Now answer these questions by clicking on the box that you most agree with. There are 40 questions. You will need to answer every question before you click the 'Finish' button.

	This is not like me at all	I am very rarely like this	This is a bit like me	This is sometimes like me	I am like this more often than not	I am always like this
I remember things like telephone numbers by repeating them to a rhythm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am sensitive to the moods and feelings of others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to think through problems while I walk or run.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pollution makes me angry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy working on my own.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a good sense of balance and like to move around a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy making music.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can take things apart and put them back together easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it easy to explain to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I know myself well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Next](#) [Top](#)


Section 4 - Multiple Intelligences What are Multiple Intelligences? | Take a Test | Results | Notes


Now answer these questions by clicking on the box that you most agree with. There are 40 questions. You will need to answer every question before you click the 'Finish' button.

	This is not like me at all	I am very rarely like this	This is a bit like me	This is sometimes like me	I am like this more often than not	I am always like this
I can link things together and pick out patterns easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can remember pieces of music easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My mood changes when I listen to music.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to think out loud.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am an independent thinker. I know my own mind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can pick out different instruments when I listen to a piece of music.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to use charts and diagrams in my learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always do things one-step at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get restless easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to make lists.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Section 3 - Multiple Intelligences What are Multiple Intelligences? | Take a Test | Results | Notes

Now answer these questions by clicking on the box that you most agree with. There are 40 questions. You will need to answer every question before you click the 'Finish' button.

	This is not like me at all	I am very rarely like this	This is a bit like me	This is sometimes like me	I am like this more often than not	I am always like this
I am interested in why people do the things they do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I need to see something in it for me before I want to learn something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to work with my hands.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy logic problems and puzzles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am good at mathematical problems and using numbers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy social events like parties.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a good sense of direction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like working and thinking on my own and quietly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can picture scenes in my head when I remember things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I learn best when I have to get up and do it for myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Next](#) [Top](#)

Section 5 - Multiple Intelligences What are Multiple Intelligences? | Take a Test | Results | Notes

Now answer these questions by clicking on the box that you most agree with. There are 40 questions. You will need to answer every question before you click the 'Finish' button.

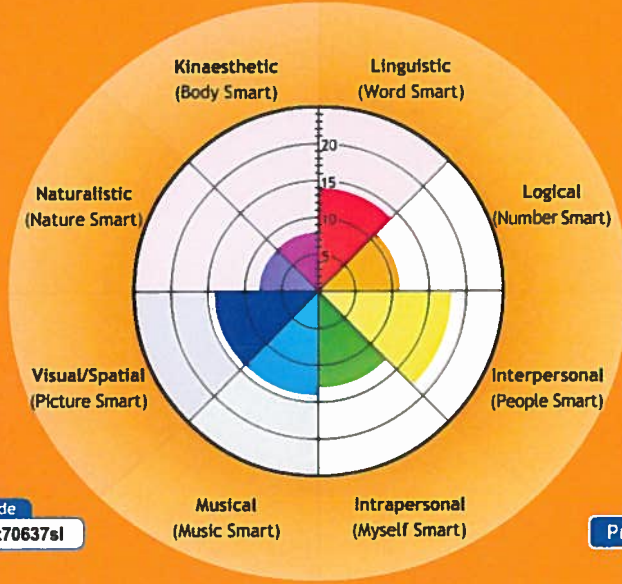
	This is not like me at all	I am very rarely like this	This is a bit like me	This is sometimes like me	I am like this more often than not	I am always like this
I like to work with a team.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can recognise and name different types of birds, trees and plants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am observant. I often see things that others miss.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I learn well from listening to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I keep or like pets.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can sort out arguments between friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy games involving other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can use lots of different words to express myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy writing things down.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy being outdoors when I learn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Finish](#) [Top](#)

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Your Results

Your answers have been saved using the secret code: ws35mjx70637sl.
To see this chart again, type your secret code into the Results page.



Code
ws35mjx70637sl

Print

APPENDIX E:
Meaningful Music Questionnaire

Meaningful Music Questionnaire

This survey is ANONYMOUS and CONFIDENTIAL. Personal data (e.g. gender, age, mother tongue, etc.) will serve to provide an overview of our PDHT student body and to identify trends. Please complete all questions and provide only one answer per question, unless otherwise specified.

Instructions:

The questionnaire consists of 1 continuous web page or 1 paper copy printed back-to-back. It should take you about 5 minutes for you to complete.

For the multi-response items, choose only one response unless the item indicates otherwise. Feel free to answer "Undecided/Do Not Know" to questions that you do not feel knowledgeable about. As you answer the questions in this survey, you may think of comments you wish to make. Your comments are a very important part of this survey and you will find opportunities to make comments at the end of the questionnaire.

VERY IMPORTANT

At the end of the questionnaire, don't forget to click on the "Submit" button to confirm your answers.

If you have decided to use a hard copy to answer the questionnaire, please put it in the brown envelope that is lying on the big table in the middle of the room.

Thank you for taking the time to complete this questionnaire!

1. In which *Typography & Design* class (or group) do you belong to? *

Group 01 early class (12:30 to 14:30)

Group 02 later class (14:30 to 16:30)

2. Gender *

Male

Female

3. Age *

17 years or younger 22-23 years old

18-19 years old 24 years old and older

20-21 years old

4. Mother Tongue *

English Other: _____

French

5. Your Student Number: # _____

6. What type of music do you usually listen to in your free time? (choose one).

- a) Popular music
- b) Blues or Jazz
- c) Classical (e.g. Mozart)
- d) Rap
- e) Hip Hop
- f) Oldies
- g) Rock
- h) Heavy Metal
- i) World music (from other countries)
- j) Reggae
- k) Other:

-
- l) I do not listen to music very often
 - m) I never listen to music.

7. Do you like classical music?

- a) Yes
- b) No
- c) Do Not Know.

8. Do you like World music?

- a) Yes
- b) No
- c) Do Not Know.

9. Please circle the answer that best describes how you like it to be when you are drawing?

- a) I like to be alone with absolutely NO music, talking, or other background noise.
- b) I like it when there is some very quiet music, talking, or other background noise.
- c) I like it when people are around, and some people are talking in normal voices.
- d) I like to read with the TV on, radio on, or when there are a lot of people around.

10. On a scale of 1 — 4, with 1 meaning greatly disliked and 4 meaning greatly liked, please put an X for the following question. How you feel about hearing music playing in the background while you are drawing?

	1. Strongly Dislike	2. Dislike	3. Like	4. Strongly Like	5. Do Not Know
1. How do you feel about hearing music playing in the background while you are drawing?					

11. If you could listen to any type of music while you were drawing, what type of music would you listen to?

- a) Popular music
- b) Blues or Jazz
- c) Classical (e.g. Mozart)
- d) Rap
- e) Hip Hop
- f) Oldies
- g) Rock
- h) Heavy Metal
- i) World music (from other countries)
- j) Reggae
- k) Other:

-
- l) I do not listen to music very often
 - m) I never listen to music.

12. Circle the letters of any statements you agree with (you can checkmark more than one box):

- a) Music helps me relax;
- b) I like listening to music;
- c) Music makes me happy;
- d) Music makes it hard to concentrate.
- e) Other.

13. Please give me the names of your three (3) most meaningful musical pieces (songs, instrumental pieces, etc.) *Please refrain from giving any music that has any form of violence in it.* Could you write down the following information:

- a) The title of the musical pieces x 3;
- b) The name of the band/songwriter/musician;
- c) Album Name
- d) Genre (hip hop, classical, reggae, blues, etc.)
- e) The approximate year that the musical piece was composed;

a. **Song #1**

Musical Piece Title: _____

Band/Songwriter Name: _____

Album Name: _____

Genre: _____

Approximate Year that musical piece was composed: _____

b. **Song #2**

Musical Piece Title: _____

Band/Songwriter Name: _____

Album Name: _____

Genre: _____

Approximate Year that musical piece was composed: _____

c. **Song #3**

Musical Piece Title: _____

Band/Songwriter Name: _____

Album Name: _____

Genre: _____

Approximate Year that musical piece was composed: _____*

This questionnaire was inspired by Drowns, M. R. (2002). The Effects of Classical Background Music on Fourth-Grade Silent Reading Comprehension

APPENDIX F:
Overall Meaningfulness of the Drawing Activity

Questionnaire on the *Overall Meaningfulness of the Drawing Activity*

This survey is ANONYMOUS and CONFIDENTIAL. Personal data (e.g. gender, age, mother tongue, etc.) will serve to provide an overview of our PDHT student body and to identify trends. Please complete all questions and provide only one answer per question, unless otherwise specified.

Instructions:

The questionnaire consists of 1 continuous web page or 1 paper copy printed back-to-back. It should take you about 5 minutes for you to complete.

For the multi-response items, choose only one response unless the item indicates otherwise. Feel free to answer "Undecided/Do Not Know" to questions that you do not feel knowledgeable about. As you answer the questions in this survey, you may think of comments you wish to make. Your comments are a very important part of this survey and you will find opportunities to make comments at the end of the questionnaire.

VERY IMPORTANT

At the end of the questionnaire, don't forget to click on the "Submit" button to confirm your answers.

If you have decided to use a hard copy to answer the questionnaire, please put it in the brown envelope that is lying on the big table in the middle of the room.

Thank you for taking the time to complete this questionnaire!

1. In which *Typography & Design* class (or group) do you belong to? *

Group 01 early class (12:30 to 14:30)

Group 02 later class (14:30 to 16:30)

2. Gender *

Male

Female

3. Age *

17 years or younger 22-23 years old

18-19 years old 24 years old and older

20-21 years old

4. Mother Tongue *

English Other: _____

French

5. Your Student Number: # _____

Circle the number that corresponds to the answer you agree with. Please answer as honestly as possible. You can only choose one answer per question.

	1. Strongly Disagree	2. Disagree	3. Agree	4. Strongly Agree	5. Undecided/ Do Not Know
6. I was able to draw to my fullest potential in the <i>Typography & Design</i> classroom					
7. I felt relaxed in the classroom while I was drawing					
8. I was able to concentrate in the classroom while I was drawing					
9. I found the current classroom atmosphere ideal for drawing					
10. The background sounds in the classroom inhibited my concentration					
11. The background sounds in the classroom promoted my concentration abilities					
12. The drawing activity was very meaningful to me					
13. I lost track of time while I was drawing					

14. I felt totally concentrated while I was drawing					
	1. Strongly Dislike	2. Dislike	3. Like	4. Strongly Like	5. Undecided/ Do Not Know
15. Do you like hearing music playing in the background while drawing?					
16. If you have any comments or suggestions, please feel free to mention them in the right-hand space.					

Source: Sigman, B. S. (2005). Using Background Music in the Classroom to Effectively Enhance Concentration Within the Learning Environment

APPENDIX G:
Consent Letter to Parents/Guardians

August 23, 2011

Mrs. Jane Hannah,
Rigaud, Québec, Canada

To Whom It May Concern,

My name is Jane Hannah and I am the *Typography & Design* teacher in the *Publication Design & Hypermedia Technology Program* at CEGEP John Abbott College. I am currently working on completing my Master's Degree in CEGEP Education at Sherbrooke University.

Part of the assigned curriculum requires me to complete a research study to write an experimental thesis. I am requesting your permission to participate in this study, or for the parent/guardian's permission to let your son/daughter participate, as he/she has not reached the age of 18 years old.

The research will focus on the use of background music in the classroom and its impact on creativity. The students will be completing three surveys based upon their interpretation of the *Overall Meaningfulness of the Drawing Activity* while listening to background music. If you agree to participate in this study, or allow your son/daughter to participate, please sign below and return this letter to me in the shortest delay possible. If you are 18 years and older, please put this paper back in the assigned envelope in the classroom. Thank you for your cooperation.

Sincerely,



Jane Hannah, teacher & researcher

- I, the student, AGREES to participate in this research study.
 I, the student, DOES NOT AGREE to participate in this research study.

STUDENT SECTION

Student Number: _____

Date: _____ Student Signature: _____
 (Year/Month/Day)

PARENT/GUARDIAN SECTION

A parent/guardian's signature is needed if the student is younger than 18 years old.

Date: _____ Parent/Guardian Signature: _____
 (Year/Month/Day)

Project Title: The Role of Music in Capturing Creativity

Researcher:	Jane Hannah	Tel: 514-457-6610 x5930
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Research Questions (if applicable):

- Main Question: How does listening to music, while ‘freehand’ drawing, impact students’ creativity in a first-year *Typography & Design* course at Cegep level in the province of Quebec?
- Sub-Question #1: Is there a relationship between achieving higher levels of creativity in students’ work if students were to listen to meaningful music while drawing?
- Sub-Question #2: Will students who listen to music, while freehand drawing in class, be moved by the music, and even perhaps experience a state of flow?
- Sub-Question #3: Is there a relationship between musical intelligence and levels of creativity?

Purpose of the research:

Brief explanation taken from your research proposal.

“It is not the hearing (of music) that improves life, it is the listening” wrote Mihaly Csikszentmihalyi in 1990. This paper will attempt to show whether by introducing music in the classroom, activities such as freehand drawing may be enhanced by triggering an increase in creativity levels and perhaps contribute to a state of flow.

The author has observed throughout the years that when music is present in the classroom, combined with specific activities such as freehand drawing, creativity levels seem to increase and may even contribute to a certain state of flow.

“Music, an Invitation for Creativity” will be explored to see whether there is a correlation between creativity and listening to meaningful music. The primary intention of this study is to investigate the role that meaningful music has on creativity, as such the hypothesis is that the act of bestowing background music into the classroom enhances students’ motivation levels, diminishes stress levels and increases students’ creativity.

What is involved in participating?

Brief explanation of what is involved in participating.

- Answer a hard-copy questionnaire on participants' "Meaningful Music" and there will be questions on how the participants relate to music playing in the background while they are studying. Should take approximately 30 minutes.
- During the freehand Doodle Project drawing in the classroom, participants will be listening to a compilation of musical pieces that were taken from the first questionnaire and chosen by the teacher/researcher. This will span over a period of two courses. There will be 20 marks out of 100 marks that will be allocated to creativity for the research purposes.
- Answer an online survey on the Overall Meaningfulness of the Drawing Activity. Will take 15 minutes.
- Take an online Multiple Intelligence Test on the web. Will take 15 minutes.

There will be no way for anyone reading the results of this study to be able to link any data with your name or student number. PSEUDONYMS WILL ALWAYS BE USED in any publications that may result from this study, as well as in the stored data. If you withdraw from participation as a participant at a later date, all data of any kind will be erased and/or destroyed.

Participation, or lack of participation in this research will NOT affect your grades in any way. Your participation is entirely voluntary and you may choose to withdraw at anytime.

Confidentiality means that no person at John Abbott College, or any other organization will have access to the materials collected and that they will be coded and stored in such a way as to make it impossible to identify them directly with any individual. All names will be changed in the stored data and resulting publications. Data will be stored on a password secured hard drive, and will be destroyed after 5 years. All other type of information (audio-tapes, cd's, paper copies) will be stored in a locked filing cabinet and will be erased and/or destroyed after 5 years.