Creativity and Arts Education

In Primary School Children From Socioeconomically Disadvantaged Backgrounds

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Master Thesis Art and Cultural Sciences
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Preface

In my own prior - and somewhat more naïve - experiences as an art educator, I always took for granted that creativity was naturally developed through the act of making, at least for those who enjoyed the challenge of doing so. Especially in my work with underprivileged children, I have come to see how important art education can be in providing a constructive vehicle through which children could channel and develop their creative energies, thus advancing their personal development.

During the course of my university studies however, I have come to realize that developing creativity is much more important and complex than this. My fascination with the possibility of proving that creativity can in fact be linked with arts education is born of my heartfelt conviction (however unscientific or instinctive this may be) that this link undeniably exists. As a Masters student of Art and Cultural Sciences, my responsibility to pursue this line of thinking through scientific research seemed unavoidable. It is in this spirit that this Master's thesis took form.

I sincerely hope that the findings of this research are able to make a valuable scientific contribution to the fields of creativity and arts education and give encouragement to the many passionate pursuers of knowledge not only in these areas but in all fields of arts and cultural sciences.

I would like to give thanks to those who made this research possible, including the Kinderatelier Punt 5 Foundation, which graciously allowed me full access in order to research its arts education program. Also, my eternal thanks to my thesis coach, J. van den Dool, who's gentle but persistent guidance gave me the confidence to persevere even in the face of uncertainty.

Finally, I dedicate this Master Thesis to my son Aiden, who was born as I started on this journey of knowledge and has been (remains) my inspiration every step of the way.

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Executive Summary

In legitimacy discourse on arts education, researchers have been hard pressed to deliver empirical evidence on the cognitive benefits of arts education. Research on arts education and cognitive skills such as those used for mathematics and language have been unable to provide convincing evidence. However, previous research on arts education and the cognitive skill known as creativity – now believed to be akin to divergent thinking – is sparse and for the most part inconclusive. This research focuses on the question of whether visual arts education can be shown to increase levels of creativity in primary school children from low socioeconomic backgrounds.

The research used a multi-method approach. The operationalization of creativity was based on its definition as a cognitive skill but took two different perspectives: one of creativity as a product and the other of creativity as a process. The methods used to research the problem were quantitative research in the form of standardized creativity testing, combined with qualitative research in the form of ethnographical participatory observation and a semi-structured interview. The use of these different methodologies contributes to scientific validity.

Findings show a positive correlation between the visual arts program at the center of this research and the advancement of the cognitive skill creativity. However, quantitative results left some questions on validity and reliability. Also, although results of qualitative research were able to account for some of these questions, the difference in operationalization made complete alignment (and therefore absolute substantiation) of the findings between the three research methods difficult. Creativity did prove to be more scientifically sound when examined in the context of the creative process. Quantitative testing could serve as a useful supplement in this case. In addition, qualitative research led to numerous discussion points and recommendation for future research.

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Part I: Research problem and question

1.1 Introduction

The field of arts education has spent a large amount of time and resources over the years trying to provide hard scientific evidence for the various benefits of arts education. In more recent years, a number of studies have been done that attempt to show that arts education can directly influence other areas of education through traditional definitions of cognitive transfer. Unfortunately these studies all fall short of providing convincing empirical evidence that arts education can – as a rule – be correlated with higher academic performances or levels (Hetland and Winner, 2000). While this may seem disheartening, these studies only show that the improvement of cognitive abilities such as those associated with i.e. languages or mathematics cannot conclusively be linked to the practices of arts education, and do not include the other benefits that are associated with learning about the arts, such as the engagement and possible advancement of creativity.

One of the biggest problems traditionally associated with legitimacy discussions of creativity within the (arts) education system has been the difficult definition of the concept creativity. In common vernacular, it is most often spoken of in terms of the artistic process, and as such has traditionally been considered a peripheral benefit of arts education programs, not formally included in curriculum or pupil assessment. However, research in the scientific field of creativity over the last half century has shown that creativity, like mathematical and language intelligence, is in fact also a form of cognitive intelligence, and can be thought of as a cognitive skill similar to divergent thinking (Guilford, 1958; Wallachs & Kogan, 1965). Divergent thinking is a cognitive skill or activity generally understood to be the thought process responsible for the ability for an individual to generate a wide variety of diverse ideas when confronted with an open-ended problem.   This premise has led to a number of theories that facilitate the operationalization of the concept creativity for the purpose of research. Two of these theories will be used as the backbone for this research. The first of these defines creativity from a more scientifically objective standpoint and deals largely with creativity as the result of a performance, or as a *product*, which can be quantified according

to the presence of certain divergent thinking indicators (Torrance, 1962; Torrance, Ball & Safter, 2008). The second of these theories also defines creativity as a form of divergent thinking, but defines creativity as a *process* which is susceptible to external as well as internal factors (Runco and Chand, 1995: Runco, 2003).

Farther outside the realm of arts education, policy makers on both governmental and general educational levels have begun to turn their attentions in recent years to the need for creative individuals in the post-industrial information society. As a result, a myriad of reports have been published on reasons why creativity is so important and calling for educational reforms in Western Europe to structurally include creativity into the curriculum (Hartley, 2003; KEA European Affairs, 2009; Sharp, 2004; Shaheen, 2010). Yet empirical research on the subject remains limited, and structural inclusion of creativity into Western European (including Dutch) curriculum or official learning goals has yet to be achieved (Greven & Letschert, 2006) . However, some more practical studies of creativity within the educational forum do exist. For example, certain studies show that creativity is at its natural peak during the early years of education (Craft, 2003; Runco, 2003), and suggest it can be capitalized on and effectively developed during these early years through arts education (Murdock, 2003). In addition, there are studies that show that students from disadvantaged socioeconomic backgrounds, who tend to do more poorly in current curricula (APA, n.d.; Jol, 2010) exhibit slightly higher creativity levels than those coming from more advantaged backgrounds (Torrance, 1968; 1973; Rogers, 1968, Koultsanis, 1974), giving them in edge if creative subjects such as arts education carried more weight in the curriculum. Such studies show the beneifical role creativity can hold for education in general.

If creativity is commonly held to be an inherent part of the artistic process, and has been traditionally linked to arts education, *and* if creativity can be considered a cognitive skill and a valuable asset that is acknowledged by educational policy makers but as of yet not fully integrated into school curricula, it would seem of reasonable importance to pursue a line of research which further explores the link between visual arts education and creativity development. When considering the links already established between creativity and primary education, and creativity and disadvantaged students, it would become even more interesting to combine the exploration of creativity and visual arts education within the domains of these target groups. With this in mind, this research will address the question

whether ***creativity can be advanced through visual arts education in primary school children coming from socio-economically disadvantaged backgrounds.***

1.2. Thesis Structure

This research is divided into four main sections. The first section is primarily concerned with laying down the groundwork for the thesis: the nature of the research question, the motivation behind the choice of research question and the societal and scientific implications of this research. The second section contains the theoretical background upon which the research is based: the main theories that define creativity, a notoriously complex term, in ways that can be clearly operationalized for use in the research methodology. In addition, supportive theories surrounding creativity and primary (visual arts) education, and creativity and disadvantaged children will be discussed. The third section contains the research and methodology, consisting of an explanation of the research methods chosen and of the research group (background and participants). Section four contains the research data: analysis and results. Finally, section four contains the final conclusion, in other words, the conclusive answer to the research question, plus any discussion points that may have evolved from this research and which can possibly be used for future research or grounded theory. In addition, appendixes and references will be included at the end of the main body of the research.

1.3 Societal and Scientific Implications

Before beginning with the theoretical background it is important to consider the implications of this study for society at large and the scientific community in specific. There are a number of ways a research on whether creativity can be developed in primary school aged children from lower socioeconomic backgrounds would be contributory. Proof that creativity is a cognitive skill that can effectively be increased through arts educations programs would be useful to current discourse on the societal benefits of creativity among government policy makers. A surge of interest in creativity among Western policy makers is evident in the volume of reports published on the subject over the past decade. Individual features linked with creativity and divergent thinking, such as spontaneity, intuition, and imagination are being hailed as new social and economic values such as new vision, differentiation,

intangible/symbolic structure and community values. This translates into the view that creativity is directly linked to a better performing economy, and necessary to modern industry, which includes not just manufacturing but also marketing research, branding, ever-increasing technological advancements, and a high degree of service-based industry (KEA European Affairs, 2009). Today's post-industrial economy needs creative individuals to help maintain a workforce that is no longer limited to manufacturing and servicing a product but also needs to be capable of providing the best (technological) solutions and meeting ever-increasing client demands . In addition, creativity is crucial to being able to compete on the global playing field, and with rising economies from non-Western countries (Burnard, 2006; KEA European Affairs, 2009; Shaheen, 2010; Sharp & Le Métais, 2000) such as China, India and Brazil, In short, these studies report that creative individuals in society lead to a superior workforce, which in turn ensures a thriving and competitive economy.

While current government policy discussions on creativity seem to be focused more on the long term societal benefits of creativity in terms of the economy, more practical repercussions of a research linking creativity development to arts education such as this one would be to the curricula and learning goals of the educational system. Although educational policy trends are always shifting, creativity has traditionally been neglected in western educational policy and pupil assessment, except as a peripheral benefit, for example as part of personal development goals in non-academic subjects such as the visual arts (Craft, 2003; Lanier, 1955; Lieftink & Wervers, 2008;).   The current interest in creativity as an important benefit to societal goals has led to renewed discussions within the western educational forum on its role as an important component of the educational process (Burnard, 2006; Ferrari, Cachia, & Punie, 2009; Shaheen, 2010), and educational policy makers are reintroducing creativity into curriculum and pedagogical discourse with the goal of preparing students for a competitive and individualized society where skills such as innovation, problem solving and flexibility are increasingly valued (Craft, 2003; Sharp & Le Métais, 2000). Indeed, given the role of education in the development and cultivation of the skills and talents of students in order to prepare them to be able to perform more successfully in society as adults, and creativity's new-found value in modern society, it seems only logical that policy makers and educators alike across the globe are looking for scientific evidence that could help legitimize creativity's position in the educational setting (for

example, including it into concrete learning goals) and in ways in which this position can be advanced, such as through arts education.

Several recent government-commissioned studies done in arts education also show a consensus throughout most of Europe and North America (including The Netherlands) on the importance of creativity in today's society and the essential part that arts education plays in the development of creativity (Education, Audiovisual and Culture Executive Agency, 2009; Ferrari, Cachia, & Punie, 2009; Sharp & Le Métais, 2000; Sharp, 2004). While creativity and arts education are implicitly linked to one another, the lack of research that can prove this stands in the way of arts education being considered on the same par with other subjects such as mathematics and language. Evidence of creativity as a cognitive skill that could be developed through arts education such as the visual arts would assist in the legitimzation of arts education within educational policy.

When considering implications of showing the advancement of creativity through (arts) education, there are farther-reaching affects that could come into play. Educational policy all over Europe agrees that developing creativity in children is important (EACEA, 2009). Creative abilities are thought to be at their peak during early years of education (Craft, 2003; Runco, 2003) and as such would be more likely to be advanced through (arts) education program during these more formative years, when, according to research, aesthetic abilities are also at higher levels (Gardner & Winner, as cited in Haanstra, et al., 2009; Rosenblatt & Winner, 1988;). Research suggests, but as of yet does not prove, that arts education is helpful to developing creativity in younger students (Murdock, 2006; Sharp, 2004). Yet another very important consequence of proving that arts education elevates creativity has to do with the opportunities this could offer to socioeconomically disadvantaged students. Since current pupil assessment does not currently include creativity, many students who are potentially creative go unnoticed. This is especially the case for children from lower socioeconomic backgrounds, whose academic performances and levels are otherwise markedly lower than those of their more advantaged counterparts (APA, n.d.; Jol, 2010). Some studies indicate students from disadvantaged socioeconomic backgrounds tend to exhibit slightly higher creativity levels than those coming from more advantaged backgrounds (Koultsanis, 1974; Rogers, 1868; Torrance, 1968; 1973). If creativity were to become a standard component of the curricula (i.e. through arts education) and of pupil

assessment, the implication for these students could be more than significant. The ability to be recognized for creative achievement in school could drastically improve the opportunities for these students to become more successful members in society later on in life.

Considering the above mentioned societal benefits and importance of creativity as a skill that is a contributing factor both to a more competitive economy and to a better- serving, more well-rounded educational system, the proposed research should prove valuable in furthering the educational reforms that would need to take place in order to see creativity fully integrated into western educational systems. Proving that creativity can be developed through arts education programs will significantly improve the position of arts education within education policy discourse, lending weight to its legitimacy as an integral part of education. In addition, including creativity in official learning goals (through arts education) and student assessment would provide important new opportunities both for younger and disadvantaged students. Finally, the lack of empirical research done to date in this area would mean that the findings of this research would make a valued contribution to the field of scientific creativity research.

Part II: Theoretical Foundations

2.1 Definitions of Creativity

2.1.1 Creativity as a Type of Cognitive Intelligence

At the beginning of the 1950's creativity was mainly thought to belong to the domain of (cognitive) psychology (Best, 1982). Up until that time, although creativity was mentioned in educational forums, specifically in conjunction with arts education, it was most often seen solely as a trait defined as (artistic) expression (Craft, 2003; Lanier, 1955). However, starting in the 1950's and over the years since, other disciplines and agencies have begun to look more closely and objectively at creativity, at its true nature and its benefits. Discussions on creativity as a kind of intelligence that differed from traditional theories of cognitive intelligence, such as those associated most often with language and mathematical skills, began gaining scientific interest and recognition back in the late 1950's and early 1960's. At this time the scientific field concluded that the type of intelligence evidenced by creativity needed to be identified and evaluated independently of the traditional kinds of intelligence measured by standard testing such as the Stanford-Binet Intelligence Quotient test (Wallach & Kogan, 1965). One of the most prominent forerunners in this line of thinking, J.P. Guilford, proposed that creativity could be seen as a kind of intelligence similar to that of divergent thinking (Guilford, as cited in Vincent, et. al., 2002). Divergent thinking is most commonly understood to be the thought process responsible for the ability for an individual to generate a wide variety of diverse ideas when confronted with an open-ended problem. In his work, Guilford theorized that divergent thinking could be broken down into several identifiable and quantifiable abilities that could in turn be used as indicators of creative performance. The abilities he identified are *fluency*, or the ability to produce many diverse ideas and that can be used to measure quantity of divergent thinking; *flexibility*, or the ability to easily adapt or change their line of thinking in order to solve a problem; *originality*, or the ability to generate clever, unusual or novel ideas; and *elaboration*, or the ability to produce a richness or complexity in details when presented with a minimum of stimuli (1958). These four aspects of divergent thinking have since become the foundation for most of the creativity research that has been done to date (Kim, 2006; Runco, 1990; Torrance, 1962; Wallach & Kogan, 1965).

2.1.2 Creativity as a *Product* - Creativity Testing and the Torrance Test of Creative Thinking

Empirically speaking, while theoretical discussions of the 1950's and 1960's on the nature of creativity as a type of cognitive intelligence were interesting, they were still lacking in the ability to provide hard scientific evidence. As a result, creativity researchers turned their attention to looking at how definitions of creativity could be operationalized for the development of empirical testing. Based on Guildford's groundbreaking works on the nature creative as a type of divergent thinking, which is a different kind of intelligence than that tested on standard intelligence (I.Q.) tests, he and some of his contemporaries attempted to develop a reliable means to assess creativity that could be based on the measurement of divergent thinking factors that were at play during the creative performance. Wallach & Kogan (1965) conducted research into the nature of creativity and creative thinking that was more specifically focused on creativity in young children. Also built on the premise that creativity could be defined in terms of the kind of intelligence recognized as divergent thinking, identified through fluency, flexibility, originality and elaboration, Wallach and Kogan developed numerous figural and verbal tests to be used in their research. These included figural tests made up of simple incomplete figures (stimuli) that test subjects were required to complete by adding lines, and verbal tests for additional skills that they considered indicative of creativity, such as conceptualization and categorization. Although their research was quite extensive, there were some limitations to these test approaches. Developed with children in mind, they were based on using stimuli to prompt *associations* that could be assessed for creativity, rather than test the mental abilities involved (Torrance, et al. 2008). Although these tests were never standardized for wider use, they served as a basis for other creativity tests that are more widely in use today.   The first standardized test was developed by Guilford himself. His Alternative Uses Test (1967) is a simple test based on divergent thinking abilities, still widely used, in which the participant is asked to name as many uses possible for a particular object (Dunbar & Forster, 2009). However, the test is designed only to extract the results of the *mental activities*, making it somewhat limited (Torrance, et al., 2008), especially in terms of the age level required in order to perform the activities. While the simplicity of this test may make it less applicable in the extensive kinds

of creativity research being conducted today, it too remains an important milestone in creativity testing

Another important figure in research on the nature of creativity is E. P. Torrance. Following in the footsteps of Guilford, Torrance has done extensive research on defining and identifying creativity.   His research is also based the four identifying factors of divergent thinking introduced by Guilford (1958): fluency, flexibility, originality and elaboration. Torrance developed the specific view that creativity was something quantifiable that resulted from creative performance, in other words, creativity was defined as a *product* (1962; Torrance, et al. 2008).   With this in mind, he began developing a series of tasks and activities which, when coupled with certain creative indicators, such as those that Guilford had identified, could be used to assess the outcome of creative performance.   Expounding the initiatives made by those such as Guilford, and Wallach & Kogan, which also based creativity assessment on the analysis of the four creativity factors, but were limited in their abilities, Torrance's view of creativity in terms of a product allowed for the development of explicit tasks and activities that were more easily objectifable and quantifiable for assessment, and that could also be more easily standardized for all age levels. These task and activities were further developed into what is now commonly known as the Torrance Test of Creative Thinking (TTCT) in 1966. Although at its inception it was meant to be used as a tool in the assessment of creative thinking for the purposes of developing more individualized education for those students who could be identified as 'gifted', today, the TTCT has been adapted for wide-scale administration to subjects of all ages and levels (Kim, 2006). There are two versions of the TTCT, the verbal and figural versions. The figural TTCT consists of a series of pictorial exercises or activities that measure levels of "creative thinking abilities": five creativity factors, or "abilities", three of which - fluency, originality elaboration – are directly derived from the four indicators of creativity discussed above. The fourth indicator, flexibility, has been replaced by what Torrance calls abstractness of titles, meaning the degree to which the subject can think beyond labeling, and resistance to premature closure, or the ability for the subject to keep an open mind. The reason for this replacement is that the measurements of flexibility on the TTCT were found to be too closely related to measurement of fluency (Hébert et al., as cited in Kim, 2006). In addition to these five major creative abilities, the TTCT also tests for the presence (and degree of presence) of thirteen

criteria-related creative strengths, which Torrance distinguishes as follows: emotional expressiveness, storytelling articulateness, movement or action, expressiveness of titles, synthesis of incomplete figures, synthesis of lines or circles, unusual visualization, internal visualization, extending of breaking boundaries, humor, richness of imagery, colorfulness of imagery, and fantasy (Torrance, et al., 2008).

Although no single creativity test – in fact, no single method – has as of yet been found to be 100% accurate or reliable in providing empirical evidence of a human quality as complex as creativity, decades of research on the results of creativity testing show that the TTCT can serve as a valid and useful tool and as an adequate basis for identifying and assessing creativity indicators in individuals (Kim, 2006; Treffinger, 1985). In addition the TTCT is shown to be relatively unbiased in terms of race, socioeconomics, culture, and gender (Cramford, 1993; Kaufmanm 2006). The view of creativity as a quantifiable product carries obvious advantages with it. Being able to test creativity levels with a standardized scoring system allows for a relatively straightforward procedure in collecting empirical data and seemingly simplifies the modus operandi of researching creativity significantly. However, due to the creativity's inherently complex nature, Kim also suggests that when using the TTCT in creativity research to include at least one other standard of measure. One example of another standard of measure would be one that approaches creativity as defined and evidenced by the creative process.

2.1.3 Creativity as a *Process*

While Torrance and his associates stipulate that creativity can be defined rather straightforwardly in terms of characteristics inherent to divergent thinking, which can then be measured in the results of certain 'creative' task performances, or the creative product, there is another somewhat more recent school of thought that postulates that creativity be defined as a *process.* While this definition may be less easily quantifiable than the above, more result-oriented definition, it is nonetheless a highly warranted and worthwhile discussion, especially within the discourse surrounding creativity in education and/or creativity and young children. One researcher who has done extensive research in these areas is M.A. Runco. In his works he proposes that, rather than the very explicit creative performance of the individual, it should be the creative potential within each person that is

considered most important. This potential is set into motion through the creative act. As such, creativity needs to be seen in terms of an interactive process, which is made up of a complexity of ingredients that, when activated together in a symbiotic way, lead to creative thinking (Runco & Chand, 1995; Runco, 2003). In his 1995 study together with Chand, he develops a two-tiered model to illustrate the interactivity between the components in the creative process. The bottom tier is broken down into three skills sets: problem-finding, ideation and evaluation. Problem-finding skills relate to an individual's ability to identify, define and solve problems. Ideation skills correspond directly to the creative skills already identified by Guilford and others, such as fluency, flexibility, and originality. Evaluation skills relate to the ability to valuation, critical evaluation and reflection. These skill sets are considered to be the controlling factors in the creativity process, inherent to an individual. The top tier is, according to Runco and Chand, made up of the contributing factors. These are knowledge (both declarative and procedural) and motivation (intrinsic and extrinsic). The degree in which all these components are present, and to which they interrelate, is representative of the level of creativity or creative thinking possessed by an individual in a given learning situation (Runco & Chand, 1995, p.244-246). This definition concentrates more on the creative potential present as a result of an interactive process than on the creative product achieved as a result of a performance. Creative potential can therefore be said to be the result of a combination of many more factors, some of which are contributory and can be influenced, as often can be found within a learning environment.

The reason why the definition of creativity as a process is so interesting is because it takes a much more real-life approach than that of the creativity tests, including even the arguably most well-developed of these, the TTCT. One of the inherent problems with testing something as complex as creativity levels is the one-dimensionality of the results, one of the main reasons why it is suggested to always be used in conjunction with another measurement standard (Kim, 2006). As the products of a creative performance, they are singular, isolated objects being assessed based solely on the creative abilities evidenced in that object. A theory defining creativity as a process, on the other hand, takes into consideration the numerous undeniable external factors that are always present in the creative performance. However, as of yet, there is no completely reliable quantitative method by which to measure the creative process (Kim, 2006). The number of factors and

their possible interactions make a straightforward quantifiable approach to the creative process oversimplified and would discount too many possible variables. Although in their model of the creative process, Runco and Chand (1995) limit the scope of influencial factors to knowledge and motivation, when considered more closely, motivation (intrinsic and extrinsic) can be expected to be linked to a variety of additional factors. Of these additional external factors, perhaps the most important are influences that inevitably transpire during an education situation or setting. This realization only compounds the need for a qualitative approach in order to be able to recognize all the components at play during the creative process.

2.2 Creativity and (Arts) Education

2.2.1 Creativity and Primary School (Arts) Education

Creativity in young children has been a point of interest in various fields for many years. In the western educational forum, creativity has been included in curriculum discussions according to the educational policy trends of the day, which have varied greatly over the years. In the1950's, for example, western pedagogical views of the day were more liberal in their approach, and education was based on a child-centered and discovery-based approach. This allowed room for creative expression, most commonly as expressed through the arts, as such art education was at this time considered an important forum for creative expression (Lanier, 1955). Over the course of the following fifty years the trend shifted and the emphasis moved away from creativity as expression and towards a more knowledge-based pedagogical approach (Craft, 2003). Recently, however, this trend seems to be shifting again. The last decade has seen not only an explosion of interest in creativity development in general European policy discourse, but also within European educational policy, and even more specifically, within primary education policy. Educational studies show that creativity reaches a zenith among children during the early years of education (Craft, 2003; Runco, 2003). International reports written over the last ten years also reflect the renewed western emphasis on creativity both as it can be cultivated among primary school age children and as can be linked specifically to arts education (EACEA, 2009; Murdock, 2003; Sharp & Le Métais, 2000; Sharp, 2004). Most studies and reports advocate the need for curriculum reforms that implement creativity into more concrete learning goals. This is proof positive of the

changing attitudes towards the position of creativity as an important component of education.

But there seems to be a delay between these theoretical discussions and the current situation within the primary school systems. In practice, creativity development in (arts) education is still more the 'hot' topic of discussion than something concretely reflected in the curriculum changes. This is unfortunately evident in the official Dutch Ministry of Education, Culture and Sciences core objectives for the primary school system, which only mention the word creativity once during the entire document, in the preamble, which states that "…education addresses their emotional and intellectual development, the development of their creativity, and their acquisition of social, cultural and physical skills." (Stichting Leerplanontwikkeling, 2006 p.1). This suggests that creativity is still being regarded as a trait, rather than as a type of intelligence, and as such gets less merit than for example mathematics or language skills. In addition, arts education in the Netherlands (as well as in most of Europe) still does not include creativity as a core objective (Greven & Letschert, 2006) but rather categorizes it under the heading 'personal development' (Lieftink & Wervers, 2008). The reason for this delay between theory and practice can of course be contributed to the usual bureaucratic difficulties in getting theoretical policy changes implemented into practice. On the other hand, it is perhaps also due to the lack of empirical research and evidence that clearly link creativity with (arts) education practices.   The (visual) arts programs in the primary school systems of the Netherlands are themselves also subject to current core objectives as mandated by Ministry of Education Culture and Sciences:

"54 The pupils learn to use images, language, music, games and movement to express their feelings and experiences and to communicate with.

55 The pupils learn to reflect upon their own work and the work of others.

56 The pupils acquire knowledge about and learn to appreciate aspects of cultural heritage." (SLO, 2006, pp. 7-8).

In The Netherlands, primary education policy also does not regulate arts (or culture) education, and leaves individual schools free to decide for themselves how to implement their arts education programs. As a result, arts education, especially visual arts education, is

often provided by the general teaching staff as opposed to specialized certified arts teachers and often combined with other projects or subjects (Oomen, et al., 2009). However, the so-called community school plays an important supplementary role in providing arts education to primary school students, especially in the lower socioeconomic neighborhoods. Their premise is that arts and culture are vital are to personal development, cultural values and on a larger scale, society. By incorporating this premise with the objectives of the primary school, the community school programs focuses on goals that include creative thinking, although they do not further elucidate what 'creative thinking '. (Ensink, Hagenaars, & van Hoorn as cited in Lieftink and Wervers, 2008). The arts education program that is the focus of this research is falls under the provisions of the community school.

Regardless of the current perceived disconnect between theory and practice, there has been a good amount of research done (mostly theoretical) on ways to develop creativity within the educational setting. In these studies, the concept of creativity is most often referred to in terms of a process, similar to that defined by Runco and Chand (1995). In educational discourse, the number of abilities, or what Runco & Chand would refer to as the "bottom tier", seen to be at the center of this process are more diverse, and include imagination, originality, productivity (of ideas, through divergent thinking), problem solving and potential to generate a result of value (Craft, 2003; Sharp & Le Métais, 2000; Sharp, 2004). Also, educational focus on the creative process seems to pay special attention to the variety of external influences on the process, Runco's & Chand's so-called "top tier", including knowledge and motivation, but also more specifically on the social conditions that can be omnipotent in a classroom learning environment, especially in a primary school setting and/or in an arts education setting. Various works on creativity and education discuss how the educational setting is pivotal to creativity development in young school-aged children (Craft, 2003; Runco, 1990; Sharp, 2004). These works elaborate on specific ways in which learning content, teachers, and classroom settings can either facilitate or inhibit creativity. Runco, for example, differentiates two categories in which creativity can be thought to be actively influenced within the educational setting: the actual assignments given and the kinds of stimuli presented along with them, and the classroom setting itself, including the role of the teacher within the classroom. With regards to the kinds of assignments and stimuli presented to students, more unfamiliar stimuli (for example, more abstract) tend to

result in more originality, since the unfamiliarity seems to promote the search for unknown and more spontaneous solutions or ideas. Conversely, mundane and predictable assignments also tend to produce less original results than those that would stimulate the student's divergent thinking abilities. It is therefore important to provide educational content that is open-ended in nature, in order to offer the student a wide range of possibilities that will promote creative thinking. In addition, a second category which exerts influence on the creativity of students is the classroom setting, meaning both the surrounding (physical) environment and the role of the teacher. The creative classroom environment should be flexible and playful so as not to impose constraints on divergent thinking and creative potential (Sharp, 2004). The class locale itself should not be too "cue-rich" (Runco, 1990, p.38) since such a setting, while it may generate fluency, tends to generate unoriginal ideas as a result. As a result, a relaxing, engaging and stimulating setting that refrains from imposing too many ideas on students is most recommended. Of equal if not greater significance is the (motivational) role of the teacher. The creative teacher is in this case of extreme importance. A teacher who is himself or herself more creative is most likely to provide the best model of divergent thinking possibilities to students (Runco, 1990; Sharp, 2004). Such a teacher would also be in a better position to recognize and reinforce creativity among their students. A teacher who can more easily appreciate and recognize creativity would therefore be more likely to encourage its development without inadvertently artificially directly influencing or forming it. Other studies name the role of the teacher as an important factor, as well as group needs and the function of play (Craft, 2004). However, although few would argue that educational content, setting and teacher influence are of great consequence to education, there are those that still see education as an inhibitor of creativity. Where creativity is associated with individuality, non-conformity, and spontaneity (as facilitators of originality), more traditional 'classical' teaching methods can be seen to get in the way of creativity (Csikszentmihalyi, 1995; Kaltsounis, 1974; Rogers, 1968). It is perhaps for this reason that most especially the attitude of the teacher is considered of great consequence to developing creativity in the classroom.

2.2.2 Creativity and Education - Disadvantaged children

When looking at the educational achievement of lower socioeconomic individuals, there are some commonly accepted facts. One of these is that they are less likely to reach higher levels of education, and another is that while still in the school system their performance is usually less than that of their better-off counterparts (APA, n.d.; Jol, 2010). That being said, some studies of primary school children categorized as 'disadvantaged', based on family income, area of residence, and parents' education and occupation, show that children from lower socio-economic backgrounds have been found to show slightly higher levels in areas of creativity such as fluency and originality when compared to those of more 'advantaged' (middle class or higher) backgrounds (Kaltsounis, 1974; Rogers, 1968, Torrance, 1968). These studies also show disadvantaged children possessing a higher level of other traits often linked with creativity, such as spontaneity, less dependence on their parents, less conforming, and high motor skills. Another study on creativity among disadvantaged children monitored the progress of students enrolled in organized creativity workshops for socioeconomically disadvantaged children ages six through 12, and discovered that children who prior to the workshop and under formal school settings had tested poorly on verbal skills, showed marked improvement when tested for verbal creativity with open-ended activities (Torrance, 1968). For these students, educational policy that would include creativity in core curriculum and pupil assessment could be highly advantageous. If creativity were to become accepted as a category of academic performance and incorporated into performance assessment, creative children that would otherwise be considered poor achievers or performers would be recognized as having the skills and potential to become more successful members of society as adults.

As one of the most active researchers in areas of creativity, Torrance has also spent a significant amount of time researching creativity in disadvantaged children. His work, all built upon the four underlying factors of creativity as originally identified by Guilford (1958, as cited in Vincent, et al. 2002) - fluency, originality, flexibility and elaboration - includes not only the development of the TTCT, but also of workshops for the discovery of creative talent among disadvantaged children (Torrance, 1968). As a result of observations made during his studies and workshops, he developed a checklist of creative indicators, which include an

interesting number of markers which could be considered especially useful in the observatory portion of this research. This checklist consists of 18 creative "positives": (1) ability to express feelings and emotions; (2) ability to improvise; (3) articulateness in role playing and story-telling; (4) enjoyment of and ability in visual art; (5)enjoyment of and ability in creative movement, dance, and drama; (6) enjoyment of and ability in music, rhythm, etc.; (7) expressive speech; fluency and flexibility in non-verbal media; (8) enjoyment of and skills in small group activities; (9) problem-solving, etc.; (10)responsiveness to the concrete; (11) responsiveness to the kinesthetic; (12) expressiveness in gestures, body language, etc; (13) humor; (14) richness of imagery in informal language; (15) originality of ideas; (16) problem-centeredness; (17) emotional responsiveness; and (18) quickness of warm-up (1973, pp 5-8). While this checklist goes beyond the scope of creativity within a visual arts education setting, it is developed based on the premises of creativity used within this research and certain indicators (those which can be applied to the visual arts education experience) can be useful in providing an additional means of identifying traits in research subjects during the visual arts education program at the center of this research.

One last note on studies of creativity among disadvantaged (primary-school aged) children these have shown that creativity has not in general been found to be significantly linked to ethnicity in cases where ethnicity is considered a variable in the profiles of research subjects (Kaufman, 2006; Torrance, 1973,). However, it remains worth noting that most research in this area involves American children coming from diverse ethnic backgrounds (Hispanic, Afro-American, European, Native-American). Ethnic backgrounds more common to the location where this research takes place (New West area of Rotterdam, The Netherlands) are Moroccan, Turkish, Surinamese, and Antillean (Deelgemeente Delfshaven, 2010) and background searches done for this research did not identify specific studies linking these ethnic backgrounds to creativity levels.

2.3 Creativity and Developmental Factors

Since the definition of creativity at the basis of this research considers creativity to be a cognitive skill (divergent thinking) theories on the development of a child's cognitive abilities should also be considered. The theory of cognitive development is the most widely accepted

theory on children's intellectual development stages. These stages are chronological and based on the premise that a child's cognitive abilities and functions develop with age. Piaget mentions four different stages, starting at birth and continuing through adolescence. These stages are discussed in short here. The first stage is referred to as the sensorimotor stage, in which the infant learns primarily based on the physical environment around him and ends at around age two, when the child understands the concept of 'object permanence' (that the self is separate from its surroundings). The second stage or the pre-operational stage, is from around ages two through seven, and includes the development of the use of symbols and language, imagination and memory. The child at this stage also engages in make-believe play during this stage. During the second stage, the child is still ego-centric and still unable to use or understand concrete logic. During the third stage, the concrete operational stage, starting at around age seven (first grade) up to about age eleven, the child's understanding and use of concrete logic begin to develop. This includes the ability to problem solve (or 'flexibility', including sorting and classifying) but is still limited to a concrete and not abstract level of thinking. The fourth and final stage, starting at around age eleven and continuing through adulthood is the formal operational stage, in which the ability to think in abstract terms develop (Delfos, 1999). Considering the research group children are primary school age and functioning at first and second grade levels, they can all be expected to fall into the concrete operational stage of development.

Also of specific consideration within the objective of this research is the aesthetic (visual arts) development of primary school aged children. Although in some ways it can be related to Piaget's theory of cognitive development, the theory of aesthetic development suggested by Parsons (1976) deals with the child's conception and appreciation of visual art. Parsons, building on the works of child development researchers such as Piaget (cognitive development) and Kohlberg (moral development), suggests that children also develop aesthetic sensibilities, along a schema consisting of four stages. These stages, which correspond to the cognitive developmental skills of the child, relate to the child's *conception* of the aesthetic aspects of a given (visual arts) object. In the first stage (up to age seven) although the child is able to express preferences between aesthetic objects, it does not yet distinguish between 'art' and 'nature' nor between 'liking' an object or thinking it is 'good' in quality. At this stage a child is almost solely affected by the choice of enjoyable or agreeable

colors and content (subject matter) of the artwork. Once a child reaches the second stage at around the age of seven, the child becomes more aware of his social surroundings and the preferences others around him may also have (conventions). At this stage the child begins to incorporate external standards into his own aesthetic experience, resulting in the development of an eye for more (loosely speaking) realism and accuracy in form and content (elaboration, valuation and evaluation). This development continues up to pre-adolescence, at which point the child begins to break free from the conventions of the previous stage and realize that there are other aspects that can be considered aesthetic than conformity to rules of realism in form and content. At this stage the child begins to show more interest in the message or intent of the artwork. During adulthood, most (but not all) reach a fourth stage. Parson declines to go into much detail about this stage of aesthetic development, except that its exact nature has been the subject of speculation for philosophers and critics for many years, and to suggest that it is a stage in which the individual is able to completely detach all subjectivity from the aesthetic experience.

In another vein of child development, additional research on aesthetic abilities in children suggest that children in early education (around age five) produce works that, aesthetically speaking, show similarities to works by twentieth century modern artists such as Klee, Picasso and Miró, calling these works "spontaneous, fanciful, non-stereotyped, and aesthetically appealing" (qualities that can be considered creative in nature), and that these qualities seem to decline in the artworks of older children (age ten), who become more subject to social conventions (Rosenblatt & Winner, 1988, pp. 4-5). Considering the studies linking high levels of creativity to early years of education (Craft, 2003; Runco, 2003) this would suggest that arts education in early years of development (both cognitive and aesthetic) could provide a good vehicle for cultivating creativity in primary school students.

Part III: Methodology

3.1 Choice of Methods

The research question is: ***can creativity be advanced through arts education in socioeconomically disadvantaged primary school children?***

Considering the complexity and elusiveness of the concept of creativity, both in its definition and the inconclusive results obtained by much of the previous empirical research done in this area, this research best calls for a multi-method approach in the combination of quantitative and qualitative methodologies. By complementing the more hard-lined and atomistic conclusions that can be attained through a deductive quantitative methodology with the more exploratory and holistic conclusions that can be attained through indictive qualitative methodology, a more comprehensive analysis is hoped to be achieved. In addition, the complementary functions of these two research methods will help ensure validity and reliability through triangulation.   With this in mind, this research has been careful to consider different definitions and approaches to creativity. Two of these approaches have been chosen to be used for operationalization in the research methodology, both based on the fundamental premise that creativity can be defined as a cognitive skill akin to divergent thinking and identifiable through four basic abilities: fluency, originality, elaboration and flexibility (Guilford, 1958; Guilford as cited in Vincent et al., 2002). The first approach to be considered, and subsequently operationalized for use in a quantitative research method, is that of creativity as a product. The second approach to be considered, and operationalized for use in a qualitative reasearch method, is that of creativity as a process.

3.1.1 Quantitative Method: The Torrance Test of Creative Thinking

The first of these approaches operationalizes creativity as something that can be evidenced in the results of a creative performance, in other words the creative *product* (Torrance, 1962; Torrance et al., 2008). This approach to creativity, as identifiable through a set of skills that can be measured in the product itself, offers an advantage to researchers in that it

views the creativity in a light which makes it possible to be straightforwardly assessed by the quantification of these skills, i.e. through testing. Quantitative testing of the results of the creative performance can provide a 'yes' or 'no' answer to the 'if' or 'whether' implicit is the research question 'can creativity be advanced through arts education in socioeconomically disadvantaged primary school children?', and support this answer with solid numbers and percentages. Reliable empirical quantification of creativity is extremely desirable in discourse on creativity legitimization, as this would provide hard scientific evidence in the form of numbers and statistics. Such measurements are made possible through the use of the TTCT (Torrance Test of Creative Thinking), which quantifies creativity by scoring the results of creative performances based on a set of creative abilities and strengths. Studies performed on creativity testing show that the TTCT can serve as a valid and useful tool and as an adequate basis for identifying and assessing creativity indicators in individuals (Kim, 2006; Treffinger, 1985). It is also relatively straightforward in its administration and designed for use by all age groups, kindergarten through adulthood, and as such is suitable for the research group in this study. The TTCT will therefore be administered to the research group and will form the basis for the quantitative methodology of this research. Additional benefits of a quantitative approach in this study are that it offsets the more exploratory approach and sometimes less clear-cut conclusions that can be reached with qualitative methods, by providing a structured, empirical and objectivist standard of measurement which can be employed both prior to and at the end of the research period. However, although the TTCT is one of the most widely-used and best-documented of quantitative assessments for creativity, it has not been proven to be 100% reliable and valid in all cases (Kim, 2006). For this reason, an additional approach and method to the research is warranted.

3.1.2 Qualitative Method I: Ethnographical Participatory Observation

The second approach or definition of creativity operationalized by this research stipulates that creativity (again, based on the premise laid out by Guilford) can be evidenced as the activation of creative potential, in other words in the creative *process* (Runco & Chand, 1995; Runco 2003) that takes place as a result of the interaction of a number of components, including internal factors such as divergent thinking skills *and* external factors such as

knowledge and motivation. This approach is especially applicable to the examination of creativity within the (art) educational setting (which is the also the foundation of this research), where external factors such as the role of the teacher or the kind of learning activities used are not only omnipresent but also inextricable. However, when defining creativity as a process made up of both internal and external factors, individually itemized measurements such as those achieved through testing become extremely difficult. Qualitative ethnographical methods, which are more interpretative and inductive, will able to examine the creative process from a more holistic perspective, in the context of its (learning) environment, and take into consideration all the various factors as play and their degree of involvement. In other words, this methodology will answer the "what", "how", "when" "where" and "why" questions that are implied in the research question and are crucial to the view of creativity as a process. In the specific case of this research, where not only a process, but a group process within a classroom environment needs to be examined, participatory observation was chosen as the best possible means to achieve this examination. This allows the researcher to observe the group activities and behavior as part of the environment, participating with the group (to a limited extent) and therefore enabling close-up and in-depth observation of complex interactions that can occur. When considering the additional dimensions of the research group (primary school students from socioeconomically disadvantaged backgrounds), another advantage of participatory observation is that it allows for the exploration of additional facets that pertain to this research group that might otherwise fall outside the realm of the study. According to research done by Torrance (1968, 1973), disadvantaged children tend to show certain creative characteristic traits. Some of these traits, for example 'expressive body gestures' are only able to be appreciated in research subjects through observation (and not through standardized testing).   By being a participating observer in the research class, the research situation can remain natural and relaxed – something especially of importance considering the age group of the research participants.   These circumstances are also important in ensuring the best possibility for measurement validity through careful observation of links between indications of patterns and concepts (either derived from the theoretical background or those which arise during the observation period itself).

3.1.2 Qualitative Method I: Ethnographical Participatory Observation

In addition to quantitative standardized testing and ethnographical participatory observation, this research will also include the use of a qualitative semi-structured interview, conducted with the primary school teachers at the end of the research period. The main purpose of this interview is providing data triangulation, and to offset and counterbalance any unintentional subjective interpretations that may result from the participatory observation. The questions will center on the observation and experience of these teachers in relation to whether they have noticed changes in the students exhibition of creativity outside – and as a result of - the visual arts program, when viewing creativity as a process (and not as results or products). This will provide a wider perspective – albeit with less depth - than that of the researcher's participatory observation. Its independence from the other two methodologies will also help to strengthen their validity and reliability.

Again, given the shortage of empirically sound data or results from previous research attempts in this area, and considering the specific strengths and shortcomings in both of the definitions and approaches to creativity used in this research, a multiple-method approach using quantitative and qualitative methodologies will guarantee the best scientific reliability and validity. The qualitative methods will complement the atomistic results of the TTCT with their more inductive findings, and the deductive findings of the quantitative testing through the TTCT will provide a statistical measurement as a supplement to the more holistic findings of the observation and interview, ensuring a well-rounded and scientifically reliable and valid research.

3.2 Research Group

3.2.1 Research Group: Background

For this research, a target group was chosen from the New West primary school district in Rotterdam, The Netherlands. The neighborhood of Rotterdam's New West (which falls under the borough of Delfshaven) has an average population that can be categorized as having a low socioeconomic status (Deelgemeente Delfshaven, 2010). The community school is very active in this neighborhood, acting as a support system (for primary schools) in

areas where socioeconomic circumstances might get in the way of educational advancement. One of the ways the community school does this is by offering visual arts education to primary school students as part of its extended learning "extended school day" program, which provides economically disadvantaged children with the opportunity to experience arts education as part of their childhood education experience (Lieftink & Wervers, 2008).

Research will be conducted on a small target group of six primary school children aged seven through nine. These children are students of the first and second grade of a primary school located in the heart of the New West neighborhood of Rotterdam. The primary school participates in the Rotterdam's community school extended day activities 'neighborhood arrangement'. The Rotterdam community school's extended day program, which has now been adopted by almost all school districts within Rotterdam, was originally developed for school districts located in neighborhoods such as Delfshaven/the New West, which have a low social index and saw the need for offering a program that would address the extra developmental needs of public primary school children coming from more disadvantaged backgrounds while at the same time providing a practical solution to after school care for children with working parents (Claasen, 2009). Since its inception, the community school has become pivotal to the public school system in Rotterdam in providing supplementary arts and culture education. Primary schools participate in the so-called community school's ' neighborhood arrangement' , in which schoolchildren are offered the possibility to attend after school programs by providers affiliated with the community school program, yet located off school premises and (in most cases) independently operated.   While the participation of students from the primary school in extended day activities is not compulsory, the attendance rate is very high. In a report done on the reach of community school participation over the school year 2007-2008, participation of children coming from the Delfshaven district was at 80%. The participants sign up for a variety of activities over the course of the school year, which include programs in sport, music education and visual arts education. This study will focus on the participants of the visual arts education program offered by the primary school's community school extended day neighborhood arrangement.

The visual arts education program at the center of this research is provided by an independently operated foundation called Kinderatelier Punt 5. Punt 5 is located in the New West neighborhood of Rotterdam, in The Netherlands. It has been providing visual art education programs to the community, often in conjunction with the Rotterdam community school for over ten years. The program offered to the community school by Punt 5 has been developed by certified (visual arts) educators and professional artists, and consist of visual arts classes that are given in a series of eight weekly lessons of 1.5 hours to a maximum of twelve participants. This ensures a small group environment, and smaller teacher-student ratio. The participants are grouped by age/class, from ages six through 12.

The visual arts education program provided by Kinderatelier Punt 5 is developed with the core objectives for arts education as defined for the Dutch primary school system in mind, and complemented by the "Punt 5 method" (Rutten & Bulte, 2009, p.4). This teaching methodology consists of a series of lessons that centers on a particular theme, for example, the art of Van Gogh, or the art of ancient Egypt. Visual (art historical) elements associated with the theme are used within the series, as well as other inspirational sources such as stories or myths. Punt 5 uses a variety of visual arts techniques within each series so as to provide for a well-rounded exposure. In addition to painting and drawing, the Punt 5 method also ensures the inclusion of at least one graphic arts technique (such as linoleum cut or dry needle etch) and one three dimensional project within the lesson series. Each series is concluded with an 'exposition', which is open to the school and/or community, of the participants' work during which the artists are able to reflect on their works to each other and to those present. Kinderatelier Punt 5's didactical approach is firmly rooted in the same well-founded arts education practices that can be found within the Dutch school system, based on the reflective, receptive and productive combination approach of Arts Propel (Gardener, 1989) and the Discipline Based Arts Education combination of art history, art criticism, aesthetics and art production (Wijdens & Haanstra, 1997). At the same time Punt 5 is unique (even within the community school-offered programs) in its offer of higher level/quality arts education to residents of a lower income neighborhood.

3.2.2.Research Group: Participants

The specific group of participants to be focused on during this research consists, therefore, of the participants of the Punt 5 visual arts education program. This group is smaller than

average (six participants in total, the maximum number being twelve), presumably due to the fact that this series took place towards the end of the school year (April through June). Participation levels for the community school's neighborhood arrangement have been shown to taper off in the second half of the school year (Claasen, 2009), ostensibly since most children would already have participated in the full range of activities/programs offered by the arrangement for the school year by that time. The research group is made up of a mix of first and second graders (two first graders, four second graders), ages seven and eight, with one participant aged nine (she was left behind a grade). In keeping with the statistical average for residents of the New West neighborhood, all participants are from ethnically diverse and/or immigrant backgrounds (Turkish, Moroccan, and West-African) and of modest to low economic means. All of the participants except one spoke Dutch as a second language. None of the participants had ever taken part in a visual arts class program (outside the primary school) before this experience.

Part IV: Research Data: Analysis and Results

4.1 Quantitative Research: Torrance Test of Creative Thinking (TTCT)

4.1.1. TTCT Scoring Analysis

The figural version of the TTCT used in this study was developed to be administered to all age levels, kindergarten thorough adulthood, and all cultures, and consists of a series of a series of visual drawing exercises. The figural version is split into two parallel forms, Form A and Form B, administered at two separate moments in time, allowing for "before" and "after" measurement (before and after the series of visual arts classes that are at the core of the research).

The content of both forms consists of three drawing activities. The first activity, "picture construction", is the completion of a drawing based on the stimulus of a single curved shape. The second activity, "picture completion", is the completion of drawings based on the stimuli of ten separate incomplete figures. The third activity, "Lines" (in Form A) or "Circles" (in Form B), in which the subject is required to create as many pictures or objects from the stimuli (sets of lines or circles) provided. The only written portion of the test is the inclusion of a title, to be thought up by the subject, for each of the pictures or objects drawn during the test. All three activities are timed. Official publication and administration of the TTCT is overseen by Scholastic Testing Services, located in Illinois, U.S.A. For an example of the test booklets for Forms A and B, see Appendix A & B.

Points are given for each the responses provided by the participant and resulted in two sets of scores: scores based on norm-referenced measures of five separate creative abilities, and scores based on the criteria of thirteen additional creative strengths.   Within the first set of scores, those based on creative abilities, derived from the divergent thinking skills first described by Guilford (as cited in Vincent et al., 2002) and can be defined as follows:

- Fluency: quantity of ideas, fluency is assessed by the number of ideas as seen the corresponding responses given by the test subject.
- Originality: the unusualness or infrequency (statistically seen) of a subject's response.
- Elaboration: the subject's ability to add details to develop an idea;

- Abstractness of Titles: the ability to produce a good title shows ability to "capture the essence" of what is important and use of the cognitive processes synthesis and organization

- Resistance to Premature Closure: the subject's ability to see beyond the immediate solution to the problem, to keep an open mind without leaping to conclusions long enough to allow for originality in ideas.

In the second set of scores – the criterion-based measures based on the presence of thirteen creativity indicators, or creative strengths – can be defined as follows:

- Emotional Expressiveness: the ability to express feelings and emotions through drawings and titles;

- Storytelling Articulateness: the ability to communicate strongly by detailing through use of context and environment;

- Movement or Action: ability to show psychological projection through inclusion of movement or action in a subject's response;

- Expressiveness of Titles: ability to produce a title that communicates emotion or feeling as relayed in the response drawing;

- Synthesis of Incomplete Figures: the ability to combine two or more incomplete stimuli (as given by the TTCT) into one unified response represents "powerful thinking" and shows ability to see relationships among "diverse and unrelated items";

- Synthesis of Lines or Circles: ability to combine two or more circles or sets of lines (which are given as stimuli in the TTCT) also shows ability to think with an open mind and see possibilities beyond (assumed) restrictions;

- Unusual Visualization: the ability to present an idea from an unusual visual perspective shows creative potentiality;

- Internal Visualization: ability to visualize internal "dynamic" aspects of things;

- Extending or Breaking Boundaries: the ability to keep an open mind and extend boundaries in order to come up with an original solution to a problem;

- Humor: ability to use humor in responses shows creativity through "unusual combinations and surprise";

- Richness of Imagery: the ability to show "variety, vividness, liveliness and intensity";

- Colorfulness of Imagery: exhilarating appeal to the senses through imagery and description;

- Fantasy: the ability to use "fantasy analogies (commonly seen in mythological, fairy tale, science fiction and other fantasy literature analogies)"

4.1.2 TTCT Results

The results of the test are based on the official scoring system provided in the TTCT Streamlined Scoring Guide (Torrance, et al., 2008). The raw data for the scoring results were entered into an Excel spreadsheet (see Appendix C). Results are presented as group totals. The reason for this is simply that although individual scores are interesting and perhaps can provide information which can be used for future discussion and research, they have no direct bearing on the current research question. This is compounded by the fact that the qualitative methodology employed for the research (which serves to complement and complete the quantitative findings) was unable to extrapolate findings based on individual students, and so would not be able to provide any basis against which to compare individual testing scores. The group totals for the both sections of the test are presented in Graph 1:

Graph 1
ALL Totals
Group Scores and Percentages
Forms A & B

Form A: 167, 15,81%
Form B: 192, 18,18%
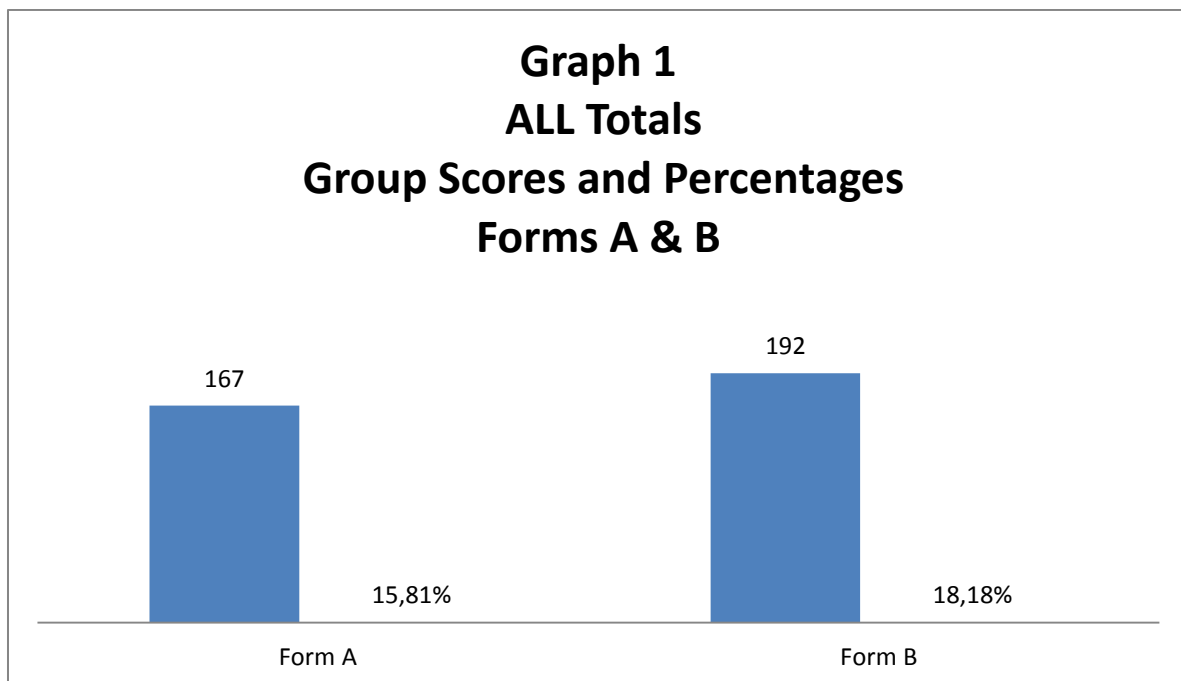
The above show an overall group improvement of creativity of 25 points (out of a possible total of 1056 points) or 2.37%. Although it is not an overwhelming improvement, it does indicate a marginal development of creativity levels after the arts education program. The scores were further broken down into two sets, one for the creative abilities, and one for the creative strengths.

The first set of scores to be handled is on creative abilities.   Fluency, originality and elaboration all score roughly the same. Points are given out of a possible score of 46 points per ability.   Abstractness of title and resistance of premature closure are also scored similarly, with points given out of possible score of 6 points each (or a grand group total of 900 points).

 Graph 2 shows the total group scores and percentages for creative abilities for both Form A and Form B:

Graph 2
Group Totals
Creative Abilities
Forms A & B
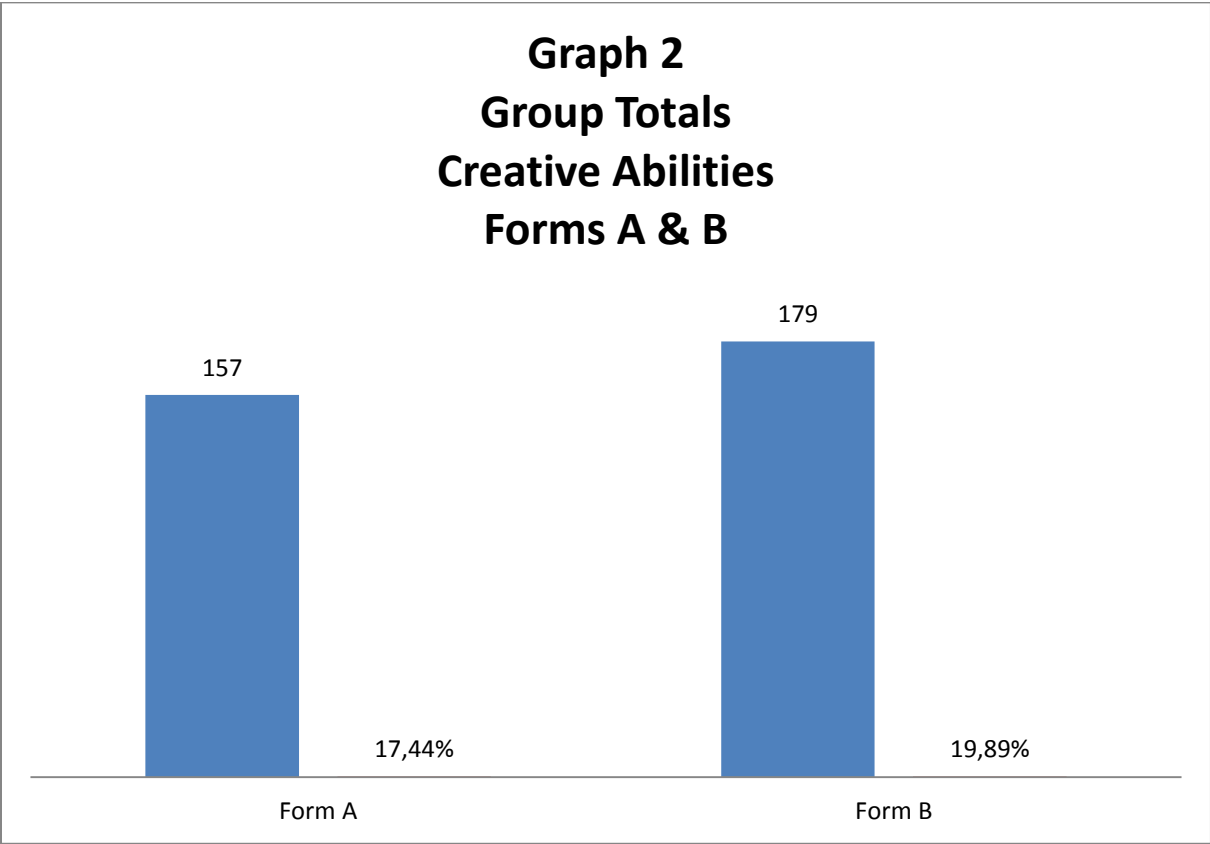
As can be seen, the difference between the two tests, before and after the art classes, show a slight overall improvement in creative abilities (22 points or 2.44%).

These results were also broken down per creative ability. Graph 3 shows raw scores and percentage differences for fluency. Scores improved by 30 points (or 10.87%)

Graph 3
Fluency Levels
Group Scores and Percentages
Forms A and B

	112
82	
29,71%	40,58%
Form A	Form B
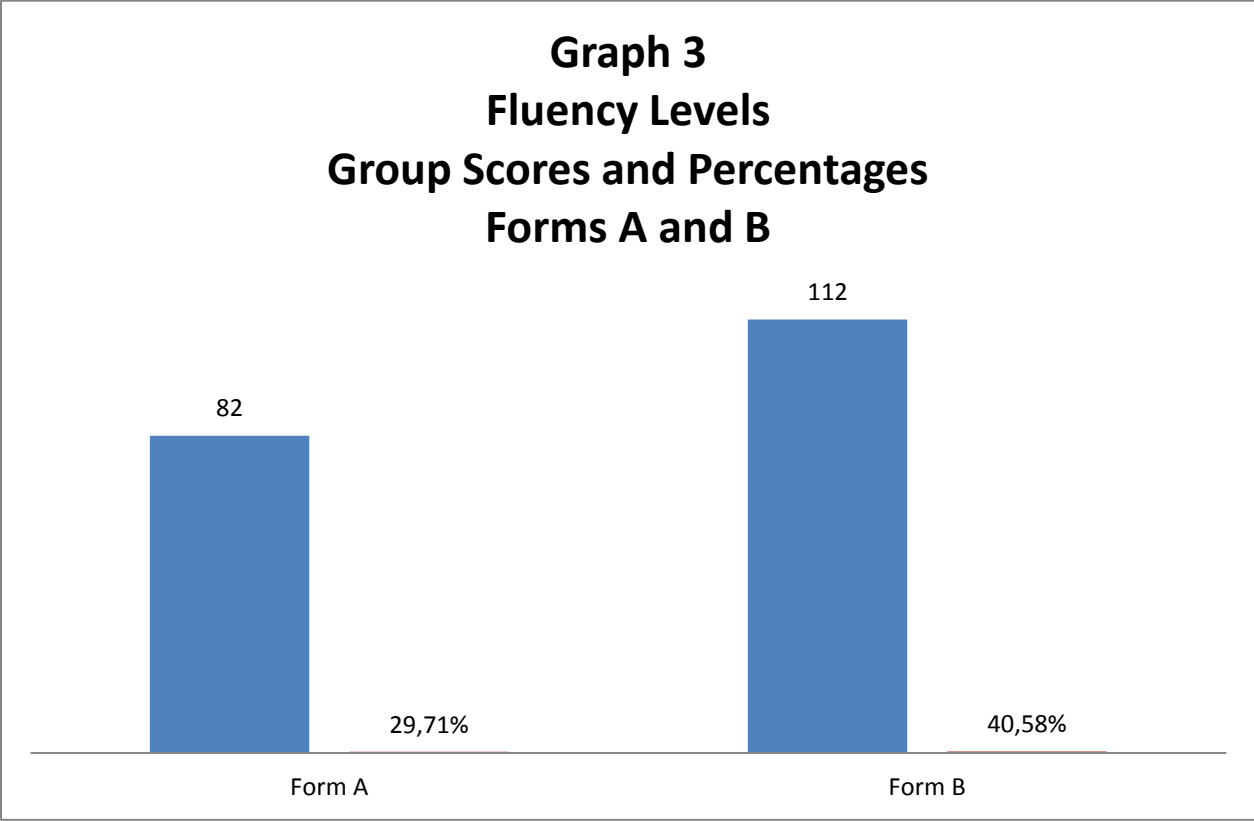
Graph 4 shows originality scores between From A and Form B. Originality scored slightly lower in Form B, 3 points, or 1.08%.

Graph 4
Originality Levels
Group Scores and Percentages
Forms A and B

49

46

17,75%

16,67%

Form A

Form B

Results of elaboration scores are presented on Graph 5. Elaboration also scored slightly lower during Form B. The scores differed 4 points, or 1.45%.

Graph 5
Elaboration Levels
Group Scores and Percentages
Forms A and B

23

19

8,33%

6,88%

Form A

Form B
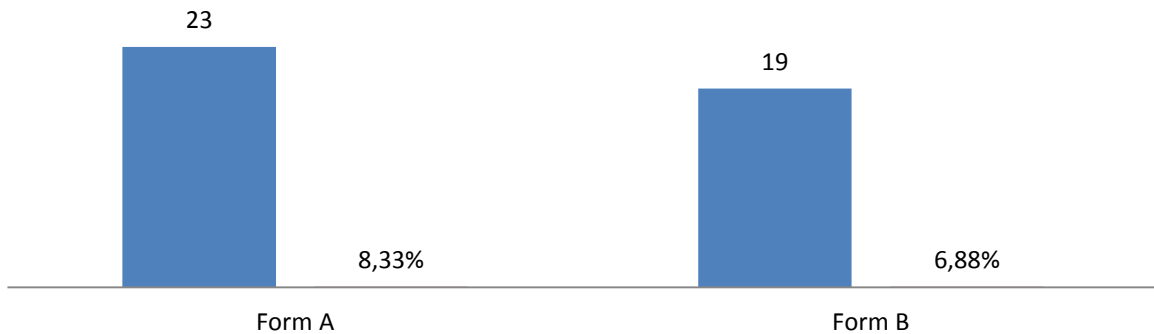
Graph 6 contains the scores for abstractness of titles. As can be seen, these scores (which are based on a total of 6 possible points per student or 36 points total for the group) are quite low for both tests. The scores dropped by one point between From A and Form B (which translates to a 16.67% difference).

Graph 6
Abstractness of Titles Levels
Group Scores
Forms A and B

2	
Form A	Form B (1)
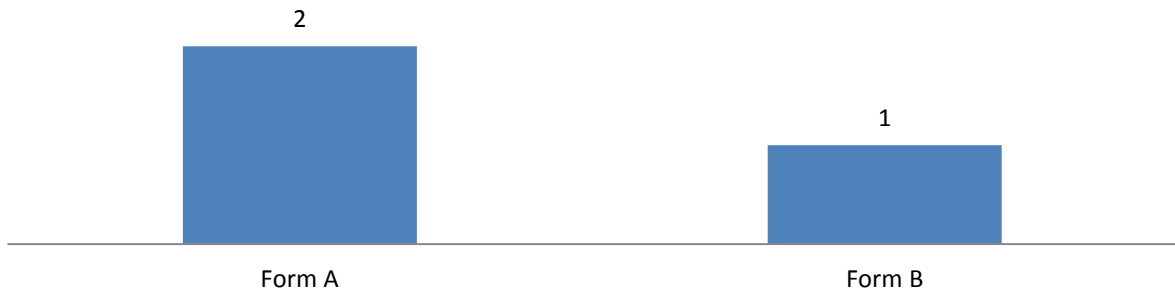
Lastly, resistance to premature closure scores, reflected in Graph 7, remained the same between Form A and Form B. The scores are also based on possible points out of a total of six, or a percentage of 16.67% for both totals.

Graph 7
Resitance to Premature Closure Levels
Group Scores
Forms A & B

1	1
Form A	Form B
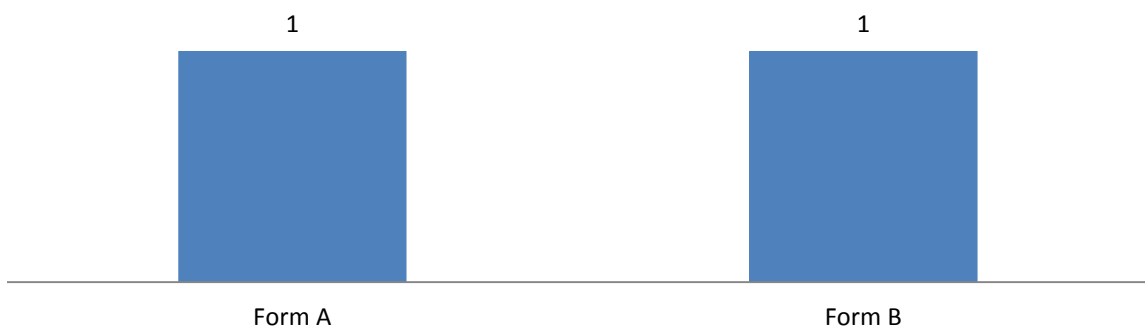
Creative strengths are scored slightly differently than creative abilities. Evidence of one or two instances of a creative strength indicator within a single response gets one point, three or more instances within a single response scores two points.

Graph 8
Total Group Scores and Percentages
Creative Strengths
Forms A & B

10		13

6,41%   8,33%

Form A   Form B
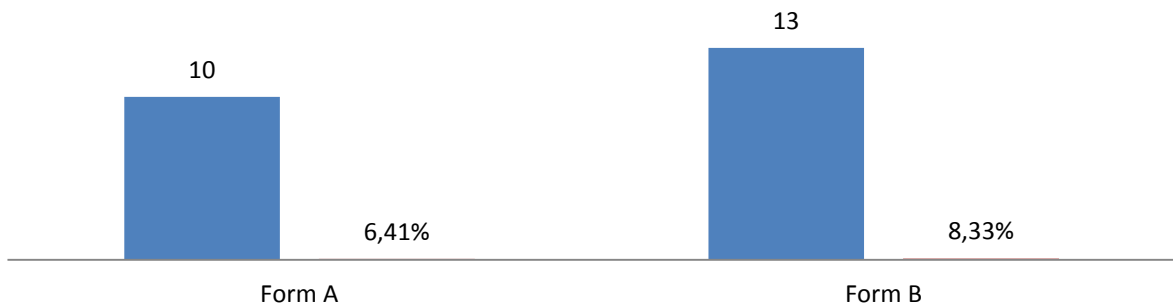
As shown in Graph 8, here too a slight increase in creative strengths is shown between Form A, taken at the beginning of the research period, and Form B, taken at the end. Total points increased by 3 (of a possible group total of 156 points) or 1.92%. The individual creative strengths are shown in below in graphs 9 through 21. Since creative strengths scored extremely low (scores are based on a total possible score of 2 points per strength and there are a total of thirteen creative strengths, making a total possible group score of 156 points) percentages were not included with these scores.

Graph 9
Emotional
Expressiveness

2	1
Form A	Form B

Graph 10
Storytelling
Articulateness

1	2
Form A	Form B
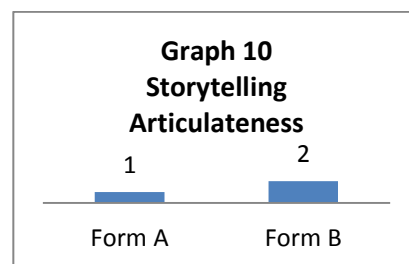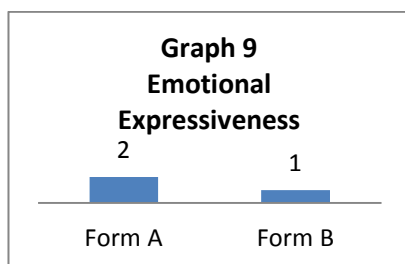
In graph 9 it can be seen that emotional expressiveness decreased by one point between the two tests. Graph 10 shows and increase of one point in storytelling articulateness.

Graph 11
Movement or Action

1   2

Form A   Form B

Graph 12
Expressiveness of Title

1   0

Form A   Form B
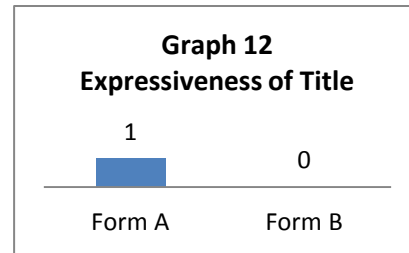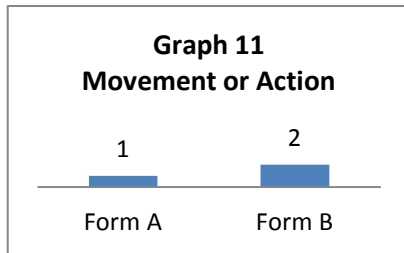
Graph 11 – movement or action – shows an increase of one point, while expressiveness of titles (Graph 12) dropped two points between tests

Graph 13
Synthesis of Incomplete Figures

0   1

Form A   Form B

Graph 14
Synthesis of Lines or Circles

0   1

Form A   Form B
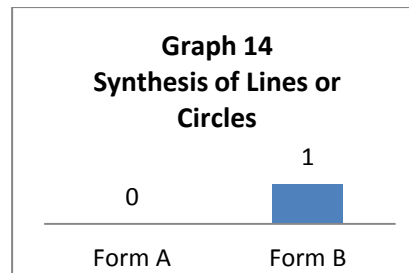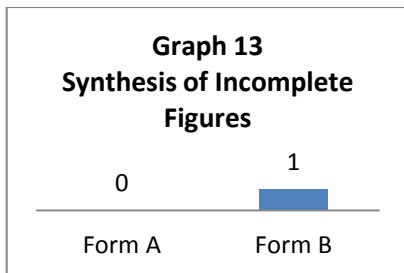
Synthesis of incomplete figures (Graph 13) and synthesis of line of circles (Graph 14) both went up a point in Form B of the test.

Graph 15
Unusual Visualization

1   2

Form A   Form B

Graph 16
Internal Visualization

0   1

Form A   Form B
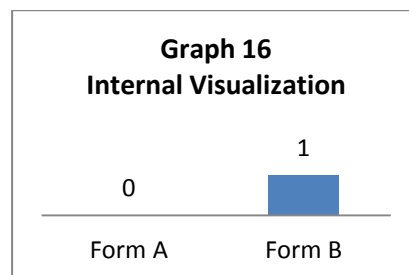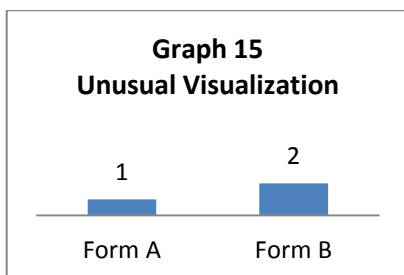
In Graph 15 there can be seen that unusual visualization increased by one point. Graph 16 also shows an increase of one point for internal visualization.

Graph 17
Extending or Breaking Boundaries

0   1

Form A   Form B

Graph 18
Humor

0   0

Form A   Form B
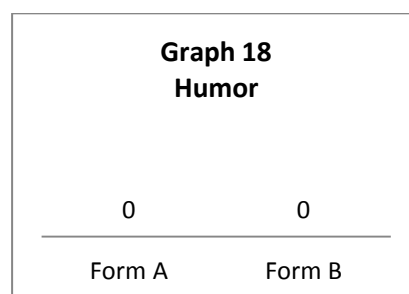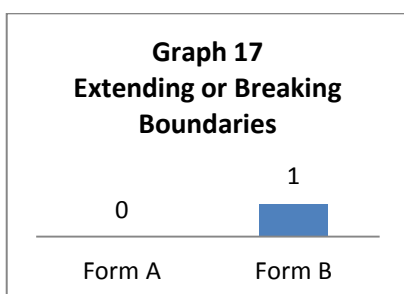
The creative strength extending or breaking boundaries grew by one point (Graph 17) while no points were scored for use of humor in either Form A or Form B (Graph 18)

Graph 19 Richness of Imagery

1	1
Form A	Form B

Graph 20 Colorfulness of Imagery

1	0
Form A	Form B
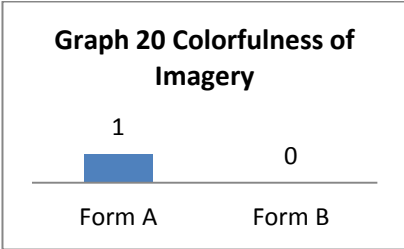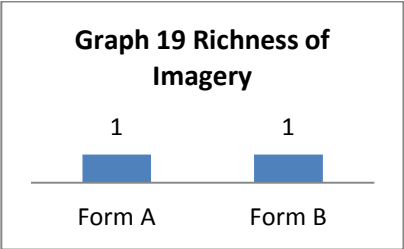
Graph 19 shows that richness of imagery remained the same, and Graph 20 shows a drop from one point to zero points for colorfulness of Imagery between the two tests. Finally, it can be seen that fantasy dropped by one point from Form A to Form B (Graph 21).

Graph 21 Fantasy

2	1
Form A	Form B
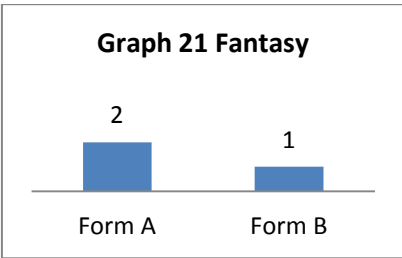
The TTCT results show a slight overall improvement in creativity levels at the end of the arts education series.   However, when broken down by ability, improvements (of about 10%) were only found to be in the creative ability of fluency. All other creative abilities reflected a status quo, or a slight drop.

Total scores for creative strength also reflect a marginal increase. When broken down, increases were found in seven of the 13 individual strengths: in storytelling articulateness, movement or action, synthesis of incomplete figures and -lines or circles, unusual visualization, internal visualization, and extending and breaking boundaries. Other strengths also either remained status quo or dropped.

While the above scores indicate a marginal increase in overall creativity – or, if broken down per ability and per strength, an increase in fluency and the above seven strengths- as measured in the results of the creative performance (the creative product), it must be noted

that there are some questions as to the validity reliability of these results. Although the TTCT figural test is supposedly designed for use by ages kindergarten and above, the researcher has issues with whether this claim is in fact entirely legitimate. According to the directions manual, if the test is administered according to the instructions and the conditions for both Form A and Form B are carefully controlled the test scores should be reliable and valid. However, some of the creative abilities (such as resistance to premature closure and abstractness of titles) and strengths (such as use of humor) tested seemed too far above the developmental levels of this age group, giving the rise to the question as to whether these abilities were in this case reliably represented and tested by the TTCT.   Also, despite following instructions, the real life circumstances of the test conditions proved to be somewhat more difficult to 'control'. Form A administration seemed to go reasonably well, in hindsight this can perhaps be attributed to the newness of the group and of the activities. The students completed the activities in an orderly fashion and their motivation and concentration was high. During the administration of Form B, however, these circumstances were considerably different: the students were familiar with the test and its expectations; this affected the motivation levels and listening skills of some of the students.   They did not actively listen to the researcher's instructions, causing inappropriate responses in some cases. Lower motivation levels led to impatience and most certainly affected elaboration levels. Also, the students had been working in a group setting for eight weeks, and to get them to all suddenly work as individuals proved difficult. Many of the students were naming their response out loud, which contaminated originality. Finally, one student became unwell with stomach pains and put his head down during one of the activities. This gives rise to the question of validity of the answers of Form B. As a result of these numerous issues, it is believed that the results of the TTCT are should be not considered a completely valid or reliable reflection of the students' true abilities.   However, the results of the TTCT do show an overall improvement in creativity at the end of an eight-week arts education product, even though it remains uncertain how accurate these findings are. In point of fact, considering the (negative) difference in circumstances surrounding the administration of the second test, it could be inferred that the scores – had external factors been identical to those surrounding the circumstances of the first test – would be higher.

The problems with the results of the TTCT once again highlight the inherent complexity of creativity and its measurement, and gives credence to the theory that creativity is indeed a process, contingent upon a host of variable factors. It also underlines the need for triangulation within this research through multiple methodologies, in order to be able to draw a reliable and valid conclusion in answer to the research question. It is the researcher's belief that the qualitative methods used in this research will be able to offset the questions of reliability in the TTCT results, through their own independently attained findings.

4.2 Qualitative Research I: Ethnographical Participatory Observation

4.2.1 Participatory Observation Analysis

Unlike the quantitative research conducted through the use of the TTCT, which tests for creativity in the *product*, the participatory observation is more interested in observing creativity as a the *process*.

Participatory observation was conducted during the entire duration of the series of art classes, over the course of eight weeks. The condition of the researcher's position within the research activities was clearly established at the beginning of the classes as 'participating in the classroom activities but not in the educative/didactic activities. The researcher was introduced to the participants as 'another teacher who was just there to watch and help their own teacher'. The participants quickly and without hesitation accepted the role of the researcher and the presence of a camera in the classroom. The use of camera to record observations was permitted by the administration of the participants' primary school only under the condition that any films made would only be used for personal use and would not be shown to third parties, as part of their strict policy regarding the filming or photographing of their students.

Classes were conducted on the premises of Kinderatelier Punt 5, which houses a studio equipped especially for the needs of art classes, including easels, paints and drawing materials, smocks, a sink, an etching press, work tables, a small kitchenette, etc. There was ample space to sit back and observe the group without being influential or in the way of the teacher, yet the space was intimate enough for the researcher/observer to be able to

participate in conversation and other (non-educative) group activities. The theme for this series of art classes was "Illustrations", in other words, visual interpretations of stories, music or other stimuli.

The data was analyzed based on a combination of thick description and open coding. Observation data were noted in a logbook as much as possible during classes, and further observations were noted after each class and derived from the video recordings made during each class order to analyze the observations as thoroughly as possible, they were first recorded as a so-called thick description (Geertz, 1973). This unabridged and detailed interpretation of each observation session that took place during the research will elucidate not only the individual behaviors observed by the the research but also the context within which they occurred. (The raw data for both the thick description and open coding for each observation session can be found in Appendices D and E, respectively). The thick descriptions were then analyzed and distilled into topics, themes, and concepts or codes. The contexts of each individual behavior observed are grouped by topics, in order to provide an initial deductive framework for further coding. These topics of focus have been divided into observations on (1) teacher behavior, such as teaching methods, (2) student behavior, or how the students respond to teaching methods and learning activities, how they work and (3) any learning environment conditions. These three topics should provide a relatively thorough coverage for the basic types of observations that can be made, and provide a frame of reference for the grouping of behaviors. Each observation is further reduced, on the basis of topic, into individual chunks of information, which can be distilled into concepts and themes. These manageable 'bytes' of information can be more easily analyzed. Through the careful analysis method that coding enables, links between indications and concepts can be more accurately identified, strengthening measurement validity. Recurring categories, themes or concepts indicate patterns, some of which are to be expected (although not guaranteed), based on the existing theories already laid out in the theoretical background of this research, and some unexpected, which can hopefully be developed into new grounded theory.

Some of the pre-existing themes and concepts that are expected to be encountered during coding of observations are listed below according to topic. It must be noted that both these

themes and concepts, as well as the division of the themes and concepts per topic are only an approximation made beforehand, and are not guaranteed.   They are being operationalized as a deductive guideline to the participatory observation, to help search for and possibly identify patterns that may already be part of existing theory. However, it is precisely the inductive nature of exploratory methodology such as participatory observation to uncover and identify new, unexpected and insightful patterns or concepts that may not have been previously documented, or may be documented but not linked to each other.

The following amalgam of possible themes and concepts is based on the theoretical background of the research:

1. Teacher behavior/teaching methods, including but not limited to:
   o Explicit instruction
   o Modeling creativity through example
   o Open-ended assignments
   o Use of Stimuli
   o Motivating through reinforcement, questions
2. Student behaviors or responses, including but not limited to:
   o Developmental level – referring to the cognitive or aesthetic developmental stage of the students
   o Knowledge: can be defined as either procedural (know how, strategic thinking) or declarative (factual information) knowledge, both kinds contribute to (or inhibit) creativity;
   o Motivation: can be defined as either intrinsic i.e. the student's own enthusiasm and extrinsic i.e. encouragement from the teacher, and are both important to fueling the creative process
   o Problem identification: the ability to define or identify a problem
   o Ideation: defined collectively as ideational fluency, flexibility (or problem solving) and originality,
   o Evaluation: the ability to value and critically evaluate ideas; reflection.
   o Expressivity in visual art media, music, dance, creative movement etc.
   o Non-conformity, individualized behavior

- Enjoyment of and ability in visual art (can be considered a type of intrinsic motivation)
- Enjoyment of and skills in small group activities, problem solving, etc.
- Use of humor in verbal communication and visual arts
- Impatience, quickness of warm-up (eager to get started)
- Use of Imagination

3. Learning environment including, but not limited to:
   - Classroom - Is the environment full of cues (examples of ideas)?
   - Group dynamic – what kind of atmosphere does the group as a whole create

The data derived from the thick description is re-recorded into schemas organized in table form. As mentioned, although coding is open and seeks to undercover new and unexpected patterns. It is also approached from a deductive standpoint, as many pre-existing themes and codes have been operationalized to form a guideline for the observations. As such the schemas were filled in according to topic/observation, after which a note, code, and finally a theme were recorded. The tables were divided into six columns as follows:

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Topic	Observation	Theme	Notes	Concept	Concept 2
This column contains type of observation made, based on the actual observation made	The 'raw' observation made	Since many pre-existing themes have been named, data will be grouped here deductively, according to them, **when applicable**	Here the details of the observation are further described, to uncover any concepts or patterns	This column lists the specific code or concept that can be identified as a result of columns 1 through 4	

4.2.2 Participatory Observation Results

The participatory observation conducted over the eight week period in which this research was held offers interesting insights into the creative process, and over the influences that govern this process. Some of these insights are supported by existing theories, most

noticeably those on the creative process (Runco & Chand, 1995; Runco, 2003)and ways creativity can be stimulated in the educational setting (Runco, 1990, Craft, 2003), while others suggest possible foundations on which new theory can be developed.

First of all, findings strongly support the theory that creativity is a process based on the interaction of different factors (Runco and Chand, 1995; Runco, 2003). Some of the factors are internal, such as individual skills, and some are external. The individual skills identified during observation were ideation (including fluency, flexibility or problem solving, and originality), use of imagination, evaluation (including reflection), problem identification, and freedom of expression.   These make up the core of the creative process, and were shown to be influenced to a greater or lesser degree (positively and negatively affecting creativity) by a variety of external factors. Some of these external influences were more tangible, such as cues or visual stimuli, but many of them were intangible. Factors such as motivation (intrinsic and extrinsic), knowledge (procedural and declarative), teaching method, learning activity, the learning environment, group dynamic, developmental levels and all were observed to play an important role in the creative process.

Observations were broken down into three main types, those of the teacher's behavior, those of the students' behavior and those on the learning environment. The results of the observation will use these topics in an attempt to report the findings in as logical and overseeable manner as possible. However it must be noted that due to the high rate of interrelation and interdependence of the various factors at play, the use of these three frames of reference can only provide the most basic of context within which to discuss the findings.

When observing the above external factors and the ways in which they influenced the creative process, the teacher's behavior was observed to be the most influential. This is more than likely due to the developmental level (both cognitive and aesthetic) of the participants, which were first and second graders between the ages of seven and nine, and fell within the concrete operational development stage (Delfos, 1999) and second stage of aesthetic development (Parsons, 1976). The choices of teaching methods and of learning activities used during the classes were observed to be the most direct trigger for the creative

process. It should be noted that observations make a distinction between the 'assignment' as the whole of the art project or exercise, and the individual learning activities, including 'tasks', which make up the assignment as a whole. During the course of the research the teacher consistently made the same or similar choices in teaching methods that were specifically geared at prompting the activation of individual skills or factors, as is illustrated in the excepts below. One example of this is the use of open-ended tasks. Every assignment given during the course of this arts education program was made up in large part of open-ended activities or tasks.   This program was centered on the theme 'Illustrations", or the visual illustration of stories, poems or music. Learning activities therefore consisted of the use of non-visual stimuli that would be visually interpreted by associatively drawing about what was heard. This use of this learning activity was seen to be an especially good trigger for ideation, freedom expression and use of imagination. The use of unfamiliar abstract auditory stimuli in the form of stories or music that required active listening as an activity made it possible for each student to develop their own unique and original interpretations. In no class was it ever observed that two students drew exactly the same thing, each had their own original version.   In addition, it was interesting to see that stimuli only served as a trigger for one task, while the assignment as a whole was often completely devoid of signs of this original cue.

 "She does not tell them what the end product (the etch) will be, she begins small, in steps, simply explaining 'listen to the music and make drawings'. The children were a little puzzled, one asked, 'but what do we write down when it's music?' And the teacher answers 'You will surely be able to draw something from what you hear [on the CD].' Another (older boy) frowns, as if in doubt and the teacher asks 'do you already know that you will draw wrong?' And he answered 'no.' She says 'Just draw whatever pops into your head.'" (Excerpt from thick description, lesson 3)

The ability for the students, by way of various divergent activities, to make their own decisions on what to draw or – within the constraints of their age group - how to carry out the assignment was not only conducive to more ideation, use of imagination, and freedom of expression but allowed for more reflection, problem identification and problem solving. However, considering the age group, assignments still needed to have some convergent or

closed elements or students would become 'lost' in the choices or options. As a result, the teacher opted to combine open-ended and explicit instruction (explaining things in a task-based, step by step manner) within one assignment.

While the open-ended tasks provided freedom, explicit instruction provided the boundaries the students needed in order to prevent them from becoming overwhelmed.

The above excerpt shows how the teacher is able activate creativity skills by giving an open-ended task – associative drawing based on a musical stimulus (which initially proved to be a somewhat abstract concept to most in the group) – while provided boundaries, by instructing the students one task at a time, so as to keep their focus on the immediate. This combination of open-ended tasks, using an abstract stimulus) within explicit steps provided the right balance of freedom and guidance. It was the teaching method of choice throughout most of the series and, when compared to other teacher methods, provided optimal conditions for the creative process of this group. Conversely, when students were faced with convergent tasks (as was the case when there was a substitute teacher for a day), such as 'drawing an animal', combined with strong visual clues, such as pictures of different animals hanging on the classroom walls, works were predictable (copies of visual clues) external motivation was perhaps initially higher but never internalized, and ideation, problem identification and problem solving were lower.

Observations showed that the creative process was also positively affected by the teacher's use of reflection as part of the assignments. In cases where the teacher used review activities to prompt evaluation, students exhibited heightened use of ideation and problem solving, self-reflection, and knowledge. The teacher's use of questions to get the students to think and trigger their processes was essential to this learning activity:

"The teacher has a pile of etches from the previous week, which she has ready to show the children. Evaluation and reflection stimulated by teacher led to some surprisingly insightful comments from children. They were asked what they could do to improve,' do you think there are things you could add to this? What would they be?' 'What could you do differently this time' and they [...] were able to see problems, think how to improve it."
(Excerpt thick description, lesson 4)

The students' answers and comments to such questions confirm the observation that the creative process was improved by the evaluation activities initiated by the teacher. The act of evaluation was not always directly triggered by the teacher, though. In other instances, the students themselves initiate self-reflection. This would seem to suggest a high level of intrinsic motivation:

"The girl who was done first is examining her work and reflecting on it together with the teacher, contemplating whether to add something else. She is really proud of it. Instead of adding something to the collage though, she goes back to her story and adds something else to it. She reads it out loud to the researcher (with pride and happiness) when she is done (the researchers praises her work)." (Excerpt thick description, lesson 2)

In this and other cases the role of the teacher, in giving constructive feedback and positive reinforcement, can also directly serve as a strong extrinsic motivating factor that can become internalized within the students. Situations where it could be observed that extrinsic motivation became intrinsic were considered indications of a stronger creative process.

Another teacher behavior that was observed as having a role in the creative process was creative modeling in the form of demonstration. Modeling creative behavior through example was in some regards seen to be a positive influence, yet also to have the tendency to become too influential, limiting ideation. Demonstration of techniques that resulted in an example of the task itself was observed to have the effect of an over-powerful visual cue, which resulted in imitation from the students. In a class where the teacher had given a demonstration on a watercolor wash technique:

"*Most attempted to reproduce the teacher's demo exactly, and kept looking at what she had just done…*" (Excerpt thick description, lesson 1)

And later on, in a class where the drawing technique was the only stimulus (and only book illustrations using the technique served as cues):

"The older girl seemed 'stuck' drawing schematic things like flowers and butterflies; also she had drawn a cat and baby wagon, in imitation of the teacher's example." (Excerpt of thick description, lesson 7)

This could also be somewhat related to the aesthetic developmental stage (Parsons, 1976) of the students (awareness of conventions) in that a creative solution as portrayed by the teacher was assumed to be the 'right' way of doing it, closing off the students' own use of imagination and ideation. The degree of influence the teacher provided by way of example (either through modeling or through visual cues) was therefore found to only help the creative process to the extent that it triggered the students without overshadowing their own potentiality. For the teacher, finding the right balance between letting the students discover their own process and guiding them through it was observed to be one of the most essential factors of the creative process.

An observation made with regards to teacher behavior in the choices made for learning activities was the seemingly fruitful results of a cross-disciplined approach to the learning activities. Many of the assignments also included that the students write a new story, one to go with the works that were created. What was found was that the use of 'creative writing' in this manner not only seemed to somehow complete the creative process by having the students reflect on their visual works and express them in language, but highlighted the observation that the original stimuli (the original story or poem) was long forgotten and during the process had become transformed in to a completely new expression. One particular happening took place which seemed to support the idea that the use of the cross-discipline approach actually served to advance the creative process during the seventh class, when the instructions did NOT include writing a story to go with their illustration:

"The youngest described his drawing (people in the truck on their way to a party) very colorfully, even though his vocabulary was very simple ... The teacher made one last walk through the classroom, commenting on and asking about the students' works. What was most noticeable is that ALL the students had a 'story' to tell about their drawing, without that being part of the assignment." (Excerpt of thick description, lesson 7).

The above scenario led to the observation that a spontaneous progression of the creative process had occurred as a result of exposure to, and experience with, the creative process through these classes. At no point during this class did any of the students ask whether a

story should be included, yet somehow the illustrations they had produced as part of an open-ended assignment (they were free to draw whatever they wanted in this assignment) shows a progression of ideation, freedom of expreesion, use of imagination and intrinsic motivation that is completely independent of the teacher's influences.

As mentioned, observations proved difficult to isolate per singular type or topic of observation, since all factors observed were in some way interrelated to another contributing factor. However, when concentrating on making observations from the perspective of the student behavior (which could only be done sporadically, developmental factors and individual work styles were observed to be of influence the creative process as well. The developmental levels between the students varied significantly and, depending on the level of difficulty of the assignment or task, the younger students sometimes seemed not to be able to fully engage in the creative process. Of course, it should be noted that this observation – along with all other observations on students – could also have to do with the individual, personality based differences between the students that the researcher was unable to recognize (due to the relative brevity of the research). However, an accurate observation would be that the level of difficulty of the assignments (as this corresponded to the students' developmental levels) affected motivation levels, which in turn influenced the creative process. When an assignment or task was too abstract or complicated, or, conversely, not challenging enough or too easy, the result was lower levels of motivation, and students became more easily discouraged and – usually – distracted or distractive as a result.   Motivation – whether intrinsic or extrinsic – proved to be an absolutely crucial component to the creative process with these students. Observations showed time and again a strong correlation between motivation and ideation.   Other observations on students' behavior were their individual work styles. Again, due to the brevity of the research and the focus of the class as a group, it was unable to fully ascertain whether the observations made were true indications of a pattern in the students or if they were situational observations. Yet during the course of the research, some patterns did seem to emerge. Observations indicated that the second graders were on the whole more 'serious' about their work and the first graders more 'playful'. Their individual work styles – conscientious vs. spontaneous, for example – did not seem to impinge in any way on the individual processes (although disruptive first graders were sometimes an annoyance to

more focused second graders), however these difference in work styles seemed to have an impact on the group dynamic, and by proxy, the creative process as a group.

One question which arose based on the observations of individual work styles was that of language deficiency and how this may have affected the student's creative process. All of the students except one spoke Dutch as a second language. The issue of language deficiency (which should be understood as deficiency in the command of the Dutch language rather than a cognitive developmental deficiency) was especially interesting: not only did it *not* seem to have an adverse effect on the creative process, in some cases it seemed to serve to its advantage, as the student with the largest deficiency also oftentimes was the most expressive and showed the most ideation, freedom of expression and use of imagination. Whereas students were most often highly susceptaible to teacher examples and influence, this student was not:

"Most attempted to reproduce the teacher's demo exactly, and kept looking at what she had just done, except one, who began using the sponge to paint a forest background, which was not part of the story or the instructions. I don't know whether this was creativity/non conformity or if he just didn't understand (he is the youngest and his language is deficient)." (Excerpt thick description, lesson 1)

Also, in situations where auditory stimuli provided cues, this student seemed to be less reliant on cues and used his own imagination:

"The poem was very visual in its description, a good stimulus for ideation. The teacher looked around at what they students had drawn and said, 'I look around and I see some drawings of trees,"and then she approached the youngest and said "and what did you draw?' He answered, 'a boat'. She asked', 'did you understand it wrong? Or did you have a different idea' […] he answered, 'a different idea'   this raises the question again about language deficiency. Observation over the course of the last four weeks suggests that it language deficiency does not hinder ideation." (Excerpt thick description, lesson 5)

Whether these observations can be factually correlated remains to be proven and it also needs to be noted that high levels of ideation, freedom of expression and use of imagination only form some aspect of the creative process.

Some pre-existing concepts that were anticipated, such as indicators of creativity in disadvantaged children (Torrance, 1973) were occasionally observed, but not as part of any consistent pattern and as such not in a way that could be directly associated with creativity as a process. Aside from situations where the question of language deficiency might have played a role, observed instances in which students showed signs of i.e. non-conformity or humor were too infrequent to be reliably shown to be anything other than snap-shot moments or at best, general character traits. Making a correlation between such observations and evidence of creativity in disadvantaged children was therefore considered unfounded.

Since the research centers on visual arts education – in particular, an arts class - group dynamic was often the (somewhat unexpected) focus of observations. It should be noted that group dynamic refers to the way the students interact with the teacher and each other, and the learning environment or atmosphere that results. This depended largely on the students' actions and interactions, but also on a host of other factors, everything from the weather outside to the level of difficulty of the learning activity.   Regardless of how the individuals may have worked, in this particular class situation, the group dynamic often proved to be the driving force behind the process. Although the students all worked on individual projects, the setting was a group setting. When members of the group were disruptive (overly 'playful' or over-excited, for example) the environment grew too chaotic for the creative process to flow. One the other hand, when the group was 'merry'- friendly, relaxed, peaceful - and the environment was harmonious, the creative process was positively influenced.

"The younger girl was especially bubbly (she is always very social) and burst out into song, everyone chimed in and the group was all singing merrily together while they worked. The teacher said 'Wow, how cozy!!' – all the students were focused on their own projects (adding

details, solving small problems, etc.) while still engaging in a positive atmosphere and group dynamic." (Excerpt from thick description, lesson 6)

The assignment during which the above observation was made was an especially good example of good group dynamic as a result of the right combination of external factors on the creative process, in particular in the balance in the level of challenge in a task or assignment. The level of challenge in this assignment seemed to cater to the developmental levels of all students. It involved the use of spatial skills in the making of a 3D project (a tree, fashioned from electrical wire and modeling wax, complete with tree house, made from cardboard boxes that needed to be cut up and reconfigured). Observations showed that all students were equally intrigued with the challenge of using spatial skills.

"The group – especially the younger ones – was surprisingly peaceful (no running around) and everyone was working hard. Although a challenge, the task of reassembling and mounting the box forms held their concentration. They looked like they were trying to figure out a puzzle. The youngest one had a box in his hand and was turning it and trying it in all different positions of the branches, to see which position was best. Even though the teacher had significant influence, she let them solve as such as they could on their own, and encouraged them to come up with the answer themselves." (Excerpt from thick description, lesson 6)

As a result the students were as a whole genuinely enjoying the process. This was also evident in the creative process, which exhibited higher than average levels of motivation, problem identification, and problem solving/flexibility of ideas.

As part of the learning environment the class locale itself served as an external motivator and stimulus. Since the subject or theme of the program was "Illustrations" (of auditory stimuli in the form of short stories, poems and music) the classroom walls were bare of any visual cues that could have influenced the students' interpretations of the auditory clues that were used. The classroom remained a 'blank canvas' for all but one lesson. This required the students to rely much more on their imagination, which, as observations showed, led to more ideation (originality and fluency), as they were not steered in any one direction of what they should draw. Each student interpreted their stimuli differently. Upon

illustration of a musical story complete with narrative, each student focused on different elements of the story:

"One of the girls (aged seven) asks 'how do you draw a' dune heath'?' The teacher said, 'Wow, that you even understood that (phrase in the story) is great', and she walked over to her and explained and helped her work out a drawing by asking questions and suggesting but not by showing her how.

This student worked out her ideas based on her interpretation of the story, which were as a result unique and original.

Finally, observations on the classroom as learning environment showed that the open plan of the classroom (all students were seated together at one large table with plenty of working room) contributed to the group setting, and the presence of equipment that the students would be using, such as easels, painting materials and an manual printing press, served as an incentive or stimulus to which the students enthusiastically responded, and working as extrinsic motivation. As children from a low socioeconomic background, they had never been exposed to such equipment, the chance to learn how to work with them was a stimulus to engaging in the creative process. These stimuli were also the means to learning new techniques, or acquire procedural knowledge, which also played a role in the creative process: having to learn how to use different equipment gave students on the whole the ability to define and solve problems during their activities

To summarize, after vigilant observations and the analysis of the raw data through open coding, findings on the participatory observation portion of this research show a high level of correlation between certain factors, many of which were anticipated as a result of the theeoretcial background on creativity as a process (Runco & Chand, 1995; Runco, 2003) and creativity in education (Runco, 1990; Craft, 2003; Sharp 2004). It is believed that these findings reflect a solid degree of measurement validity. Most factors involved with the creative process were observed to be interrelated or interdependent upon each other in some way: evaluation led to problem identification, motivation led to ideation, etc. Motivation seemed to be an especially powerful inluence on the creative process, and when levels dropped, the creative process slowed down. In most cases the teacher provided the

most immediate trigger for the creative process, which in some part can be attributed to the young age of the group. By using non-visual cues and open tasks the teacher was able to prompt imagination and ideation, and encourage freedom of expression. Her use of review and reflection also triggered the students' ideation, problem identification and motivation. Level of difficulty of the assignments given and degree of teacher modeling also affected the creative process, when either was too high, motivation and ideation dropped.

While many of the factors observed at work during the creative process could be derived from the pre-existing themes and concepts already operationalized for this research, a number of unexpected themes also came to light. Despite the lack of supportive evidence found for individual indicators of creativity in disadvantaged children, the observations made with regards to language deficiency (which can be seen as factor that is linked to socioeconomic background rather than to developmental levels) and ideation (which corresponds to fluency, flexibility and originality) raise the question as to whether these two could be linked. Although language deficiency is relatively common among disadvantaged immigrant children, especially in this area of Rotterdam (Deelgemeente Delfshaven, 2010), a connection between creativity and language as such was not considered beforehand. The importance of the group dynamic was also an inductive finding based on the observations: while working in a group is mentioned in theory (Torrance, 1973), the degree to which the group setting affects the creative process was not anticipated and was observed in many cases to be the driving force of the process. Also, although developmental stages were covered in the theoretical section as a referential frame, the extent to, or context within, which these would play a role (in a mixed age group, and to with regards to the level of difficulty of an assignment) were not anticipated ahead of time but were observed to be of significance to the creative process and its degree of success.

Finally, perhaps the most important observation to come out of this portion of the research, one which was also rather unexpected (and not expounded in any of the background theory on the creative process), was the importance of and need for balance in all of the factors described above in order to ensure a productive creative process. Too much or too little of any one factor – whether it be stimuli, level of difficulty, or even a relaxed atmosphere - upsets the balance, which, as observations have shown, ultimately adversely affects the

process. When the balance is right, students are highly motivated, have confidence in their own abilities, and enjoy themselves and the challenge of making art, resulting in a successful creative process. In this sense, when the balance of factors governing the creative process was favorable, creativity levels were observed to be advanced through the arts education classes.

4.3 Qualitative Research II: Semi-structured Interview

4.3.1 Semi-structured Interview Analysis

This portion of the research is important to triangulation, as its objectivity and independence from the other two research methods strengthens reliability and validity. In addition, it offers a new insight on the research question from a different – and not less important – perspective. The form of the interview was semi-structured, leaning more towards informal. The interview was conducted between the researcher and the two primary school teachers (from the first and second grades) whose students had participated in the arts education program that are the subject of this study. It took place at end of the school day in the first grade classroom at the students' primary school location in Rotterdam, one week after the last art class was held.

The premise of the questioning was based simply on the definition of creativity as a process (Runco & Chand, 1995; Runco, 2003) and not as a result or product, since the main purpose of the interview was as a 'checks and balances' to the first qualitative method to be used, participatory observation. The definition given to the teachers was simplified slightly for the benefit of the teachers understanding and in the interest of time.

The researcher had four prepared open questions, but also allowed for and encouraged the interview to freely develop, as answers prompted new, unexpected avenues of questioning. More prepared questions would steer the conversation too much, and since the teachers could only set aside twenty minutes for the interview, the researcher chose to focus more on quality of answers (answers that would lead to other insights) than quantity. The prepared questions (and the reasons behind them) were the following:

1. Has there been any noticeable change in level of creativity since the beginning of these art lessons? (directly related to the research question)

2. Why is creativity important? (To establish the teacher's position on the subject)

3. What socioeconomic factors – of any – could make creativity and/or arts education important? (indirectly related to the research question)

4. What (other) ways could creativity development be stimulated in this research group? (general knowledge for possible future research)

The raw data consists of the transcribed interview, in which "teacher 1"refers to the first grade teach and "teacher 2"refers to the second grade teacher. The transcript was analyzed with the help of open coding, again using a schema in table form to group chunks of data into individual concepts.   The table is divided into five columns, as follows:

Topic/Question	Teacher 1 comment	Code	Teacher 2 comment	Code
The topic of questioning or discussion	The answer or comment made by the first grade teacher	Concept or code that could be identified from comment	The answer or comment made by the second grade teacher	Concept or code that could be identified from comment

The concepts are then further scrutinized to see if any patterns can be detected to support or rebuke the findings of the observations. In addition, any new concepts or patterns can be useful in the development of possible new theory.   For raw data of the interview transcript and the open coding analysis schema, see Appendices F and G, respectively.

4.3.2 Semi-structured Interview Results

This interview – in its semi-structured form – allowed for both direct answers to questions as well as to the exploration of themes or concepts that developed during its course. Both teachers expressed their interest in the research and the importance of creativity for their students. During the interview it became obvious that the second grade teacher had much more to contribute, a fact which could be related to the slightly more advanced developmental level of the children. Regardless, the interview provided important and

interesting information that helps to triangulate the findings of the other research methods of this study.

With regards to the main question: whether the teachers had exhibited any improvement in creative skills (defined at the start of the interview by the researcher – in more plain language - as ideation, problem ID, and evaluation) since participating in the art classes. Both teachers answered that the duration and frequency of the art classes was too short for them to make any certain conclusions.

"…they were only once a week, and they are not constantly busy with it, so it is hard to say if they have really improved or developed"

The fact the classes were only once a week, and only for eight weeks long, made it difficult for them to ascertain of there had really been any long-lasting changes in the students. However, the second grade teacher followed her answer with the observation that some assignments did seem to trigger knowledge, ideation and motivation more than before the classes:

"…but I have noticed that when I give them a drawing assignment, for example, they think about the things they have done with you and they are more involved…I noticed that they got deeper into the assignment, looked at it more and thought better about it…"

She added that it was evident that the students had thoroughly enjoyed the classes throughout (can be interpreted as intrinsic motivation)

In response to the question whether longer and more frequent classes would have made a difference she responded that although it was hard to say if differences would be long term or transfer, it seemed likely that they would. Later on in the interview both teachers agreed that the more often students are given creative assignments (in general) the better developed their creativity would become as a result. Given the teachers' pedagological expertise, this answer carries some weight with it.

When questioned on the current in school arts education, both teachers answered that these were very low level ("arts and crafts").

"We (teachers) regularly do art projects with them, but we are not artists, so what we do is more 'arts and crafts' than art that encourages real creative skills, like the skills you mentioned."

This gives a frame of reference as to the current quality of arts education in primary schools located in the lower socioeconomic neighborhoods of Rotterdam.   It also raises a question on the difference in quality between professional art teachers (who are themselves artists) and non-professional.

The developmental/age level of the students - and how this translated into current classroom activities - was an important topic of discussion. The difference in level between the two grades is significant, and greatly influences what and how the teachers teach. Grade one relies more heavily on "play", for example, grade two is more involved with academic disciplines such as language and math. However both grades are still in the beginning phases of their education, and as such not exposed to many activities that could be characterized (according to the working definition used here) as allowing for creative expression, as most activities for these age groups could be considered "closed" assignments :

Teacher 1: "I agree that the more creative assignments they have, the more they would be likely to think creatively. The problem with this age is that their subjects and assignments are all still very concrete (closed) so that creativity sometimes can't really be used...applied or triggered, I mean. "

The exception in this seemed to be arts education, play (for the first graders) and a limited amount of language assignments (for the second graders).

Teacher 2: "Yes, the only subject that really allow for 'open' assignments at this age is language...and art. Music too, but music is also not considered a 'regular' or 'serious' subject here, maybe even less so than art. I know that other neighborhoods and schools might work differently, but they also have more funding."

Researcher: "So would it be right to say that those subjects that use open assignments offer the most chance for developing creative skills? In this age group, or age groups, I mean?"

Teacher 1: "Yes. I would actually dare to say that if you are looking at creativity as problem solving, art assignments can trigger that even more than language at this age. Especially in my class (first grade) we are still really just getting started with the basics. In my class the children still spend a lot of their time learning through play ('playtime')."

The first grade teacher also commented that "play" offered opportunities for creativity through open-ended activities, triggering problem identification and solving, and ideation schools for her students. Language activities such as creative writing (however limited this may be) for the second graders also could be considered to trigger ideation and evaluation. Both teachers stated that "open-ended" activities were the best for stimulating creativity. These statements support the findings of the observations that visual arts activities, which are open ended assignments, are successful stimulators of creativity/the creative process.

The teachers both agreed that these students worked well in a group setting, although they also both stated that the degree to which they worked well depended on the right balance a number of different circumstances that affected group dynamic.

Teacher 1: "At this age (first grade) most children enjoy working in a group. Because they still are so involved with play. But it works both ways, because sometimes they get each other more involved, and sometimes they distract each other – it depends…"

Teacher 2: "In our class we also do group work, but less than first grade, I think. But it is the same, sometimes they work better than others. But in second grade you have to begin to try to get the students to work more individually. There are more assignments done 'in quiet'. It has a lot to do with the type of child, I think, how they work best…"

This too supported the findings of the observations on playfulness and group dynamic (and how this can affect the creative process). While this point may not specifically link creativity with working in a group, it does show that working in a group environment is standard practice used for these age groups (although more often in first grade).

The second grade teacher confirmed the fact stated in the theoretical section of this research that creativity is currently not included by the state school system as part of the

curriculum, or as a learning goals, and is only peripherally mention in primary education policy as goal for personal development.   When discussing why the teachers though creativity was important, they both answered that students that were creative were able to adapt more quickly (problem solve), something which helps advance their standings in class.

The researcher asked her to elaborate.

Teacher 2: "…the skills you named, they are all important skills that underlie a lot of everything else the children need to learn. Creative children always seem to have a certain advantage over non creative children. Even if they are not more intelligent, being creative helps them in other ways. But now I'm talking about children who are already 'creative'.

Researcher: "Ok, I understand, but how do you mean an advantage? Can you maybe give an example?"

Teacher 2: "Well, good problem solving skills, for example. Children who are creative in this way seem to adapt quicker…if they can be creative in their thinking and problem solving, you notice that as a teacher."

The issue of language deficiency was mentioned in this context. Interestingly, both teachers agreed that the more creative language deficient students – who scored notoriously lower on i.e. cito tests – were often times able to use their creativity to compensate for their poorer academic standing.

Teacher 1: "I agree that creative children are smart in a different way.   Especially when it comes to children with poorer language skills (I have a few in my class)…their cito scores are almost always lower and a lot of the times they are the more 'clever' of the children."

Both teachers described the more creative students with the word 'clever' and the second grade teacher remarked that this was something the teacher could only see during a (group) process. This statement lends credence to the theory of the creative process.

Teacher 2: "That's a good way of saying it. Creative children are cleverer than non creative children, and that is something that often can get missed in the cito test. It's something you see more in the way that they work and interact."

In discussing possible reasons creativity could be considered important for disadvantaged students, the first grade teacher answered with a slightly irrelevant comment that still gave some additional insight, by stating that money (budget, funding) on both the home and school level was an important factor in providing more opportunities for creative learning (more money = more creative opportunities, something these students otherwise missed out on). The second grade teacher responded to the question by saying creative children (when positively channeled) would 'stay out of trouble'.

Teacher 2: "Maybe as they get older, being more creative can help them stay out of trouble. They are still young now, but as they get older a lot of them wind up in trouble. I think that is a factor of this neighborhood, or as you say, the "socioeconomics" of this neighborhood."

This does not directly state the creative students would ultimately have a better chance at becoming more successful, but an inference can be made from this comment that this would be the case. This is important to the societal implications of this research, which suggest that creative individuals can grow up to be more successful and contributing members of society.

Researcher: "What would your suggestions be, if you wanted to see creativity development in these children?"

Teacher 1: "I think things like better art classes, and playing, offer the most realistic chances at this age. Maybe at an older age you really could use assignments in other subjects… "

Teacher 2: "I think art classes are really good for creativity too. But if you wanted to develop it, you would need to be more consistent and have it become part of the learning goals. If it (creativity) was integrated in the curriculum, we (teachers) would be able to do more with it. And to get back to your first question, whether the children in the art classes showed an improvement in creativity at the end? I think in the short term, they showed some differences in their work, and that if they had classes more often and for a longer time – maybe a whole year long - they could show some differences, but I'm sorry, I can't say I saw any long terms changes."

In closing, the interview offered some very interesting information that both help validate the observation findings but also contributed useful insight that can prove useful in

answering the research question and for inspiration for further discussion and/or research. According to the teachers, the process of creativity for this age group is most likely able to be developed through open arts education activities, however the particular arts classes that served as the focal point for this research were too short-lived and infrequent to be able to say with absolute conviction that an increase in these students' creativity had occurred as a result.

The professional opinions of the teachers also supported the assertion that more frequent arts classes for a longer duration would likely have a positive effect on creativity levels. That being said, the teachers did offer the observation that, in certain isolated cases, evidence could be seen of increased use of problem finding, ideation and evaluation. Motivation levels in other arts (or open-ended) activities of these students were also improved, although transfer to other academic subjects was not observed by the teachers. Developmental levels of these students confirm the use of certain tactics as suggested in studies (Craft, 2003; Runco, 1990; Sharp, 2004) and as reported during observations. Creativity in connection with socioeconomic circumstances was named as a possible deterrent to 'getting into trouble'for students from a disadvantaged background, something which could lead to the inference that students who were more creative also had a better chance of succeeding in life.   The discussion of language deficiencies among certain students only led to the statement that at least some of these students often show signs of being more creative, something which helps them compensate their lower standardized testing scores (cito) by exhibiting problem solving skills and better ability to adapt. A new topic to enter the discussion and which was especially interesting was the distinction the teachers made between the 'quality' of arts education as offered by the primary school system's curriculum (and given by non-artists) as opposed to the quality of arts education given by certified art teacher/artists. The quality of the latter kind was according to them far superior.

Part V: Conclusions and Further Discussions

5.1 Conclusions

In order to reach a decisive conclusion as to how the research question can be answered, the results from the three different methodologies need to be carefully examined. The concept of creativity is notoriously complex, and the use of three separate research methods means that the results need not only to be carefully considered, but also compared and contrasted with each other, before drawing any final conclusions. The results will therefore be summarily discussed individually beforehand, and any points of discussion that may come to light, but are not in direct relation to the research question, will be reserved for later consideration.

The results of the quantitative methodology show a slight increase in overall creativity, as measured in the results of the creative performance, or the creative *product* (Torrance, 1962; 2008). Yet it must be noted that there may be some reservation held as to the reliability and validity of these results. According to the directions manual, when the TTCT is administered according to the instructions and the conditions for both forms and are carefully controlled, the scores should be reliable and valid. However, some of the abilities and strengths being measured - whether they be due to cognitive or motivational levels - seemed too abstract for this age group in the context of the activities, giving rise to the question of reliability of the scores. Furthermore, the real-life circumstances of the test conditions proved to be somewhat more difficult to 'control'. Form A administration seemed to go reasonably well, in that the participants were more receptive, completed the activities in an orderly fashion and showed high motivation and concentration. During the administration of Form B, these circumstances were somewhat different: the students were familiar with the test and its expectations; this affected the motivation levels and listening skills of some of the students. They were easily distracted and did not actively listen to the researcher's instructions, resulting in some instances in unsuitable responses. Lower motivation levels led to frustration and impatience, most certainly having an effect on responses. Furthermore, because the students had been working as a group for eight

weeks, getting them to all suddenly work silently and individually, despite clear instructions to do so, proved difficult. Many of the students were naming their responses out loud, which contaminated originality, and an incident with student who became unwell during Form B added to the disturbance of the environment. As a result it is believed that the results of Form B are less valid, actually artificially *lower* than they would have been had the administration gone without incident, and not a completely reliable reflection of the students' true abilities. It therefore remains questionable to the researcher whether the TTCT is a valid and reliable method of measurement, at least for this research group.

In spite of the reservations in the reliability and validity of the responses (most specifically in the case of Form B, which resulted in lower scores), the scores do represent a *before* and *after* measurement that show that creativity – most specifically fluency – had increased over the course of the arts education program. In addition, considering the (negative) difference in circumstances surrounding the administration of the second test, it could be inferred that the scores – had external factors been identical to those surrounding the circumstances of the first test – would be higher, showing a more prominent increase in creativity levels. Unfortunately, due to the impossibility in duplicating the testing environment exactly, the affect of external factors such as motivation levels and concentration remain a deterrent to calling the results of the TTCT absolutely reliable. This inability to take into consideration the many extenuating circumstances that can have an effect on the creative performance at the center of such a measurement method confirms previous findings that the TTCT should always be performed in conjunction with another method (Kim, 2006). Therefore, before drawing a conclusion that creativity was effectively increased during the course of the arts education program the remaining two – qualitative – methodologies must also be considered.

The qualitative methodologies employed in this research took a different approach to the concept of creativity. For these methods, creativity was operationalized according to the theory of the creative *process*, in which creativity needs to be viewed as evident in the creative potential that arises from symbiotic interaction of a number of factors (Runco & Chand, 1995; Runco, 2003). Results from participatory observation do in fact support this theory. In addition, they show that the creative process is a largely interdependent one,

relying on the interrelation between the different factors. In providing an answer to whether the arts education program was able to increase creativity, a direct conclusion is more difficult to reach, precisely due this symbiotic nature of the different factors observed at play during the creative process. On the other hand, while reliability and validity were found to be somewhat hindered during quantitative testing, mainly due to the inability to precisely duplicate all the conditions (and factors) for the second set of tests, qualitative research based on observations of a creative process were able to take this inability into consideration.   Through vigilant documentation of observations and its subsequent careful analysis using open coding, measurement validity is considered solid. Findings on the participatory observation portion of this research show a high level of correlation between certain factors that – when positively associated – can and did contribute to an improved creative process, showing that arts education can increase creativity in the research group. Many of these were to be anticipated as a result of the theoretical background on creativity as a process (Runco & Chand, 1995; Runco, 2003) and creativity in education (Craft, 2003; Runco, 1990; Sharp 2004). Results showed that most factors observed to play a role in the creative process were also observed to be interrelated or interdependent upon each other in some way, and that when they coincided or interacted in a balanced and positive manner, the creative process was effectively improved: evaluation prompted problem identification, motivation prompted ideation, etc. Motivation showed itself to be an extremely powerful influence on the creative process, and when levels dropped, the creative process slowed down. In most cases the visual arts teacher – and her teaching methods - provided the most immediate trigger for the creative process, which in some part can be attributed to the young age of the group. By using non-visual cues and open tasks the teacher was able to prompt imagination and ideation, and encourage freedom of expression.   Her use of review and reflection also triggered the student's ideation, problem identification and motivation. The level of difficulty of the assignments as well as degree of teacher modeling also affected the creative process: when either was too high, motivation and ideation dropped.   In addition to these factors (many of which were anticipated from existing theory), some unexpected themes also were identified as affecting creativity advancement. The degree to which the group dynamic affects the creative process during this arts education program was unexpected and – when positive - was often observed to be a significant factor of the process. Also, although developmental stages (both cognitive and aesthetic) were covered

in the theoretical section as a referential frame, the extent to -or context within - which these would play a role (in a mixed age group, and to with regards to the level of difficulty of an assignment) were not anticipated ahead of time but were observed to have an effect on the creative *group* process and its degree of success. Conversely, some markers were *not* observed, such as consistent indications of creativity that could be specifically associated with children from lower socioeconomic backgrounds, as outlined beforehand (Torrance, 1973). In cases where 'non-conform' behaviors were observed, for example, no direct link could be established as to whether this was in any way a significant observation related to creativity or an incidental one. Yet despite this lack of supportive evidence found for individual creative indicators in disadvantaged children, observations made with regards to language deficiency and ideation raise an important question as to whether these two could be linked. Although language deficiency (where deficiency is understood to be in regards to the Dutch language as a second language) is relatively common among disadvantaged immigrant children (Deelgemeente Delfshaven, 2010) a connection between creativity and language was not considered as a socioeconomic factor beforehand. However, since language deficiency in this case can be considered as such, there is a possible link that can be identified between creative expression through visual arts and language deficiency – an observation that should be noted for future discussion and research possibilities.

As can be seen in the results of the participatory observation, this methodology supports the assertion that creativity can be improved in disadvantaged primary school children through arts education. Observations show that the assignments and teaching methods used during the arts education program (such as open-ended assignments, limitation on cues, a balance of familiar vs. unfamiliar stimuli, teacher modeling and reflection, and so forth), when in proper balance with each other, were seen to elicit an increase in creative skills such as ideation (fluency, flexibility and originality), problem finding and evaluation among the research group participants. On the other hand, this finding – being the result of observations of a '*living' process* - is contingent in large part on the positive interaction and correlation between a myriad of different factors, which, as seen, requires a good deal of effort on the part of the instructor, and is also constantly subject to a host of other outside influences – many of which are unforeseeable or uncontrollable - that can vary from situation to situation and class to class. This makes the straightforward conclusion that

there was a *linear* improvement from one point in time to the other impossible to state with absolute certainty in this research case.   Each art class represented a new process, unique and self-standing experience for the participants, dependent on the factors, and observations over the eight week time frame in which this research took place could not uphold the contention that the arts education program delivered a *steady* increase in creative abilities over time. They did however confirm the supposition that creativity can be increased by ensuring the best possible balance of factors within each instance of creative process.   The lack of evidence of linearity in improvement over the course of the research is, however, substantiated by the results of the measurements of creative abilities and strengths at before and after periods that took place through quantitative testing. These results are also able to diminish any reservation in validity in the results of the participatory observatory method.

The final methodology used in this research consisted of a semi-structured interview with the primary school teachers of the participants of the arts education program. The interview served to triangulate the quantitative testing and participatory observation, and as a 'check and balance' to the reliability of the observation findings. Here too, creativity was viewed and defined as evident in the creative process. Again, the results need to be considered within their context, which in this case was the teachers' observations of any increased in creativity among the participants outside, and as a result of, the arts education classes. In this case, the interview was unable to provide a straightforward and conclusive answer to the research question. The teachers were unable to state that they had definitively witnessed an increase in creativity since the children had participated in the arts education program. Both teachers indicated that the duration and frequency of the program was too short for them to have concluded with certainty that there had been any long lasting change.   This immediately gives rise to the possible need for longitudinal research project in this area, since in order to be able to conclude long-lasting effects of an arts education program on creativity the exposure should be longer and more frequent (i.e. a longitudinal research). That being said, the teachers did offer the observation that, in certain isolated cases, evidence could be seen of increased use of problem finding, ideation and evaluation. The teachers both also stated that they believed that open-ended assignments, such as those performed during the arts program, were more conducive to developing creativity and

that they believed that arts education provided by professionals (such as certified arts teachers) would be one of the best ways for this age group to try to improve their creative skills. These observations, although not directly in answer to the research question, are independent an professional opinions that lend significant weight to the broader discussion surrounding the research question and give credence to the assertion that – especially for younger age groups – arts education (when given for a longer and more frequent length of time, and by professional instructors) can effectively help increase creativity levels in the target group covered by this research.

5.1.1. Final Conclusion

When taking all three sets of research results above into final consideration, the conclusive answer to the research question "**Can creativity can be advanced through visual arts education in primary school children coming from socio-economically disadvantaged backgrounds?**" can on the whole be answered affirmatively, although not absolutely. Creativity levels were found to be successfully advanced in the research group of disadvantaged primary school children as a result of the arts education program they followed. This finding is supported by the results of the quantitative testing done both before and after the research period, which showed a marginal increase in – at least – levels of fluency among the participants of the study. Also, the findings of the participatory observation showed increased creativity as a result of individual occasions of a successful creative (group) process having taken place during the course of the research program. Only the results of the interview were inconclusive in determining that creativity levels were increased, however this can be contributed mainly to the brevity and infrequency of the arts education program and research.   In addition, another lack of evidence (which does not negate the conclusion but remains unfortunate) is the lack of specific results, observations or conclusions that can be related specifically to the demographics of the research group (as socioeconomically disadvantaged primary school aged children).

The fact that this research made use of multiple approaches to creativity and multiple research methods proved valuable and necessary, but in some regards should perhaps be seen as a double-edged sword. The different approaches to creativity used in this research

highlight the complexity of trying to capture the essence of creativity as it may take shape, express, or otherwise develop itself within either an individual or a group. Although both approaches to creativity - the creative *product* (Torrance, 1962; Torrance et al., 2008)and the creative *process* (Runco & Chand, 1995; Runco, 2003) - are based on the same original four markers: fluency, originality, flexibility, and elaboration (Guilford, 1958; Guilford, as cited in Vincent, et al., 1950) and as such share the most important scientific foundations, they are in fact quite divergent, which makes the alignment of the findings of this research somewhat difficult. On the other hand, the different approaches and methods do in fact supplement and substantiate each other. For example, the issue of validity that arose during the quantitative portion of the research can to a good degree accounted for by the conclusions found as a result of the participatory observation that approached creativity as a process. And the limitations of the qualitative approach in successfully isolating and quantifying individual factors of creativity are offset by the statistical measurements of certain core factors. The triangulation provided by the data of semi-structured interview offers an independent conclusion that serves to strengthen both validity and reliability. While the methodologies may have been different, the core factors originally laid out by Guilford formed the basis for all three approaches. As a result the final conclusion of the research may be positive, but the degree of absoluteness of this conclusion is unfortunately not without some reservation.

5.2 Discussions and Suggestions for Further Research

As can be seen above, the creativity research carried out here delivers a positive answer to the research question, although the degree of certainty with which this answer can be stated is less than 100%. However, the results of this research provide a promising and sound foundation for a host of recommendations, future discussions and possible research that can possibly contribute to new grounded theory. This final section will attempt to outline some of the most relevant points for future consideration.

A number of recommendations for future research can be derived from this study. To begin with, based on the research findings, it is believed that a definition of creativity as a process

(Runco & Chand, 1995; Runco, 2003) carries more substantiality than that of a creative product (Torrance, 1962; Torrance et al., 2008). This is because creativity has shown itself - in all the methods employed during this study - to be much more complex than a mere summation of creative activities as postulated by the definition of the creative product. As such, the use of the approach to creativity defined as a process is the recommended choice for operationalization in further creativity research. The TTCT, while it does enable the assessment of creative levels for statistical use, does not seem to be able to take into consideration the many extenuating circumstances surrounding the so-called creative performance or the creative product and not a reliable (stand-alone) research method. Another recommendation for consideration in future studies on creativity and arts education is the length of the research period. It is believed that a longitudinal research is necessary in this area in order to increase the validity and reliability of the qualitative findings. As reported by the teachers who were interviewed in this research, if the arts education program was longer – and more frequent – they would be more able to give a definite conclusion as to whether the children had shown any improvement in creativity levels. This research was not long enough for the teachers to be able to correlate observations to effects of the arts classes themselves. In addition, while the participatory observation provided a more thorough set of findings, the inability to report a linear improvement over the duration of the course could perhaps be overcome if the research period had been longer. A study of at least six months to a year is recommended for qualitative research on creativity advancement. Again, although the quantitative testing performed here did seem to be able to measure before and after levels more successfully, as reported earlier, this method should always be used in conjunction with a more through approach such as the observation of the creative process. A final suggestion that pertains to the construct of the research itself would be the use of control group. The addition of a control group to test the differences between creativity improvement that can be linked to the result of arts education and creativity that manages to evolve either on its own or as a result of other (educational) activities would strengthen scientific validity. In the same vein, the use of a control group could also be implemented to test methods used within arts education. One of the advantages of the qualitative research performed here was that it also brought to light some of the characteristics of this arts education program that can be linked to creativity advancement. Teaching methods such as using open-ended assignments, the right

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balance of stimuli, motivation, and so forth, are all mentioned as part of the results. In addition, the interview results reported the difference between the types of arts classes the participants had received as opposed to the in-school arts education program, which they themselves described as arts and crafts. This brings to light the difference in approach to arts education that can be found within the educational system. Of equal consideration would be the addition of a research group made up of advantaged (or non-disadvantaged) students, or perhaps different age levels, for comparison measurements, since this research was unable to conclude signs of creativity or creativity improvement that could be specifically to the research group's demographics. The addition of a (control) group to the research that could account for these differences in approaches and demographics, and would enhance the validity of a research on creativity and arts education, would serve to strengthen conclusions.

While the above recommendations concern the actual structure of a research project on the current, specific issue of creativity advancement through arts education in disadvantaged primary school aged children, additional observations were made during this research that, although they did not necessarily fit into the parameters of this particular study, lead to interesting lines of questioning which can be considered for future discussion or research projects that may also extend the boundaries of research in creativity and arts education into other fields. One of these was the observation during qualitative research that the student who was typified as having the largest language deficiency (where deficiency can be seen as a lack of command of the Dutch language as a second language, not as a cognitive developmental deficiency) oftentimes was the most visually expressive and showed the most ideation, freedom of expression and use of imagination. When considering the statements made during the teacher interview on language deficient children, that while their standardized test scores ('cito') may be low they prove themselves highly creative in other areas such as problem solving, this observation leads to the question whether language deficiency and (visual) creativity (as defined by ideation and problem solving skills) could be linked in any way. A preliminary search for existing research on 'language deficiency and creativity' shows several studies, most of which focus on or are from the viewpoint of language development (learning theory) itself. A study which focused on a hypothetical link between i.e. creative expression through arts education and (second)

language deficiency within the educational system might prove very beneficial to educational policy for disadvantaged immigrant children struggling with academic performance and assessment issues, or for the so-called 'schakelklas' (intensive language classes for immigrant children in the Dutch school system), as well as being beneficial to legitimacy discourse of arts education in general.

Another suggestion for future discussion and/or research stems from observations made during the participatory observation portion of the study. This concerns the finding that a balance of factors was integral to the creative process. One of the most obvious balances that served in the interest of a successful creative process was that of the use of stimuli. As Runco (1990) has already suggested in a previous study, stimuli that are neither too familiar nor too abstract are most conducive to a creative learning environment. This was consistently observed during the research period. The disinterest exhibited by students when the stimuli was either too simple or too difficult, as opposed to the level of interest shown when the stimuli was 'just right' leads to the question of whether the U-shaped theory (Berlyne, cited in Silvia, 2005) could be applied to creativity stimuli. There has been work done on the U-shaped theory and visual aesthetics such as artistic abilities among children (Rosenblatt & Winner, 2008) and aesthetic responses to artistic stimuli (Silvia, 2005) but a preliminary search on 'u-shaped theory and creativity' does not yield specific research on how stimuli could affect (visual) creativity. It would seem that a study in this area could be beneficial to (arts) education in determining more precisely what kinds of stimuli (or what level of abstractness) would be most successful in stimulating the creative process.

Another proposal for possible future discussion derives from the qualitative interview with the teachers of the research group participants. During the course of unstructured questioning, both teachers expressed the importance in the difference between the quality of art education the students received during the arts program organization (Kinderatelier Punt 5) and the quality the students received during in-school arts classes, which at this particular school seemed to be was given by the primary teachers themselves. In The Netherlands there is no regulation within the primary education system regarding arts education, and in most cases – such as in the case of the teachers interviewed – schools opt for the use of their general teaching staff for visual arts needs (Oomen, et al. 2009).

Kinderatelier Punt 5, however, works with certified specialized visual arts teachers.   It would seem and interesting point of discussion or research to monitor possible differences resulting from the creativity levels that can be generated by a specialized visual arts teacher as opposed to a general primary school teacher who teaches art. There have been expressions of interest in this subject, but as of yet there does not seem to be sufficient research in this area (Sharp, 2004).

One final suggestion on creativity research possibilities stems from the observations made on the omnipotent force that the group dynamic had on the creative process, in this case during the educational setting that surrounded the visual arts program. This research was unfortunately not able to take into its scope a comparison between individual experience and group experience in the case of a creative process within a group setting. In addition to being able to conclude that creativity is validly defined as a creative process, observations clearly suggested a group process as well. The literature used in the theoretical background of this research on creativity and education discusses the creative process in the classroom but does not specifically address group dynamic. A (post-conclusion) search of "creativity and group", and "creativity and social" returns a fair amount of literature on the subject of creativity within a group or as part of a social system, none dealt specifically with the creative group process such as would take place between students in an (arts) education setting. Research in this area could prove valuable to educators as well as creativity researchers, in looking more closely into how the creative process can be cultivated within the educational system.

In closing, the future of creativity research as a cognitive skill linked to divergent thinking is full of possibilities.   This study – despite the difficulties encountered and reservations that need to be maintained in order to uphold the scientific validity of the research – can rightfully be considered an encouraging addition to empirical research in both the fields of creativity research and in arts education. Further research into creativity and arts education – as seen in this study - could be conducted using theoretical perspectives stemming from diverse disciplines such as sociology, psychology, pedagogy, and philosophy. Considering the current interest in creativity as an invaluable asset in society, it is to be hoped that more resources be made available to continue research in understanding this most extraordinary

facet of humanity and ways in which it can be most efficiently cultivated, such as through

the arts and/or education.

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Appendices:

Appendix A: Torrance Test of Creative Thinking Form A

THINKING CREATIVELY WITH PICTURES
By E. Paul Torrance

FIGURAL RESPONSE BOOKLET A

NAME _____

AGE _____ GENDER _____

SCHOOL _____

GRADE _____

CITY _____

DATE _____

Streamlined Edition

SCHOLASTIC TESTING SERVICE, INC.
480 Meyer Road
Bensenville, Illinois 60106–1617

Activity 1. PICTURE CONSTRUCTION

On the opposite page is a curved shape. Think of a picture or an object which you can draw with this shape as a part.

Try to think of a picture that no one else will think of. Keep adding new ideas to your first idea to make it tell as interesting and as exciting a story as you can.

When you have completed your picture, think up a name or title for it and write it at the bottom of the page in the space provided. Make your title as clever and unusual as possible. Use it to help tell your story.

2

YOUR TITLE: _____

3

Activity 2. PICTURE COMPLETION

By adding lines to the incomplete figures on this and the next page, you can sketch some interesting objects or pictures. Again, try to think of some picture or object that no one else will think of. Try to make it tell as complete and as interesting a story as you can by adding to and building up your first idea. Make up an interesting title for each of your drawings and write it at the bottom of each block next to the number of the figure.

1. _____ 2. _____

3. _____ 4. _____

4

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

5

Activity 3. LINES

In ten minutes see how many objects or pictures you can make from the pairs of straight lines below and on the next two pages. The pairs of straight lines should be the main part of whatever you make. With pencil or crayon add lines to the pairs of lines to complete your picture. You can place marks between the lines, on the lines, and outside the lines—wherever you want to in order to make your picture. Try to think of things that no one else will think of. Make as many different pictures or objects as you can and put as many ideas as you can in each one. Make them tell as complete and as interesting a story as you can. Add names or titles in the spaces provided.

1. _____   2. _____   3. _____

4. _____   5. _____   6. _____
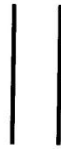
6

7. _____ 8. _____ 9. _____

10. _____ 11. _____ 12. _____

13. _____ 14. _____ 15. _____

16. _____ 17. _____ 18. _____

GO ON TO NEXT PAGE

7

19. _____ 20. _____ 21. _____

22. _____ 23. _____ 24. _____

25. _____ 26. _____ 27. _____

28. _____ 29. _____ 30. _____

8

CAT# TT 171002R1

Appendix B: Torrance Test of Creative Thinking Form B

THINKING CREATIVELY WITH PICTURES
By E. Paul Torrance
FIGURAL RESPONSE BOOKLET B

NAME _____

AGE _____ GENDER _____

SCHOOL _____

GRADE _____

CITY _____
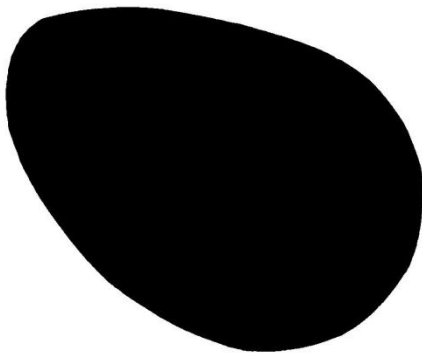
DATE _____

STS® Streamlined Edition

SCHOLASTIC TESTING SERVICE, INC.
480 Meyer Road
Bensenville, Illinois 60106–1617

Activity 1. PICTURE CONSTRUCTION

On the opposite page is a curved shape. Think of a picture or an object which you can draw with this shape as a part.

Try to think of a picture that no one else will think of. Keep adding new ideas to your first idea to make it tell as interesting and as exciting a story as you can.

When you have completed your picture, think up a name or title for it and write it at the bottom of the page in the space provided. Make your title as clever and unusual as possible. Use it to help tell your story.

2

YOUR TITLE: _____

3

Activity 2. PICTURE COMPLETION

By adding lines to the incomplete figures on this and the next page, you can sketch some interesting objects or pictures. Again, try to think of some picture or object that no one else will think of. Try to make it tell as complete and as interesting a story as you can by adding to and building up your first idea. Make up an interesting title for each of your drawings and write it at the bottom of each block next to the number of the figure.

1. _____ 2. _____

3. _____ 4. _____

4

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

5

Activity 3. CIRCLES

In ten minutes see how many objects or pictures you can make from the circles below and on the next page. The circles should be the main part of whatever you make. With pencil or crayon add lines to the circles to complete your picture. You can place marks inside the circles, outside the circles, or both inside and outside the circles—wherever you want to in order to make your picture. Try to think of things that no one else will think of. Make as many different pictures or objects as you can and put as many ideas as you can in each one. Make them tell as complete and as interesting a story as you can. Add names or titles below the objects.

6

7
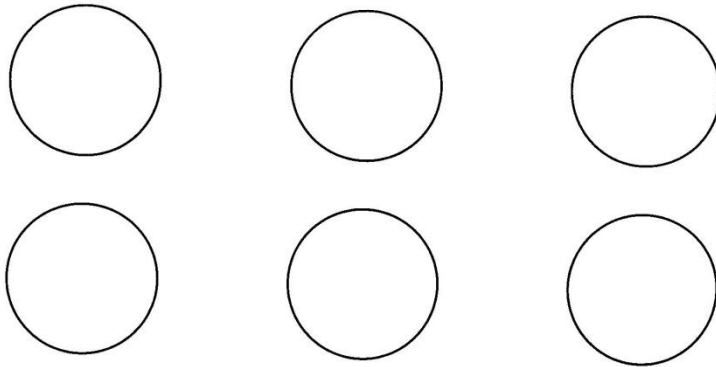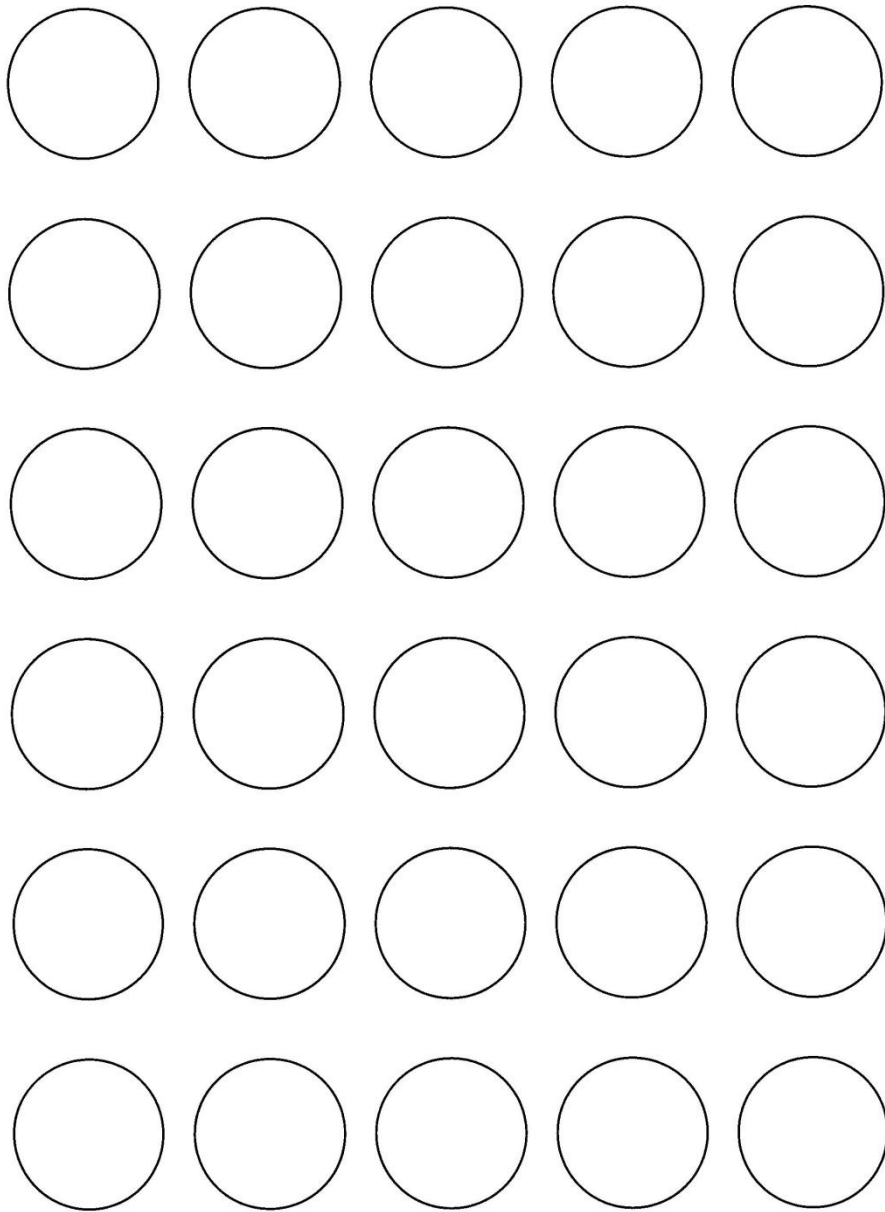
Appendix C: TTCT Results Forms A&B
Creative Abilities

		Student (age 7)	Student (age 8)	Student (age 7)	Student (age 8)	Student (age 8)	Student (age 9)	Totals
	A	11	14	5	20	13	19	82
Fluency	%	23,91%	30,43%	10,87%	43,48%	28,26%	41,30%	
	B	10	13	26	24	17	22	112
	%	21,74%	28,26%	56,52%	52,17%	36,96%	47,83%	
		21	27	31	44	30	41	194

	A	4	9	1	12	10	13	**49**
Originality	%	**8,70%**	**19,57%**	**2,17%**	**26,09%**	**21,74%**	**28,26%**	
	B	**3**	**8**	**5**	**6**	**13**	**11**	**46**
	%	**6,52%**	**17,39%**	**10,87%**	**13,04%**	**28,26%**	**23,91%**	
		7	17	6	18	23	24	95

	A	4	3	3	4	4	5	23
Elaboration	%	8,70%	6,52%	6,52%	8,70%	8,70%	10,87%	
	B	3	4	3	3	3	3	19
	%	6,52%	8,70%	6,52%	6,52%	6,52%	6,52%	
		7	7	6	7	7	8	42
	A	1	0	0	0	0	1	2

Abstractness of Titles	%	16,67%	0,00%	0,00%	0,00%	0,00%	16,67%	
	B	1	0	0	0	0	0	1
	%	16,67%	0,00%	0,00%	0,00%	0,00%	0,00%	
		2	0	0	0	0	1	3
	A	0	1	0	0	0	0	1
Resistance to Premature Closure	%	0,00%	16,67%	0,00%	0,00%	0,00%	0,00%	
	B	0	1	0	0	0	0	1

	%	0,00%	16,67%	0,00%	0,00%	0,00%	0,00%	
		0	2	0	0	0	0	2
All Totals A	Form A	157	17,44%	2,44%				
All Totals B	Form B	179	19,89%					

TTCT Results Forms A&B Creative Strengths								
		Student (age 7)	Student (age 8)	Studetn (age 7)	Student (age 8)	Student (age 8)	Student (age 9)	Totals
Emotional Expressiveness	A	0	0	0	0	1	1	2
	B	0	0	0	0	1	0	1
	Totals	0	0	0	0	2	1	3

Storytelling Articulateness	A	1	0	0	0	0	0	1
	B	1	1	0	0	0	0	2
	Totals	2	1	0	0	0	0	3
Movement of Action	A	0	0	0	0	0	1	1
	B	1	1	0	0	0	0	2
	Totals	1	1	0	0	0	1	3
Expressiveness of Title	A	1	0	0	0	0	0	1
	B	0	0	0	0	0	0	0
	Totals	1	0	0	0	0	0	1
Synthesis of Incomplete Figures	A	0	0	0	0	0	0	0
	B	0	0	0	1	0	0	1
	Totals	0	0	0	1	0	0	1
Synthesis of Lines	A	0	0	0	0	0	0	0
	B	0	0	0	1	0	0	1

	Totals	0	0	0	1	0	0	1
Unusual Visualization	A	0	0	0	0	1	0	1
	B	0	0	1	0	1	0	2
	Totals	0	0	1	0	2	0	3
Internal Visualization	A	0	0	0	0	0	0	0
	B	0	0	0	0	1	0	1
	Totals	0	0	0	0	1	0	1
Extending or Breaking Boundaires	A	0	0	0	0	0	0	0
	B	0	1	0	0	0	0	1
	Totals	0	1	0	0	0	0	1
Humor	A	0	0	0	0	0	0	0
	B	0	0	0	0	0	0	0
	Totals	0	0	0	0	0	0	0

Richness of Imagery	A	1	0	0	0	0	0	**1**
	B	1	0	0	0	0	0	**1**
	Totals	**2**	**0**	**0**	**0**	**0**	**0**	**2**
Colorfulness of Imagery	A	1	0	0	0	0	0	**1**
	B	0	0	0	0	0	0	**0**
	Totals	**1**	**0**	**0**	**0**	**0**	**0**	**1**
Fantasy	A	1	0	0	0	1	0	**2**
	B	0	0	0	0	1	0	**1**
	Totals	**1**	**0**	**0**	**0**	**2**	**0**	**3**
		8	3	1	2	7	2	23
Form A	10	6,41%	1,92%					
Form B	13	8,33%						
GRAND totals A	**Form A**	**167**	**15,81%**	**2,37%**				
GRAND totals B	**Form B**	**192**	**18,18%**					

Appendix D: Thick descriptions, Participatory Observation

Class 1

Assignment: Make a visual interpretation of a children's poem using watercolor paint and collage As the poem was read to the students, they made drawings of what they heard, which they later used as references for their collage.

Thick Description

The classroom is ready: set up with two rectangular tables placed in a long row (head-to-head, to form one really long rectangular table) so that each student has ample space for themselves. There are 7 easels set up in the classroom, all ready to go with paper (instead of canvas). Aside from that there are no visual cues on display related to the day's activities that would trigger creativity. Paints and other materials were set aside neatly (unobtrusively) in the corner. The participants had all enjoyed a quick snack, at which time, since they didn't know the teacher or researcher yet, they talked among themselves, talking about friends and things that had happened at school: they were all enthusiastic and some were a getting a little impatient to start. As they got seated they paired off: the two boys from first grade sat together, the two girls from second grade and the two boys from second grade. Although it was not yet clear, there was already the emergence of a sort of group dynamic. As the teacher got started, she did an attendance call; all of the children had to correct the pronunciation of their names. As soon as this was done, the teacher handed out some pieces of paper stapled and folded into "sketch books" for each of the students. These would be the books they could draw and write their ideas in throughout the course.

The teacher explained to them that they would be listening to a poem and drawing what they had heard, after which they would make a "collage". She didn't explain what collage was, just that they should listen to the story and if they had an idea to draw it. She gave pencils to them, and they all grabbed for the erasers. During drawing, one of the girls (Student 1) immediately started erasing and drawing again. The teacher was reading too fast, a few students stuck their finger in the air and asked her to slow down. Most listened and drew at the same time, one girl (Student 2) was listening, thinking, then drawing. The results were literal translations of the poem (or attempts at a literal translation) by all but one (student 6 – the youngest) – but whether he differed intentionally or because he didn't understand I couldn't tell. They finished and the teacher repeated that they could use these drawings for their collage later on. The students started comparing drawings with each other, but in a friendly way. The teacher showed a book with illustrations made from collages as an

example (stimuli), to which student 1 said "oh wow!". But no further explanation of collage was given at this time.

The students watched in fascination for a few seconds while the teacher got palettes with primary colors and white (paint) ready. Then she told them to get their smocks on. These were in a chest in the corner of the room and were all too big, which led to laughter and poking fun. They then all gathered around the teacher again while she finished the palettes and grabbed a sponge and container with water for dipping, and a palette, and told the students to follow her to one of the easels in the classroom. Everyone followed obediently and watched and listened as she explained what she was doing. She dipped the sponge first in the water, then in the paint on palette, and then wiped it on the paper to make a 'watercolor wash' as the background. A few mumbled "wow!" and they kept watching, as the teacher used three different colors to make a 'background' (new word for students). One of the students (Student 2) had a question: how were they going to paint a boat over that 'background'. The teacher said they would be cutting the boat out of paper and gluing it onto the background, which helped the children finally understand what a collage was. One of the boys (student 3) said "Oh, I get it now`. Then the teacher asked them, "what if I want green?" and two of the students answered, both knew the answer. The teacher gave them one tip, to make sure the sponge was good and wet, but not too wet, or the paint would be too thick. The demo ended when she said, Ok everyone get ready to make your own backgrounds. They almost all started right away except for student 6 who remained at the table with his book for a few seconds, looking at the ideas he had drawn. Interesting to see how they started: some tentative, others dove right in. Most attempted to reproduce the teacher's demo exactly, and kept looking at what she had just done; one began using the sponge to paint a forest background, which was not part of the story or the instructions. I don't know whether this was creativity/non conformity or if he just didn't understand (he is the youngest and his language is deficient). The students talk lightly among themselves, commenting on the colors they mixed and on how they need to use their 'imagination'. They finished up and the teacher told them to take their seats while the paint dried. She told them she would explain the rest of the assignment now, and had a book in her hand ready to show them. Everyone was quiet and ready to listen, there was (I had laid it out while they were painting) paper, scissors and glue now on the table that she could refer to, and she explained that a collage was made by cutting shapes and drawings out of paper and then gluing them onto a background. They remained a little too quiet and perplexed so the teacher held up a book with illustrations made form collages and pointed out the details, then all the students went "ohhhh". She then told them to get to work. She was not very explicit in exactly how to proceed, and some asked her again what they should be doing. She explained again, to look at the drawings in your book for ideas and then cut

them out of paper to glue onto the background they just painted. Now it seemed the quarter dropped and all students began working. Conversation between them started again, nothing to do with assignment at first, things about the school day. Some worked faster than others, and the first two students were ready for gluing. Their boats were somewhat similar to each other's and also based on what they had drawn in their books. The boats of the other children were also somewhat similar in shape (which I think has to do with schematic coding or drawing), although all were different in color and size, and details differed. After the boats, the students stopped referring to their books for ideas and either must have known from their head (remembered the storyline) OR just decided to make their own story, because original things began to appear. But class was ending, and only a few students had managed to glue things, the rest had to put their work away in their sketchbooks and save it till the next week.

They all got ready to go (jackets and books) and the teacher and observer walked them back to school.

Class 2

 Assignment: complete collage started in the previous week's lesson.

The atmosphere at the start of the class was more relaxed, since the students now knew the teacher and expectations. The easels were already set up with the works they had started from the week before (cues). Students took their seat as they did the week before, paired off. Before class started there was a chance for a snack, during which the students chatted and talked (partly based on researcher's questions) about family life and ethnic background. It was quite obvious that all the children were very aware – and proud – of their ethnic backgrounds and the fact that they all (with the exception of one) spoke a language other than Dutch in the home. When snacks were almost finished, the teacher began casually reminding the children what they did the week before: they listened to a story. Did anyone remember what the poem/story was about? One student raised his hand and said "a poem about a boy whose bed turned into a boat at night", another added "and the cat sailed with him", another added "and they were on the sea". The teacher said "very good! And what did we do then? We made drawings, and then we made backgrounds, and then we started cutting out shapes [based on the drawings] from colored paper and gluing them to the background. And does anyone remember what that is called?" No response, so she continued "that is a collage". "Oh yea" they said in unison. Then to further illustrate what collages were the teacher held up two different books with collage illustrations, as examples. She repeated the definition of collage again.

Now she took attendance, and again she had trouble pronouncing the names of the kids, which prompted some laughter. Then the students put away their belongings (snack time was over) and got ready. One (the youngest girl, 7 years old) already had her collage boat from the week before in her hand, and could hardly wait to start. Others (the oldest girl, 9, and the two youngest, 7 years old) were taking their time. The others were ready to go, and comparing work with each other while waiting. At that time, the two youngest boys, again seated as a pair at the other end of the table, started singing a children's song. After a few seconds everyone chimed in. After a few seconds of disruption, the teacher interrupted and said that they now needed to be quiet or they would not begin, after which everyone got quiet and paid attention. She started with a review, pointing out the backgrounds and shapes, and complimenting them. She encouraged them to continue, and also to try to use different colored paper for the different shapes, including the patterned paper available for use. One student (youngest girl) had already done that the week before, and the teacher used her work as an example. She asked how the students thought they could best know what shapes to cut out, and one (the youngest) answered by drawing them first with a pencil." To which the teacher said "very good". Then the youngest girl commented that they had no pencils, and the teacher said, "as soon as I finish my story." The teacher continued by saying "you can draw the shapes on the back of the paper and then cut them out and glue them". She finished up by saying that when they were done with their collages, which they would finish by making them beautiful with different colored shapes, she wanted them to write a new story in their sketchbooks about what their collage showed. She added that they were free to think up new things to add to their work and story if they wanted. Everyone got to work.

By this point the individual levels and working styles are beginning to show. The two oldest boys are the most serious and conscientious, the **girls** seem to be enjoying themselves, the two youngest seem to be more interested in playing than getting to work. They spend the first 5 minutes running around the tables looking for things.

No one referred to their book during the rest of the assignment. In letting go of the constraints of their original drawings, the students'works became more expressive. The two girls helped each other, one (Asia) worked in a very schematic style, and cut out hearts and flowers to add to their collage. One of the older boys got the idea from the teacher that he could also use newspaper; he used this to make a cutout of an airplane which he added to his collage. One of the younger ones, finally getting serious, finds a small toy lizard in his pocket and tries to glue it to the collage, when it doesn't work he follows the teachers advice to trace it on paper and cut and glue that. The teacher continues to give direction and hints "you can maybe add some waves" etc, to which the children all respond by doing as she suggests. The girl (Asia) is done first, and the teacher says, "OK now you can

write a new story in your book" so she gets her sketchbook and sits down to write. The rest continue, most are still enthusiastic; the younger ones are losing interest. One of the oldest boys (8 years old) has cut out waves and shows them to the teacher, she tries to convince him that they should be bigger but he resists and says instead he wants to add a fish. The second to finish and start writing is the other girl. The one with the lizard is still playing; I encourage him to write a story, with his lizard in it. After another few minutes the two older boys finish up their collages and start to write. Only the two youngest ones seem to have lost all interest and are need t be told again to write their stories, which they finally do. Finally everyone is seated at the table again and is writing their stories. All seem to have completely forgotten about the original poem and are happy writing new stories "I go on a journey in the night…and I bring a fish and a frog…" All the while everyone is chatting and laughing and in general enjoying themselves. The atmosphere is relaxed and peaceful.

The teacher calls "5 more minutes" and everyone gets focused. The girl who was done first is examining her work and reflecting on it together with the teacher, contemplating whether to add something else. She is really proud of it. Instead of adding something to the collage though, she goes back to her story and adds something else to it. She reads it out loud to the researcher (with pride and happiness) when she is done (the researchers praises her work). The two older boys continue working hard, still working, and showing each other their work and talking amongst themselves, when the teacher calls time. All but one are still working on their stories (but because they are enjoying the assignment and are involved, not because they are behind – even the younger ones). Writing a new story to accompany the collages is a good rounding off open ended idea, it seems, and they enjoy the chance to put write about their visual story. The students finally have to stop; they gather their belongings and get ready to go. As they are cleaning up the teacher takes the opportunity to take photos of them with their work (to be given to the school later) one by one, and they are all happy to pose, with pride.

Class 3

Assignment Make an etch print based on musical story of Peter and the Wolf. Students listen to a children's CD of Peter and the Wolf (with instrumental characters and spoken narrative) Students first listen to the story and draw their visual interpretations, then use these to create and etch which they will make prints of.

To start with it was a beautiful day outside, one of the first warm days. Children are excited because of the nice weather. Also, the students notice there are different tables set up with materials, and anticipate that they will be doing something but don't know what. Some ask, and are told to they

will find out shortly. Other than that the room is a blank slate, no visual cues or stimuli. Everyone is extremely talkative during snacks; atmosphere is a bit unruly in comparison to the week before. After the snack the teacher wants to get started right away. She does not tell them what the end product (the etch) will be, she begins small, in steps, simply explaining "listen to the music and make drawings". The children were a little puzzled, one asked,"but what do we write down when it's music" And the teacher answers "You will surely be able to draw something from what you hear on the CD". Another (older boy) frowns, as if in doubt and the teacher asks "do you already know that you will draw wrong?" And he answered "no." She says "Just draw whatever pops into your head". She hands out erasers and the students all grab for one. They seem a little doubtful. She asks "who doesn't understand" No one answers but they all giggle. She says, "I'm going to play the music and you just draw whatever you think of when you hear it".

The CD starts: it is a children's version of Peter and the Wolf which is narrated by an third party while instruments play the parts of the characters (flute for the bird, clarinet for the cat, oboe for the duck, tuba for the grandfather, etc). The narrator starts by introducing the players, "the duck, played by the oboe…" and then the oboe played, "the cat, played by the clarinet…"and then the clarinet played a few notes, etc. The children were motionless for a few seconds while they comprehended what they were listening to, they comprehended that there was also a story (cue) and not just music, then they all started drawing. Except the one student who had frowned before, he whispered out loud "I don't get it", and looked at the other's works, and grabbed his eraser. The rest kept going. The more serious of the two older boys said "shhhh!" and the teacher said, "You can come sit here if you can't hear" which he did. The other characters were introduced, the grandfather, the wolf, and finally Peter, who was played by the strings (Tchaikovsky's music). Noticeable was that they seemed to stop drawing when the music played and start again with the narration. So the spoken story overrode the music stimulus.

They all continued drawing, although a few of them were doing a lot of erasing. It seems that this stimulus made them a little unsure of themselves (in comparison to the read story), which translated into hesitancy in ideation. One of the girls asks "how do you draw a dune heath?" The teacher said "wow, that you even understood that is great" and she walked over to her and explained and helped her work out a drawing. By now the other girls (who is the oldest of the group but was left back a grad and deems to be the least bright of the group) has slowed down with drawing and seems to be half-listening. The rest keep drawing though. The youngest (whom by now I wonder if he has a language deficiency) is eagerly drawing, but the drawings don't have much to do with the story, just a cat and a some cars. The younger of the girls now also pulls up her chair closer to the CD to listen better, her and the older boy are actively listening, the rest are more passive, the two youngest are

beginning to giggle .Still, everyone continues drawing for another few minutes. But then they all begin to lose interest. The phone rings, and the older girls starts asking non related questions about the other children who come to Punt 5. The teacher asks them to refocus, which they o, and she splits up the two youngest (who are sitting next to each other as usual) and they continue for another few minutes. Most work with their head down, except those who are actively listening, who first try to listen to what is being said, and then draw (same as last time too – is this a creative behavior?) After another few minutes though everyone has lost interest so the teacher hits 'stop' and says "if you all have drawings started, I'd like to go further, or should I stop" They all yell "Stop!". Still, she says, "no I'd like to go al little further – let's try" and hits play. Now the active listeners have slowed down drawing and are doing more listening, the youngest is explaining to the teacher what he drew, the others are all half-listening, half-drawing. After another few minutes, they start looking at each other's work and commenting. The teacher finally decided to stop the CD.

The teacher continues with the second step, making the etching plate (plexi-glass plate and iron needle for etching). She says, "The drawing you just made, we are going to use…" and she hold up the plate and glass "with these". She explains (instruction) what they are and how they work. Then she asks "so how can you get your drawings from your sketchbook to this?" One of the older boys offers an answer "you trace the drawing" and the teacher asks the younger girl (who is seemingly distracted) "what did he say" and she repeats him verbatim. The two youngest ones however are completely distracted and the teacher has to reprimand them. The teacher continues to say "you can make a new drawing by laying the glass over different parts of the drawings you made to make a new composition (students obviously don't know this word and the teacher does not explain it) – a new drawing". The students seem to understand, so the teacher hands out the equipment and they all get started. They are all fascinated by the scratching/etching (how to), and by the discovery that they can move the glass plate around to compose a different drawing. They all work hard, concentrated, sometimes raising a finger to ask an opinion (so they are behaving well). The teacher prompts them but does not influence them.

When they are done, the teacher tells them they are now going to make a print of their etch (step three), so they need to put on their smocks. Getting on the smocks, they start to get excited again. The teacher calls them over to a separate table where inks have been laid out for the ink-rubbing. Before she can start explaining what to do the students start reaching for the ink and talking excitedly. She has to call them to attention and reprimand them to listen and watch first. She explains that they should take a tiny bit of ink and run it on their plate, then take a piece of

newspaper and rub the ink into the scratches until the plate is almost clean. While she is explaining the children some children keep talking, one more easily distracted of the youngest two makes a teasing comment to one of the girl and the teacher has to reprimand again (atmosphere). They continue, and the younger of the girls says "this is hard!" and the teacher says "yes, it's hard work – it's cleaning!" She takes the older girl's plate as an example and holds it up to the light to show that most of the ink is gone, except what is in the scratches, so you can see the scratches/drawing clearly. This gets everyone's attention again. She asks "can you see how this is done?" Then she instructs them, when they are done with their plate they set it apart, pointing to a clean surface, and wash their hands, and get a piece of paper from the pile on the other table,

At this point the room has become divided into two groups : those waiting to print, those still wiping their plates, and the atmosphere is getting increasingly restless, so the researcher begins assisting the children still wiping their plates. The ones who are ready to print lay their etch plate on the press and cover it with a piece of paper, they then turn the press wheel to print the etch. Being able to control this (the turning of the press wheel) seems to be a huge motivator for them. The results show that the students did not give much thought to the colors they used, nor to any way they could keep the colors on the plate separated (most results are grayish).

Finally all children are either printing or waiting to print. Those waiting get increasingly restless, and the teacher needs to keep reprimanding the younger ones. When the younger ones finish their prints, they (without permission) take off their smocks and start playing. The teacher notices but decides to let them go in order to focus on the older ones who are more concentrated. Although he older ones are interested, the atmosphere is chaotic. The researcher asks the younger ones to help cleaning up to keep them distracted while the older ones finished. The teacher calls time a few minutes early this week. They collect their belonging and walk back to school.

On the way back the researcher asked them if they thought it was hard, what they did today. The older boys said it was fun, not hard. No one referred to the musical stimulus, only to the etching. The younger girl said it was hard work, but turning the wheel of the etch press was like driving a car (she meant like a steering wheel) and that was fun.

Class 4

Assignment: Continuation from the previous week, print etches in different color combinations
Teacher begins right away during snack, cutting the usual chit chat short. The students are seated in their usual seats, the room is set up again for etching, the students recognize this and have no questions about it. The teacher starts on a serious note: by addressing the chaos from the week

before and admonishes the students for being too loud, unruly, and not listening enough. She asks the students if they are going to behave better today, and they agree.

The teacher has a pile of etches from the previous week, which she has ready to show the children. Evaluation and reflection stimulated by teacher led to some surprisingly insightful comments from children. They were asked what they could do to improve, "do you think there are things you could add to this? What would they be?""What could you do differently this time" and they ...were able to see problems, think how to improve it. One student had made a green print, the teacher asked "did you intend to make this green?" he answered no. She asked "how do you think it happened?" This triggered know-how in their reflective comments. Reflection (evaluation) is important, especially to get this group to stop and think – this helps knowledge sink in too, as well as helps with ideation. In other words reflection leads to ideation.

The teacher said "so this week we are going to continue to make etches that are even more beautiful". The younger girl said, `Teacher, to make another story, I mean another drawing for that story, that is not fun!" The teacher had to clarify that the same etch plate as the week before would be used so they didn't need to make a new one, just make new prints with different color combinations. That clarified it, but one of the older boys wanted to make a new one, he was told he can add things to the one from last week. The teacher says in general "so you can add details to the etch you made last week, things like fur or scales on the animals you already have".

The two youngest are sitting really far apart, and aren't paying as much attention. The researcher tells them to move a little closer, so they belong more to the group, which they (reluctantly) do, and the teacher makes a point to discuss and praise their works, in an attempt to get them more involved. The others seems to be getting irritated at the younger one's immaturity (developmental difference), even the girls who have been more playful than the older boys (who are more serious). The four children from grade two are mixed ages and their experience seems to be markedly different. Could this be gender-related, or is the developmental difference so marked?

The teacher handed out the work from the week before and told them to write their names on the prints they had made, and told the two girls (since they did not want to add anything else to their etch plates) to put on their smocks, that they would be first. They cheered in anticipation. The older boys finished their additions to their plates, and the rest also got their smocks on and everyone made their way to the etching workstations. During putting on the smocks the atmosphere started getting unruly again: the two youngest were horsing around.

At the etch table the older ones dove right in, and began applying ink, no need for instruction or help, they all knew what they were doing. The two youngest again needed to be redirected to the table and reprimanded (this time by the researcher) to do "a little less playing and more working". They too started applying ink. The younger girl announced that she was finished (applying ink), the teacher came to see and asked the group, "What does she need to do know". She answered "I need to keep the colors separate!" The teacher used her plate to show everyone how she could do that (by covering one half with newspaper while wiping the other half/color clean). The others looked on with semi-indifference; everyone was focused on their own work. The process itself however, is a messy one (newspaper to wipe ink away is wadded up and thrown on the table and floor instead of in the garbage can) the two youngest are joking and yelling the entire time, the moment gets chaotic and the teacher again needs to reprimand. She makes them stop to look at the etch plate of one of the younger ones, who has been wiping away the ink, and asks the others "is he done?" they all say no (too much ink still on the plate) – so the teacher uses the work of the students as example and stimulus, this is 'closest to them'.

Those who are finished first, the younger girl and the youngest boys, move on to the etch press to print off their etches. When they are done, the younger boys stop working and start playing, it seems that the teacher gives up on them and decides to concentrate on the older ones who still want to work. The younger girl is eager to make another print, with new colors, and the researcher lays out more ink for her to use. She is enthusiastic to practice what she has learned another time. In the meanwhile the other three were ready to print and waiting for the teacher (to supervise use of the etch). They knew how to make their prints, were all more confident. They worked as a group together while each taking turns printing their etches, they all watched each other and encouraged each other.

The younger girl was still enthusiastically working on applying ink to her plate for a second print and the three others joined the table. The group dynamic (minus the 2 younger boys) was peaceful. One of the younger ones – who had already applied ink but not yet printed his plate – got a turn at the press while the others were applying ink. The other one came to watch, and when the print was done, they returned to their play. The teacher announced that those who were finished with their etches should write something about it in their book. Whether this was part of the assignment or a tactical maneuver to keep them busy is not known, but those who had finished their etches made their way over to the long table to write. The younger ones also eventually started to write a story, Writing stories seems to calm them or get them focused more so than this particular art activity, although they would not sit down to do so (remained , and one was continually playing with the pencils)

As most were done the atmosphere got continually louder. It was clearly time to start wrapping things up. At the end of this class, it seems that the developmental difference between the grades is problematic to the group dynamic, and also that the activities might be just a little above the level of the youngest two. This can be a hindrance to the group and creative process. This activity in particular – etching, since it has many steps and requires independent working – does not seem well suited for the less serious.

That said, the work was markedly improved – it would seem as a result of their knowing what to do/confidence: color choices and techniques were more vivid. Also, especially for the serious ones, the motivation seemed to switch from extrinsic to intrinsic (as knowledge and confidence increased).

The teacher called time; the children got their belongings and walked back to school.

Class 5

Make a 3D tree and tree house based on poem by Annie M.G. Schmidt. Students listen to poem and make drawings that serve as inspiration for a 3D tree and tree house made of wire, wax, cardboard and decorative materials

The older girl was absent today, and the teacher had laryngitis. The classroom was without cues, materials were unobtrusive in the corner. Students took their seats, all sat on one side of table in a row, girl in middle, older boys at one end younger boys at the other. As they ate their snacks they chatted, mostly about football cards, the girl started teasing one of the older boys, so the teacher asked one of them to move. The atmosphere was relaxed and friendly. The teacher took attendance while they finished their snacks and announced that her voice was very soft so they would be calm today.

The teacher said they would be hearing a story that and she wanted them to draw about what they heard in their books. She did not yet explain what they would be doing with the drawings (assignment in steps). The students anticipated drawing to a story, and the girl took the initiative to hand out the sketchbooks and pencils. The students seemed semi-receptive of the assignment, less enthusiastic than the first time, but as soon as the teacher started reading, they started listening and drawing. The same patterns emerged: active listening by the oldest boy and the girl, the other older boy was actively listening (first listening and then drawing) as well. One of the younger boys was also listening and drawing, but the youngest appeared not to be listening at all, and was drawing furiously. The poem ended and the teacher showed the book illustration.   The students half-looked at the illustration, they were more interested in their own drawings. The poem was very visual in its description, a good stimulus for ideation. The teacher looked around at what they students had

drawn and said "I look around and I see some drawings of trees,"and then she approached the youngest and said "and what did you draw?" He answered "a boat". She asked "did you understand it wrong? Or did you have a different idea" She was careful to word it so as not make him feel like he did something wrong. He answered "a different idea"   She asked "were you listening?" He said "yes, they sat in a boat." The girl corrected him "no, a tree!" and the teacher said "it was in a tree". The boy thought for a second and said "oh". This raises the question again about language deficiency. Observation over the course of the last four weeks suggests that it language deficiency does not hinder ideation. The teacher suggested they listen to the poem one more time, everyone agreed. They began again, and the youngest began making ticking noises with his pencil, to the other students' irritation. The oldest (most serious) boy complained and the teacher told the youngest to move further away from the group. The teacher continued and finished reading the poem, while the students continued drawing, some adding details, some making new drawings. When the poem was done, the girl said "I think that poem was a little strange" and started looking at her neighbor's work to see what he had drawn. The teacher said, "Please look at your own work, not his".

With the drawings completed, (this time only one eraser between them all) the teacher grabbed some electric cord that had been pre-cut and tied together to form a 'pliable bundle' that could be bent to create branches and roots. Before she told them what it was for the students showed tremendous curiosity, saying "whoa!" and "what is that?" She answered "electric wire" and paused before continuing "and what do you think we are going to make with it". No one guessed. The teacher asked, "What was that poem about?" The girl answered, "An oak tree" and the teacher showed the wire bundle and started bending the wires into branches. The students all said "ohhhh" She said "you can bend these wires. What does a tree have on the underside" and started bending the wires into roots so the tree form would stand upright. She said "You can make a tree out of this". Then she grabbed some modeling wax and showed it them. One asked "is that chocolate??" She explained that this was called wax, and that you could knead it until it got soft, and mold it around the wires to make a tree. She showed them how. The children were eager to get their hands on the materials for themselves once the saw what the teacher did. This is a hands on project, in 3d which differs from 2d since they are busy 'building' something solid instead of flat. As she got the rest of the materials the students passed around the example she had just made. She asked them, "what else does a tree have that we could add". The oldest boy said "leaves" she said "right". But first they would make the tree form, so they all received wire and wax and started working. Conversation was friendly while they worked, group dynamic too, but within a few minutes the two youngest started running around the tables. They remained distracting for the others but stopped running. The other students worked industriously to mold the wax around the wires and make a tree. The teacher sat at

the table to make one too – one for the absent girl. This seems like taboo but without it the girl would be too far behind to catch up next week.

It was interesting to see (again) how the different children worked. The older boys were seriously working and lightly chatting amongst themselves, the girl was more social, and talking with the two younger ones. They started getting excited and louder, to which the teacher commented that they were getting too loud, and she couldn't talk over them.   Still, most paid attention to what they were doing and worked conscientiously. The teacher did walk around to everyone and adjust the tree form when they weren't standing well – the result was that all trees had roughly the same form – 5 branches and 5 roots. The technique was fairly simple, to stick the wax to the wires, no one needed much help with that.

Suddenly one of the students asked why the researcher was filming. The teacher said "She can tell you" and let the researcher explain that she also went to school, and pat of her homework was to see what the students learned in this class, and to do that, it was easiest to film the class and then look at the film when she got home. That satisfied them; none of them had any questions or comments for her.

As they got towards the end, the younger boy started getting ideas on what else they could do with the wax: chocolate and poop were the obvious suggestions. Surprisingly, it wasn't as hysterical to the others as it would seem. However, the atmosphere started getting loud again, especially the younger girls, was adding to the volume and giving comment on everything. Finally the teacher had enough, and told her to go sit apart. She actually came to the table where the researcher was seated, who told her to just sit there and relax for a while, calm down. She seemed happy to be sitting there and actually got really focused on her work.

The only problems seemed to be the very last bits, the ends of the branches and roots. Some of them had no wax left and had to think what they could do. The teacher suggested they remove some wax from around the trunk.   Once the first students were done, the oldest boys, they took the wax that was left over and started making poop jokes with them, while they thought no one was looking.

Conversation at the table turned to language, prepositions "on" versus "in". They all seemed to pay attention the teacher's explanation. Finally everyone was finished with the tree form and ready for the next step.

The teacher started laying out paper, scissors, and little bits of thin wire (to make leaves which they could attach to the trees. The two older boys started right away, no explanation needed, the girl

rejoined the group and also started, but the two younger boys started playing games with the trees. The researcher redirected them, and explained to them how they could cut leaves from the paper. They half heartedly started to work. In the meantime the teacher was seated at the table again and helping attach leaves. For some reason, the teacher did not leave much room for the students to discover things for themselves during this project, maybe because she didn't have the voice, which led to uniformity and less individual ideation. She began attaching some leaves to the absent girl's tree as well. She suggested and helped make a butterfly for the girl's tree. Only the older two boys worked independently and made their own decisions, the teacher directly influenced (more than prompted, this time she influenced) the others'works. As the class ended, the group had lost interest, only the two older ones worked up till the very end.

In hindsight again, the original inspiration of the poem is long forgotten and the students create an original product. Unfortunately the project is rather closed, less room for ideation (due to material restrictions and perhaps due to teacher influence)

Class 6

Assignment: Trees continued: Tree house and decoration with cardboard, paper, paint, etc.

Everyone was present today. Again, the classroom was bare of cues, and the students took up their usual places, in pairs. During the snack the researcher asked if the students always sat together at their school also. Although the two youngest boys are good friends outside of school, the other students have a different friend group at/outside of school. The students were quick to eat their snacks today: they were excited to get started. The girl absent the week before was very happy to see that there was a tree waiting for her, she asked with happily, "did you make this for me??" The teacher said "of course! Did you think we would forget you?" The other students were also cheerful and enthusiastic.

The teacher took attendance and the trees from the week before were distributed. Materials for decoration were also laid out on the table. This time the teacher separated the youngest two, and had them sit at different ends of the table. Instruction was minimal, the teacher simply announced only that they were to continue working on their trees (with the materials found on the table) and that if anybody needed any help or had any questions to ask. Everyone was working individually on their own trees and talking animatedly. The researcher was seated at the far end, next to one of the youngest boys, and the teacher at the other end with the other younger boy. All the students were standing to work this time, they were able to search through the available material better this way. Materials included scraps of colored paper and bits of cloth and string, and a selection of small boxes

(donated by teacher and researcher) which the teacher explained they could use to make a tree house. Also available was glue, masking tape and scissors, and small wires with which leaves and other small details could be attached to the tree branches. The younger girl was especially bubbly (she is always very social) and burst out into song, everyone chimed in and the group was all singing merrily together while they worked. The teacher said "how cozy!!" – the atmosphere and group dynamic was very conducive to creative productivity.

In comparison to last week, this week the students were left to make their own decisions. They had seen the week before from the teacher how they could make leaves and attach them to the tree. However, only the older ones seemed interested in continuing with this. It was delicate work (small leaves, small wires) – perhaps the younger ones did not have the patience for this, or the motor skills? They needed to be encouraged and helped by the teacher.

It was interesting to see how the students dealt with the problem of how to cut, tape and reform the box to size/make it into a tree house and secure it to the tree. The all (but especially the younger ones) had trouble with the spatial skills needed to see how the box could be cut i.e. how they could make a triangle roof. Here the teacher actively participated. She sat next to one of the older boys, who was turning a box around in his hands and asked "what kind of house do you want" He answered "just regular, but how do I make a roof?" The teacher said "let's see" and she took the box from him and started playing with the flap, she told him that by cutting one part and folding it a certain way, and then taping it, it would form a roof. She made the first cut and fold to show him what she meant and handed it to the boy, who eagerly continued on his own.

The girl who was absent the week before saw that the younger girl had a butterfly in her tree, and asked the teacher to make one for her too. The teacher said, "You make the butterfly from paper, and I will attach it to the tree for you". It was becoming obvious that working with very thin wire to attach things to the trees (leaves etc) was asking too much from most of the students, which explains why most of them were resistant to making tiny individual leaves.

The group – especially the younger ones – was surprisingly peaceful (no running around) and everyone was working hard. Although a challenge, the task of reassembling and mounting the box forms held their concentration. They looked like they were trying to figure out a puzzle. The youngest one had a box in his hand and was turning it and trying it in all different positions of the branches, to see which position was best. Even though the teacher had significant influence, she let them solve as much as they could on their own, and encouraged them to come up with the answer themselves. At this point none of the students were considering the aesthetic appearance, only that

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it "worked" (that the boxes were houses, and that the houses would stay in the trees). The teacher told them not to tape them into the trees yet, since they would be painting the houses first.

The oldest boy was done first, and was ready to paint. His form was roughly the same as the one the teacher had helped make for his peer, but he had not needed help. His tree was decorated with small leaves that were carefully detailed and attached with small wires. The teacher pointed to a table in the corner and told him that it would be the painting table. She told him to put on a smock, and while he did so, she got a palette with paint and some brushes ready for him. Newspaper was already laid out on the table, and asked him if he remembered how to mix colors, he said yes. She put his tree house on the paper and said "OK, let's see what you can do".

Back at the main table the youngest announced he was done. He showed the teacher his "tree house" mounted in his tree with pride, "Teacher look!!" He had hardly any leaves (one or two done by the teacher the week before) but he was one of the first to solve the problem of getting securing the box to the tree, on his own. This boy, although he may very well have language deficiencies, shows more signs of ideation and problem solving than his classmate. The teacher praised his work and told him to get ready to paint.

In the meantime the other younger boy and the younger of the girls were also finished. The researcher set up a second table to serve as a painting station and told him to put on a smock, that he could paint here. She also got a palette ready. The painting tables were small: room for two to a table, so one palette needed to be shared by two students. The two students did not like this fact and the younger girl complained. The researcher answered "well, there's not enough room, so you will have to share. You should be able to share with your classmates, right?" The girl answered "But teacher, he is NOT my classmate" and the researcher said "not at school maybe, but here you are, so you can share with each other". They seemed to accept that and started working. The boy starting mixing to make green, he used the right colors but added too much blue and it was very dark. He looked disappointed and the researcher assured him "that is green, dark green like a pine tree. There are lots of different colors green, how do you think you could make a lighter green?" (getting this involved with the children's work was out of character for the researcher's role, but the teacher was occupied by the students still finishing up their houses). He guessed "more yellow?". The researcher told him to try. In the meantime the girl was still frustrated that they had to share a palette, and starting mixing indiscriminately on the other end of the palette: she made a brownish color that she was happy with

Back at the first painting table, the oldest and youngest were working together without problems. Both were using primary colors, the youngest was imitating the oldest, who had painted each side of

his house a different color. The oldest finished and went back to main table to ask the teacher to ask what to do next. She answered, "I have some things that you could make nice steps (up the trunk of the tree) with". She got some small sticks out and a pairs of scissors and asked "how could you make steps with these? Think about it". The other older boy (who was still working on his house) also got involved. The older one cut one of the sticks and said "I know already" and cut another piece off, so he had some little sticks (the sizes of matchsticks) and the other boy said "Oh, I know too!" He took the stick and held up to the side of the tree "like this!" A nice example of problem solving, although the problem was closed.

The older girl had taken her place at the painting table next to the youngest boy. She had spent a lot of time on the smaller details first (catching up with last week? Gender related?). At the second painting table the two sharing the palette had made a mess of the colors. The brushes were not cleaned between colors, so each color was contaminated and the result was a brownish grayish color. They had seemed to have lost their interest in individualism and were content to paint everything the one color. The girls asked the teacher if she could paste something to it, the teacher said that she needed to finish painting it first and let it dry.

The last of the students (the older boy) was finally painting his house. He inherited the palette used by three others before him so he too wound up with premixed grayish colors and primary colors. By now the other two painting students had finished their painting and were making a huge mess of mixing all the paint left on the palette. They started using their hands to mix. The teacher told them to stop and clean their hands, so they started making a mess at the sink. The older girl got in on the mess. Since they all had their smocks on, and were finished with the paint, the teacher let them enjoy – it was an opportunity to experiment.

The older boys and the youngest were now working on the finishing touches of their trees. They were all working on making steps, as the teacher had suggested/prompted, which meant that all these students had exactly the same steps. The older girl, however, had a different idea. She had found a piece of rope and got the idea (herself? Or from teacher?) to use this as a rope ladder instead of steps. The other girl decided that she too wanted a rope ladder, so their two trees wound up with the same ladders. Finally, the teacher showed them some string/thread, which she suggested they could use maybe for a birds nest. As a result, every tree had a bird's nest made from this material. So although the process itself was very creative, the products were unfortunately rather uniform-looking.

Class 7

The students would hear and see illustration of a children's story about the work of the artist Alexander Calder and make a drawing in which the goal was not to lift the pen (fineliner) off of the paper. They would then decorate their drawing with colored markers and collage material.

The younger of the two girls was absent today. The teacher received news today from the primary school, that the one student who was absent the week before was undergoing some severe family problems (allegations of abuse). No one discussed this. The weather was hot and the students were complaining that they were tired from the heat. They ate their snacks slowly and the teacher had to tell them to finish their snacks more than once. The room was devoid of cues, but the illustrations in the book would serve as stimulus (not cues, since they would only see them once).

She explained the first part of the assignment: to listen to the story and look at the pictures carefully. In the beginning the students were slow to get into the story, until the teacher pointed out the pictures (and the name of the book "The Thread of Alexander"). She asked "What do you notice about these pictures, if you know the name of the book is ""The Thread of Alexander" The older boys said "they look like they are all made out of thread". The teacher said "right!" These drawing all look like they are made from one long thread…this is drawn with a pen, this drawing, but if you look at some other things Alexander makes " she showed a book with the artist's real works, made of wire clothing hangers "you can see that he sometimes uses iron thread – see this is a clothes hanger made into a statue – and so they all look like they are made with one long line, or thread" The students think the wire hanger statue is really interesting, and they all get focused. The teacher continues with the children's story. Now everyone is actively listening and looking. So the teacher got them interested by stimulating them with pictures and questions.

The illustrations were very varied: animals and objects made from one line. Some were imaginary (monsters). The story was not as visual as the poems read earlier on, but the illustrations were very stimulating. The teacher pointed out each drawing and discussed the element of 'one line'. The drawings were in pen and ink, and the older girl asked "where are all the colors?" The teacher turned the page and on it there were primary colors added to the drawings. That seemed to answer her question for the time being. The children remained interested in the entire story, although not so much listening to the story as looking the pictures.

When the story was done, the teacher explained what they were going to do: they were going to make drawings like Alexander Calder did: made out of one long line. They would do that by drawing with a fineliner marker and they would not lift the pen from the paper, so that the line they drew would continue through the whole drawing. The students looked a little perplexed, so the teacher grabbed a piece of paper and marker and did a small demo. She started to draw a cat, and showed

them how instead of stopping the line and starting it again, she let the line continue without interruption. They still looked a little uncertain so she made a different drawing, of a baby wagon, and that was maybe a better example of one line, because the children all said "ohhh" in understanding. The teacher said "and you are going to make drawings in the same way, on special paper and with special marker, and afterwards, you can color them in with markers or with paper collage" That was the instruction. She asked if everyone understood and if anyone had any questions. The older girl asked if they could draw imaginary things too. The teacher answered yes, but they had to draw something, not just scribble.

Maybe it was the heat or the absence of the usually quite bubbly and social girl, or the fact that the exercise demanded concentration, but the atmosphere and group dynamic was until this point calmer than usual. No yelling or running around.

The teacher handed out paper that was cut very long and folded harmonica style, so they would be encouraged to draw one long continuous drawing, and fine liners, and the students started drawing. A few students commented with "oh, I lifted the pen!" and "this is irritating!" but they all seemed to enjoy the challenge. The older girl said she didn't know what to draw. The teacher took the book and said: let me see what things I can name that the artist drew in this book…I see a horse, an umbrella, a peacock, a dinosaur…" etc, until she had named a number of examples for ideas, but she didn't show them the drawings again.   Teacher walked around the table giving encouragement but otherwise not influencing them. She told them to think about what they were doing, and to try to remember to keep the fine liner on the paper at all times.   The children were all focused, even the younger ones. The advantage for them was that they could just draw whatever they wanted (which were a bus and cars and a truck). They all worked individually, heads down. There was less than usual group conversation, since they all needed to concentrate on not lifting the pen. One of the older boys drew a skyline. The book had an illustration of one skyscraper, but the idea to draw one long skyline was his own. (cue -> own ideation). The other older boy was drawing an abstract (but not scribbling) drawing using his imagination. This drawing, although not figurative, was very obviously well thought out. The youngest of the boys was making a story out of his drawing – although he was less successful in keeping the pen on the paper the entire time, his drawing ran the entire length of the paper and when the teacher asked what it was he described a story with a tractor trailer and people riding on top. The older girl seemed 'stuck' drawing schematic things like flowers and butterflies; also she had drawn a cat and baby wagon, in imitation of the teacher's example. Modeling created imitation/influence lowers ideation/too many cues lower ideation. However she was able to keep the pen on the paper through the whole drawing.

The oldest one finished first, and the teacher talked about his drawing with him briefly, admiring his work, and asked him how he thought he could add color. She had markers and collage material ready for him to choose from. He chose for the more difficult collage technique. He said he wanted to fill in the windows of his skyscraper with little paper squares. The teacher agreed this was a great idea and let him get started.

The other two older students finished next. They both chose for colored markers, the teacher asked if they had any ideas how they wanted to color their drawings. The boy answered that he wanted to color his in like a "graffiti wall", which the teacher thought was good, and the girl seemed half hearted about coloring hers in, so the teacher encouraged her to start with markers and see what happened.

The youngest two were still hard at work, talking animatedly now with each other. They had started to slow down their drawings, and the teacher saw one of them forgetting to leave his pen, reminded him "one long line, remember?" He answered that he kept forgetting, but he would try. She spent some time with them, not influencing them but encouraging them and asking about their drawings/stories.

After a few more minutes the youngest two boys' drawings had gotten so full, and they showed no sign of stopping, so the teacher decided to stop for him and take the pen away. She encouraged the other to also stop the drawing and that she would go get markers and collage materials for them. They seemed satisfied to start on the next step and waited for her to return. The youngest one began immediately to use the colored markers to continue drawing. The teacher said "these markers are for coloring in, not for drawing, do you both understand? – Think with me. There are plenty of things to color in here, look" and she pointed out the stop sign, the people, the grass. He saw the collage paper and said I want to make grass out of that. The teacher said "you can do that…how would you cut out grass from this paper?" He took the scissors and said "in spikes" and starting cutting a strip of grass.

The other young boy was also using collage material, but cutting out huge pieces of paper that covered his drawing. The teacher removed them and said he shouldn't cover up his beautiful drawing like that and helped him think about what else he could cut out (again: some - younger? - ones not keen on small details). Once she got him thinking he continued on his own with some smaller details (mostly just small blocks of colored paper to fill in his outlines with).

In the meantime, the two older boys were enjoying their work but the older girl had lost interest and was bored. She had glued a few pieces of paper and colored a few lines but that was it. The teacher

tried to encourage her but she said she couldn't do it. After a few minutes of distracting the older boys she started looking outside and gesturing to children outside the windows. The teacher removed her from the main table and sat her by herself in the corner with her own supply of paper and markers and said "let's see what we have – what can you do to brighten this up?" She got the student to think together with her, and soon she was re-interested. Being set apart also seemed to help her focus.

The oldest had finished, the other older boy was engrossed in his graffiti wall. The two younger ones were also finished. Only the older boy and girl were still working, so the oldest boy looked over his own work and decided to add some more details. The youngest boys had left their seats to play and the teacher called them back to the table and asked them to explain their drawing. The youngest described his drawing (people in the truck on their way to a party) very colorfully, even though his vocabulary was very simple. The girl in the corner was more focused on her own work, not as distracted by external influences, she had worked more conscientiously and added more details.

It was getting close to the end of the lesson, and everyone was showing signs of slowing down, although they were still working – more or less – on their drawings. The teacher made one last walk through the classroom, commenting on and asking about the students' works. What was most noticeable is that all the students had a 'story' to tell about their drawing, without that being part of the assignment. The teacher said, "What a shame we have no time left, or you could have written down a story in your books!" She told them it was time to finish up and get ready to go

Class 8

Assignment: Using pen and ink, and random ink droplets on paper, the students create different fantasy animals using different tools (pen, ink dropper)

On the last day of class there was a substitute teacher. The students were excited that this was the last class and that next week summer vacation was starting. The younger girl was back and no noticeable change in her demeanor. This week there are pictures of animals hanging up in the classroom, material are already on tables.

Students eat their snacks and are excited. They all ask where the teacher is but accept the substitute with no further questions or comments, are receptive to new teacher. The teacher gets started right after snacks by doing attendance and trying to learn their names. After that she begins to tell them what they will be doing: they will be using ink and reed pens to make fantasy animals. The students don't understand at first, so the teacher explains again, showing them the materials at the same time. She also points to the pictures hanging in the classroom and tells them they can use those to

see what an animal looks like. The teacher sets small dishes with black ink on the tables and hands each of them a reed pen, and tells them again: they can use the pen to draw fantasy animals by combing two or more animals, by dipping the pen first in the ink and then drawing with it (explicit, semi-closed). The students seem to understand and all get started right away, they are all studying the pictures hanging up on the wall, trying to copy from them (too many visual cues?). Some of the children are noticeably relieved that this exercise is semi closed and that they can rely on the visual cues for a lot of their ideation. The teacher tells them to start thinking up different names for their new animals, like a "peack-iger" (peacock – tiger). They all are motivated and enthusiastic about making these drawings, working independently while socializing as a group.

The teacher collects the drawings just made and puts them away, then gets out a tray with all different colored ink. The older girl is extremely excited to see color. The teacher does a demo, saying that they had just drawn animal combinations, but now they would be "letting their animal grow out of an ink drop". She used a dropper to squeeze some ink drops onto a piece of paper, and explained how the dropper worked, which the students found interesting. She also showed how you could use the tip of the dropper as a 'pen' to draw with. She started showing them how and said "I think I see a bat here". She told them they would make animals from what they saw in the ink (open ended, imagination).

She hands out new sheets of paper, and walks along the students with the tray of colored ink and one by one, she asks them what color they want on squeezes a few drops on the paper, then hands the dropper over to the student. The fact that they get to choose the color and get to use the dropper was a great stimulus, motivation and they were all focused, working independently and not really talking to each other. The teacher walked by again and added another color, their choice.

Noticeable was the work style of the oldest boy, normally so 'conscientious': he was smearing the ink around into a bigger blot, but not attempting to make a figure of it. Also, of the oldest girl, who was very attent at working out small details from the ink, in her butterfly. The girl asked for purple ink (not available ready-made) and the teacher said you can mix it right on the paper, from the red and blue she already had, the girl said "ohhh, that's right!" and tried it. The teacher walked around and encouraged and helped each child individually, showing them how they could use the dropper to suck extra ink up and redistribute it She told the oldest to try and make an animal, not just smear the ink, but by making lines with the dropper. One of the older boys was making a peacock (based on the picture hanging), the teacher reinforced him and gave some tips, which he was happy to hear. The youngest two had been working well, but made abstractions from their ink, although they

named them after animals (free association), but they obviously thoroughly enjoyed the process. The older girl worked more carefully, the younger more abstractly (development/age?).

In using imagination in this more open-ended task, most of the children lost interest in using the cues and were more involved more with the actual process of using the dropper and ink to make abstract forms.   Since they had lost interest in the assignment – to make animals – problem id, and ideation faded, and even though the teacher tried to direct them, most of them resisted or ignored her. However the environment remained calm, even the two youngest remained focused until the end of class, and the teacher had to tell them to stop or they would have kept going.

Appendix E: Open Coding Schemas Participatory Observation

Coding Schema: Class 1

Topic of Observation	Observation	Category/theme	Notes	Concept	Concept 2
Student behavior	Students were seated at table, enthusiastic and intent to work	Group dynamic	Everyone was eager & positive atmosphere	Positive atmosphere	
Student behavior	Eager and enthusiastic to get started	Motivation		Extrinsic AND intrinsic	
Environment	Classroom set up with no visual cues to be seen,	Classroom	Nothing hanging up to influence ideas,	Visual cues (none)	
Environment	Easels set up served as stimuli	Classroom	Easels got them excited	(materials) Stimuli	
Environment	Children all sat in pairs (boys and girls, ages)	Group dynamic	seating arrangement suggests group dynamic	Seating arrangements	
Environment	Appropriate seating/workplace	Classroom	Enough room to work	Enough room	
Teacher behavior	Explanation from teacher what they would do, step one	Teaching method	Instruction was explicit, only explaining one step at a time,	Explicit instructions, step, task open	
Teacher Behavior	No influence from teacher on what or how they should draw	Teaching method	Free to express and interpret as they wished	Open ended -> ideation, freedom to express	Interrelation (external internal)
Teacher Behavior	Teacher reads a poem to the students	Teaching method	Active listening as cue -> ideation, imagination	(Use of) auditory stimuli	
Student Behavior	Students actively listened to poem while drawing	Learning activity	Listening and drawing simultaneously	(Use of) association	
Student Behavior	Lots of use of erasers	Work style	Uncertainty made them want to keep 'correcting'	Uncertainty -> closes off ideation	
Student Behavior	One child drew different drawings than cues	Developmental? Or high ideation?	One kid already changed the story and drew different things	Developmental or individual ideation?	
Student Behavior	They worked at their developmental level (drawings and attitudes)	Work styles	Coded drawings of boats, waves, etc	Schematic stage	
Student Behavior	Compared drawings non competitively	Work styles	Compared drawings in a friendly way, as group activity	Working as group;	
Student Behavior	They worked well side by side, playfully	Group dynamic, PLAY	Friendly and playful atmosphere in class	Playful, Positive atmosphere > Freedom to express	INTERRELATION

Topic of Observation	Observation	Category/theme	Notes	Concept	Concept 2
Teacher	Teacher gave demo painting technique for background	Teaching Method	Showed them how to mix colors, wash technique, thought aloud	Modeling creativity	
Student Behavior	All watched demo with great interest	Learning activity	Learned by watching example	Example > Procedural knowledge	Interrelation of factors
Student Behavior	Student asked question	Problem ID	Wanted to know how they would paint a boat on the background (confusion about technique)	Visual example -> problem ID	Interrelation of factors
Student Behavior	Some dove right in, other more tentative	Work style,	Interesting to see differences in working style	Individual work style,	developmental or individual differences
Student Behavior	They all wanted to do what teacher did	Cue	Most tried to copy teacher, wanted to do it "right"	Example as cue = copy	
Teacher	Next step: Collage images deviate from initial drawings (new ideas)	Learning Activity	New step breaks form old, and they started to show new ideas,	Steps > Ideation, imagination	INTERRELATION
Student Behavior	Steps break up activities which leads to ideation	Learning Activity	Steps > ideation	Interrelation	
Environment	They were loosened up by atmosphere, more free to express themselves	Group dynamic	They were able to relax and feel more secure, not "new" anymore	Playful > expression;	INTERRELATION
Environment	Felt more at home by end of class	Group dynamic	A 'secure' environment helps ideation	Security > ideation, freedom of expression	INTERRELATION
	General observation	Environment Style Activity	Seemed to begin to flow once they got to the open/free part of task and once the group dynamic between teacher and students was established, however, task was introductory level	Motivation Ideation Knowledge Freedom to express Playful	

Coding Schema: Class 2

Topic of Observation	Observation	Category/theme	Notes	Concept	Concept 2
Environment	Atmosphere more relaxed	Group dynamic	Students knew teacher and expectations	Positive atmosphere	

Environment	Easels set up with works from week before	Classroom	Works from week before serve as stimulus	stimulus	
Environment	Classroom contains cues from their own work	Classroom	Their own work as stimulus for reflection	Stimulus -> reflection	INTERRELATION
Student Behavior	Students took seats, paired off in twos	Work style	Tend to 'buddy up	smaller groups	
Student Behavior	Students talked about ethnic background	Socio economic	All allochtone,	Ethnicity	
Student Behavior	all Dutch as second language	Socio-economic	All but one speak Dutch as second language	Language deficiency issue?	
Student Behavior	Teacher reviewed, reminding them of last week	Learning activity	Triggered knowledge by asking questions	Questions -> knowledge, prompts ideation	INTERRELATION
Student Behavior	Teacher praises their answers	Teacher's style, motivation	Positive reinforcement	Reinforcement -> motivation	Interrelation
Student Behavior	Some were obviously eager to start	Motivation	Enthusiasm	Intrinsic motivation	
Student Behavior	Also getting impatient	Indicators disadvantaged children (or of individual?)	Students didn't want to wait	impatience	
Teacher	Illustrations shown briefly of collage technique	Teaching method	Examples helped prompt ideas	Visual cues -> knowledge	Interrelation
Student Behavior	Some dragged their feet	Motivation	Distracted by each other	Lack of intrinsic motivation	
Student	Started singing inappropriately	Play	Perhaps a little too relaxed	Group dynamic	BALANCE

Behavior				
Teacher	Teacher reviewed works	Learning activity	Evaluation	Reflection	
Teacher	Teacher asked how they thought they could do something	Teacher style	Asked them to think about how to solve problem	Open ended -> ideation/problem identification	
Teacher	New assignment: think up new story	Learning activity	Encouraged imagination for new ideas	External motivation	
Student Behavior	Individual levels starting to show	Work style	Some serious and individual, some playful and together	Developmental or individual	
Student Behavior	They all enjoyed themselves while working	Group dynamic	Enjoyable activity	Enjoyable, play	
	Original stimuli from sketches long forgotten	Cues	Letting go of cues leads to freedom of expression	Lack of cues -> Expression	interrealtion & BALANCE
Student Behavior	Most draw very schematically	Developmental stage	Same kind of boat, girls with hearts and flowers	Schematic	Still individual details, developmental stage clashes with some ideation
Student Behavior	Younger boy tries to glue plastic 3d lizard to collage	Learning activity	Didn't work, teacher let him try then gave guidance	Problem ID; balance influence	BALANCE
Teacher	Teacher gave class direction and hints	Teaching method	Too much influence is not good for ideation, right balance is good	Balance Influence	BALANCE
Student Behavior	Again, the older ones working hard younger	Developmental	The younger get bored more easily	Age =attention span	

	ones playing				
Stuident bhavior	Play with plastic lizard	Play	Gets idea to stcik lizard to collage	Play > ideation	INTERREALTION
Teacher	Teacher tries to convince student to do something to his work	Teaching method	Too much influence from teacher	Influence	Student resisted idea
Student Behavior	Everyone was into writing their new story, forgot old one	Learning activity	Open ended task	Open ended -> freedom of expression	To be writing about visual seemed great stimuli for creative writing
Student Behavior	One girls, finished early, reflects on her own collage, then adds something to story	Valuation	Self reflection triggered new ideas	(self) reflection -> ideation, intrinsic motivation	INTERRELATION
Environment	Atmosphere is enjoyable, relaxed	Work style	Group cooperation and friendliness is good for productivity	Working as group -> ideation	INTERRELATION
Student Behavior	Student reads her story to teacher	Learning activity	Wants to show what she did, looking for feedback	Reflection	Also looking for reinforcement, which she gets
Student Behavior	Students spontaneously show each other their work	Learning situation	Reflection	Working as group; intrinsic motivation	Leads to intrinsic motivation too
Teacher	Teacher took some pictures	Motivation	Positive feeling through pride	Extrinsic and intrinsic	

Coding Schema :Class 3

Topic of Observation	Observation	Category/theme	Notes	Concept	Concept 2
Environment	Beautiful weather outside	Environment	Has the children excited	Interfering stimulus	
Environment	Table/workstation set up in room for the day's project	Classroom	Children anticipate what's coming, increases excitement	Stimulus	
Environment	Rest of the room is empty (no examples	Classroom	No visual cues	Cues	
Environment	Atmosphere is unruly	Environment	Excited and talkative, won't settle down	Group, class order	
Environment	Students want to compare sketchbooks from week before	Group dynamic	Friendly, non competitive sharing	Motivation (intrinsic and extrinsic)	
Teacher behavior	Teacher explains in steps, begins with step one	Teaching method	Not too much info at once	Instruction in steps	BALANCE IN ACTIVITY BALANCE IN STIMULI
Teacher behavior	Task is listen to the music and make drawing	Teaching method	Draw whatever pops into your head	Open-ended	
Teacher behavior	Story AND Music as cue	Learning activity	Auditory cue as stimulus	cue	
Student behavior	Some have trouble understanding	Developmental	The concept is hard to grasp	Cognitive (level of difficulty)	LEVEL

Student behavior	Seem affected by uncertainty of what to do	developemental	too difficult leads to uncertainty	Uncertainty <- Ideation	INTERRELATION
Student behavior	One asks how to draw something from story	Learning activity	Visual interpretation of unfamiliar	Knowledge (know how and procedural	
Teacher behavior	Teacher praises her listening	motivation		Positive Reinforcement	
Student behavior	Some children are naturally less motivated by activity than others	Developmental	One of the youngest and the least bright are least motivated	Cognitive (level of difficulty) > motivation	Interrelation
Student behavior	The youngest is drawing unrelated pictures	Developmental (socio economic)? Or individual ideaton	Could it be because of his language?	Language deficiency	LANGUAAE & CREATIVITY
Student behavior	The youngest is drawing unrelated pictures	Development or individual	He is still drawing creatively	Language deficiency > ideation	INTERRELATION
Student behavior	The younger girl and older boy are actively listening and drawing	Motivation, individual	They listen, pause, think and draw	Auditory Stimulus = motivation	Cognitive level or individual difference
Student behavior	Less motivated are losing interest, need guidance more from teacher	Motivation	Teacher needs to keep encouraging them	Intrinsic not strong, extrinsic through encouragement	Developmental differences?
Teacher behavior	Step two explained, material shown	Teaching method, learning	She breaks the instruction	Step, explicit, procedural	

	(how to etch the plates)	activity	down in steps for the level	knowledge	
Teacher behavior	Teacher explains they can make up a whole new drawing using new composition	Learning activity	Leaves them a choice of composition	Open ended, choice	
Student behavior	They all concentrate hard while scratching the etch	Learning situation		Procedural knowledge -> concentration	Interrelation
Teacher behavior	Teacher helps by prompting not influencing	Teaching method	Keeping balance between how much influence	Balance motivation and influence	
Teacher behavior	Teacher explained etch technique	Teaching method	Used big words, kids seemed 'lost' and distracted	Developmental level	Need to stay on their level to keep them engaged
Teacher behavior	Teacher uses student's work as example, they are impressed	Learning activity	Good to see a colleagues results	Extrinsic motivation from peer's work	
Environment	Room gets divided into two groups/two tasks	Classroom	Not enough guidance leads to restlessness	Developmental level and independent work	
Environment	Two groups lead to chaos	classroom	Workplace needs to be peaceful for ideation to be able to occur	Group -> ideation	INTERRELATION

| Student behavior | Students are able to control the printing process themselves | Learning activity | Giving them control over their work keeps them enthusiastic | Control over own work, balance level of difficulty | |
| Student behavior | Students admit that it was hard, but fun | Learning activity | Balance again, of challenge and fun | Balance level of difficulty | Should I think of U-shaped theory? |

Coding Schema :Class 4

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Topic of Observation	Observation	Category/ theme	Notes	Concept	Concept 2
Environment	Room already set up, usual seating arrangement	Classroom	No questions, no over excitement from room stimulus	Routine in group dynamic	
Environment	Teacher admonishes them for week before	Group dynamic	When individuals are disruptive group is dysfunctional	Group- class order	
Teacher behavior	Teacher starts by reviewing works from week before	Evaluation	Lots of responses from children, insightful; Leads then to think about problems and solutions	Reflection -> problem identification/ ideation	INTERRELATION
Teacher behavior	Teacher asks question about works	Teaching method	Questions on how to improve prompt reflection and problem identification	Questions-> problems identification/ideation	INTERRELATION
Student behavior	Students answered using know how	Knowledge	Problem identification with their procedural knowledge	Reflection + knowledge -> ideation	INTERRELATION
Student behavior	Student had trouble conceiving	Learning activity	Can developmental be too low to understand	Developmental level	LEVEL

	making more than one print from etch plate		certain things		
Teacher behavior	Teacher prompts adding of details	Extrinsic motivation	Suggest to student to add scales or fur – high influence	Balance Prompting vs influence	BALANCE
Environment	Younger are sitting apart		Sitting apart and not paying attention, leads to disruption	Group - Class order	
Teacher behavior	Teacher makes a point of praising younger one's works	Extrinsic motivation	reinforcement brings them back to group	Reinforcement	
Environment	Others seem to be irritated by younger ones' behavior	Environment; Developmental level	Difference in levels is disturbing to others	Group -Class order; age difference	
Student behavior	Children from second grade also show significant difference in work styles	Work styles; developmental level	What are reasons between classmates for differences in work styles?	Differences in gender, level, age or individual?	LEVEL
Teacher behavior	Today's activity explained: multiple etch prints	Learning activity	Activities today allow for application of procedural knowledge	Procedural knowledge	
Student behavior	Two girls cheered in anticipation	Motivation	Enthusiastic to be first to print	Intrinsic motivation	
Student	Two older	Evaluatio	Teacher's review and	Reflection ->	INTERRELA

behavior	boys added details	n; Learning activity	reflection prompted them to make led to ideation	ideation	TION
Student behavior	Showed confidence in applying ink	Knowledge	Having learned the technique they now have confidence to experiment more	Knowledge leads to ideation	INTERRELATION
Student behavior	Youngest needed redirecting and reprimanded	Developmental	This activity seems above their level which leads to disinterest	Balance -> Developmental level	BALANCE LEVEL
Teacher behavior	Teacher asked group how student could solve problem using one of the student's works as example	Teaching method	Teacher prompted problem ID, ideation by using student's work and asking open question	Open ended (asking questions) -> problem ID and ideation	INTERRELATION
Student behavior	Reacted well to Using student's work as example is closest to them	Learning activity	Example of peer works good	Stimulus	
Environment	Messy environment adds to chaos	classroom	Mess and chaos hinder creative process	Group dynamic: Creative environment needs to be fun but calm	
Teacher behavior	Teacher again uses one of student's plates as example of how to work	Teaching method	Asks group if they think the plate is ready	Open ended (asking questions) to prompt knowledge	INTERRELATION
Student	Younger girls	Motivatio	Enthusiasm to	Knowledge ->	INTERRELA

behavior	goes back to make a third print	n	experiment with new knowledge	intrinsic motivation and ideation	TION
Environment	Group worked together well at individual task	Work style	During printing they all waited for each other,	Group dynamic	
Teacher behavior	Teacher told them to write story about their etch in the sketchbook	Teaching method	Was this a tactic or assignment? Students were eager	Cross discipline -> ideation (creative writing and illustration) goes well	INTERRELA TION
Student behavior	In hindsight this activity is difficult for some of the students	Developm ental	Requires many steps and independent working	Level of difficulty	LEVEL
Student behavior	Work today showed more ideation	Learning activity	Use of colors, more experimentation, additional details, multiple copies	Knowledge -> motivation, ideation	INTERRELA TION
Student behavior	Motivation seems to be shifting for certain students	Motivatio n	As time goes on and knowledge/confidence builds, motivation goes from extrinsic to intrinsic	Extrinsic becomes intrinsic	

Coding schema: Class 5

Topic of Observation	Observation	Category/them e	Notes	Concept	Concept 2
Environmen t	One girl absent, teacher has laryngitis		Affects balance of group dynamic	External factors factors on group dynamic	Interrelation
Environmen t	Classroom is bare of visual	Classroom	no visual cues to help with	Cues	

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	cues,		ideas		
Environment	Seating arrangement, girl in middle	Classroom	Atmosphere relaxed and friendly	Group dynamic	
Teacher behavior	Teacher explained step 1 – listen and draw what they heard	Learning activity	open ended	Open ended -> ideation	INTERRELATION
Teacher behavior	Teacher explained step 1	Teaching method	Explained d in steps	Explicit	
Student behavior	Students less enthusiastic about assignment but comply	Learning activity	Getting disinterested in same type of assignment	Lack of challenge - > decline in ideation	INTERRELATION
Student behavior	Same patterns in work style among students	Work styles	active listening and thought out drawing leads to more drawings	Active listening -> ideation,	INTERRELATION
Student behavior	Youngest boy not listening but drawing furiously	Developmental or creative individual ideation	He hasn't listened but still uses ideation	Combination of language deficiency and ideation	LANGUAGE & CREATIVITY
Teacher behavior	Poem content was very visual	Stimulus	Good stimulus for ideation	Auditory stimulus - > Ideation	INTERRELATION
Environment	Youngest distracted older students	Developmental difference	Older students irritate by immaturity	age or individual developmental	
Teacher behavior	Teacher reread poem	Additional stimulus	Some added detail, some new drawings	Stimulus leads to Ideation	INTERRELATION

Student behavior	One girl found the poem strange, looked at neighbor	Learning situation	Not understanding leads to uncertainty	Uncertainty lowers ideation	REVERSE INTERRELATION
Teacher behavior	Teacher asked questions to prompt problem id	Teacher method	Questions on what they thought they would do with materials	Question, Open ended -> problem id and ideation	INTERRELATION
Teacher behavior	Teacher showed them through example	Teacher method	Hands on project, so demo best method to explain	Example as cue, not good for ideation (too few alternatives)	REVERSE INTERRELATION
Student behavior	Spatial activity – high challenge, different skills	Learning activity; challenge	Building something in 3d requires different knowledge	Spatial knowledge is different form 2d?	
	Atmosphere remained friendly during work	Environment	Students work well in group	Harmonious group leads to higher creative process	INTERRELATION
Student behavior	Most worked conscientiously	Work style	Was this due to harmonious environment or activity	Motivation on ideation	
Teacher behavior	Teacher adjusted trees for students	Teaching method	Teacher influence led to uniform looking trees	Too much influence (closed)hinders ideation	
Student behavior	Wax technique low level of difficulty	Learning activity	Not much challenge, but enjoyable	Need more challenge	BALANCE LEVEL
Student behavior	Other ideas on how to use wax	Learning activity		Play	

Student behavior	Girl was pulled apart to calm down		Girl calmed down and focused better, enjoyed more	Peaceful environment helps concentration	
Teacher behavior	Teacher got material out for step two, leaves for trees	Learning activity	No explanation, self explanatory Children reacted half heartedly	Motivation waning (extrinsic and intrinsic)	
Activity	Less room to discover their own things	Learning activity	Assignment too closed, too much influence for teacher	Too closed hinders ideation and motivation	REVERSE INTERRELATION

Coding schema: Class 5

Topic of Observation	Observation	Category/theme	Notes	Concept	Concept 2
Same classroom setting: no cues,	Classroom	No pictures of trees, etc, materials not visible yet	Cues		
Youngest two boys separated from start	Classroom	Teacher and researcher each sat by one of the younger boys	Group dynamic		
Instruction from teacher was minimal	Teaching method	Materials laid out, she let them discover how to continue on their own	Open ended -> ideation	INTERRELATION	
Everyone worked	Work style	Socially working together but	balance group social and	GOOD	

individually while socializing as a group		concentrated and working independently	individual work	BALANCE	
Group dynamic (social but working independently) was good atmosphere	Work style	Balance of social interaction and independent work style seems to be the best	Atmosphere was enjoyable		
This week the teacher let students discover/decide on their own	Learning situation	Open ended in choosing how they should continue to decorate trees	Open ended		
Making small details seemed unpopular with some	Work style	Tiny leaves, working with small wires, younger ones not interested	Developmental		
Watching students deal with problem of making treehouse from boxes	Knowledge; problem ID	Finding out how they needed to use spatial skills	Spatial skills, how to; difficulty level		
Teacher actively participated	Teaching method	Difficulty level required hand on help	Higher difficulty level requires more guidance		
Teacher asked questions to prompt problem solving	Teaching method	Questions what they wanted to do prompted them to think up solutions	Open ended -> problem id and ideation	INTERRELATION	
Teacher showed by example	Teaching method	Showing him first in effect closes possibilities	Influence closes ideation		

Student asked teacher to make something for her too	Learning activity	Teacher told her to first make it, then she would attach it	limiting influence leads to ideation		
Most younger students did not want to work in minute detail	Learning activity	Detailed work seemed to be too much for them	Developmental level? Difficulty level?		
Working with spatial challenges generated concentration by all	Learning activity	Seemed to consider the spatial skills challenge puzzle work, focused!	Problem ID through spatial skills		
Teacher influenced how to but left decision making to individuals	Teaching method	Need influence to raise level of how to but let them solve as much as they can on their own	Balance in influence (how to) and individual ideation	BALANCE	
Children more interested in the puzzle aspect than in the aesthetic appearance of tree	Working style	Challenge of figuring out how to make it work overrode appearance	Pretty vs functional?		
Teacher asked boy if he remembered color-mixing	Know how	Teacher asked with open question to test procedural know how	Procedural know how		
Youngest shows his success spatial skills	individual indicators	His was one of the first – he showed above average skills	language deficiency ideation/problem solving	LANGUAGE & CREATIVITY	

Pride in work is a sign of intrinsic motivation	Motivation	Intrinsic motivation from pride	Intrinsic motivation		
Frustration with sharing led to indiscriminate work	Motivation	Frustration lowers motivation	Frustration <- intrinsic and extrinsic motivation	REVERSE INTERREALTION	
Oldest and youngest working side by side	Learning situation,	Modeling also done by peers, older student was imitated by younger	Modeling		
Teacher asked students to think about how they would solve a problem	Teaching method; learning activity	Asking the question how would you make that triggers ideation and problem ID	Open ended ->ideation and problem id	INTERRELATION	
Older girl spent most of her time with smaller details	Developmental ? Individual?	She preferred details, others spatial	Pretty vs functional		
Students made a mess mixing colors, teacher allowed	Learning activity; procedural knowledge	Experimentation through playing lead to know how, teacher allows	Play -> Knowledge	Interrelation	
Teacher suggestion became high influence; students imitated	Learning activity	Teacher's own vision was impressed on students, they all followed	Modeling?		
Teacher suggested bird's nest for	Learning activity	Teacher's suggesting imitated by	Balance prompting and influence	BALANCE	

tree		everyone			
Process was extremely creative, product not so much					

Coding schema Class 7

Topic of Observation	Observation	Category/theme	Notes	Concept	Concept 2
Environment	Weather was hot, girl was absent	External factors	Group dynamic affected by external influences	Group dynamic	
Environment	Room had no visible cues of stimulus	classroom	Nothing to influence the students was visible	Cues, stimulus	
Teacher behavior	Teacher explains step one of assignment: actively listen to story and look at pictures	Teaching method;	Explains instruction is step by step, only step one now, no drawing involved	Steps, explicit	
Environment	The stimulus requires no direct drawing, visual cues present in stimulus	Stimulus,	Visual cues in illustrations of story	Visual cues	
Teacher behavior	Teacher starts reading story, children at first slow to get interested	learning activity; motivation	Teacher asks questions to get them interested	Questions (open ended) -> motivation	interrelation

Teacher behavior	Teacher shows illustrations from books,	Stimulus	Illustrations and questions together	Visual cues as example	
Teacher behavior	Teacher discusses elements illustrations "one line"	Teaching activity	Students listened to teacher and compared to what they saw in illustration, triggered understanding	Declarative knowledge	
Teacher behavior	Teacher explained second step: make drawings like they had seen (all made of one line)	Teaching method	Some looked confused by instruction	Level of difficulty? Or choice of teaching method?	LEVEL?
Teacher behavior	Teacher decides a demo would explain better	Learning actiivty	She makes a drawing without lifting pen from paper, all understand	Example as stimulus	
Student behavior	Children ask questions, what they can make? Teachers leaves choices very open	Teaching method, learning activity	Can they also make a fantasy drawing, they asked? Yes! But no scribbling	Open ended -> Ideation,	INTERRELATION
Environment	Group seemed calmer than usual	External Inlfuence	Heat, group dynamic?	Group dynamic	
Student behavior	Students got started, most enjoyed the mental challenge	Learning activity	Keeping pen on paper was fun, mental challenge	Balance difficulty and fun	

Student behavior	One couldn't think what to draw	Learning activity	Was the activity too open, did the students need more guidance/more closed?	Open vs closed, balance	
Student behavior	Being stuck affected motivation	Motivation	Lack of motivation affects ideation	Motivation -> ideation	
Teacher behavior	Teacher names ideas based on illustrations in books	Stimulus	Named objects but didn't show picture again	Balance –cues	
Student behavior	One student draws entire skyline based on ideas of building from book	cue	From one illustration his idea grew	Cue -> ideation	INTERRELATION
Student behavior	One student makes abstract drawing using imagination	Stimulus	Imagination as stimulus leads to idea	Imagination as Stimulus -> ideation	INTERRELATION
Student behavior	The young ones have more trouble leaving pen on paper,	Developmental level	Can this mental challenge be too difficult level	Level of difficulty and age	LEVEL
Student behavior	Girl is "stuck", no ideas	Low motivation or stimulus?	Is it her lack of motivation or lack of stimulus that leads to lower ideation	Stimulus, motivation <- ideation	REVERSE INTERRELATION
Student behavior	Teacher provides encouragemen				

	t				
Teacher behavior	Teacher asked student how he thought he could add color)	Teaching method	Asking questions prompts ideation	Questions -> ideation	INTERRELATIO N
Student behavior	Student able to make his own decision	Learning activity	Making his own decision (control) motivated him	Control -> intrinsic motivation	
Teacher behavior	Teacher encouraged students	Teaching method, motivation	Positive reinforcement and encouragemen t as extrinsic motivation	Extrinsic motivation	
Student behavior	Drawing kids get a sort of second wind	Work style	After prompting, continued to add details and ideas, build up drawings	Motivation, stimulus,	
Teacher behavior	Individual attention to youngest	Teaching method	Age difference, younger ones require more guidance	Developmenta l level – guidance	
Student behavior	All drawings were described as a story!	Learning activity	The students turned their drawings into stories	Reverse stimulus, cross discipline -> ideation	Story shows ideation in process as well as drawing!!

Coding Schema Class 8

Topic of Observation	Observation	Category/theme	Notes	Concept	Concept 2
Environment	Substitute teacher uses visual cues in classroom, material in	Classroom	Excited reaction to see cues in classroom	Cues -> stimulus	

	sight, pictures hanging				
Teacher behavior	Teacher begins first assignment with instruction and showing materials	Teaching style	Instruction is explicit, task is semi-closed	Explicit, semi closed,	
Student behavior	Students make much use of visual cues	Cues	Although they like having the cues they rely too heavily on them	Too many cues, less ideation	
Teacher behavior	Teacher tells them to think up new name for fantasy animal	Learning activity	Inventing new name is stimulus	Imagination as stimulus	
Student behavior	Students work independently while socializing as group	Environment, work style	Working in a group atmosphere but each on their own works	Working as a group	
Teacher behavior	Teacher does demo with droplets of ink in different colors: use imagination to create animal using droplet as tool	Learning activity stimulus	Children are eager to work with dropper and ink, demo is good stimulus	Open ended, procedural knowledge, ideation	
Student behavior	Students get to choose color and work with	Learning activity	Students are motivated by making	Control - > stimulus, motivation	

	their own dropper		their own choices, have more control		
Student behavior	Working more quietly, independently	Work style	Not much socializing for this exercise	Independent work	
Student behavior	Everyone is enjoying the use of the droplet as tool	Leanring activity	Students try to figure out how to work with dropper and ink	Procedural knowledge; problem id as -> stimulus	
Student behavior	Older girl attention to detail	Work style		Developmental? Individual? details	
Student behavior	Many get lost in playing with the ink and droplet, forget to make animal from it	Learning Activity	The abstract cues of the ink/open ended task combined with new tool leads to abstract work/free association	Developmental, balance between open and closed	BALANCE
	Students enjoyed the process, process itself was creative				

Appendix F: Transcript, semi-structured interview

Researcher: Hi ladies, thank you for making time for me today. I understand how busy you are so will try and keep it short. Basically, you know already that I am researching creativity and whether it can be developed in primary school children from lower socioeconomic background. So I wanted to ask you if you think the children have in any way increased in their level of creativity since starting art lessons 8 weeks ago. And I define creativity (in a scientific way, it's a long story, but in short) as broken down into four skills: the amount of ideas they have, how original and detailed their ideas are, how flexible their thinking is (in terms of problem identification and thinking up alternatives), and how much they are able to reflect on their ideas.

Teacher 2: So, at the end of the lessons, how the children are now, you mean?

Researcher: Yes.

Teacher 1: To be honest, I think this is difficult, because there were only 8 lessons, we find it... (trails off)

Teacher 2: I agree…and they were only once a week, and they are not constantly busy with it, so it is hard to say if they have really improved or developed, but I have noticed that when I give them a drawing assignment, they think about the things they have done with you and they are more involved. This past week I gave them an assignment about a tropical bird that they could make in whichever way they liked, and since they had done something with fantasy animals during your classes I noticed that they got deeper into the assignment, looked at it more and thought better about it, that I do notice. But if I can say that this is with all creative assignments, I don't really dare to say, that is difficult to say.

Teacher 1: (nods head in agreement) Yes. But like I said, because it is only once a week, it's not really possible to tell if there are lasting changes…

Teacher 2: Although they obviously get enormous pleasure out of it, and most weeks talked about the things they had done in your class the next day.

Researcher: OK, I understand. And what do you think, knowing this age group, knowing these children, might have been the results if the classes were more structural, regular and more often?

Teacher 2: It is hard to say whether the affect would be long term, or if the same creativity would 'cross over' to other assignments (or subjects) but if I think about the differences they showed after

being at the class on Wednesday afternoons, with assignments that triggered what they had done with you, that there would be a better impression made if the classes were more regular.

Researcher: So what kind of art classes do they get here in school? Aren't they regular?

Teacher 1: Oh we (teachers) regularly do art projects with them, but we are not artists, so what we do is more 'arts and crafts' than (serious) art that requires real creative skills, like the skills you mentioned. I think it's more fun and play time for them…coloring, cutting out things and pasting them…those kinds of simple things. But of course, I teach first grade, their level in second grade is higher, you can do more with them (teacher 2 nods in agreement).

Researcher: OK, of course, the difference in age and level… (To teacher 2): And when you said assignments that triggered what they had done with us, what did you mean?

Teacher 2: Well, like I said about that tropical bird. But – and now I am really thinking! - if I really think back, I would also dare to say that I sometimes noticed a difference in (named two students) assignments that had to do with 'story telling'….they put more effort into making a story more expressive or imaginative.   Took more care, I guess I could say. But didn't they have to work with stories in this lesson series? So it could just be that. At any rate, I do think that if they were exposed to more creative assignments it would make a difference all around.

Teacher 1: I agree that the more creative assignments they have, the more they would be likely to think creatively. The problem with this age is that their subjects and assignments are all still very concrete, so that creativity sometimes can't really be used…applied or triggered, I mean.

Researcher: Do you mean "closed" assignments?

Teacher 1: Yes – they follow directions and there is only one right answer.

Teacher 2: Yes, the only subject that really allow for 'open' assignments at this age is language…and art. Music too, but music is also not considered a 'regular' or 'serious' subject here, maybe even less so than art. I know that other neighborhoods and schools might work differently, but they also have more funds. Music is harder because they don't really 'make' anything. At least in art there is a….hmmm….picture or something to look at afterwards.

Researcher: So would it be fair to say that those subjects that use open assignments offer the most chance for developing creative skills? In this age group, or age groups, I mean?

Teacher 1: Yes. I would actually dare to say that if you are looking at creativity as problem solving, art assignments can trigger that even more than language at this age. Especially in my class (first

grade) we are still really just getting started with the basics. In my class the children still spend a lot of their time learning through play ('playtime').

Teacher 2; It's true. I have a little more room (with language assignments), but still at this age (grade 2) they are getting started with their spelling and vocabulary, grammar.   Plus there is a problem with children from this neighborhood who need extra help with language, which makes it even harder for the teacher to do your own creative things – you have to follow the school's curriculum policy. So yes, art definitely gives you the most opportunity to trigger the skills you mentioned.

Researcher: OK, that's good news to hear. But can I go back one second…I heard you (teacher 1) mention play. Do you see play as means of developing creativity?

Teacher 1: Oh definitely. Definitely. Because it's so spontaneous it allows for all sorts of creative opportunities. I thought you meant work assignments. But actually, play includes problem solving, definitely, and developing ideas. It is also very important for social skills. But I never really thought about giving play assignments with creativity as a learning goal. Not like that.

Researcher: OK. So, another thing: how would you think working in a group environment differs from working individually…for these children, I mean?

Teacher 1: At this age (gestures to the first grade classroom) most children enjoy working in a group. Because they still are so involved with play. But it works both ways, because sometimes they get each other more involved, and sometimes they distract each other – it depends…

Researcher: Depends on what, would you say?

Teacher 1: Oh, a lot of things…of course, what they are doing, but their personalities, even the time of day and what they ate…if it's someone's birthday and everyone had candy it lunch, you definitely notice it in the students.

Researcher: (to teacher 2): and how about your class?

Teacher 2: In our class we also do group work, but less than first grade, I think. But it is the same, sometimes they work better than others. But in second grade you have to begin to try to get the students to work more individually. There are more assignments done 'in quiet'. It has a lot to do with the type of child, I think, how they work best…

Researcher: OK, thanks…. In your curriculum guidelines, do they mention creativity?

Teacher 2: Not really, only indirectly. Creativity is considered part of personal development, but is not mentioned in terms of learning goals. But it should be.

Researcher: Why do you think creativity is important?

Teacher 2: (laughs) Now you got me thinking! Well, the skills you named, they are all important skills that underlie a lot of everything else the children need to learn. Creative children always seem to have a certain advantage over non creative children. Even if they are not more intelligent, being creative helps them in other ways. But now I'm talking about children who are already "creative"

Researcher: Ok, I understand, but how do you mean an advantage? Can you maybe give an example?

Teacher 2: Well, good problem solving skills, for example. Children who are creative in this way seem to adapt quicker…if they can be creative in their thinking and problem solving, you notice that as a teacher.

Teacher 1: I agree that creative children are smart in a different way.   Especially when it comes to children with poorer language skills (I have a few in my class)…their cito scores are always lower and a lot of the times they are the more "clever " of the children.

Researcher: You mean, the children with poorer language but more creativity?

Teacher 1: Oh, yes.

Teacher 2: That's a good way of saying it. Creative children are *cleverer* than non creative children, and that is something that often can get missed in the cito test. It's something you see more in the way that they work and interact.

Researcher: (To teacher 1) You say that there are students with poor language skills in your class. That is something you can say is a result of socio-economics. Are there other socio-economic factors that you could say make creativity – or art classes even – more important?

Teacher 1: I think that how much a family – or a school even, like ours – can spend on the extras, things like arts classes, helps them develop better. But I don't know if that answers your question.… (Looks at clock)

Teacher 2: Maybe as they get older, being more creative can help them stay out of trouble. They are still young now, but as they get older a lot of them wind up in trouble. I think that is a factor of this neighborhood, or as you say, the "socioeconomics" of this neighborhood (looks at clock too!).

Researcher: OK, thanks…I see you need to get going, so if I could just ask one more question… What would your suggestions be, if you wanted to see creativity development in these children?

Teacher 1: I think things like better art classes, and playing, offer the most realistic chances at this age. Maybe at an older age you really could use assignments in other subjects…

Teacher 2: I think art classes are really good for creativity too. But if you wanted to *develop* it, you would need to be more consistent and have it become part of the learning goals. If it (creativity) was integrated in the curriculum, we (teachers) would be able to do more with it. And to get back to your first question, whether the children in the art classes showed an improvement in creativity at the end? I think in the short term, they showed some differences in their work, and that if they had classes more often and for a longer time – maybe a whole year long - they could show some differences, but I'm sorry, I can't say I saw any long terms changes. But good luck – it's a really good idea and I think we need to pay more attention to creativity in school.

Teacher 1: Yes, unfortunately I don't think the length of classes (8 weeks once a week) was long enough to be able to give any kind of definite answer. But it is logical that creative assignments like in your art classes on a more regular basis could help develop it (creative skills). But, I also want to say – before I forget - that I think that creativity is also something you are born with and in certain regards cannot be really taught, only practiced and developed, and that plays a part in it too.

Teacher 2: Indeed, good that you say that! I believe creativity is like intelligence in that way, some are born with more than others.

Researcher: Noted! OK! Ladies, this has been really interesting and very helpful. Thank you so much for your time.

End of Transcript

Appendix G: Open coding schema, semi-structured interview

Topic/Question	Teacher 1 comment	Code	Teacher 2 comment	Code
General (all assignments all the time) differences	Too short a period to tell	Duration and frequency	Same	Same
Per assignment differences	-	-	Some assignments triggered knowledge, ideation, motivation	Per assignment sometimes (short term)
Students enjoyed	-	-	Talked about experiences in class	Motivation
Would results change if classes were longer/more frequent	-	-	Again hard to say if long term or cross-over, but likely to stick better	Possibly the longer the better the impression made
Kind of art classes in-school	Not professional, arts and crafts	Low level of quality	Same	Same
Developmental level differences	Can do more with grade 2	Level of difficulty	Same	
What kind of assignments triggered	-	-	Assignments with similar theme trigger skills	Non-crossover triggers
Number of creative assignments makes difference in creativity	The more the better	More = better	Same	Same
Creative assignments at this age	Play and art, others subjects too concrete	Play and art only open"	Less play, more language, and art, other subjects still basis levels	Language and art
Difference in school/neighborhood	-	-	Less opportunity to use creative (non arts)assignments, due to funding	Socio-economics
Open assignments best for creativity in age groups?	Yes, art is best for grade 1	Art for creative skills	Yes, art and language for grade 2	Art for creative skills
Use of play for creativity	Lots of play in grade one, good for creative opportunities	Play = open, problem ID, ideation (creative process)		
Working in group environment	Group enjoyable for them, is like play	Group work = play	Work in group less often, more individual	Older = more individual
Working in group environment	Success depends on circumstances	Balance in group dynamic	Success depends on circumstance and work style of individual	Individual work style
Curriculum guidelines	-	-	Creativity not learning goal	Creativity not learning goal
Why is creativity important	Smart in different way	Clever	Compensates for lower cito scores, language deficiency	Problem solving = adapting quicker, compensation

				language skills
Creativity and cito	Cito used to measure intelligence, language, not creativity	Intelligence		
RESEARCHERS NOTE Language deficiency is not the same as intelligence	Cito scores low due to language	This does not mean they are less intelligent		
Clever noticed in work and interaction			Clever/creative not seen in cito,	Clever = creative, seen in group process
Importance of creativity for disadvantage children?	Funding for extra arts education	More funding = opportunities for creativity	Keep them out of trouble	Creativity as Positive outlet
Suggestions for creativity development	Better art classes, playing, when older other things	Art, play, open assignments	Developing requires consistent exposure, be part of curriculum requirements	Consistent exposure, curriculum
Creativity is inherited	Creativity like intelligence is inherited, cannot be completely taught	Creativity can be developed, not instilled	Same	Same