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Reimagine, redesign and transform

Enhancing generation and exploration in creative problem finding processes in visual arts education

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CHAPTER 1

INTRODUCTION

1. CREATIVITY AND ORIGINALITY IN VISUAL ARTS EDUCATION

Creativity and originality are considered as driving forces of contemporary visual arts practices from around the world (Meskimmon, 2011; Smith, 2011). Visual arts practice is characterized by continuous attempts to envision and reveal unseen worlds (Hammershøj, 2014) and attempts to evoke new aesthetic experiences (van de Vall, 2008). New meanings are generated by continuously pushing the boundaries of imagination towards the new (Meskimmon, 2011). In visual arts, creativity results in a painting, a performance, a movie, a design object or a graffiti work: an original visual arts product that was based on an original concept which was transformed – i.e., *visualized* – in an original way (Boden, 2004; Bresson, 2004). Learning to become original is one of the main aims in visual arts education (Groenendijk, Damen, Haanstra & van Boxtel, 2015; Seidel, Tishman, Winner, Hetland, & Palmer, 2009).

Although the importance of creativity and originality are acknowledged in visual arts and visual arts education, these topics have received less attention in the field of educational research than one may expect. In the field of creativity research, empirical studies on the development trajectories of creativity were performed by for example, Barbot, Lubart, & Besançon (2016) indicating an irregular development of creativity. Furthermore, Kleibecker, De Dreu, and Crone (2013) indicated a peak-performance in creativity for visual divergent thinking during adolescence. Yet as was reported in the OECD study by Winner, Goldstein, and Vincent-Lancrin (2013) a limited number of empirical studies were performed on the enhancement of students' creativity and originality through learning and instruction.

This lack of empirical studies may be due to the complex nature of creativity, as the definition of Plucker, Beghetto, and Dow, (2004, p. 90) demonstrates:

"Creativity is the interaction among aptitude, process, and environment by which an individual or group, produces a perceptible product that is both novel and useful as defined within a social context".

Studying creativity is complex since it involves these different and interrelated factors such as aptitude, process and environment and since the underlying skills are difficult to measure.

Another cause for this lack may be the complexity of measuring creativity of visual arts products, which involves various ways of measuring, different types of creativity tasks and different knowledge domains (Barbot, Besançon, & Lubart, 2011). Furthermore, collecting, assessing and analyzing data on originality of ideas

and visual arts products in a real-world educational setting is very labour-intensive and therefore time-consuming, due to organization of technical equipment needed (in this dissertation: cameras; computers; full-colour printers) and to technical aspects (collecting, analyzing and assessment of large samples of images (data) demand either physical space or digital space).

Recently, two dissertations on learning and instruction in visual arts were published (Groenendijk, 2012, and, Heijnen, 2015). Both dissertations demonstrate the importance of research to support the knowledge domain of visual arts education and the educational practice of teachers. Groenendijk (2012) examined effects of observational learning on students' creativity in poetry and visual arts. In observational learning, the learner activity is the response to cognitive modeling and consists of students observing other students who show by thinking aloud how they perform a creative task, and by evaluating and reflecting on these performances. Groenendijk, Janssen, Rijlaarsdam, & van den Bergh (2013b) reported positive effects of observational learning on students' creative processes as well as products in visual arts. Furthermore, they found positive effects of observational learning on creativity of design products, compared to students who executed a creative task. These findings indicate the importance of observation and cognitive modeling for learning to become creative in visual arts.

Heijnen (2015) focused on a model for authentic art education inspired by practices of contemporary visual producers. He examined design principles and constructed a model for learning and instruction for authentic art education. This model follows three design principles: (a) learning is related to the students' cultural world; (b) learning is construction of knowledge in complex task situations and this learning takes place in learning communities, and (c) learning tasks are related to professional art practices. Heijnen (2015) pointed to the crucial role of an authentic environment in terms of contemporary art practices for creativity learning in arts education. Both dissertations, following different sets of principles, demonstrated the importance of particular learning and instruction practices for further development of creativity in visual arts.

Earlier, in 2010, two other dissertations were published on the subject of cultural and arts educations, investigating cultural policy on teaching and learning on the participation of students in cultural activities (Damen, 2010; Dieleman, 2010). These dissertations discussed the impact of different instructional approaches on students' participation in cultural activities, focusing on either the curriculum or on the student. In studying educational practices Damen (2010) indicated that a student-oriented approach may be related to cultural participation focusing on popular culture (such as movies and popular music) and a curriculum-oriented approach may be related to cultural participation focusing on high culture such as visiting a museum or attending a modern theatre performance. For the longer term (six years after finishing secondary education) however, she did not find effects of different instructional practices in cultural education on students' cultural participation.

The other thesis (Dieleman, 2010) was based on field-studies through in-depth interviews with participants involved in the field of cultural and arts education.

Dieleman (2010) indicated that instructional practices focusing on knowledge and aesthetic learning (i.e., learning to analyze and value works of art) – and a balance between skills and challenges – were crucial for students' motivation for cultural and arts education (including theatre education) and their cultural participation. Furthermore, Dieleman noticed teachers apparently sometimes had problems with learning and instruction in cultural and arts education, due to a lack of criteria both for the selection of cultural activities as for the assessment of students' performances.

The current thesis builds on these four studies on creativity learning in cultural and arts education by examining effects of learning and instruction and by focusing on learning through assignments in art production and aesthetic reception and reflection. For the design of the metacognitive strategy instruction in the first two studies (Part 1) of this thesis, we will build on the insights from the thesis by Groenendijk (2012) demonstrating the importance of cognitive modeling and reflection for learning to become creative in visual arts. For the second part of this thesis, we will perform further research on creative generation and exploration and their relation to originality of visual arts products. From the creative process model developed by Groenendijk (2012) we learned about the nature of creative generation and exploration processes. The present thesis further examines the specific visual nature of these processes of generation and exploration and activities used in these processes.

Although the studies presented in the current thesis do not specifically address learning in communities as Heijnen (2015) did, we do acknowledge the value of the design principles for authentic learning. To a certain extent we will also use these design principles in this thesis: (a) in this thesis the main focus will be on photography and this medium is closely related to students' cultural world; (b) all assignments consist of creating original visual arts products and knowledge, these can be considered as complex task situations (c) learning tasks and themes we use for the lessons are all related to themes, assignments and processes used in professional art practices.

In contrast to the thesis by Damen (2010) we do not focus on either the curriculum *or* on the student in this thesis, instead we focus both on the curriculum *and* the student. Furthermore, we build on the thesis by Dieleman (2010), by acknowledging the crucial role of instructional practices with a focus on knowledge and aesthetic learning (i.e., learning to analyze and value works of art) and a balance between skills and challenges that is crucial for students' motivation. The current thesis therefore extends insight from these studies by Groenendijk (2012); Heijnen (2015); Damen (2010) and Dieleman (2010) by:

- 1) recognizing the importance of metacognition for creative generative activities and strategies in the subjects of cultural and arts education and visual arts education;
- 2) studying ways to enhance students' creative thinking through instruction;
- 3) examining processes in creative generation and exploration and especially focusing on the role of 'problem finding';
- 4) studying students' generation and exploration activities and the relation of these activities to the originality of their art production.

The four studies we report in the current thesis serve the overall purpose of enhancement of the knowledge domains of contemporary cultural arts education and visual arts education. The studies inform and support learning and instruction about creativity and originality in these domains.

The first two studies, examine the effects of explicit instruction on metacognition (Study 1) and metacognitive strategy instruction (Study 2) about creativity on students' skills to generate more ideas in different directions to arrive at more original ideas. In the first study, instructional supports consists of instruction on metacognition, focusing on students' obtaining knowledge and awareness of their creativity and originality in visual arts. The second study also includes metacognitive *strategy* instruction about creativity, in which students' receive instruction on specific strategies in generation through *association*, *combination* or *abstraction*. These two studies focus on the research question whether and to what extent students will be able to generate more and different kinds of original ideas if they obtain more knowledge on creativity and originality and on how to monitor and control their own creative processes.

In the third and fourth study, we will dive deeper into students' creative generation and their exploration. The focus then shifts from examining effects of instruction to examining students' processes to create an original visual arts product. In the third study we examine creative processes and products and the different skills in generation and exploration – *visual* and *conceptual* – in visual arts education that may contribute to students' originality in visual arts products. In the fourth study, we continue examining generation and exploration, and study in detail to what extent specific activities in three types of exploration (*association*, *combination* and *abstraction*) can explain originality of students' visual arts design.

PART ONE

Examining ways to enhance students' creativity in visual arts involves studying students' skills in generating ideas for arts products. Skills in generating many different kinds of ideas to arrive at an original idea are called 'divergent thinking' skills (Guilford, 1956; Runco, 2008). Divergent thinking may result in the generation of original concepts. Divergent thinking is important at the beginning of a creative process. Therefore it is considered as an indicator of creative potential (Runco, 2008). From a preliminary study (Van de Kamp, Admiraal, van Drie, & Rijlaarsdam, 2014)*, that we performed in secondary education, we learned what visual arts students from Grade-7 to Grade-11 ($N=183$) in one Dutch secondary school knew about divergent thinking and whether they used this knowledge in the initial phase of their creative process to arrive at an original concept to visualize. Students completed a self-report questionnaire on the initial phase of their visual art process. In these questionnaires, we presented five drawings to all participants. These drawings represented different

* Van de Kamp, M. T., Admiraal, W., van Drie, J., & Rijlaarsdam, G. (2014). *Wat weten leerlingen over divergent denken bij beeldende vormgeving?* Script! Perspectief, 1. Tilburg: Ons Middelbaar Onderwijs.

initial strategies and represented a holistic impressions of divergent thinking. The drawings represented five strategies, varying from either (almost) no-divergent thinking to divergent thinking, in random order. The first question asked students to report their strategy used in the initial phase of their creative visual art process by indicating one of the five drawings and to explain their choice. The second question asked students to report which strategy they considered optimal for initial phases in creative processes in general by indicating one of the five drawings and again to explain their choice.

In Table 1, numbers in the cells demonstrate that 34.2 percent of students did not seem to know that divergent thinking would be an optimal strategy to use in the initial phase of creative processes and the majority of students (25 %) also reported not to apply divergent thinking within their own processes. A small group of 9.2 percent of students reported to have applied divergent thinking in their own initial phase, but did not know that this was an optimal strategy. 65.8 percent of all students, reported divergent thinking was the optimal strategy for the initial phase, however the majority of this group also reported they did not use it themselves (39.7 %). Of all students, only 26.1 percent reported that they thought divergent thinking was an optimal strategy and that they applied divergent thinking in their own process in the assignment to create an original visual arts product.

Table 1. Distribution of students (N=183) reporting Strategy use (rows) and Knowledge of optimal strategy (number of students; percentages of total in italics)

		<i>Self-reported Metacognitive knowledge of optimal strategy for initial phase</i>		
		<i>(almost)</i>		
		<i>Divergent</i>	<i>Non-divergent</i>	<i>Total</i>
<i>Self-reported</i>	<i>Divergent</i>	47	17	64
		<i>26.1</i>	<i>9.2</i>	<i>35.3</i>
<i>Strategy</i>	<i>(almost)</i>	73	46	119
<i>used in initial phase</i>	<i>Non-divergent</i>	<i>39.7</i>	<i>25</i>	<i>64.7</i>
	<i>Total</i>	120	63	183
		<i>65.8</i>	<i>34.2</i>	<i>100</i>

These results seemed to indicate that developing more metacognitive knowledge about divergent thinking would enhance students' creative processes. From Nelson & Narens' (1990) model, students who can regulate their creative process through monitoring and control, know this strategy is optimal for the initial phase of creative processes in general and also use divergent thinking as a strategy in their initial phase. Moreover, they can build up procedural and conditional knowledge to improve their divergent thinking skills. Enhancing divergent thinking skills in visual arts education is usually performed through extensive and deliberate practice in producing visual arts products. In this tradition, explicit instruction does not seem to fit

well, although this might be an effective instructional strategy for complex skills as divergent thinking. From a meta-analysis by Dignath and Büttner (2008) however, we know that this explicit instruction on metacognition is important for enhancement of learning skills.

In the first two studies of this thesis, we examined the effects of explicit metacognitive and strategy instruction on enhancement of Grade-11 (aged 16/17) students' divergent thinking. The first research question in this thesis was (addressed in Study 1, Chapter 2):

(1) Does an explicit instruction on metacognition about creative processes improve students' divergent thinking?

With a quasi-experimental design, we examined the effects of a 50-minute lesson with explicit instruction on metacognition, on students' divergent thinking indicated by *fluency*, *flexibility* and *originality* of generated ideas. We found a positive effect on fluency and flexibility, but not on originality. Therefore we developed an improved instruction including strategy knowledge about specific generation through *association*, *combination* and *abstraction*. The second research question was:

(2) Does an explicit strategy instruction on metacognition enhance students' divergent thinking – and especially their originality – more than a regular brainstorm-lesson in visual arts education?

To inform the redesign, we examined empirical studies on creative thinking and specific activities and strategies to become original. The result was a matrix of creative activities that were expected to enhance students' fluency, flexibility and especially their originality in divergent thinking. One matrix dimension was *abstractness*, ranging from more concrete to more abstract ideas. It consisted of three types of divergent thinking: *association*, *combination* and *abstraction*. The other dimension was *remoteness* from a stimulus, ranging from less to more remote ideas. It consisted of four levels of remoteness in each of the three types of divergent thinking. In a quasi-experimental design we then examined effects of the redesigned strategy instruction on two cohorts of Grade-11 students' divergent thinking. We compared the explicit strategy instruction with a regular brainstorm-lesson used in visual arts education. The results showed that in both cohorts the explicit strategy instruction of 50 minutes had positive effects on students' fluency, flexibility and originality. This study implies that instructional support in building up knowledge about creative generation strategies may improve students' creative processes in visual arts education.

PART TWO

Part 2 of this thesis focuses on processes of generation and exploration: not only on *conceptual generation* but also on *visual generation* and *visual exploration*. *Concep-*

tual generation is thinking in many different directions towards an original idea (or divergent thinking). *Visual generation* is producing many images through envisioning or perceiving existing images that may be used as a source of inspiration for further exploration. *Visual exploration* is experimenting with images that were generated, to construct novel visual designs. Conceptual generation, visual generation, and exploration have been related to the originality of creative products in empirical studies on visual art and visual artists (Ellamil, Dobson, Beeman, & Christoff, 2012; Fürst, Ghisletta, & Lubart, 2012; Getzels & Csikszentmihalyi, 1976; Schlegel, et al., 2015). Although conceptual generation is considered as crucial for creative products, original *ideas* generated do not always lead to original visual arts products. To what extent generating original ideas is related to students' creative achievements is therefore dealt with in both studies in Part 2. The underlying question was: *What are factors, creative skills and creative activities involved in students' learning to be original in visual arts?*

Being original is to create an original visual arts product. This means "a creator has to think in a new, tweaked way about a solution, a problem, a structure or a domain" (Boden 2004, pp. 3–5). Perkins (1988, p. 310) questioned: "How can one hope to explain a process that by definition breaks existing patterns?" Although being original involves breaking boundaries in unpredictable ways, this will require knowledge and skills about *how* to break boundaries in unpredictable ways. Learning to become original therefore must focus on learning about ways to deal with the 'unknown'. Originality is always rooted in the knowledge of a domain; it then surpasses this knowledge to reveal unexpected or surprising new ideas or images. This requires specific knowledge and skills. David Perkins (1988, p. 309) considered this learning how to deal with 'the unknown' a quest of discovering, he called this "Creativity and the quest for mechanism". Learning how to become original means students need to develop knowledge on creative processes and how to deal with open ended problems, i.e., knowing how to find a creative and relevant question and knowing why in creativity generating many ideas may increase the chance to find an original question. Problem finding demands skills in generation to think of original ideas to further explore and skills in exploration of the ideas generated, to construct a novel visual design (Getzels & Csikszentmihalyi, 1976). Creative potential in visual arts is therefore often measured through skills in divergent thinking, a *conceptual* way of generating. To actually produce a creative outcome in a specific domain as visual arts, demands more than conceptual generation. It also involves *visual* skills, in *visual generation* and *visual exploration*, which we measure in Study 3 (Chapter 4). Measuring originality of visual arts products is difficult. Rating a large sample of images in a valid and reliable way is also complex, due to different idiosyncrasies. Rating procedures for assessment of originality of arts products demand a substantial group of raters to produce a reliable assessment, whether using jury ratings in a consensual assessment procedure or using ratings by experts in a Comparative Judgement procedure.

In Study 3 (Chapter 4) we studied the processes and outcomes of creative generation and exploration, i.e. the originality of students' visual arts products on four meas-

urement occasions and in this way we could analyze different patterns in originality. We also examined what process variables could explain differences in the patterns of originality. The third research question from this thesis was:

(3) What are the patterns of students' original visual arts products? And to what extent do conceptual and visual generation and visual exploration explain differences in these patterns?

We found that the more students generated visually and the more they explored visually, the higher the originality of their arts products. For the fourth study of this thesis, we then studied in close detail – based on separate portfolio-events ($N=196$) – exactly which activities in exploration could explain originality in visual arts designs. To examine this, we used portfolios from eleven students (Grade-11, aged 16-17), and studied separate portfolio-events from these portfolios. The final and fourth research question from this thesis was:

(4) To what extent do three types of exploration activities - association, combination and abstraction explain differences in the originality of the visual art designs of portfolio-events?

For the coding of portfolio-events we used the matrix of creative generation and exploration activities, constructed for Study 2 with creative activities organized along the dimension of abstractness (*association*, *combination* and *abstraction*) and the dimension of remoteness (four levels of remoteness). We determined visual originality of portfolio-events using the Comparative Judgement procedure. We then found specific activities in *association*, *combination* and *abstraction* significantly contributed to the originality of visual designs of the portfolio-event. In general, the more remote from a stimulus the activities were, the more original the visual design of the portfolio-event.

In Chapter 6, we discuss the results of all four studies. We elaborate on instructional designs and the instructional design principles we have constructed, based on the insights of Part 1 and Part 2 of this thesis. Next we will reflect on our findings on processes of generation and exploration in visual arts education and the importance of *visual generation* and *visual exploration* for creating original visual arts products. This involves also, measuring these skills and the assessment of originality of products, which we will address in Chapter 6. Furthermore, we will focus on issues about research in authentic contexts, since all studies involved in this thesis were performed in the authentic context of visual arts classes in secondary education, involving visual arts teachers. For all of these issues, we will explain the rationale and reflect on and discuss our findings. Finally, implications for further research on creativity in cultural and arts education and visual arts education and for educational practice in cultural and arts and visual arts are made.