Creative Thinking as an Actor in the Process of Formulating Professional Identity

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This study tracks the influence of creative thinking on the developing professional identity of outstanding teachers-in-training. It is based on the questionnaire responses of 120 teachers-in-training who studied at a cross-section of Israel’s teacher-training institutes and participated in the “Creativity Changes Learning” program that combines the academic study of creativity with activities designed to change learning into an interactive, dynamic and rigorous experience, actively engaging students in the process of generating knowledge.

This study analyzes the responses of these teachers-in-training. The findings suggest that the teachers-in-training acknowledged that creative instruction necessitates special effort, that their learning environment promoted the learning of the subject matter, that teamwork contributed to ideological and conceptual variety, and that the combination of their learning experiences and the multi-cultural nature of the group helped them to understand the challenges they will encounter as future educators. It was apparent that the element of creative thinking was part of their emerging professional identities. With this, they expressed hesitation regarding the possibility of implementing creative instruction in the classroom with the confidence and support of veteran teachers who, in their estimation, will not respond well to deviating from standard lesson formats.

*Keywords*: training excellent teachers, pedagogy promoting creativity, Creative teaching and learning; Teachers' professional and self-identity.

# Introduction

Creative thinking pertains to a person, a process and a creative product (Kaufman & Beghetto, 2009). It brings to bear motivation, one’s personal character traits and emotions (Cropley, 1999), problem-solving abilities (Barak & Albert, 2017), imagination (Dziedziewicz & Karwowski, 2015), and the capacity to persevere in the face of uncertainty (Plucker, Beghetti & Dow, 2004).

Yamin (2017) defines creativity as the ability to execute a task in a unique, original and relevant manner, considering the limitations of the task or the situation. The creative process occurs in the transition from divergent thinking, where possibilities for action are identified, to convergent thinking, where ideas and information are organized and structured (Lubart & Batton, 2017).

Plucker and Dow (2010) include interactions between different attitudes, as well as the processes and environment where an individual or group produces an original, useful product in a social setting. Creative thinking is identified as a stimulus for social growth in culture and industry, given that original and innovative thinking, problem-solving and coping with uncertainty are necessary in every area (Yamin, 2017).

# Creative Thinking in Teaching and Learning

A lesson that encourages creative thinking must include both divergent and convergent thinking. The creative process includes detecting the problem, identifying the limitations of acting, flexibility, adaptation, raising different ideas, comparing sources of information and identifying problems (Lubart & Batton, 2017). Groham and Szmidt (2013) and Plucker and Dow (2010) contend that creative thinking can improve teacher instruction and student learning, making it a crucial component of teacher training and an influential factor in future teachers’ professional identities.

According to Selkrig and Keamy (2017), “teachers need to be informed not only about how to teach creatively and for creativity, but also how to consider possibilities and understanding things in new ways, thereby making a case that teacher's own creative learning is crucial"(p. 317). The “Creativity Changes Learning” program, conducted in conjunction with the national program for excellent teachers-in-training, was developed in this spirit. The program’s goal is to expose participants to the untapped potential in creative thinking and its implementation in the classroom. 120 teachers-in-training participated in the program in three separate cohorts over the course of three consecutive years. Participants partook in theoretical learning, problem-solving, building models and implementing theories. Our research project tracked creative thinking as a component of the participants’ emerging professional identities by analyzing the way that they described their experiences in this program and their impact on them.

Creative teaching must encourage playfulness, imagination and flexibility, openness and dynamism, and cultivate curiosity, investigation and different mechanisms for developing new ideas (Craft, 2011; Grohman & Szmidt, 2013). Cheung and Leung (2013) maintain that teachers must create an atmosphere that encourages student collaboration and active involvement in learning. The creative teacher needs to encourage students to be self-directed and flexible thinkers; he needs to promote a range of options for learning different content; and use a wide range of tools, structures and concepts that will enable students to express themselves in a variety of ways (Craft, 2011).

Lin (2011) introduces a model that includes creative teaching, teaching towards the development of creativity and creative study. To her, creative pedagogy as an educational practice encourages the development of creative ideas and products. Craft (2005) describes creative teaching and teaching towards the development of creativity as complementary activities, with the first focusing on activities determined by the teacher, and the second focusing on student activities and encouraging active student participation.

A lot of funding has been invested in multi-cultural learning programs where student diversity promotes the development of creative thinking (Dziedziewicz, Gadja & Karwowski, 2014). Evaluations of these programs found that participants improved both in their ability to entertain ideas and in their mastery of subject matter. Studies show that learning in a multi-cultural environment helps to develop fertile thinking, flexibility and creativity; exposes participants to different perceptions and ideas; and influences their ability to use ideas that derive from different cultures, to retrieve unusual information and raise far-flung associations to create fertile ideas (Chang, et al., 2014; Leung, Maddux, Galinsky & Chiu, 2008).

According to education researchers, excellent teachers are creative teachers; creative people who develop creativity in their students (Das, Dewhurst & Gray, 2011; Gregerson, Kaufman, & Snyder, 2013).

It is obvious that future teachers need to be creative thinkers. The question remains though as to how this skill should be developed such that it influences a teacher’s emerging professional identity.

# The Professional Identity of Teachers

Professional identity is difficult to define. It includes perception of self-worth, a sense of belonging to the profession and what it represents, as well as the way a teacher perceives himself, and the way his colleagues, students and parent-body perceive him. Creative thinking is not usually part of this definition.

Lamote and Engles (2010) maintain that teachers’ professional identities are connected to their manner of teaching and their perceived possibilities for action. Their professional development is impacted by their attitudes towards the type of teacher they seek to be. Professional identity can be understood from the internal perspective of the teacher which derives from the question “How do I see myself”, or from the external perspective that is inferred from the question “How do others perceive me” (Dugas, 2016). Identity can be understood as a narrative; an “internal story” of the past, present and desired future that will provide a meaningful life experience. The concept of “social identity” is relevant in teacher-training. Teachers-in-training experience many different things in their training and crystallize their concept of their ideal professional identity. This identity includes both their current perception and their concept of the type of teacher they wish to be in the future. Among other factors, their individual life experiences, learning environments, knowledge base and teaching experiences influence their professional identity (Lamote & Engles, 2010).

# Course Description

The course was designed to expose students to theories of creative thinking through non-conventional means, connecting theory with practice, thereby revealing the wide creative potential of the theories and the way they engage creative thinking and improve the learning experience.

The primary theories that were chosen were: Advanced Systematic Inventive Thinking (ASIT), melioration, and the theory of meaning. These theories were chosen as they are different from one another and can be incorporated within topics included in the school system’s core curriculum.

ASIT is most often used to address problems in mathematics and the natural sciences. It deals with problem-solving and developing new products. Two conditions stand at its core, the closed world condition and the achieving qualitative change condition. In problem-solving that invokes the closed world condition, only the existing components of the problem may be used. The achieving qualitative change condition helps identify the main factor that created the problem and harnesses it to arrive at a solution. The process of problem-solving or developing a new product includes five thinking tools that can be used with the problem’s components; multiplication (or division), breaking symmetry, unification, object removal or adding another dimension (Barak & Albert, 2017; Turner, 2009).

The skill of melioration is defined as: “The skill to identify an appropriate combination of data and apply it to problem-solving, thereby improving the aggregate” (Passig, 2003 p. 85). This thinking encourages the development of unique ideas by connecting content from different unrelated disciplines. It can be developed using a five-stage spiral model (Margaliot, 2012) that includes intent, process, invention, assessment, and continuity. This model gradually integrates personal knowledge with cultural awareness and scientific data to bring about improvement in a specific domain.

The theory of meaning (Kreitler & Kreitler, 1990) provides a framework for communication or explanation of a word, text or idea that can be expressed verbally, visually, or through movement, among other ways. The dimensions of meaning include four classifications of content: the dimensions of relevance and context; the dimensions of the internal world; physical dimensions; and dynamic dimensions (Margaliot, 2012; 2014). Each dimension class includes a set of questions that are directed towards the overarching question of “What are we talking about”. These questions facilitate open communication and encourage questioners to ask about the content under discussion.

The chart presents the learning format developed in the course. The study of theory was combined with activities that included games, movies and non-sensical content in each session. Participants established the connection between the theories and activities through experiential and active play with the learning materials, which they continued to develop on the course’s online site.

# Description of the Sessions and Subject Material

The session on ASIT was conducted as a fast-paced “gaming event” featuring math challenges, word riddles and different puzzles. Subsequently, the theory was presented, and participants mapped out and matched each riddle to one of the thinking tools (multiplication/division, breaking symmetry etc.). The clip from *Apollo 13* was then shown (well-known for the expression “Houston, we have a problem”) demonstrating the closed world condition in problem-solving. The session included several funny examples from children’s books where everyday problems were solved with creative solutions. The session ended with a discussion that examined applying these thinking principles and this learning style in school.

 In the session on melioration thinking, we learned about different Chindogu inventions (<http://www.chindogu.com>). Chindogu is aimed at inventing intentionally useless gadgets to solve everyday life problems. Linking melioration thinking and Chindogu enabled participants to practice problem-solving and experiment with a thinking style that is not necessarily directed at achieving practical solutions. Its purpose was to escape the inherent limitations of inventing a practical product and the necessity to find “the correct solution” (in direct opposition to the ASIT approach). Participants were then challenged to invoke the principles of melioration to find new uses for existing objects, such as a disk holder.

 The theory of meaning was presented via a Taboo-style word identification game, where participants used the questions associated with the theory of meaning to guess the hidden word. In this way participants learned the questions that comprise the theory, used them and sorted them in accordance with their content classifications. Additionally, we focused on the different meanings of “book” in two different children’s books: *We Are in a Book* by Mo Willems (2016) and *It’s a Book* by Lane Smith (2011).

 Through experiential learning activities, participants actively discovered theoretical principles and applied each theory’s thinking precepts. They problem-solved, established models, and conducted discussions. The transition from theory to application happened quickly and dynamically, in synch with participants’ superior academic abilities. The participants presented the learning conclusions that they developed; all conclusions were presented on the course’s website and provoked reactions and discussions that further developed and refined the initial ideas.

# Participants and Setting

REGEV (Hebrew acronym for "self-starter in education") is an honors track in teacher education. A total of 1,350 teachers-in-training participate in this accelerated 3-year undergraduate program towards a B.Ed. that includes a teacher’s certificate. Out of all the students, about 120 from all the teacher education colleges in Israel, and from all social sectors – religious and secular Jews, Christians, and Muslims - come to study in a unique program known as the inter-collegial students' forum. Recognized for academic credits, the program spans one academic year and involves six full day seminars. Each student can choose one of four interest groups: computer-based learning games; a visual journey, dialogue of social dilemmas; creativity changes learning. It is the work of this last group that is discussed here.

Thisgroup was composed of excellent, highly motivated students, specializing in different fields of education, and stemming from different backgrounds and ethnicities. Participants were of both genders and varied in age from 20-45 years old.

Over the course of three years, from 2013 until 2016, 44, 37 and 39 students participated in this course respectively, including 96 women and 24 men. Participants came from 22 different teacher-training programs throughout Israel.

# Methodology

## The Research Question

How do participants describe their learning experience in the “Creativity Changes Learning” program and how does their participation contribute to them as future teachers?

## Data Collection Method

Upon course completion, participants were asked to complete a questionnaire that included both open-ended and closed-ended questions and dealt with different aspects of the course. These responses were analyzed for our research purpose of assessing the learning in the course.

2. What aspects of the process that you underwent are important for you to share with your colleagues in the course and in your teacher-training college?

Questionnaire responses were analyzed only after participants had received course accreditation and had explicitly agreed to participate in the study. The respondents’ anonymity was guaranteed.

## Data Analysis

Data was collected from three successive cohorts who participated in a similar program. Participants’ statements were categorically analyzed by each researcher independently, according to different themes in several rounds. The categories where the researchers agreed were subsequently consolidated.

The qualitative findings were analyzed according to categorical content analysis (Elo & Kyngas, 2008). In total, 140 statements were analyzed. A statement is defined as a sentence or number of sentences that relate to the learning experience and its contribution to the respondent, as well as his attitude towards the program’s contribution to the development of his professional identity. The categories were identified independently by each researcher to establish the validity of the statements. Afterwards, they discussed the areas in which they disagreed and reached a consensus within each category (Seidel & Kelle, 1995). In total three categories were identified: acquisition of knowledge, understanding and practice of creative thinking; the learning experience in the course; and learning in the course as developing professional identity. Qualitative analysis of open-ended questions enabled us to employ a bottom-up process (Maykut & Morehouse, 1994; Saldana, 2015) to derive respondents’ attitudes about the way they perceived learning in the course in response to our research question, and the attitudes that they developed towards creativity in teaching.

Inter-method reliability was 85%.

# Research Findings

The research question examined how participants describe their learning experience in the “Creativity Changes Learning” program and their attitudes towards it after participating in the program. For the purpose of analyzing respondents’ answers, only those statements that directly related to course of study and its implications were used. In total, 140 responses (statements) were found. They were sorted into three categories: acquisition of knowledge, understanding and practical application; the learning experience; and adopting creative thinking as a component in establishing professional identity.

Description of the categories accompanied by relevant responses:

### Acquisition of knowledge, understanding and practical application of creative thinking

In relating to the course of study, participants noted that they acquired academic knowledge and understanding of creativity in general, and about creativity in teaching specifically, as well practical pedagogical information that will be useful to them in implementing creativity in the classroom in the future. Many responses (54) included a reference to the knowledge, understanding and practical application that they gained in general, or focused on specific topics that they defined as significant to them. Several representative statements were selected from among these responses:

Table 1: Statements that relate to the acquisition of knowledge, understanding and practical application of creative thinking

|  |  |  |
| --- | --- | --- |
| Statement Number/ teacher-training college/ cohort  | Sample excerpt – out of 54 statements | Significance |
| 1 | 1 | 2 | “I always thought that to be creative one needs to incorporate things that are unconnected to the topic or learning, but in the program we learned that one of the methods of creativity is to use the ‘data’ in the problem itself.” | The participant understood that creativity is promoted by focusing on the problem itself. |
| 2 | 5 | 3 | “A place where you open up your mind to new avenues that do not exist in college constitutes for me a different level of thinking, not thinking along the lines of completing assignments and tests, but rather thinking deeply about goals, mechanisms for coping in different situations.” | The speaker relates to thinking deeply about goals, which is different than thinking that relates to a formal academic assignment. |
| 3 | 11 | 3 | “I felt that I gained a lot of information and was enriched in content and new materials. After each session, I really felt that I was lucky to be on this route!! I really learned a lot and I have already been able to apply things and I am certain that I will use it again.” | The participant acquired information, has begun to apply it and will use it in the future.  |
| 4 | 16 | 1 | “We were exposed to ideas to inspire creativity through pictures and impossible combinations and a sudden change in our physical location.” | The participant points to the need to make unexpected connections and sudden changes. |
| 5 | 19 | 2 | “The course taught us that there is no such thing as an individual who cannot be creative, and that we can be creative with everything that surrounds us, not only in the realm of formal study.” | This statement demonstrates that creativity can be achieved in every discipline. |
| 6 | 2 | 1 | “The process that we underwent is the gateway to a journey that hopefully won’t end when the course ends, but that will continue to develop as we cultivate our own creative thinking and creative thinking in our students.” | You can understand that this is an ongoing process that should be continued. |

Respondents related to course content, as well as learning style. They noted that they gained knowledge in subject matter that was previously unfamiliar to them and had not been addressed in their teacher-training colleges. They affirmed that this knowledge opened new horizons and they were able to specifically pinpoint what was novel: One noted that using the data contained in the problem itself was a novel concept to him, another noted that she was exposed to impossible combinations which were demonstrated in pictures. After they described what was new to them, they noted that creative thinking is possible for them. They further said that the learning contributed to thinking thoroughly about goals and coping in different situations. The respondents established a connection between the program’s contributions to thinking, and their attitudes towards the learning process. They indicated that they were exposed to ideas that unleased their creativity (meaning that they maintained that creativity is generated by sparking it), and they said that they were lucky to partake in this program. They related to the content studied and expressed that they anticipated using their acquired knowledge and thinking skills again.

### The learning experience

Table 2: Statements that relate to the learning experience in the “Creativity Changes Learning” program

|  |  |  |
| --- | --- | --- |
| Statement Number/ teacher-training college/ cohort  | Sample excerpt – out of 40 statements | Significance |
| 1 | 12 | 3 | “A nurturing environment that allows for creativity and broadens horizons without any pressure, so different than any other learning experience I have ever encountered.” | Notes the absence of academic pressure |
| 2 | 3 | 1 | “I felt that I received a lot here, that I am happy to come each time, curious and ready to learn.” | Notes curiosity, happiness and openness |
| 3 | 7 | 2 | “I felt that the course was heartwarming, the atmosphere pleasant, warm and fun – which is a great opening for learning subject matter from this channel, it opened the mind and the heart.” | Points to the pleasant atmosphere as the basis for conceptual and emotional openness.  |
| 4 | 14 | 2 | “I gained an appreciation for humanity, and openness to diversity, which indirectly contributed to my positive feelings, even more than the creativity and new ideas that were presented by the program, and I will use them as well.” | Notes human openness and tolerance as an encouraging and supportive source for finding new ideas. |
| 5 | 18 | 3 | “I learned to take chances and think differently, to let creativity lead me and not to always lead it. I learned that I can be a trailblazer, to lead, to think, to learn from mistakes, to believe in my abilities and to understand that the process takes time and patience. And even further, that creativity is within me, I just need to find it. ‘It’s not distant… it’s not across the sea…’” | You can detect willingness to take chances, to participate in a process whose end is unknown. Uncovering the capacity in themselves to promote creativity brings about pleasure. |
| 6 | 13 | 2 | “We were exposed to an entire world, filled with a variety of colors, ideas, different ways of thinking and such diverse methods of instruction.” | Notes the wealth of ideas, including the feelings, methods of teaching, and ideas. |
| 7 | 9 | 3 | The experience was not only fun and refreshing during the actual session, but also a process of understanding that remains in the deep recesses of memory for use on my ongoing path thanks to a wide range of experiential methods – games, discussion, thinking and writing – as a summary. | The respondent notes the connection between experiential learning and deepened understanding. |

 Course participation is described as an experience that is free from pressure. Respondents spoke about happiness, curiosity, and comfort (statement 2). The learning environment was described as warm, open, and tolerant, and was perceived as a greater promoter of creativity than the innovative ideas (statement 4). In their words, the academic-pedagogical component was intrinsically connected to the emotional component, and the connection between them was what differentiated the learning in this course from previous learning environments (statement 1). They assessed their creative abilities, the ways in which they could act to be creative themselves and develop creativity in their students. The statements demonstrate that they underwent a conscious change and they can take risks, make mistakes, relinquish control (statement 3). We find expressions of self-efficacy; respondents explained that creativity is a “matter of choice”; every person can be creative in his way and in his environment. They understand that it is their responsibility to be creative and it is not dependent on external change (statement 5). They noted that this is a deep process, rich in ideas that flow from it (statement 7). Respondents understood that one needs to be bold, and forgo certain success, and that processes demand time and patience.

### Adopting creative thinking as a component of the emerging professional identity

Table 3: Statements that describe creative thinking as a component in the emerging professional identity

|  |  |  |
| --- | --- | --- |
| Statement Number/ teacher-training college/ cohort  | Sample excerpt – out of 46 statements | Significance |
| 1 | 6 | 1 | I recommend that any student who comes to inter-collegiate courses should open up and get to know the possibility of integration – integrating the course work with his own personal credo and getting ideas from other students who are studying entirely different professions. | Recommends the integration of pedagogic rationale with program content and ideas of other participants. |
| 2 | 10 | 2 | “Additionally, the concept of cooperative work was reinforced. We saw, and we experienced, the dramatic increase of creativity when we worked in groups, and we would develop ideas presented by others.” | Group work and its contribution are sources of creativity. |
| 3 | 21 | 1 | “The experience taught me that there are a range of methods to teach subject matter, as teachers our goal is to teach material in an interesting, different way that will challenge students and develop their skills to the maximum, in the best way possible. A teacher therefore needs to be creative and dare to teach in a different manner that he believes in. | Teaching must be pursued in a variety of ways, teachers need to challenge students, and be daring in their professional approach. |
| 4 | 17 | 2 | I believe that the integration of different students – ideas, thoughts, materials and learning styles can be a winning combination for creating a learning experience that is significant to students in this modern era. | Integration of students, thoughts, materials and learning styles help facilitate meaningful learning.  |
| 5 | 9 | 3 | I am confident that thinking out of the box is ultimately beneficial not only to students, but also to the teacher, who will enjoy herself more, and even raise the teacher’s confidence in her abilities and the tools she uses. We therefore need to continually assess ourselves – is the easier choice, the one that is familiar and readily available, also the most correct one, that is most enjoyable and effective in teaching the material? | Creativity benefits and improves the professional confidence of the teacher, strengthens him and contributes to the teacher’s ability to self-assess.  |
| 6 | 5 | 3 | This course inspired me to delve deeper and deeper into education, to understand and explore different educational methodologies, thereby reaching a deep and real understanding of creative thinking in education. My participation raised a lot of discussion about the topic, which in turn helped to refine and clarify it more.Without a doubt, participating in this course is a change of direction for our professional development as teachers. The ability to think out of the box, helps us as educators to reach even struggling students and find the right path to success by investing ourselves and approaching the subject matter differently. | The course inspires deep inquiry of creativity in education and its influence on the professional identity of educators and their ability to help struggling students achieve more. |

The responses indicate that participants adopted creative thinking as a component of their professional identity (statements 3-6). They describe the kind of teachers they seek to become in light of their experiences and the style of activities they were exposed to during the program. They related to multi-cultural engagement and cooperative work as driving forces in teaching (statements 1,2). They further related to the wealth of ideas and the existence of a personal educational credo, alongside creating challenges, taking chances, being daring, invoking interesting methods of teaching and the impact of these methods (statements 3,4). For them, a teacher is a researcher who clarifies and assesses his path to find the ways that will help him best address the different needs of his students (statements 4,5,6)

# Discussion

This study was designed to explore how outstanding teachers-in-training perceive the learning experience in the “Creativity Changes Learning” program and how they perceive the role of creative thinking in their professional capacity as educators in the future.

The mission we set for ourselves was to motivate the students to create, to be involved and to be interested through tasks that offer new game-like spaces to explore. We sought to enable participants to identify their inherent potential and understand what creative thinking is, so that it could become one of their resources to develop original thinking about teaching content and learning processes.

Our aim was for each learning session to become a unique and meaningful experience for the students so that they would be able to translate that into a personal and pedagogical viewpoint in which creativity plays a central role.

Both features of the group: its multicultural composition of excellent, highly motivated and personal high abilities can enhance creativity (Maddux, Adam & Galinsky, 2010; Klavir & Gorodetsky, 2011). The understanding that this unique group provides an opportunity for a special human encounter, led us to plan and lead an educational adventure shared by the students and ourselves.

A highly-diverse group can create opportunities to inspire group and individual creativity. Instead of a challenge, we decided to view diversity as a valuable opportunity (Dziedziewicz, Gajda, & Karwowski, 2014). We consciously decided to use this diversity to leverage learning and shape new personal, educational and professional outlooks.

Maddux, Adam & Galinsky (2010) address the role of a multi-cultural group: "Multicultural experiences help [….] facilitate an appreciation that the same problem can have multiple solutions."(p. 738).

 Participants’ responses indicate that they identified the contribution of the multi-cultural group to learning in new ways, that it left a mark on them, and influenced their understanding of their job. Like Lin’s (2011) recommendation, the participants thought that the differences among group members was fertile ground for ideas (table 3, statements 1,2,4). They saw their colleagues as a helpful resource and noted that this was a new experience that was not possible in their respective colleges. They further noted that they were surprised by both the quality and the depth of the multi-cultural encounter (table 3, statement 6).

 The teaching methodologies presented in the course benefited participants, as demonstrated by the respondent (table 1, statement 1) who realized that he can take advantage of the closed-world condition in systematic inventive thinking. One participant saw melioration as a source for generating ideas (table1, statement 4). They noted behaviors that support creative thinking (table 2, statement 5): “I learned to take risks, to think differently”, just as Lubart and Batton (2017) noted that risk taking is a pre-requisite to creative thinking. One respondent (table 2, statement 7) pointed to an all-encompassing benefit: “A process of understanding that remains in the deep recesses of memory”.

The respondents’ answers show that the course influenced their professional identity. Kenny, Finneran and Mitchell (2015) assert that the professional identity of teachers-in-training undergoes “developmental transformation” when practical knowledge joins theoretical information and supports the feeling of self-efficacy, and they understand that they can act effectively, in a variety of ways, confident in their ability to succeed. The respondents expressed this (table 3, statements 4,5). Respondents affirm that their experiences caused them to think deeply about their future job. They see congruence between their study and their ability to provide for their students’ needs (table 3, statements 5,6). The understanding that their experience integrated study, search and thinking over time is apparent.

At the stage of data analysis, an additional component that integrates the theories with the learning activities was added to the learning model that was presented. This component demonstrates the benefit of active involvement in the building of participants’ professional identity. Respondents indicate that they gained academic knowledge and pedagogical tools that they can implement in creative teaching in the future (table 2, statement 7).

The course of study was described as an experience that fashioned their attitude towards teaching and advanced them cognitively, emotionally, socially and professionally (Gregerson, Kaufman & Snyder, 2013). Cognitively, they were exposed to learning materials, educational methodologies and new ways to connect them (table 3, statement 6). Emotionally, they expressed happiness and satisfaction with their choice to actively participate and noted the benefit of an open, tolerant, pleasant environment to improved thinking skills (table 2). Socially, they pointed to the social interaction and its role in promoting creativity (table 3, statements 1,2).

Some respondents maintained that creative thinking is a fixed quality, and because of the course, they recognized that personal responsibility is necessary to develop creativity personally and pedagogically. Their responses (table 3, statements 5,6) reflect the perception that was developed in accordance with the rationale of researchers (Craft, 2005; Cheung & Leung, 2013; Das, Dewhurst & Gray, 2011; Grohman & Szmidt, 2013; Maker, Jo & Muammar, 2008) that teachers with positive attitudes remain inquisitive and develop teaching methodologies over time.

Participants expressed that the course of study linked learning, thinking and experience by building non-trivial connections between content, ideas and people. This impacted their ability to understand that the development under discussion is never ending: “In my eyes, creativity is like a ramp that brings me higher providing me with a more extensive view of teaching and I will see new possibilities for methods of teaching (college 14, cohort 2).

This study assessed the attitudes that participants developed towards creative thinking and its place in their emerging professional identity as future teachers. From the data it seems that the teaching model and pedagogical methods employed were new to participants and caused them to consider how they might incorporate the activity style that they experienced as teachers in the future. The study did not assess the program’s impact on student creative thinking. We plan to dedicate another study to this fundamental concept.

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