Towards a model to evaluate creativity-oriented learning activities

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Abstract

Creativity is becoming a keyword in that it is considered one of the essential competences both to live in today’s knowledge society and to build a “better future” and for this reason educational systems have started investing in the development of student creative abilities and skills. This paper proposes a model to evaluate learning activities aimed to nurture and sustain “creative skills and attitudes”; the model is based on three main dimensions, namely: the cognitive, the meta-cognitive and the affective dimension.

Keyword: Creativity; learning; cognitive indicators; meta-cognitive indicators; affective indicators; evaluation.

1. Introduction

2009 has been declared “European Year of Creativity and Innovation”. The decision taken by the European Parliament and the Council is based on the conviction that “Europe needs innovation, and learning systems which inspire innovation” and that creativity should be seen “as a driver for innovation and as a key factor for the development of personal, occupational, entrepreneurial and social competences”1. As a matter of fact, research around the topic “creativity” has started attracting interest in recent years: most creativity research concerns the nature of creative thinking, the distinctive characteristics of the creative person, the development of creativity along the individual lifespan and the social environments more strongly related to creative activities (Kerr & Gagliardi, 2003; Simonton, 2000). Besides, following the idea that “Education has the dual power to cultivate and to stifle creativity” (UNESCO, 1972), the relationships between creativity and learning are also being investigated and the idea that there are basic skills and attitudes that can be fostered in educational settings as potential conditions/agents of creativity, has been widely recognized (Nickerson, 1999; Csikszentmihalyi, 1997; Craft, 2005; Loveless et al., 2006; Torrance et al., 1989). Starting from some of the studies on personality (e.g. Barron & Harrington, 1981) where attempts have been done to identify a fairly stable set of personality characteristics and behaviours typical of the “creative individual”, the idea has started consolidating that it is possible to design learning activities specifically aimed to foster /strengthen those attitudes and skills which are believed to be at the heart of the creative expression. Addressing those abilities and skills may require a change in the educational settings and practices, as usually school

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systems tend to invest more in traditional educational skills (e.g., literacy), rather than in creative skills. Rubenson & Runco (1992) outlined the reasons for this; the basic idea is that creativity is a riskier investment, with less-certain payoffs, than literacy and other skills tied to traditional education.

As a consequence of this, creativity, after being the exclusive patrimony of researchers in the field of Psychology and Neurosciences, is now becoming a keyword also in the fields of Education and Educational Technology.

Starting from all these considerations, the need has emerged for teachers and educators to have models and tools aimed to evaluate the learning activities they propose, as far as their capacity to cultivate those skills and attitudes which are considered potential conditions / agents of creativity (hereafter referred to as “creative skills and attitudes”, for brevity sake). Here it is worthwhile anticipating that, while there are studies concerning the issue of observing and evaluating creativity (Hocevar & Bachelor, 1989; Candy & Bilda, 2007), this study is strongly oriented to the educational field, and thus the focus of the paper is not on a model for creativity measurement, but rather on a model for the evaluation of learning activities from the point of view of their capacity to cultivate those student creative skills and attitudes which are potentially at the basis of the creative expression.

2. Proposal of an evaluation model for learning activities

In order to tackle the issue of evaluating learning experiences oriented to the cultivation of creative skills and attitudes, at least two key aspects should to be considered:

1. The concept of creativity is often associated with that of innovation (Fischer, 2005). Even the Council of the European Parliament has recently defined innovation as the follow up of the creative process, something which stems from the application of new, creative ideas into concrete and specific contexts and which is explicitly recognized as valuable by the society. Nonetheless, looking at creativity in an educational context means taking a step back and focusing on what is often referred to as “little-c creativity” (everyday, evolutionary creativity), as opposed to the “Big-C Creativity” (revolutionary Creativity). Thus, within a learning situation what might be fostered / strengthened is the ability of students to combine ideas, links concepts, their curiosity and positive attitude towards new solutions and finally their capacity to look at what they are doing, judge it and find out suitable (re)actions; in other terms, an adequate learning activity may foster the set of abilities and skills which are potentially at the core of “little-c creativity”.

2. While Stenberg (2005) even argues that there is not only one creativity, but rather we should talk of a number of “creativities”, there is no doubt that creativity should be regarded as a complex, multidimensional and multi faceted human characteristic involving different aspects of human behaviour and thought. Nonetheless, the need to study the phenomenon has brought to some simplifications and some researchers (Amabile, 1996; Sternberg, 1999; Torrance et al., 1989) have finally recognized that creative processes are grounded mainly on: cognitive capacities (understanding and building knowledge), meta-cognitive abilities (i.e. the capacity of perceiving and elaborating weaknesses and strengths of own reasoning and/or actions), and affective involvement in the tasks to be performed (which implies positively accepting the task and actively work to reach the intended goal).

In the attempt to develop a model to assess learning activities from the creativity viewpoint, the authors have taken the above mentioned classes as three main categories of indicators, so that the model is composed of:

- indicators of the cognitive category, which is defined by Bloom et al. (1956) as dealing with “the development of intellectual abilities and skills”, and refers to the student's ability of reasoning on the proposed contents, linking existing elements, making hypotheses, thus constructing new meanings to accomplish the task at hand;
- indicators of the affective category, which was argued by Kearney (1994) as emerging from “the internalization of attitudes toward the content or subject matter”, and addresses the students’ interests, opinions, emotions, attitudes, and values (Anderson & Krathwohl, 2001; Krathwohl, et al., 1964). This category basically deals with how much students like and value the content of what they are learning, refers to their actual engagement in the proposed activity, and, ultimately, reflects the students' emotional status and behaviours, the attitudes they show while accomplishing the task;
- indicators of the meta-cognitive category, which is defined by Flavell (1976) as dealing with “one's knowledge concerning one's own cognitive processes”, and refers, instead, to the ability demonstrated by the student to take the overall process under control, either during, or at the end of the learning activity.

1 http://db.formez.it/ProgrammiComunitari.nsf/0d401f29e9298bdc125696500252e17/e604e1f0ac39d1a8c125742c004b1990?OpenDocument
As to the cognitive sphere, three fundamental indicators have been identified by referring to the New Taxonomy of the Educational Objectives proposed by Anderson & Krathwohl (2001), where creativity (defined as the ability of “putting elements together to form a novel coherent whole or make an original product”) is considered the top educational objective to be met. Following the arguments put forward by these authors, in fact, the three cognitive indicators are:

- **Generating**, a process which involves the mental representation of the problem at hand (whatever it could be), in all its aspects and details, possibly making comparison with other problems/situations.
- **Planning**, namely the process of figuring out and mentally designing problem solutions or even defining methods and plans to achieve a goal.
- **Producing**, which is the process which deals with the actual enactment of what was generated and then planned and which may give rise to a new act or product.

As to the affective aspects, by referring to the existing research in the affective domain field (Bloom et al., 1956; Rovai et al. 2009), two indicators have been adopted, able to account for students’ attitudes towards:

- **Receiving**, or paying attention to stimuli. This is denoted by involvement and immersion in learning activities and includes being curious, motivated, trying over and over…
- **Responding**, or reacting to stimuli. This refers to the actual expression of positive/negative feelings: satisfaction, joy, disappointment, excitement, depression, fear…. 

As to the meta-cognitive aspects, following the recent works of both Kim et al. (2009) and Murphy (2008), three main indicators have been considered, namely those related to the students capabilities of:

- **Monitoring** the enacted learning process, which implies the attitude and the ability of recalling and evaluating one’s own cognitive process, by also evidencing strengths and weaknesses.
- **Regulating** one’s own behaviour on the basis of the perception/understanding of previously performed actions (which also means reviewing, controlling and tuning the activities by carrying out possible improvements, etc.)
- **Evaluating** one’s own activities/performance from the viewpoint of the final outcome; this implies acquiring the awareness of what has been done by criticizing single actions in the light of a comprehensive estimation / judgment of the results obtained.

Figure 1. The model to evaluate learning activities
The idea is that the teacher should use the model and the associated indicators as a lens to observe the learning process, so to detect whatever and to what extent those skills and attitudes are promoted, which are considered potential agents of creativity. Thus the model has been supplied with a tool (a grid, see Figure 2), to be used by the teacher who is evaluating the activity. The tool helps the teacher to keep track of the processes s/he is observing.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>Student 1</th>
<th>Student 2</th>
<th>Student 3</th>
<th>Student n.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generating</td>
<td>combines estimates compares</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Planning</td>
<td>predicts infers hypothesizes</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Producing</td>
<td>builds enacts applies</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Receiving</td>
<td>is curious is motivated is frightened</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Responding</td>
<td>expresses joy expresses disappointment</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Monitoring</td>
<td>is aware of the process reflects on the process</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Regulating</td>
<td>controls the process adjusts the process</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
<tr>
<td>Evaluating</td>
<td>judges the process evaluates the outcome</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
</tr>
</tbody>
</table>

Figure 2. An excerpt of the grid operationalizing the evaluation model

### 3. Discussion and Conclusions

In the last few decades, educational systems have started investing in the development of student creative abilities and skills. Although the majority of scholars agree that the proper design of a learning activity oriented to creativity, may foster students’ creative abilities and skills, this is hardly put into practice by teachers in their everyday practice. This is (at least partially) due to the lack of models and means for the teachers to tackle the issue.

In the present paper a model has been briefly presented to evaluate learning activities oriented to the development/reinforcement of a certain set of student abilities and skills, namely those that are potentially at the core of a creative act. The proposed model is still at its early stages of development and has just started being tested into two different contexts, which have been selected to prove its usability in very different situations (as to learning context, age of students, kind of activities, etc.). Complete results are not yet available, but preliminary indications can be drawn. The model is composed of three main categories and a set of indicators; these have been identified on the basis of the literature in the field and on some previous experiences of the authors, still they are far from being a complete and stable set: given the need to be used as an everyday tool by teachers, an attempt was made to find a balance between usability and exhaustiveness; this may have led to an excessive simplification of the model, which may need further tests to improve such a balance.

Besides, the model – as it is now – is very much focused on the learning process and does not take into consideration the product of the learning activity. This is because the model has been thought as a means for teachers to tune ongoing activities, but of course it should be integrated with other evaluation means, in case the aim becomes student creativity measurement.

Finally, the very first results indicate the model and the grid presented in Figure 2 to be quite flexible: looking at the eight indicators as a whole allows one to have a general overview on the students’ behaviours, attitudes, skills in
respect to the enacted process; at the same time, the possibility to investigate separately the three indicator categories may better serve the purpose of changing the tack and fine-tuning subsequent educational interventions. Besides, the applicability of the model appears to be quite independent on the actors’ age, the type of learning environment considered, the type of task at hand.

In the next future further research is foreseen, in an effort to strengthen the proposed model.

References