

STIMULATING STUDENTS' CREATIVITY IN MTM AND ELTM CLASSES: TEACHING AND ASSESSING METHODS AND INSTRUMENTS

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Abstract: *The purpose of the present study is to emphasise different means of stimulating students' creativity with English Language Teaching and Mathematics Teaching Methodology courses and seminars. The basic analysis tries to exemplify and compare the cultivation of creativity by means of the teaching-learning-assessment methods used to teach and evaluate the content of the classes mentioned. The conclusions will summarize and review the two studies dedicated to creativity, as a result of the data collected by the authors and their first hand experience in such classes.*

Key words: *creativity, teaching-learning-assessment methods.*

1. Introduction

Considered a sequel to the paper based on analysing the means by which students' creativity can be discovered and encouraged to emerge as a driving factor within the teaching process, as a consequence of the content taught and of the personal talent the teacher has in doing that, the present research paper, belonging to the same two authors, is interested in analysing the most significant methods of the very same process, in all its steps: teaching, learning and assessing, that can achieve the same goal, i.e. stimulating students' creativity.

The formation and stimulation of creative thinking can never be considered as an ending process, as it can never be imagined as stretching to the maximum limit of a person's possibilities or of a life's requirements and challenges.

The outcomes of university work for any professor represent a reflection of, first of all, the first-hand experience she has with the mass of students, and, second of all, but nevertheless equally important, of the relationship established, at a professional level, with each and every student individually, perceived as a particular entity, with personalised profile and parameters.

Different ways of addressing the idea of creativity in a language class, for example, can be viewed depending on whether we see it "as a property of people (who we are), processes (what we do) or products (what we make)" (Fisher, 2004, p.8). Therefore, the

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concept of creativity can be generally referred to as encompassing a number of different dimensions, yet again, according to Richards (2013, p.3), “the ability to solve problems in original and valuable ways that are relevant to goals; seeing new meanings and relationships in things and making connections; having original and imaginative thoughts and ideas about something; using the imagination and past experience to create new learning possibilities.” And that is why, he continues, “when creativity is viewed as a product the focus might be on a particular lesson, a task or activity in a book, or a piece of student writing.” While when viewed as a process, the focus is on the thinking processes and decisions that a person makes use of in producing something that we would describe as creative (Jones, 2012).

For language teaching, Maley’s (1997) work focused on creativity by means of texts extracted from various non/literary sources in order for them to be used to enable creative thinking and facilitate the ability to make creative connections. Reading from Richards (2013, p.2), “creativity has also been linked to levels of attainment in second language learning. Many of the language tasks favoured by contemporary language teaching methods are believed to release creativity in learners – particularly those involving student-centred, interaction-based, and open-ended elements, and are therefore in principle ideally suited to fostering creative thinking and behaviour on the part of learners. Creative intelligence seems to be a factor that can facilitate language learning because it helps learners cope with novel and unpredictable experiences. *Communicative teaching methods* have a role to play here since they emphasize *functional* and *situational language* use and employ activities such as *role-play* and *simulations* that require students to use their *imagination*s and *think creatively*.” (emphasis added)

For a more comprehensive perspective over the concept of creativity, Țopa (1980, p. 9) relies on verbs like “to do something which did not exist before, to ground, to produce, to invent, to conceive, to bring into existence, to coin”, meaning that “creativity denominates the human capacity to make creation possible, the human potential without which creation cannot be produced and valued.”

By its very essence, when it is related to the proper process of teaching, the capacity to create within the didactic activities involves the transformation of the student from a mere recipient of knowledge, passive and empty-headed, into a direct participant in his own formation, by using active-participative methods and strategies (Vălcan, 2013).

In order to be able to develop students’ creative thinking, these ones have to be encouraged throughout the activities, appreciated for their effort and stimulated even when they provide completely wrong answers. The development of the cognitive potential and creativity can be met through activities that elicit a person’s intelligence and originality in an independent manner (Dobrițoiu, 2015, p.132-133).

The present article intends to reveal appropriate approaches for improving the quality of the didactic activities with the Mathematics Teaching Methodology (MTM) and English Language Teaching Methodology (ELTM) classes, by means of using those teaching methods that once implemented will lead to involving the students into solving the problems in such a manner that they will have their creativity (flexibility, fluidity and originality) stimulated to the highest levels; by means of applying those ways of evaluation that once an assessment passed the students will feel motivated to go to the next level and challenge themselves for a new endeavour. At the end, conclusions will be drawn with respect to both the current analysis, which will have focused on methods, and the bigger research undertaken by the authors on creativity, considering to include in the

final section outcomes resulted on the occasion of writing the previous paper on stimulating students' creativity by means of the choice of content taught to them and teacher creativity.

2. Cultivating students' creativity by means of the teaching-learning methods used

According to Vălcan (2013), efficient learning presupposes the involvement and determination of the one who learns all throughout the act of learning, the method playing here a fundamental role.

Besides the means of cultivating creativity referred to above, the ones which should not be, by any means, overlooked, are the ones referring to the teaching-learning methods used, as they are obviously conducive to a boost of creativity in students' thinking and approach to learning. But of all of them, the ones which can really be relied on when it comes to modern teaching are the active-participative and interactive ones, or the communicative approach. The ones that can be listed here are: problematizing, learning through discovering, heuristic conversation, didactic game, Brainstorming, the RAI method, the Cube, the Mosaic, Starbursting, etc., which can be successfully applied, as proven in a previous paper of the authors (Purcaru & Nechifor, 2015) to both MTM and ELTM classes as well.

Dwelling on the same three main features that can encompass the idea of creativity in a complete and comprehensive manner, flexible thinking, fluid thinking and originality, as considered with the previous paper of ours, mentioned before, the followings are situations depicted from the extended data collected in class, as a result of direct work with the students that we experimented with and exemplified on throughout two years of close study.

As an example in case, with a MTM seminar focusing on the stages of solving a mathematical problem, the following task was assigned to the students, with the aim of exemplifying the fourth stage, using the Brainstorming method: *Fill in the text of the given problem with as many requirements as possible, adding or not any other pieces of information in the hypothesis: consider the ABC triangle right-angled in A , $AB = 12$ m and $BC = 15$ m. (d) $\perp(ABC)$ straight-line is built in A , on which point D is chosen so that $DA = 7$ m.* When the solving time was up, all the solutions suggested by the students were written on the board, and, as a result of the discussion generated, 12 questions correctly formulated were found. It is for sure that using the Brainstorming method, by means of which the students managed to discuss within the working groups created, brought its contribution to finding so many solutions, as well as to developing the fluidity and originality of the students' creative thinking.

Another example, from the same MTM seminar, still for developing students' fluid thinking, focused on using the interactive Mosaic method. The group was split into three sub-groups, each receiving as a task to equate a problem which they had to solve using at least two methods. The students from each sub-group discussed among themselves and then sent a representative to explain and to write their solutions on the board. Mention is worth making that one of the three sub-groups found three methods of solving the problem instead of two: two using Algebra and one using Arithmetic. For the same type of method, but this time used at an ELT Methodology seminar focused on the topic of describing learners, another type of manifestation of creativity could be recorded, as the way in which the method itself was used differed from one group of students asked to

teach using it to another. For example, as illustrated in Fig. 1, one of the groups even decided, due to the fact that physical setting of the classrooms where this seminar was held allowed this, to ask their subject-students to physically divide into separate groups, using separate classrooms in which each appointed student-teacher presented the content allotted for teaching and then re-united in the main classroom for the joint presentation of the main ideas and conclusions.



Fig. 1. *II28D, II27, II28C classrooms – three settings – The Mosaic*

Designing questions by the students for their peer-students contributes a lot to enhancing flexible thinking, an example being taken this time from both seminars interested in teaching Methodology, i.e. Mathematics and English Language, more specifically the one focused on the methodology of designing specific items: what was used as a method was the RAI method and the way in which it was implemented was as follows: each student was asked to formulate a question for his colleague in order for it to elicit a certain item corresponding to a certain given lesson content. The students whom the question was addressed had to answer it orally, and if the answer was correct (intervention from the initiator of the question, from other colleagues, or from the teacher was accepted), he would be invited, in his turn, to address another question to another colleague on the same topic. In this way, flexible thinking was definitely encouraged because by means of the questions asked, there were more complicated issues addressed than normally, from different chapters previously studied, either in Mathematics or in the English Language.

Among the specific Mathematics teaching-learning methods, the generalisation of certain theoretical concepts, of some problems or category of problems will increase the potential of creative thinking, in all its aspects: flexibility, fluidity and originality. An example would be, from one of the seminars focused on Algebra, a situation in which students were asked to teach pupils the modality through which they can establish whether two polynomials are prime polynomials or not, without having previously introduced to them the specific notions regarding this concept, by simply asking them to put into practice whatever they already know and could work in a similar situation, but applied to a concept that they were already familiar with, that of natural numbers, from the fifth grade, using Euclid's algorithm. A similar example could be traced to students of the English language when asked to try to teach class changing suffixes to pupils of elementary school without naming the concept as such because its introduction as a professional term is linked faculty syllabus; still, students managed to resort to the concept of conversion, which is taught in schools with the Romanian classes, and its meaning could be transferred in order for the pupils to understand that certain suffixes can make one word change its morphological class.

In order to improve creative thinking among students, there are several specific

methods and procedures that can be implemented, but they have to be appropriate to the content taught and to the class of pupils/students the teacher is working with. Any method has an intrinsic creative potential that can be explored (Păcurar, Niculescu, & Panțuru, 2003, p. 259).

3. Cultivating students' creativity by means of the assessment methods and instruments used

Next to the traditional assessment criteria (the written or the oral exam), the use of alternative evaluating procedures (continuous evaluation, progress measurement) can contribute with both Mathematics and ELT Methodology subjects, up to the end, to a student's creative thinking development regarding a specific content from the teaching process.

Finding ways to evaluate students' performance throughout the process of teaching and learning, to mark their progression and to appreciate good answers, will help motivate them on the way, and their self determination to find even more creative answers to difficult questions, to find answers alone, to look for examples and counter-examples or to produce and develop an application as a result of their own involvement in solving a theoretical problem will grow in time and will attain unimaginable peaks, contributing, at the same time, at the enhancement of their creative thinking.

Continuous assessment based on portfolio evaluation, with both subjects compared in the present paper, can consist in different practical assignments accompanying the theoretical background taught in classes, its structure and its presentation (oral, poster, question based) being left to the students' choice for a greater freedom in point of manifesting creativity associated with this last step of the teaching-learning-assessing process. The portfolio can also contain all the tasks assigned as homework along the semester and the mark that will be granted for it will be part of the final percentage of the average mark in the end-of-the-course exam, an aspect which will motivate the student to work with more determination in order for him to contribute to a more accomplished final mark. The documentation and research dedicated to gathering the necessary information for the portfolio, the effort taken to look for, to select and to properly use the necessary bibliography, the design and conception of the central piece in the portfolio will all be evaluated and will all contribute to the importance of, on the one hand, developing creativity and, on the other hand, amassing necessary research skills for a possible future academic career.

Still for the purpose of raising interest in students' creativity, more precisely in their original and fluid thinking, role-play can be used when assessing both MTM and ELTM, as part of the continuous evaluation process: "teacher for 20 minutes" is the approach through which the student is elicited to present in front of his colleagues parts of the theoretical information regarding a certain topic, or even to problematize new situations. The choice and understanding of the material taught will benefit the student in terms of shaping his logical thinking, of enhancing his interest for the topic and of boosting his creativity. Using this assessment method along several years with the same generation of students, but also from one generation to another, as analysed and proven in 2014 by the authors of the present paper (Purcaru & Nechifor, 2014, p.47-56), satisfaction was noticed among the students in both Mathematics and English, both within the classes as such, regarding the attention span and the interest in the topics debated, and in what the interest for the final exam was concerned. Here again, the mark granted for this activity

was part of the final mark for that particular subject. Fig. 2 below is a representation of such a role-play method used within an ELTM seminar, the students being in their second year of study, in their second semester, belonging to the 2013-2016 generation, and dealing with role-playing a seminar text on “Teacher’s roles”.



Fig. 2. II27 Classroom – one setting – Role-Play

The same type of benefits can be obtained with both subjects, as part of the continuous assessment, if interactive methods are used, methods meant to stimulate and evaluate group creativity: Cube, Philips 6-6, Brainstorming, Starbursting, or Mosaic.

The Philips 6-6 method stimulates creativity, encourages the free expression of ideas and arguments, supports creative competition, shapes solidarity spirit, and engages students in evaluation. For example, with a Mathematics Methodology seminar, the students can be divided into sub-groups of six students, each group being assigned the same task of designing problems using two literal formulae: $a + a \times b + a : cxd = ;$ $(a + a : b + a : b \times c) : d = ,$ within 6 minutes.

Another example of a method that can be creatively used to assess students as part of the continuous process of evaluation can be Brainstorming with a seminar in either MT or ELT Methodology, focused on didactic means, and can be implemented in the following manner: each group of students receives a sheet of paper on which there is written the topic for a certain lesson and its type; what they are asked to do is to specify the didactic means they can use to accomplish that lesson, associated to each lesson stage, explaining in detail the ways in which each method will be used. All the ideas of the students will be written down on the piece of paper received and only after their thorough examination by the members of all groups will the accepted ones be written on the board.

One more example, extracted this time from the Mathematics Methodology seminar, regarding the continuous type of assessment, could consist of the the Mosaic method (which was so creatively used by the language students as a teaching method – see previous chapter) and would be appropriate for the unit focused on differentiated training

strategies in Mathematics. Its professional slip would look like this: subtopic 1 – differentiating Mathematic content; subtopic 2 – active-participative and interactive methods used as strategies for differentiated training in Mathematics; subtopic 3 – didactic means used as differentiated training strategies in Mathematics; subtopic 4 – specific aspects related to the assessment and design of a mathematical lesson unit for which differentiated training strategies were used. The interaction among students while solving the tasks contributed to raising satisfaction towards teaching methodology, while the examples provided corresponding to each subtopic, enhanced students' creativity relative to those topics, in both what flexibility and originality were concerned.

One last example for this section regarding continuous assessment, which proves its validity for both MTM and ELTM classes or seminars, for a unit focused on methods and instruments of evaluation, is the Starbursting method, which is somehow similar to Brainstorming, and can be implemented in this way: each group receives a sheet of paper on which there is already written the title of the lesson unit. Students talk among themselves and list on the paper as many questions as possible related to the topic of the unit, of the type: what?, who?, where?, why?, when?; the list of initial questions can generate unexpected follow-up questions, which may trigger even more concentration on the part of the students. After the time assigned for designing the questions is up, the students from one group start asking a number of their questions to another group which will have to answer, and then the procedure is continued until the last group has asked their questions. The teacher is the mediator of the activity and corrects either the questions or the answers, if the students cannot do it themselves.

5. Conclusions

The applicability of creativity in classroom interaction is thus an issue that can be addressed and it can encompass, as previously mentioned, strategies also discussed by Richards (2013, p.1117), such as: making use of an eclectic choice of methods, such as even blended learning, including activities with an intrinsic creative dimension in class progression, encouraging original thought in students, providing personal examples or working with the fantasy element (Dörnyei, 2001), but most importantly making the most of the teaching moments, by giving students choices, customizing the teaching content from adapting the textbook to serve a certain micro-teaching situation up to the limit of encouraging students to question the textbook, using blogging as a resource and focusing on students as much as possible by using activities that showcase students' talent, using activities from the learners' world or by simply encouraging creative collaboration.

Besides being audacious enough to choose their own content to teach, in point of not necessarily the macro-topics, but of the applied micro-contexts that can make the main subject more interesting than a mere directive in the syllabus, or even from the courage to adapt and to change the content according to the real level and interests of the students, to the methods the teachers decide to use in class in order to be able to make creativity spring and up to the moment when a teacher asks herself how to make the seed of creativity intrusted in her when she first considered becoming a teacher burst into a fluorescence of colourful petals blooming with original ideas to attract students to class, everything was subjected to analysis in the pages of the two papers written on the topic of creativity in class. And yet potential may be exploited further on if any teacher is interested in working with the creativity that she managed to invigorate in her students.

As apart from one another that they may seem and as belonging to two so different areas of the curriculum, MTM and ELTM classes meet on the common ground of methodology, each and every time principles are under discussion. And even if the particularities will always make the profile of analysis in point of differences, starting with the content properly and ending with the examples, the similarities will any time make the subject of papers like these ones, especially when even persons like Ion Barbu, famous mathematician and poet, who had direct creative contact with both of them, agreed that inherently these two areas can, somehow, meet: “No matter how contradictory these two terms may seem at first sight, there is there somewhere, in the high domain of geometry a bright place where it meets poetry. As with geometry, I understand through poetry a certain symbolism for representing possible forms of existence.” (Valerian, 1927)

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