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STIMULATING STUDENTS' CREATIVITY IN *MTM* AND *ELTM* CLASSES: CONTENT CHOICE AND TEACHER CREATIVITY

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Abstract: *The aim of the present paper is to highlight different means of stimulating creativity with students attending English Language Teaching and Mathematics Teaching Methodology courses and seminars. What is primarily analysed, exemplified and compared is the cultivation of creativity relative to the scientific content taught in the classes under discussion, by means of the creativity of the teacher seen as a key factor to stimulating students' creativity in nowadays challenging teaching context. The conclusions invite to perspectivization and broaden the view over such a complex concept such as student creativity.*

Key words: *student creativity, flexibility, fluidity, originality, content choice.*

1.Introduction

Generated by a long-term collaboration between the authors, as a result of a common interest in the area of teaching methodology, the present paper can be enlisted in a series of previous articles published on related topics from Mathematics Teaching Methodology (MTM) and English Language Teaching Methodology (ELTM) classes and based on research extracted from the first-hand experience had, as tutors of these classes, by the authors.

This particular paper is focused on creativity, as a key concept, and is interested in analysing the most efficient modalities by means of which the creativity of the students can be revealed and stimulated and in opening a line of further investigations in the field; the chapters comprised by this paper will deal with the choice of scientific content that any teacher has at hand to choose from when it comes to making decisions related to her subject, as well as on the way in which she can do this, based on personal creativity and talent, while a further study will deal with the way in which student creativy can be enhanced according to the methods used for the teaching process, in all its aspects: teaching, learning and assessing. This topic-area is wide and deserves attention to detail, considering the fruitfulness of the data gathered and of the class material, as well as the time span of almost 2 years dedicated to this close observation in class and literature reading.

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Creativity is a multidimensional concept and can manifest itself in many domains: arts, cognitive science, psychology, philosophy, etc. According to The Encyclopaedic Dictionary (1993), creativity is listed alongside the complex traits of human personality, consisting of the capacity to create something new, original, while Encyclopaedia Britannica defines it as an ability to find a new solution to a problem, being it a new method or a new device. The Webster Dictionary (1996) offers three meanings to creativity: the state of being creative, the ability to be creative, the process of accomplishing creativity, all of them contributing to the complexity of the concept under discussion.

Creative thinking is the main component of creativity, and the most significant characteristics of creativity that we are interested in, both with Mathematics and with English Language classes, are: flexible thinking, fluid thinking and originality.

Associated to Mathematics, creativity refers to designing and solving problems with a high level of originality, without an explicit command, or writing notes or articles. (Banea, 1998). According to Dobrițoiu (2015, p.132-133), solving problems plays a very important role in the area of mathematical activities for cultivating and educating creativity and inventiveness. For the purpose of committing to long term memory and applying the theoretical background taught, the teacher has to guide the students through a permanent activity of exploration and of association of the newly learnt concepts. A notion, theorem or definition is well managed by the students only when it can be correctly exemplified or successfully used in practice or applied for solving other problems.

When talking about creativity with the English Language classes, teachers practically have to consider the bigger picture, the one which actually takes them outside the class room into the real, i.e. into the greater context than the one limited by the walls of their classroom, in order for them to be able to re/create for their students the premises of life. And for this, they can make use of the modern teaching approach, which is called "communicative" (West, 1992) because its main purpose is to facilitate understanding through creative thinking and originality.

Flexible thinking represents the capacity of the human mind to quickly adjust and easily pass form one situation to another. Practically, when solving problems for Mathematics, the student's mind must be determined to look for rules and combinations of rules and to formulate hypothesis which later on will be validated. When dealing with a new grammatical structure, the student's mind must be pushed towards placing it into an appropriate life situation that requires such a pattern to express the complexity of the context and must quickly analyse, through a paradigmatic comparison, why any other grammatical structure wouldn't be correct for the same situation.

Fluid thinking consists of the capacity of the human mind to offer several methods for solving the same given problem, being it mathematical or vocabulary related. When required from the students, the teacher must state this overtly, in order for the students to understand that they have to active multiple thinking. (Vălcan, 2012; Vălcan, 2013).

Originality can be measured through the factor of novelty and uniqueness attached to the answers and solutions offered by the human mind to a problem, as well as through the ingenuity of their formulation. And even though all the above mentioned characteristics display their degree of importance, originality is the most precious one as it guarantees the value of the creative work's result (Nicola, 1994, p.126). Original is that student who can find different solutions for the same problem solved either by him or by somebody

else, before him. Original is that student who, under pressure, when faced with a translation problem, can manage to get the correct message across by paraphrase, explanation, contextualisation, demonstration, etc., even if, for that particular moment, he cannot name the exact term under discussion.

In any conversation, flexibility can refer to the ease with which a person can negotiate meaning (Thomas, 2013), while fluidity can anytime dwell on the richness of associating images or ideas (Cosmovici & Iacob, 2005, p.149), or, more precisely, associating images with ideas, under the form of an already classical information transfer, as well as on the capacity to produce a great number of words, ideas and phrases in a very short period of time (Nicola, 1994, p.126).

The present paper aims at shaping solutions, procedures and suggestions for improving the quality of the didactic activities with the MTM and ELTM classes, by means of choosing that scientific content which, once taught to the students, will contribute to boosting their creativity (flexibility, fluidity and originality. But in order for all this to be successful, a particular emphasis should be laid on the creativity of the teacher which will be analysed separately. At the end, comparisons will be made visible between two such (apparently) different curriculum areas, such as those of Mathematics Teaching Methodology (MTM) and English Language Teaching Methodology (ELTM) classes.

2. Cultivating creativity in students through the scientific content taught

With MTM classes, problem solving is one of the most certain means which can open the path to creativity stimulation and creative thinking in students. And this does not even presuppose approaching too many types of problems or solving methods, but the mere creation of new learning contexts, to which the student is invited to answer in as many ways as possible, in order to find the appropriate one, as a result of an investigating type of an approach.

With ELTM classes, the main approach to stimulating creativity in students is contextualisation, in an attempt which is similar to the one considered by the one that MTM has, but which more precisely refers to the possibility of varying situational and pragmatical discourses as much as possible for the students, in order for them to visibly understand the difference between grammatical structures, vocabulary phrases or even literary backgrounds, so that creativity can find its path under the form of normality durimg the cognitive process of learning.

Designing and solving problems considerably contributes to developing creativity in students, especially when it comes to enhancing their flexible thinking. For example, for the following task, assigned as independent work with a Mathematics Methodology seminar: *design a problem modulating a real life situation which can be solved through an equation and exemplify four working tasks for the solving of the problem*, all students provided correct solutions, but what varied in point of creativity was the task environment, i.e. the formulation of the problem, which simply proved how different minds can shape the same situation depending on flexible thinking. The same type of task, assigned to students in ELTM classes had an even more spectacular result, as the raw material that language classes work with in the first place exposes them almost automatically to the invitation of being creative, if we consider a task such as the following one, for the writing skill: create a task environment for your students starting

from the grammatical structure of present perfect simple, asking them to write a story. Almost each and every student thought of a different possible real life context in which present perfect must be used, and even though the composition, i.e. the writing assignment, was focused on a grammatical issue, they came up with so many variations of the task environment that everybody felt as if they were actually dealing with a creative writing type of task, in an attempt that proved that grammar can be fun, that skills do not occur in isolation, that teachers can be creative and that students'' creativity, as a consequence, can be challenged at any time.

Another way of developing flexible thinking can consist of asking the students to solve the same type of problem in different contexts. For example, seminar problems in Mathematics classes can be solved by means of using a special arithmetical method, but having environments extracted or inspired from completely different real life situations. Functional language can be explained better to language students exactly by asking them to shift the context, when it comes to teaching turn-taking mechanisms, for example, in discourse analysis. Homework can consist of asking the students to solve the same type of problem, but to formulate the task environment from other domains than the one used in class, which can be a valid requirement for both types of classes.

Yet another possible method by means of which flexible thinking can be developed is the resort to other branches of the specialised field the class is about. For example, in MTM seminars an Arithmetic problem can be solved by making use of the figurative method, for which knowledge from Algebra (equating a problem and solving a system of linear equations), as well as from Plane Geometry (properties of various polygons) is also necessary in order for the solution to be a valid one. Or in ELTM seminars, students can relate information from Grammar to Pragmatics, a new branch of Linguistics, which can provide for their future pupils a possible better explanation of why a sentence in which present perfect is used as a grammatical structure, in the situational case provided by the adverbs *just, already* and *yet*, will never refer to the semantic meaning of the words that make that sentence, but will go beyond them and will depend on the context prior to it and will have consequences over the close future of it, as only an indirect speech act from Pragmatics can act.

Still for developing the same factor of creativity for both subjects, MTM and ELTM, there can be created interdisciplinary seminars with their content oriented towards asking the students to make connections between various related fields in order to solve certain mathematical and/or linguistic, or literary problems, or there can be chosen practically applied tasks. And what other better suited example can be provided here, if not one from Language classes, especially today, when the interdisciplinary approach has made its way through the academia and offers so many solutions to so many different language problems if these one are fragmented, decontextualized and then restructured, reframed and re-contextualized according the possible various approaches to language that Sociology, Anthropology, and even Computer Science can offer to a linguistic situation.

Many students consider the content taught by the teachers to be a burden and cannot see the practical side of the theory presented to them, the usefulness of the general background offered by the core, as well as, sometimes, even by the specialised curricula displayed by the syllabi. But the worst part is that they are unable to make connections between classroom content exhibited in universities and real life situations. For example, a course in the Methodology of the Analytical Geometry of cones can be ended with a power point presentation, projected by a video projector, displaying a set of real examples

for the design of which cones were used: countless buildings shaped like this, bridges, or even realia such as flowers with a conical bloom. The homework can consist of asking each student to bring for the next seminar five such further examples, creating thus a sort of indirect motivation towards learning this specialised content focused on cones. or a seminar focused on Applied Linguistics, in which errors in expression are analysed at different language levels, can provide examples from real discourses, belonging to famous personalities of the day, from different domains of activity, in which such error led to miscommunication, breakdowns in communication, funny situations or even had disastrous consequences at political levels, if translation errors occurred as a result of faulty expressions. As homework, students can be asked to start compiling a data base in which to include further examples like the ones offered at the seminar discussion, extracted from real samples of conversation, for better understanding the phenomenon, further research and for a possible further writing of a specialised paper on this topic.

Flexible thinking in students can be cultivated, for both subjects that make the interest of the present analysis in the same way, i.e. MTM and ELTM, each and every time a certain knowledge network must be created among different chapters from the same subject, either with the courses or with the seminars, being them theoretical problems or practical applications. Thus, irrespective of the type of work used: individual, pair, group, blackboard display, etc., various lessons are linked together in order for the students to get the "big picture" and to form a bird's eye view over the task at stake. A simple example at hand, for both subjects, can be the one provided by the following task: design a lesson plan, by filling in next to each stage of the lesson, according to the separate theoretical chapters studied so far. For this particular task, individual pieces of information, studied separately out of didactic reasons, come together and ask for flexibility in approach, because depending on the variables provided at the beginning of the task (students' age, level of knowledge, number in class, prerequisites etc.), the plan must be adjusted to fit the correct teaching situation. Moreover, the student must rely on information taken in throughout several weeks of attending classes, to come into contact with the content of the appropriate manual that he has to use, to select the suitable tasks from it, to establish the operational objectives, to choose the didactic strategies, teaching-learning methods, temporal resources, forms of organisation and evaluation instruments.

Solving, with seminars, those exercises which retrieve theoretical knowledge from several chapters help develop in students flexible thinking, forcing them to connect separate pieces of information taught to them along a longer period of time. The same successful goal is achieved with the reviewing classes or seminars, preparing students for exams, because for solving complex and comprehensive problems asks for passing from one type of reasoning to another, for the same situation. Let alone that the same type of benefit can be obtained with the attaining classes, at the end of a chapter, lesson unit, or semester, when solving a problem requires relying on information from the whole unit or from several units put together, thus providing the student with the opportunity to see the whole process, a process whose stages have been separately presented to him that far.

Finding several modalities to solve a problem in a MTM seminar stands for proving that creativity can be stimulated at another level of logical thinking, that of fluid thinking, and demonstrates that students' creativity can be cultivated and developed in various ways. Offering to students problems that bear multiple ways of solving represents an active modality to raise students' interest in a content which otherwise would simply be considered monotonous and plain. For example, in a seminar focused on the methodology

of designing and solving problems, assigning the task: *determine the length of the median in an irregular tringle, using different means and comparing the methods found*, there were four solutions obtained: a vectorial one, an analytical one, and two synthetic ones, but different from each other. To all these solutions, the only common item was the characteristic of the median as an important line within a triangle. The size of the median could very easily be obtained by using the Stewart Theorem, both by means of synthetic geometry and vectorial geometry. And simply by using these two methods, a comparison could be stricken in order to see that with the other two methods, especially with the analytical one, the calculations were much more complicated. Asking language students to find different ways to solve a task in translations for example, or even in interpreting, can elicit the best representation of creativity, as, by means of being able to quickly form paradigms of alternative words, synonyms, paraphrases, exemplifications, definitions, or simply strategies of opting out in difficult translation contexts, the student will be able to actually save the situation, not only to solve it.

In order to encourage and enhance originality in students' thinking, it is indicated that the teacher should set as a supplementary goal with each course and seminar to tackle, non-standard problems, problems that make the subject of high level manuals, booster books, or readers, problems which are usually offered to students in competitions or contests. Without making out of them the standard norm of the class, teachers must have these types of problems in mind with the sole purpose of stimulating originality and inviting to creative thinking, as well as of challenging students to try their minds at more complicated problems than the average. Language candidates to learning can any time be made to think outside the box and to try bigger shoes than their size whenever asked to imagine situations that can occur in class, for the distinct entry of possible anticipated problem of the lesson plan, for which they have to simulate different awkward teaching-learning that may arise during class time, for which they are also required to project creative solutions.

Another modality to raise originality in students' creative approach to learning is to offer them problems or tasks with a steady growth in difficulty from one sub-requirement to the next, in a smooth crescendo of the level of difficulty from one question to its follow-up, the last question being usually addressed to the most creative students, with a high level of knowledge that can be flexibly transferred into solving the problem.

With the specific case of MTM, complicating a problem solved within a seminar, by introducing new data, or by modifying the initial question contributes to a great extent to developing original creative thinking in students; while for the particular situation of an ELT Methodology class, changing variables in an interaction by simply adding data to the dialogue, modifying the second part of a preferred answer from an adjacency pair to measure the interlocutor's reaction and adaptability to creatively by triggering spontaneity can qualify for very interesting samples of variations in the degree of difficulty within a task to raise creativity.

Besides all the curricular related activities mentioned so far, the ones that can also contribute in a very successful way to the development of students' creativity is the urge to participate in students' professional competitions, outside the premises of the university, as well as the occasion of writing their BA or BS projects, which represents, at their level, the most complex process that enables them to express their creative thinking.

3. The creativity of the teacher

The suspension of the entrance examination by the majority of the universities has generated situations characterised by the fact that candidates to learning, from former graduates from arts high schools to participants in the Olympics, are reunited under the same amphitheatre roof with no discrimination, but a common desire: to have enlisted themselves for a faculty, no matter which that faculty might have been. Under such circumstances, to deliver an attractive lecture has become a challenge for the teacher, superior to that of scientific research (Căuş, 2015, p.189).

Thus, an extremely important role in generating, preserving and developing students' creativity is played by the teacher himself nowadays, irrespective of the type of course offered, that is from subjects completely unrelated in topic, at first sight, such as Mathematics and Languages, to those which display a great potential in point of creativity by the very nature of their content but which still may struggle to gain attention from the student-candidates. Consequently, the creativity displayed by the teacher is at its utmost and unprecedented importance and the skills the teacher has to make use of it, even more, because it will be the only incentive prone to manage to trigger creativity in students, as a fact.

For achieving this scope, equally important is the attitude the teacher displays, both towards her own adaptation to the current novelty in the educational system, and towards her students. Tensed relationships cannot generate creativity, but can block affective blockages. Vocation, in other words, is fundamental, the teacher being keen on displaying a genuine desire for the new, preserving her curiosity and interest in anything up-to-date in her field, being also open to interculturality and intercommunication (Păcurar, Niculescu, & Panţuru, 2003, p.89). The teacher, thus, must absolutely necessary dump the authoritarian style used until some time ago, in favour of the more friendly and permissive relations between teachers and students. Students must be allowed to manifest their curiosity freely, as well as their characteristic spontaneity, thus being encouraged to challenge their teachers and to ask them questions without being afraid. The teacher, in her turn, must support fantasy, original ideas, and accept the nonconformist style of the creative students. And even though there are some inborn creative students, naturally endowed with superior creative potential, the teacher must make sure that she uses all the means to stimulate creativity in all her students, taking into account that a grain of creativity exists in every human being.

The attitude of the teacher in class, with either MT or ELT Methodology, can contribute to the enhancement of students' fluid thinking. Thus, the teacher shouldn't suggest, immediately after assigning a task, possible ways to solving it, especially by favouring a certain method, but should discuss with the group of students all the variants existing for that matter and to analyse the advantages and disadvantages of all of them before settling upon the easiest one, at the same as appreciating the students who contribute the most, with the most interesting solutions, to solving the task.

The creativity of the teacher becomes obvious in the how she tackles the teaching process. For example, after teaching the unit focused on the methodology of designing and solving problems at the MTM course, at the seminar students can be asked to design complete didactic approaches for problems not displayed with the course, without being made aware of the similar reasoning they may already be in possession of from previous experiences or of the possible improvisations, thus allowing them to problematize all of

the above, by themselves. In this way, some of the students may stand the chance to discover on their own these solutions, developing for themselves the observation spirit and the originality of thinking.

Moreover, teacher creativity comes as a result of the way in which she manages to use differentiated training strategies with any of the two subjects under analysis, because some tasks which happen to be difficult for some students may prove to be simple for some others and for this reason, in order to offer chances to everybody to become creative, it is sometimes indicated to approach such a situation in a differentiated manner, in an individual way.

A relevant example of using the Cube method in a differentiated manner is represented by an activity within the Mathematics Methodology seminar on the topic of using the interactive methods of teaching in a differentiated manner. Thus, the students can be asked to either apply the general modalities of differentiation presented at the course, in order to design an example of how differentiated the Cube method can be applied to the 6^{th} grade, on the topic of Fractions, proportions and percentages, the type of lesson being one of reviewing. (high level of difficulty); or to describe the general modalities of differentiation presented at the course (low level of difficulty); or to compare between them and then to exemplify the interactive methods of the Cube and the Mosaic, from the point of view of their differentiated implementation in class, within Mathematics courses (medium level of difficulty); or to analyse the possibility of implementation of each general modality of differentiation presented at the course, focusing on the RAI and Starbursting methods (medium to high level of difficulty); or to present an argumented defence, in 20 lines, of the following statement: *the differentiated use of the interactive methods within Mathematics Methodology classes can increase students' creativity* (low to medium level of difficulty); as well as to associate to each general method of differentiation introduced at the course, the interactive method that this one can be applied to in the easiest and most efficient manner and then to exemplify it through a lesson on a topic of their choice (extremely high level of difficulty).

Teacher creativity can also be depicted from the way in which she chooses to select the content for teaching, i.e. the way in which she lays stress on certain aspects with a particular topic, or, on the contrary, chooses to insist on the bigger picture with some others; when to extract only the essential information without giving rigour up, and when to get into as many details as possible, according to context; with which classes to avoid demonstrating certain taught theorems, and what topics to select with different groups of students for conversations, depending on the complexity and diversity of the group, even if the subject-matter is the same. In order for some elegant demonstrations not to be considered boring or useless by the students, the teacher must put into practice all her skills to make the same demonstration sound like a problem and not like a mere theoretical display of content, in order for the students to see the utility in it, thus making creativity occur when most unexpected.

A creative teacher of Mathematics will almost never read to his students the texts of the exercises and problems in the exact form as printed in the manuals, but will rephrase the ones which make this approach possible, so that they become more interesting and complex, enhancing their creative potential. For example, the teacher can read only the beginning of the task, asking the students to come with the requirements themselves and to solve them as well.

A creative language teacher, according to Richards (2013, p.4-11), is the one who is

knowledgeable, confident, non-conformist, risk-taker and reflective, and at the same time committed to helping her learners succeed, familiar with a wide range of strategies and techniques and seeks to achieve learner-centred lessons. Drawing on the knowledge of texts, making use of socio-linguistic knowledge, following her intuitions, developing self-confidence in learners, focusing on learners as individuals, creating effective surprises, avoiding repetition, even of the examples provided, varying tasks and activities, trying something new all the time, redesigning the lesson plans, personalising lesson content, as well as using student-selected content, reflecting through journal writing about self as a teacher and her daily teaching experience, getting constant feedback from learners are all, in a nutshell, successful approaches to being a creative teacher and were referred to with examples in the above chapters of the paper.

4. Conclusions

If the teacher, both in MTM and ELTM classes, is preoccupied with the way in which she can proceed in order to make all her students, irrespective of their learning level, love the subject she teaches, or become passionate about it, then creativity must have been either the means through which she managed to do that or at least the catalytic necessary element that linked subject-matter to content, methods, personal talent and professionalism. What is certain is that from this moment on, she will definitely succeed in making her students develop their sense of creativity, creativity being the driving force towards professional academic accomplishment.

Students' creativity can be supported, enhanced, and developed, in both MTM and ELTM classes, when the most appropriate didactic content is chosen or when, if choice is not an allowed option, adaptability, variation and tailoring are applied as instruments at hand to step in and take over on behalf of creativity in order to save monotony, dullness and boredom in class. Still, a boost in students' creativity cannot be registered without counting on, as well as in, the teacher's creativity which has become extremely important in today's competitive academic environment.

As Rusu (1965) very clearly stated, an important role of the teacher is that of guiding the candidate to learning so that this one should feel the charm and specific attraction of this activity. Not only that of helping the learner understand, but also feel.

The next study that the authors of this paper intend to bring to the attention of methodologists is the one which will have under stage light the most productive didactic strategies and methods of teaching-learning-assessing which, still according to the authors' close insight into the classes thei teach, provided the best results when applied and implemented, as one of the most modern and up to date means that the students can use to become actively involved and can willingly participate in the discovery of the appropriate solutions for any task they are faced with.

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