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Adaptation and Implementation of Modern Learning Techniques in Master of Sustainable Manufacturing: Cultural Challenges, Effects and Potential for Improvement

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Abstract

In the modern and globally integrated world, international cooperation in education plays significant role in making the teaching and learning process more effective, innovative and sustainable. Modern learning methods differ significantly from each other as well as from the classic ones. This article gives an overview of utilization of flexible learning methods, flipped classroom and describes subsequent changes from post communistic towards modern teaching style and challenges that professors have to cope with to adopt it. The process of implementation of techniques within Master of sustainable manufacturing program developed during the run of Eurasia project is presented and the outcomes are discussed. The study is based on empirical data from project development meetings, interviews with participants, students' satisfaction and academic results.

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1. Introduction

In the modern and globally integrated world, international cooperation in education plays significant role in making the teaching and learning process more effective, innovative and sustainable. By creating a synergy and multiplying efforts of different concepts and traditions of different cultures, we may manage to reach the sustainability of international interuniversity cooperation. It can be achieved only by picking up and combining the best practices of different educational systems that reinforce the teaching and learning process by sharing experience.

We may reach sustainability also by adopting and incorporating best matching approaches and utilizing partnering institutions' potentials and capacities. Combining efforts within sustainable international university cooperation helps to overcome the traditional educational challenges and face the current challenges and trends of modern education. The challenge to education considering time, closing the educational technology gap and discovering new pedagogy are also issues international university cooperation can help to overcome.

University wants new learning factories based pedagogy to harness the new technologies to provide a more complete and effective learning experience, and implement longstanding pedagogical notion that students do their best in learning when they study independently. In addition, we would like restoring life to education, creation of context, which is another vital pedagogy aspect, trans-disciplinarily, reuniting life and knowledge, achieving values-based and person-centered education, etc. [2].

Modern learning methods we have been using are blended learning, flipped classroom, flexible learning methods and modern teaching and learning techniques. Blended learning takes place both online and in the classroom, the online component of the learning usually consists of exercises. Flipped classroom is a kind of blended learning method, where students

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at home see video lectures online and uses the time on campus to problem solving mainly as guided teamwork.

Flexible learning methods are educational systems providing students with increased choice, convenience, together with personalization to suit their particular learning. Modern teaching is, contrary to classic lecturing methods of education, a method to make students active in their learning process, it is important with relationship between content and context. The teachers are supposed to practice students centered learning that includes practice. The methodology includes case studies, interactive activities and students' group discussions.

2. Person-centered learning model

The terms non-directive, client-centered, and person-centered used to describe the therapeutic approach developed by Carl Rogers. The therapist's task was to follow the client's lead and helping them to uncover their own solutions. The psychological environment was one where a person felt free from threat, to achieve the environment you had to be in a relationship with a person who deeply understood. Rogers replaced the term non-directive with the term client-centered [4]. Rogers' began to apply his ideas derived from client-centered therapy in other contexts, such as education [5]. The non-directive student-centred model supposes building a non-judgmental and empathic relationship between professor and student, reaching such level of a student involvement that he/she becomes an equal partner of the learning process.

Students are aware of their secured rights and degree of freedom from one side, and certain responsibility and duties on the other side. Therefore, the teaching becomes a mutual two-way creative process. Here it is very essential for a professor to not only establish a "contact" with the audience and lead the "ship". However, which is even more vital, to "feel" the feedback and how things are developing in order to be more flexible and quickly react managing efficiently the teaching process according to the real time situation.

Thus, a professor transfer to a facilitator, who carefully and emphatically listens to the students, respects and takes into account the student's point on different issues, trying to be not judgmental, but rather cooperative. Here we come up with the principles of modern Contextual Education, "Meaning emerges from the relationship between the content and its context" [6]. The teaching and learning method grounded on a constructivist theory, where data, generally any information, provides or delivers such a way, that student are capable to:

- construct meaning based on the own practical experiences
- process new knowledge with reference to their memory, practical experience and to already gained heuristics

Within the process of teaching, the contextual education supposes a constant emphasis on establishing interrelation link between different subjects, between the data and the accompanying circumstances of the findings, between lesson and learner, between theoretical knowledge and real life.

Upon delivering the necessary minimal theoretical background on a topic under consideration, students are split on occasional groups and assigned to fulfil related tasks in a form of simplified but very solid research project using all available means, tools, references and online data. Giving student a chance to express his/her own creativity while doing small group assignment and facilitating competitive presentation and follow up discussion it trains their practical skills. Important skills like investigator's / independent researcher's and team player's skills, rhetoric and presentation capabilities, ability for constructive analysis and ground discussion, encourages doing their best while competing with other group.

Before assigning the students their task as a small research project, it is important to explain the general essence of a research project. A research project consists of the two major stages – analysis (of the information, data, events, processes, etc.) and synthesis (of the results/conclusions or proposed solution concept).

In addition, it is important to mention that such tool as info-graphics (preparing / drawing the presentations on a flip chart) helps the student to turn on their imagination, visualize their points and findings and train their capability to systemize and logically interrelate things. Finally, it makes the presentation/discussion more fun and live.

The essence of the practical case study (one of the core element of the student-centered learning) concept is [7]:

- Students are encouraged to participate in the collective exploration of a sustainable development related problem-solving aiming to reach a joint resolution
- Analyzing the case story, working out the decision, drawing conclusion from the certain case and relating it to the theory
- Three key elements that make a practical case an effective vehicle for students learning the process of collective analysis, decision-making and reflection: a complex problem, an inside perspective, detailed realism

In addition, it is worth to point out importance of the combined technology of using the internet and face-to-face classes. The internet helps with work to be done before and after the classes because it provides important information and an opportunity for exchanges to happen between professors and students which otherwise would not happen. The dialogue before and after class can add a lot to the richness of the student's and professor's experience, professionally and personally, allowing for example the clarification of issues left unclear in class [5].

3. Empirical feedback on international cooperation within Master of Sustainable Manufacturing Program

The project team had to face various challenges – cultural, traditional, distance, lack of face-to-face contact while online teaching, lack of tutoring and facilitating small group presentations and follow up discussions. All these issues of