Challenges and Methods of the 21st Century in Logistics Education

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In the 21st century teachers have to face a number of expectations and challenges coming both from the customers of education services (i.e. students and the potential employers) as well as from the regulatory bodies of the service provider side (school management, governmental organizations). Teachers must meet these expectations in a constantly and rapidly changing economic, social and informational environment.

In this complex and heavily interconnected / interdependent world education should focus on developing capabilities (sometimes called soft skills) like critical thinking, communication and handling complex social situations.

In addition to these general skills, potential logistics experts also should be able to think in systems, be accurate, flexible, cooperate with other functions, etc.

In schools the "digital immigrants" (teachers) usually cooperate with the "digital natives" (Prensky, 2001) (students belonging to generations Y (Tari, 2010) and Z (Tari, 2011) to develop the desired skills and competences. The spread of Internet and e-learning platforms can facilitate this development process through the selection and combination of the adequate educational methods.

In our research, we asked students belonging to generations Y and Z studying any fields of logistics about their perception of cooperative learning.

The result will enable us to learn about the experiences and opinions of the students of cooperative educational methods. Our research compared the usefulness of different methods as perceived by students to how they are rated in the literature.

Introduction

The main research goal was to see if there is a gap between the students' competences - in the context of Logistics or Supply chain management - and the employers' needs and expectations.

To answer this question, we asked for the students' opinions about the required competences at relevant workplaces. In the questionnaire we collected the cooperative methods that the students encountered during their studies with regards to improving the required competences.

This paper presents the most prevalent cooperative methods in higher education focusing on the effects these make on the improvement of the required competences in section 2. (About these methods see Cserné, 2006) Section 3 presents the research method and the dataset. Section 4 demonstrates the main findings of the research. It is a relevant topic because logistics students are concerned with the potential employer needs and requirements after their graduation. Developing students' competences will be highly beneficial for both future employers and the students, as well.

Literature review

Education in the heavily interdependent 21st century should place the focus on developing such soft skills as communication or being able to handle sophisticated social situations as well as critical thinking. Moreover, besides these skills, the ability to think in systems and accuracy as well as flexibility would be of importance for the logistics experts of the future. It is difficult to develop these kinds of competences with traditional learning methods (teacher presentation, reading-writing, etc.). Kagan and Kagan (2010) realized that there is a special need for new teaching/learning cooperative methods, otherwise the students would not be able to acquire the new employer-required competences. (About cooperative learning, see Kagan & Kagan, 2010; Li & Lam, 2013.)

Since the eighties cooperative learning has become a crucial and acknowledged method in Hungarian schools (Benda, 2002 presented the Hungarian experience in detail). The currently used forms of cooperative methods depend on the teacher's style and preparedness. The use of these methods does not require massive investments, structural changes or special systems. To introduce such methods, it may be enough to have a single enthusiastic, dedicated teacher whose goal is to create a better atmosphere, stress-free and more useful lessons in order to enable students to gather more knowledge that is useful in real life and to eliminate the disadvantages of the competition-driven and/or frontal traditional education systems.

The cooperative learning method includes the implementation of cooperation itself. If the group is not able to cooperate to reach the given goal, the problem becomes unsolvable for them. Nowadays there are only a few jobs/workplaces where people do not need to cooperate with others to achieve corporate goals. In order to be successful at work in the future, the required competences – critical thinking, communication and handling complex social situations, thinking in systems, being accurate, flexible, cooperating with other functions – have gained an even greater importance in education.

Therefore, the application of cooperative learning is now at key importance not only because of the employers' requirements but also because generation X, Y and mostly Z cannot be satisfied by the frontal methods. Reaching these new goals and outcomes is possible by combining the available tools of schools and students as well as methods. In literature there are two other learning methods besides the cooperative one. These are the competitive and the individual learning method. Of course, each method has its own advantages and disadvantages and we need to be aware of these in order to combine and use them properly to reach the best results.

There are two approaches of the cooperative learning methods. The first one is when the teacher and the students collaborate during the process of learning, the second is when the students cooperate with each other.

In this paper we will describe the cooperative methods that are the most relevant, most prevalent and best-known by students. We will focus on how the students evaluate such methods with regards to developing the required competences.

Drama activities

Drama activities have different forms, for example improvisations, simulations, role play activities. They are most widely used in teaching English as a Foreign Language (See types of drama activities: Harmer, 2007; Scrivener, 2011; Dundar, 2013). Blatner, 1995 emphasized the importance of role play activities and other similar techniques if the teaching goal is not just about information transfer but improving problem-solving skills and communication.

Kazainé-Ónodi (2015, 2016) investigated the use of role-play activities in business education. She found a significant gap between the frequencies and usefulness of them while she explored the preferences of graduate and undergraduate students in connection with role-play activities. Moreover, she identified three main reasons for using role-play activities in business education. 1. They serve the transmission of knowledge in a more effective way. Simulations help students to understand complex problems, they can provide a deeper insight and learning than any other methods. 2. Students can try different roles which prepare them for future situations. 3. Lessons will become more enjoyable, which can serve the activation of students. According to Kazainé-Ónodi (2016) the two most important challenges of role-play activities are class management problems and students' attitude. She advised shorter games where between two activities the educator should provide students with feedback which can direct the activity toward the educational goal more easily.

Teamwork

This method is the root of cooperative learning methods. (For a detailed description see Cserné 2006.) It has many goals among which it intends to form or improve:
  ➢ the - social - cooperation skills
  ➢ the expansion of knowledge
  ➢ creativity
  ➢ problem solving in a group – teamwork

Jigsaw is a special grouping strategy, where the members of the class get into groups then they are reorganized into new groups to share what they learned. This is a special method for improving students' communication and teamwork skills (About Jigsaw method see TeacherVison, 2012; Social Psychology Network, 2000-2018).

There are usually 4-6 persons in one team. The formation of the groups can be spontaneous or constructed by the teacher. The composition can be homogeneous or heterogeneous. Groups can be created based on the members' interests, life experience, age, jobs or the problem itself that has to be solved.

The group can use different methods to complete the tasks or to reach the goals. The solution of the problem can result from discussions, debates or splitting the task into sub-tasks, solving these and then unifying the partial solutions into a final one. The weakness of this method is that when the level of motivation is too low among the members then it may happen that only one or two participants solve the problem while the others deal with off-topic activities. Usually the most active participant will be appointed to make the final presentation. The most difficult part in the end is the evaluation. Identifying the exact roles within the team and carrying out realistic individual assessments accordingly is almost impossible unless the teacher is able to follow the whole problem-solving process. Usually the final grade is accepted by the whole team. Working in teams is an effective method of constructive learning where individual opinions help to develop the necessary and pragmatic knowledge of adults.

Project-based learning (PBL)

PBL or the project method is effective and efficient for developing key competences such as problem solving, creative thinking, cooperation, handling complex information, planning and making decisions and self-evaluation skills. The participants gain new knowledge during the process. Projects are usually defined by the students/groups on their own based on a given real- life situation or on the problem to be solved or any other instructional goal. This method is featured by independence from the beginning (defining the problem) till the end (assessment) of the project, thus interest is student engagement is guaranteed during the whole

process. The students are supposed to carry out the assessments of the outcomes. During the implementation the teacher acts as a guide or facilitator, which naturally evokes teacher-student cooperation. (see Cserné 2006 pp.85-102.)

Conversation as a form of cooperative learning

According to Cserné, 2006 some important criteria to reach the teacher's goals with conversation are:

➢ The participants need to have prior knowledge and/or experience about the topic and some interest to initiate discussion about it so that they could start the "building" process.

➢ The group members should know each other already, if not then it is highly recommended to start with an introduction phase as it is obviously easier to talk to somebody who we know.

➢ The leader of the discussion needs to have the required competences to reach the goals and avoid the time spent on the activity becoming a waste.

➢ The active participation of the members is very important to prevent the conversation turning into a dialogue or monologue.

➢ Well-structured opening question.

As long as these required criteria are met, the team members will have the opportunity to discuss the questions they are interested in and as a result, their knowledge will be expanded. This is one of the methods of constructive learning, which results in an active learning process and helps reaching the learning goals too.

Training method

Cserné, 2006 highlighted that this kind of learning method will only be effective and successful if the trainer is extensively prepared. The goals of the training method is to develop such competences that are related to personality development, influencing ability, effective communication, teaching skills etc. An important feature of this method is that the expected results can be defined instantly therefore it is possible to determine how well the desired behavior was adopted. About the application of training method in higher business education see Árváné et al 2013.

Debates in class

In a debate – used for educational purposes – the role of the teacher is to define the problem to discuss, to set up and enforce the rules, to create the structure, to help move the discussion forward with questions and finally to

summarize the results. For a knowledge-expanding debate the participants need to have prior knowledge about the topic and feel motivated to tell their opinions and argue about them. Debating can be independent or a part of another method. During the process conflicting opinions and standpoints are expressed and one party develops logical arguments using this structure: 1. Assertion 2. Reason 3. Evidence, and try to convince the other that his/her own standpoint is the correct one. The debate improves very important key competences and skills, such as self-knowledge, tolerance, logical and critical thinking, synthesizing information and proper argumentation. (About the usage of debates in higher education see Brawn, 2015; ACU, 2012.)

The moderation method

This method is very similar to the conservation and the debate methods. According to Cserné, 2006 the basic difference comes from the layout of the classroom and from the devices used. The chairs are placed in a half-circle shape to facilitate open communication while the main purpose of the devices used – flip charts, cardboard sheets, thick marker pens, glue etc. – is to help record and organize the ideas emerging throughout the process. This method improves cooperation skills, creativity, the ability to evaluate and organize and the expression of thoughts in an appropriate way.

In the moderation method the groups improve their knowledge and solve the problem through an independent learning process. Unless the members know each other well, it is recommended to start with a phase when they introduce themselves to avoid the effects of isolation and forced motivation. The keys to the successful use are the well-motivated students and the moderator who practices the methodology at such a high level that he/she is able to support the process by bringing the ideas to the surface and asking leading questions. It is important to note that the moderator does not have to be an expert of the topic discussed.

The case study method

The goal of this method is to analyze a specific situation – usually described in writing – based on the participants' prior knowledge. In the optimal case the problem reflects a real situation (case) the source of which is a press release, academic literature, own experience etc. The case is described in a concise manner highlighting the important information. The missing information pieces should be filled in by the participants using their creativity. There are two types of cases: 1. Open case: when the team needs to come up with the solution. 2. Closed case: when the case is presented together with the solution and the task is to argue for or against its successful usefulness.

It is also possible to combine the two types if the team finds the originally presented solution inadequate. If the method is used with separate teams it is worth looking into the different solutions and analyzing the different viewpoints used. The advantage of this method is that it builds upon the experience of the team members, enables individual problem assessment and facilitates active thinking. About the case study method in management education see Shivakumar (2012).

Research method

The purpose of this research is to learn about the opinions of the students (in further education/ adult training course - in Hungary it is called "OKJ" - and MSc levels) on the awareness and usability of the cooperative learning methods they encounter during their studies with regards to the competences required by the employers.

The online survey was conducted in one logistics assistant training course and four logistics- and forwarding assistant courses of the Budapest Center of Economic Vocational Training and in three MSc supply chain management courses of Corvinus University of Budapest in October 2017. The participation was voluntary, and 86 persons completed the survey. The split of the students completing the survey was the following: adult training course - OKJ - :35% (30 students), MSc: 65% (56 students).

It is worth taking a look at the age distribution. Table 1. shows that only 10% of the respondents are over the age of 30, and 90% are between the ages of 18-26. The breakdown of the latter group is the following: between the ages of 18-20 17.44%, between the ages of 21-23 18.6%, and between the ages of 24-26 53.49%. The mean of the respondents is the age of 25. The gender distribution of the participants is 72% female and 28% male.

Table 1. The distribution of participants by age

Age	%	Count
24-26	53.49%	46
21-23	18.60%	16
18-20	17.44%	15
30-40	4.65%	4
41-50	4.65%	4
50-	1.16%	1
27-30	0.00%	0
Total	100%	86

Source: own research

The survey was run in each group using the same method. Its link was presented on a platform accessible for everyone (Moodle, Facebook), with a short description of the purpose and the link led to the online survey interface accessible both from PC and mobile devices.

Findings

Awareness of cooperative methods

Students were asked to answer the following question: "Which cooperative teaching method do you know?" Multiple answers could be selected. Table 2. summarizes the awareness of cooperative methods based on 86 respondents.

The best-known methods are teamwork (94%), field trips – company visits – (87%), learning through online interfaces (74%), the case study method (72%) and the guest lecturer method (72%). These are closely followed by simulation games (69.77%), short videos (69.77%) and project based learning (59%). The least-known ones are the conversation (as a form of cooperative learning) (50%), the debate method (48.84%) and the training method (34.88%).

We can see that the best-known method is teamwork while the least-known one is the moderation method (12.79%). Note that two persons selected company visit as "another" method however this is included in the field trip method that is why the moderation method was evaluated as the least-known one.

Table 2. Awareness of cooperative methods

Methods	%	Count
Field trip	87.21%	75
On-line applications for learning (kahoot, learning apps, mentimeter)	74.42%	64
Simulations games	69.77%	60
Short videos	69.77%	60
Teamwork	94.19%	81
Project - based learning	59.3%	51
Conversation as a form of cooperative learning	50,00%	43
Training method	34.88%	30
Debates in class	48.84%	42
The moderation method	12.79%	11
The case study report	72.09%	62
Guest lecturer	72.09%	62
others:	2.33%	2
Total	100.00%	86

Source: own research

The development potential of the selected methodologies

The survey question was: "To what extent do you think the listed methods help developing the required competences related to the fields of supply chain management (purchasing, manufacturing, warehousing, distribution)? (1: not at all 5: absolutely)"

Teamwork was the best known method and it was evaluated as one of the most useful methods (4.05), therefore this method seems to have the highest potential to develop the required competences. It is worth noting that there were only two methods – teamwork and project-based learning – where the average rating was over four (See tables 3, 4). Among well-known methods, after teamwork the most useful methods were individual presentation (3.95), simulation games (3.89) and field trips (3.88). Despite the fact that generally students thought that teamwork was useful, the declared usefulness of teamwork at home was not so high (3.45). The majority of students gave it only a score of 3 points. Only short videos received a lower rating (3.39). (See table 3)

Table 3. Evaluation of frequently used methods - "To what extent do you think the listed methods help developing the required competences related to the fields of supply chain management (purchasing, manufacturing, warehousing, distribution)? (1: not at all.. 5: absolutely)"

Methods	number of respondents	mean	minimum	maximum	modus
Teamwork	85	**4.05**	2	5	5
Individual Presentation	85	**3.95**	1	5	4.5
Field trips	81	3.88	1	5	4.5
Simulation games	82	3.89	1	5	4
Presentation in group	84	3.70	2	5	4
Guest lecturer	83	3.65	2	5	4
Teamwork at home	84	3.45	1	5	3
Short videos	82	3.39	1	5	4

Source: own research

Project-based learning proved to be as useful method as teamwork according to the students. (Only 20% of them could not evaluate this method). Less than 60% of the students could rate training methods but they considered it useful (3.94). Debates in class (3.82), conversations (3.78) and case studies (3.71) proved to be more useful than online applications for learning (3.28) and the moderation method (3.26). (See table 4)

Table 4. Evaluation of rarely used methods - "To what extent do you think the listed methods help developing the required competences related to the

fields of supply chain management (purchasing, manufacturing, warehousing, distribution)? (1: not at all - 5: absolutely)"

Methods	number of respondents	mean	mini-mum	maxi-mum	modus
Debates in class	71	3.82	1	5	5
Conversation as a form of cooperative learning	68	3.78	1	5	5
Project-based learning	68	**4.01**	2	5	4
The case study report	77	3.71	1	5	4
Training method	51	3.94	2	5	4
Online applications for learning (kahoot, learning apps, mentimeter...)	76	3.28	1	5	4
The moderation method	31	3.26	2	5	3.5

Source: own research

Overall, we can say that teamwork, project-based learning and the self-prepared presentations have the highest potential for developing the required competencies. The survey pointed out that the usefulness of different activities in groups could be different. Finally, it is worth noting that the declared usefulness of online applications and short videos did not reach the other methods' usefulness.

Conclusion

The research goal was to introduce the cooperative learning methods and assess their awareness within the different fields of logistics education. As a result of the research we can state that the participants are aware of the cooperative learning methods and they know the development potential of these methods concerning the required competences.

The further development of the research described in this paper is already in progress: it will include assessment of the competences expected/required in the different fields of logistics based on real data from the industry, a more thorough examination of the main hypothesis as well as extending the survey to a larger audience and also providing a concise description of the relevant attributes of generations Y and Z (Tari, 2010-2011).

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