

KNOWLEDGE COMPETITION: AN ENTERTAINING AND USEFUL WAY TO REVIEW CONCEPTS THAT WOULD ENABLE STUDENTS TO DEVELOP OTHER UNDERLYING SKILLS

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Abstract. *Traditional examinations are demotivating for most students and difficult to implement in practical lessons (mainly based on skills). Therefore, innovative assessment methods where students play a major role in making the choice of it can motivate students better than traditional methodologies. Based on Teams-Games-Tournament (TGT) technique developed by DeVries and Edwards (1973) and DeVries and Slavin (1978), this paper presents a cooperative learning technique to assess a course, as an alternative to traditional assessment methods. Students are actively involved in the decision-making process to choose the continuous assessment criteria. It fosters group cooperation to achieve common goals as well as healthy competition among teams. The purpose is to promote knowledge and transfer of learning among groups, develop cross-curricular skills, motivate and encourage students. Several techniques proposed by students were implemented in different courses. Most of them were successful and highly valued by students, who think it is a stimulating way to test knowledge, creates a positive atmosphere, fosters class participation, has a positive effect in the students' mood, and makes lessons more interactive as well as interesting, among many other advantages. As a result, students strongly recommend implementing this learning technique in other courses.*

Keywords: knowledge competition, Teams-Games-Tournament, review, concepts, learning.

1. INTRODUCTION AND LITERATURE REVIEW

Courses like Managerial or Communication skills are often seen by students as non-relevant and useless, which results in their disengagement from the subject. If students disengage from the course at undergraduate level, then how are we going to create innovative and creative thinking professionals who have to critically think, motivate people, make complicated decisions, find "out of the box" solutions to ordinary problems, and deal with other real world issues? In response, traditional learning and assessment methods need to be changed in order to enable students to learn cooperatively and to take active participation in the learning strategies design.

Given the difficulty of assessing theoretical content in courses which are mainly based

on skills, and in the light of the need to engage students in the course and to attract their interest in it, it was essential to find a new continuous assessment methodology. The purpose was to consolidate the academic knowledge acquired about different skills, before performing tasks involving those skills. Similarly, traditional tests were avoided, since standard methods to assess theoretical knowledge had been already applied without any success and without engaging students. The aim was to adopt a more playful and entertaining methodology, so that at the same time that students learn they are also motivated.

In this context, some researchers found that games are effective as a way of learning (Kayes, Kayes & Kolb, 2005; Kolb & Kolb, 2010). Games are used in education as part of the experiential learning process (Camp, Avery & Lirely, 2012). Thus, educational games are a useful teaching strategy to develop cooperative learning (Hainey, Connolly, Stansfield & Boyle, 2011). When students have the opportunity to incorporate course content within a game, and then play the game in class, students acquire significant knowledge through their gaming experience (Coller & Scott, 2009). In a similar vein, Light (2001) identified that student learning teams are extremely effective; students learn considerably more and are better prepared. An alternative to the individual assessment is the group assessment, in which students are allowed to support each other in their learning tasks. Taking all of that into consideration, a classroom method involving all those benefits is the **Teams-Games-Tournament** (TGT) technique, first developed by DeVries and Edwards (1973) and later improved by DeVries and Slavin (1978), as a useful cooperative learning technique to assess a course. TGT is an alternative to traditional assessment methods such as individual tests. It is based on group cooperation to achieve common goals. Students learn to compete among them in a healthy way through cooperative work.

One of the objectives of TGT is to create a positive and participatory learning environment which fosters cooperation (within teams), competition (among teams), knowledge as well as students' involvement and proactiveness. Therefore, this method involves both cooperation (on small work-oriented teams) and competition (across all the teams). Van Wyk's (2011) study results indicated that the cooperative learning technique TGT is more effective in terms of academic achievement than the traditional lecture method.

According to the name (Teams-Games-Tournament), this learning method has three main components (DeVries & Edwards, 1973; DeVries & Slavin, 1978):

1. Students are divided into small groups (3 to 5 people). The teacher explains the lesson and then students work in groups to check that all members know what has been taught.
2. Games are played during tournaments, as a technique to review academic concepts. Each game is played after one or more units have been taught. Teams compete against others on academic content to contribute points to their team scores. Games can consist of different questions covering topics taught in class. Points are awarded according to teams' performance. The idea is that all team members have equal opportunities to contribute to the group score. Therefore, competition is balanced, as students will face others of their same level. The group score will mean the same grade to all their members, and it will be taken

into account as part of the personal assessment in the course.

3. The academic tournament is held over a period of time, in which games are played several times. Finally, the winner or the best group is announced by the teacher, and can receive a specific reward.

Research shows (DeVries & Edwards, 1973; DeVries & Slavin, 1978) that TGT increases academic achievement, student satisfaction with the course, cooperation among students, acceptance of classmates and understanding of the concepts. Students' desire to win the game motivates them to review course materials before they play, which in turn can improve student motivation and help them to achieve better learning outcomes (Jong, Lai, Hsia, Lin & Lu, 2013). Moreover, TGT and game-based cooperative learning present many other advantages:

- It does not need special or expensive materials.
- It is easy to implement and perform in 45 minutes classes and in any course.
- Students learn in an enjoyable and informal way, so that they do not feel bored (Ketelhut & Schifter, 2011). At the same time, students improve their interpersonal relationships, get to know their group, and recognize the efforts made by each team member.
- Increase academic achievement, since learning process is more attractive and students are more willing to work.
- Improve students' attitudes and responsibility, as they have to attend classes to play the game and support their team.
- Increase students' motivation, who feel encouraged to review the knowledge they have just acquired (Ketelhut & Schifter, 2011).
- Improve students' communication skills, since students can exchange knowledge with one another during the game (Ketelhut & Schifter, 2011).
- The instant feedback provided by the instructor allows students to know their results and learn from their mistakes (Ketelhut & Schifter, 2011).
- Foster positive attitudes, such as cooperation, responsibility, tolerance, and acceptance of others' opinions.
- Games and simulations blended with real world technology can improve the quality of learning, and employable skills (Davis, 2011).
- Simulate the real world, involving collaboration within a team and competition among teams. Team members cooperate with each other to compete with other teams.

Team games have been broadly used in cooperative and experiential learning approaches. Camp, Avery & Lirely (2012) implemented a successful teaching strategy that involved students in the learning process by requiring them to design a game that the whole class would play with the aim of increasing student knowledge and retention of course materials. Enable students to develop their own games has been proved to be a better way to enhance student motivation and deep learning, more than playing an existing game (Vos, Van Der Meijden & Denessen, 2011). Therefore, games and simulations should be considered as part of the teaching and evaluation method, as a way to narrow the existing gap between academic and professional environment.

2. OBJECTIVES

In relation to TGT purpose, the objectives of this study are the following:

- Review a unit or substantial part of the content about a given course.
- Learn new concepts and reinforce what has been learned.
- Introduce ludic methodologies in the classroom, aimed to review concepts.
- Compete cooperatively among different teams.
- Promote knowledge and transfer of learning between groups.
- Assess theoretical content with unconventional methodologies.
- Develop interpersonal communication skills as well as creative skills.
- Involve students to actively participate in choosing a continuous assessment method.

3. METHODOLOGY

A similar TGT technique was carried out with students pursuing degrees in the Social Sciences area (such as Business Management, Marketing, Finance, Tourism, or International Relations) at Universidad Europea (Madrid). It was specifically implemented in several Communication Skills and Managerial Skills classes, during the academic year 2013/2014.

The classroom method was called “Knowledge Competition”. Students were requested, in groups, to think of a way to review the concepts of one or more units (once the unit was taught, and therefore, finished). It could be a game, a competition, an activity, etc. The idea was to do a kind of knowledge competition between different groups. It should involve all students and serve to review the concepts of the course in a playful and participatory way.

Each group had to define the rules of the task (including the way to earn points, or anything needed to know in order to play the game correctly). Groups also had to think about the score system and how it should be graded, that is, how game scores would be translated into a mark (there could be a group or an individual assessment, based on participation and performance). The grade obtained in the game was included as part of the continuous assessment of the course (which weighted 35% in the final grade).

These were the guidelines to follow:

1. Think of a knowledge competition proposal in groups and write down the instructions of it.
2. Upload it to Moodle (virtual shared space of the course).
3. Explain and present the proposal in class to the rest of the groups.

After the different proposals were known, all students had to vote to decide which proposal was going to be finally implemented. The elected proposal would be checked and approved by the teacher, and then uploaded to Moodle so that everybody had access to the information. If needed, the whole class would prepare any required material.

Since the knowledge competition was implemented in several classes during the academic year, different proposals were also carried out. The main features of some of them are the following:

- One of them was based in an existing game called **Halli Galli**. It consisted of a competition between two teams, who had to answer five questions per round. All students played in at least one round. The faster player in ringing the bell could give an answer. If it was wrong, the competitor had a chance to answer. Teams were accumulating points according to right answers.
- One game was called **Video Competition**, as it was about relating the studied concepts to videos. Each group had to find (or make) a video which reflected a specific concept or skill, and the rest of the groups had to guess the concepts or skills shown in each video.
- One group designed a **game board**, to play in groups. The game was played according to the set of rules developed by the students. It had several boxes with different functions each (e.g. answer a question, bonus, meetings with the CEO, bankruptcy). The winner was the first group arriving to the final box.
- Another game involved to show **time limited questions** in a Power Point. The group had to agree in an answer and write it down in a piece of paper. Before the time was over, each group had to stop writing and raise up their papers with the answers. The instructor checked the answers, and students earned points according to right answers.

In the different knowledge competitions, students had to think the questions to ask to the rest of the class. Thus, it was also a way to review concepts. Abramson, Burke-Bergman, Nolf and Swift (2009) argued that preparing game material (such as questions) by students will force them to have lecture notes more organized and will enhance their critical thinking skills.

4. OUTCOMES AND STUDENT PERCEPTIONS

The overall results of the different knowledge competitions were the following:

- **Halli Galli** performance was successful, promoted competitiveness among students, who were concerned with reviewing topics before playing. Some of them complained about the difficult questions asked by their peers.
- The **Video Competition** was a bit chaos and messy, because it was quite difficult (or too easy) to exemplify concepts through videos.
- The **game board** was a good idea, but difficult to be performed in class because it took too long to play it properly. Therefore, it could not be implemented, as it was very time consuming. Instead, we played to **Kahoot** (online quizzes in which students answered questions in real-time through their laptops, tablets or smartphones, and played against each other) (see <https://getkahoot.com/>). Students found it more engaging and motivating, and it allowed them to obtain quick individual results.
- The **time limited questions** were also successful among students and the implementation did not have major problems.

Moreover, at the end of each trimester, all the students were asked to complete a survey of the competition (see below questions in bold and italics, and answers in bullet points). The results were as follows:

		<i>I personally found the Knowledge Competition...</i>					
		Very	Quite	?	Quite	Very	
Boring					40%	60%	Stimulating
Useless				10%	40%	50%	Useful
Irrelevant	2%			3%	40%	55%	Relevant
Poorly conducted			1%	1%	55%	43%	Well conducted
Undemanding			10%	15%	55%	20%	Demanding
Objectives not achieved				8%	28%	65%	Objectives achieved
Poor use of time spent			3%	3%	23%	73%	Good use of time spent

Table 1. Source: Prepared by the author, based on the data provided by students.

The most useful elements and what pleased me most about the Knowledge Competition were:

- Fostering teamwork.
- Reviewing course content and learning from your own mistakes.
- Funny way of learning. Makes studying more fun and boosts motivation.
- Thinking about questions (teacher's role), as it is a way of reviewing topics at the same time.
- Easy to understand and perform it, and useful to learn and remember new concepts.
- The fact that it was a game and a friendly competition, which had a positive effect in the students' mood, and made it more interactive as well as interesting.
- Students know their right answer immediately, which makes easier learning from mistakes and remembering correct answers.
- Positive atmosphere and class participation.
- Fostering knowledge sharing among students, and developing negotiation and decision-making skills (to make fast decisions).

The least useful elements and what annoyed me most about the Knowledge Competition were:

- Short time to answer.
- Group focused: it could lead to conflicts to choose the right answer.
- Students' grades depending on others or relying too much on your group.
- Some tricky or confusing questions.
- Some logistics and internet problems that slowed down the competition.
- People looking at someone else's results and trying to cheat.

Do you think it would be worth implementing the Knowledge Competition proposal in other courses? Would you make any change?

- 80% of students stated that the Knowledge Competition could be easily implemented in other courses, especially in theoretical ones, as it is a stimulating way to test knowledge. Classes would be more interactive and dynamic.
- Students mentioned they would like to implement more interactive processes to other classes. They think that apart from being a good way to review what has

been studied in class, it is useful to get to know their classmates. Moreover, it is a way to foster motivation among students, who in this way are eager to study more frequently.

Any other comment, criticism, or suggestion:

- Knowledge competitions were a great and exciting alternative to ordinary tests and exams.

Students' feedback is fairly positive. There is clearly a strong feeling that it worked well as a learning tool, was enjoyable as well as useful, and it allowed to achieve the proposed objectives.

5. CONCLUSION

The experience was extremely positive and stimulating. The way professors assess students can really make a difference to how students learn. Changing traditional forms of assessment into competitions or games can be highly motivating for students.

Students must become independent, lifelong learners, so instructors must help them take responsibility for their own learning. Moreover, the possibility to customize their learning activities or be involved as partners in assessment can be a powerful motivator for students.

With the methodology used, students learnt not only the main concepts of the course, but also many other underlying skills, such as researching, planning, cooperating, negotiating, making quick decisions, and critically assessing their own learning experiences. All the mentioned skills are crucial to succeed both academically and professionally.

A learning and assessment method such as the one explained in this paper would be equally beneficial to students from other areas, and hence applicable to any course or degree. Therefore, it is a valuable and useful cross-curricular tool.

REFERENCES

- Abramson, C.I., Burke-Bergman, A.L., Nolf, S.L., & Swift, K. (2009). Use of board games, historical calendars, and trading cards in a history of psychology class. *Psychological Reports*, 104, 529-544.
- Camp, K.M., Avery, S., & Lirely, R. (2012). Cooperative-experiential learning: using student-developed games to increase knowledge retention. *Journal of Instructional Pedagogies*, 9, 1-10.
- Coller, B.D., & Scott, M.J. (2009). Effectiveness of using a video game to teach a course in mechanical engineering. *Computers & Education*, 53(3), 900-912.
- Davis, J.S. (2011). Games and students: Creating innovative professionals. *American Journal of Business Education*, 4(1), 1-11.
- DeVries, D. L., & Edwards, K. (1973). Learning games and student teams: Their effects

on classroom process. *American Educational Research Journal*, 10, 307-318.

DeVries, D. L., & Slavin, R. E. (1978). Teams-Games-Tournaments (TGT): Review of Ten Classroom Experiments. *Journal of Research and Development in Education*, 12(1), 28-38.

Hainey, T., Connolly, T.M., Stansfield, M., & Boyle, E.A. (2011). Evaluation of a game to teach requirements collection and analysis in software engineering at tertiary education level. *Computers & Education*, 56(1), 21-35.

Jong, B-S., Lai, C-H., Hsia, Y-T., Lin, T-W., & Lu, C-Y. (2013). Using game-based cooperative learning to improve learning motivation: A study of online game use in an operating systems course. *IEEE Transactions on Education*, 56(2), 183-190.

Kayes, A. B., Kayes, D. C., & Kolb, D. A. (2005). Experiential learning in teams. *Simulation & Gaming*, 36(3), 330-354.

Ketelhut, D.J., & Schifter, C.C. (2011). Teachers and game-based learning: Improving understanding of how to increase efficacy of adoption. *Computers & Education*, 56(2), 539-546.

Kolb, A., & Kolb, D. A. (2010). Learning to play, playing to learn: A case study of a ludic learning space. *Journal of Organizational Change Management*, 23(1), 26-50.

Light, R. J. (2001). *Making the most of college: Students speak their minds*. Cambridge, MA: Harvard University Press.

Van Wyk, M.M. (2011). The effects of Teams-Games-Tournaments on achievement, retention, and attitudes of economics education students. *Journal Social Science*, 26(3), 183-193.

Vos, N., Van Der Meijden, H., & Denessen, E. (2011). Effects of constructing versus playing an educational game on student motivation and deep learning strategy use. *Computers & Education*, 56(1), 127-137.