

Theory in the Picture: Video Production as a Tool in Accounting Teaching

Abstract

Leveraging students' interest and experience in using technology to achieve learning objectives in a course is a challenge for educators. The production of video by students is a teaching-learning method that involves technological resources and requires that the student take an active posture in the learning process. This activity can help in the development of the skills and competences required for accountant training, such as thinking conceptually, relating theory and practice and exercising creativity and leadership. In that sense, the purpose of this research is to analyze the students' perception of the usefulness of video production as a teaching-learning mechanism in the subject Accounting Theory. The study participants were 65 students, enrolled in this discipline in the second semester of 2015 at a public university in Minas Gerais. The results of the research suggest that, in the students' perception, the production of videos made the content of the discipline more interesting, instigated the creativity to use the concepts, besides developing skills such as commitment to the group, organization, planning, dynamism, creativity, proactivity, interpretation and self-learning. It is concluded that the method is timely and its continuity is recommended as didactics in the teaching of Accounting Theory and other contents.

Key words: Video production; Accounting Theory; Teaching technology.

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1. Introduction

Technology has become a significant element in the university environment (Goode, 2010) and students are immersed in a context of high availability of resources, both inside and outside the classroom. With rapid technological progress, the new generations of students, known as generation Y (born between 1960 and 1980) and generation Z, identified as digital natives (born between 1990 and 2010), are always connected to the internet, making intensive use of resources (Castanha & Castro, 2010). Thus, the challenge for educators in higher education is to leverage students' interest and experience with technology to achieve the learning objectives of a course (Engin, 2014). Therefore, it is necessary to discuss the inclusion of such resources in the teaching-learning process in order to attract students' attention (Castanha & Castro, 2010).

The production of videos by students is a teaching-learning method that involves technological resources and requires that the students take an active posture in the learning process (Engin, 2014). This method allows the student to research and understand the topic, having to simplify the information, summarize, synthesize the relevant parts of a subject - which requires a critical and responsible attitude in learning (Engin, 2014). With this, creating videos enables learners to build and rebuild their learning, helping them to develop creativity and leadership skills; teamwork; communication; critical and conceptual thinking; and relating theory and practice (Silva & Oliveira, 2010, Holtzblatt & Tschakert, 2011, Engin, 2014).

Lessons can be made more dynamic by preparing videos, reducing the number of lectures and allowing students to research and develop activities outside the classroom (Holtzblatt & Tschakert, 2011). For Holtzblatt and Tschakert (2011), this strategy can offer several benefits to the teaching of Accounting, such as: helping students memorize key concepts, linking them to practical experience; improving communication skills and persuasion; favoring greater accommodation of the different learning styles; and increasing student motivation and enthusiasm. For the authors cited, the video preparation strategy reaches the cognitive and emotional levels of the student, strongly impacting the motivation and the affective learning. Video production also has the ability to engage students, stimulate a strong interest in a topic, activate emotional states, and facilitate the absorption and processing of information (Marshall, 2002).

The elaboration of videos is an appropriate strategy for the teaching-learning of both practical and theoretical contents (Sargent, Borthick, & Lederberg, 2011). According to Sargent et al. (2011), such an activity may be useful in reducing students' anxiety about mathematics-related content in the teaching-learning process of accounting, in order to make learning the practical content of accounting easier and more motivating, as well as to develop, in students, the ability to think conceptually and to build a solid conceptual foundation in the learning of Accounting Theory. Thus, from the beginning of the course, in the introductory disciplines of Accounting, conceptual thinking could be developed through the production of videos (Sargent et al., 2011).

Thus, in essentially theoretical disciplines, such as Accounting Theory, the use of video production could make classes more dynamic, interesting and didactic, benefiting students and teachers. In this discipline, compulsory in the course of Accountancy since the publication of Resolution No. 732/1992 (CFC, 1992), concepts, theories, controversies and principles of accounting are presented. On that occasion, the student is instigated to think conceptually and critically, skills that can be developed during the construction of the videos.

In this context, the objective of this research is to analyze the students' perception of the usefulness of video production in the teaching-learning process of the subject Accounting Theory. The students' perception was obtained through a survey carried out with 65 students from the sixth period of the Accountancy course at a public university in Minas Gerais, in the second semester of 2015.

This research is relevant to evaluate the students' perception about the use of video production as a teaching-learning mechanism, being a sign of effectiveness in the approach of theoretical contents of Accounting and to verify if there is an increase in the practical training of the student (such as the development of skills in group work, organization and distribution of tasks). Based on its results, we hope to contribute to the literature by expanding discussions about strategies that produce improvements in accounting learning. In addition, the students' perception of the effectiveness and results of the application of the method may point to an alternative path when skills and competencies need to be developed that are relevant to the training of accounting professionals.

2. Literature Review

2.1 Technology and teaching of Accounting Theory

People belonging to generations Y and Z have grown up under the influence of technology because they know the innovations and even help other people to use these new technological resources, such as smartphones, tablets, notebooks (Castanha & Castro, 2010). For Castanha and Castro (2010), in relation to the teaching-learning process with teacher-centered educational models, many of these people, mainly generation Y, do not present good results and show apathy in performing the activities suggested by educators. Therefore, when teachers use technology tools the students are familiar with and use on a day-to-day basis, they can get closer to the students, stimulating their interest in the activities carried out in the classroom.

Still from the authors' perspective, the Y generation lives in an immediate world, connected all the time, obtaining the most diverse information it needs from the available technological resources and easy access to the media. Thus, it will not be possible for the educator to disregard technological advances and existing generational changes and disregard differentiated strategies that create a space of communication between student and teacher (Castanha & Castro, 2010).

For Engin (2014), teaching, through the various technological devices, makes the students become active in the learning process, granting them the responsibility for researching part of the content studied. Dahawy, Tooma and Kamel (2005) believe that the use of information technology and communication in the classroom allows students to learn at their own pace, as they will have more time and flexibility to use the material, freedom to take initiative, which will arouse creativity in the learning process. These authors also point out that the use of technology in classrooms enables students to learn to work together.

According to Machado, Vieira and Meirelles (2012), Castanha and Castro (2010) and Silva and Oliveira (2010), the way the teacher plans the lesson and how it happens is what awakens a certain degree of interest in the students, demanding the use of teaching methods based on the technological resources of information and communication and the intention to make education more appropriate to the reality of digital natives.

It is also opportune that teachers combine several teaching methods to attract students, since, according to Neves Júnior and Rocha (2010), no two persons are the same, with different learning styles that deserve the educators' attention. For the authors, the knowledge obtained through the different teaching methods leads the students to take advantage of the learning strategies employed by the teachers, to develop the skills and competences that may be required by the job market in the future.

Machado et al. (2012) believe that the use of technologies within the classroom transforms teaching, often theoretical and decontextualized, into a more dynamic and pleasurable process. Thus, the use of technology in teaching Accounting Theory may be appropriate because it is an essentially theoretical discipline, which may mitigate difficulties in understanding and interpreting accounting procedures and norms, reducing the students' lack of interest, because it is a discipline that requires more attention, concentration and reading (Campos, Machado, & Rech, 2015).

It can be perceived, therefore, that students and teachers can gain from the use of technologies in the teaching-learning process of the discipline Accounting Theory, since this method can arouse the creativity and motivation of students in the development of activities and in studying the course content.

2.2 Video production as a teaching-learning strategy

For Leal and Cornachione Júnior (2006), the school is the place where the student can experience and have contact with problems and elaborated questions, awaken critical thinking and learn to be creative. In the Accountancy course, Accounting Theory has the role of instigating students to reflect, seeking to develop critical thinking and encouraging them to expose and confront their ideas with other points of view (Campos et al., 2015).

Silva and Oliveira (2010) believe that the production of videos helps in the development of diversified skills in student training, being a pedagogical tool that produces learning in a meaningful, motivating and dynamic way. For these authors, media resources, especially video, awaken creativity while building multiple learnings in accordance with the students' sensitivity and emotions.

The video production, then, as a teaching-learning tool, furthers the students' in-depth understanding of the course content, awakening critical thinking and the will to explore (Engin, 2014). When approaching a theme through video production, the student will have to learn the content to pass on its knowledge and understanding to those who are watching (Engin, 2014).

In this context, video production is associated with the development of the idea of responsibility assumed by the students, in the collective construction of a product, in which the teacher has the role of mediator in guiding the groups (Pereira & Rezende Filho, 2013). The video production enhances the student's autonomy in the learning process and the teacher helps the students in the interaction with the proposed activity and among the peers (Almeida, 2013).

According to Vargas, Rocha and Freire (2007), although the production of digital videos is related to entertainment and fun, it can be used as a teaching-learning activity with high educational potential. The authors highlight the main educational benefits that can be achieved with this method:

- **Improvement of critical thinking:** it develops an analytical basis necessary for the student to become more observant and critical about the products of this type of media;
- **promotion of expression and communication:** the students involved in this activity tend to lose their shame and expand their forms of discussion, that is, to be in a group, the students need to express their opinions and get into the picture to develop the activity;
- **fostering of an interdisciplinary vision:** the process of producing videos is an activity in which students learn in an interdisciplinary, flexible and practical and not only theoretical way, that is, it causes the student to convey their understanding about the subject, instead of just standing as a passive listener;
- **integration of different capacities and intelligences:** the production of videos awakens possibilities, such as: linguistic, logical-mathematical, musical, spatial, body-synesthetic, interpersonal and intrapersonal intelligence; and
- **boosting of group work:** it values social interaction, participation and the initiative of the students, demanding good coexistence among them.

The creation of videos can help in the development of skills and competences required for the exercise of the accounting profession (Holtzblatt & Tschakert, 2011). For Costa, Santana, Brounbeck and Gomes (2016), the most appropriate skills for the training of the accounting professional are: the ability to determine several alternatives for solutions to real problems; interpret scenarios; consolidate various contents of the subject and course and associate them with practice; and develop critical sense and individual accountability for the learning itself. It is noticed that the video production activity can help in the improvement of these skills.

In addition to the skills mentioned, Martin, Evans and Foster (1995) also point out that the method of producing videos requires a greater degree of active participation and concentration than traditional methods, such as the lecture. The production of videos makes the students research the subject, search for bibliographies, understand, simplify, evaluate and select the relevant information, which forces them to leave their comfort zone and take responsibility for their own learning (Engin, 2014). For Engin (2014), the process of researching, collecting and explaining information about a given topic is a fundamental part of knowledge development.

Some skills and competencies can be developed throughout the process of creating videos. Vargas et al. (2007) divide this process into three stages: 1) pre-production, which consists of the preparation, planning and design of the video to be produced; 2) production, which is the filming of the scenes that will compose the video; and 3) post-production, which consists of the finalization of the video, with the editing and the organization of the scenes. Pereira and Rezende Filho (2013) also point out that, in this process, students spontaneously resort to non-mandatory elements, such as music and dramatization, which are part of their culture and make the video more attractive, showing that this activity arouses creativity and enthusiasm in learning.

Almeida (2013), in investigating the production of videos in the classroom, concluded that students, in addition to solving the requirements proposed by the activity, also develop organizational skills, group negotiation and search for solutions to unexpected issues. In this line of thought, Vargas et al. (2007) concluded that the use of video awakens motivation in students; promotes the loss of shyness and increased self-confidence; instigates teamwork and causes students to get out of the routine of passive agents in the teaching-learning process. This assertion is confirmed by Malheiros, Lima and Mariani (2016, p.1088), when referring to the playful function of video as a form of motivation and involvement, considered as a “source of pleasure and the benefit becomes indispensable and motivating for the spectators, being a *conditio sine qua non* for learning to occur.”

Besides the playful function, pointed out by Malheiros et al. (2016), the production of videos also has informative functions (when portraying realities); evaluative (self-assessment results from being able to see how others see it, permitting the identification of addictions, behaviors, expressions and other points of improvement); motivational (possibility of stimulation, sensitization and provocation of the public); and expressive (the video portrays the manifestation of visions, desires and feelings of its authors).

Table 1 presents a summary of the skills and competencies that can be developed through the production of video, according to the literature.

Table 1:

Skills and competencies that can be developed through video production

Skills and competencies	Source
Dynamism	Silva and Oliveira (2010)
Autonomy in the learning process	Almeida (2013)
Memorization of key concepts, linking them to the practical experience.	Holtzblatt and Tschakert (2011)
Sharing the learning	Engin (2014)
Understanding of content	Engin (2014)
Communication	Vargas <i>et al.</i> (2007)
Concentration	Martin <i>et al.</i> (1995)
Creativity	Silva and Oliveira (2010), Pereira <i>et al.</i> (2013)
Stimulating strong interest in a topic	Marshall (2002)
Facilitating the absorption and processing of information.	Marshall (2002)
Interaction among peers and group work	Vargas <i>et al.</i> (2007), Almeida (2013)
Interdisciplinarity	Vargas <i>et al.</i> (2007)
Motivation and enthusiasm	Vargas <i>et al.</i> (2007), Silva and Oliveira (2010), Pereira <i>et al.</i> (2013), Malheiros <i>et al.</i> (2016)
Negotiation and leadership	Almeida (2013)
Active participation	Martin <i>et al.</i> (1995), Vargas <i>et al.</i> (2007)
Critical thinking	Vargas <i>et al.</i> (2007), Engin (2014)
Research	Engin (2014)
Accountability for learning, self-learning	Pereira <i>et al.</i> (2013)

Source: elaborated by the authors.

In short, the use of video production can further the expansion of the students' knowledge, turning the teaching-learning process attractive and allowing them to interact more in the classroom, also arousing organization and planning skills.

3. Methodological Aspects

The strategy of video production was used as an evaluation activity for two classes that studied the subject Accounting Theory, taught in the sixth period of the Accountancy course at a public university in Minas Gerais during the second semester of 2015. It should be emphasized that the Accountancy course at the university studied takes five years, that is, ten semesters.

To perform the activity called Theory in the Picture, students at the beginning of the semester met in groups of three or four members and chose a topic, among those that would be discussed in the subject Accounting Theory (any subject listed in the menu or course plan) to search and compose a video. During the semester, on specified dates, the groups should deliver the following activities: 1) theme, justification and relevance; 2) bibliographic research and timeline for video development; 3) script; 4) first version; and 5) final version of the video. Each activity was evaluated by the teacher of the discipline and discussed with the groups in two-weekly orientation meetings. Students used their own resources (cell phone, camera, location, editing material, etc.) to develop the videos.

The final video version of each group was presented to both classes during a single session in the college amphitheater. After the groups had handed in the activity and before the grades were distributed, a questionnaire was applied (Attachment A) to collect students' perceptions about the use of this teaching method.

The survey was carried out by means of a questionnaire structured in three parts (Attachment A). In the first part, the profile of the respondents was characterized (Table 2). Sixty-five students participated in the study, 43 (66%) of whom were female and 22 (34%) male; 34 studied fulltime (52%) and 31 (48%) in the evening. Most students (56) were enrolled in the sixth course period, when the subject Accounting Theory is taught. In addition, most students in the sample (78%) were working when they answered the questionnaire. The average age of the students is not statistically different.

Table 2:

Characteristics of respondents

Items	Semesters'				Total	
	Sixth	Seventh	Eighth	Others		
Gender	Female	36	3	4	4	43
	% sample	55%	5%	6%	6%	66%
	Male	20	0	1	1	22
	% sample	31%	0%	2%	2%	34%
Period	Fulltime	31	1	2	2	34
	% sample	48%	2%	3%	3%	52%
	Evening	25	2	3	3	31
	% sample	38%	3%	5%	5%	48%
Works	Yes	43	3	4	4	51
	% sample	66%	5%	6%	6%	78%
	No	13	0	1	1	14
	% sample	20%	0%	2%	2%	22%

Source: elaborated by the authors.

The second part of the questionnaire was intended to identify the students' perception about the activity Theory in the Picture (Tables 3 and 4). In the Tables, the 24 questions about the students' perception of the skills and competencies developed in the activity are displayed, as well as about the benefits of video development in the subject. The students attributed scores between one, indicating complete disagreement, and ten for complete agreement with each of the 24 assertions.

Table 3:

Questions about the perception of the activity Theory in the Picture

I consider that the development of the Project Theory in the Picture...	Attributes
1. facilitated the understanding of the subject	Understanding
2. made me study more to develop the project	Study
3. furthered the application of the theoretical concepts	Application
4. the activity significantly contributed to my performance in the subject	Performance
5. aroused my interest in the subject	Interest
6. I was able to enhance my knowledge	Knowledge
7. I became more creative after the development of the project	Creativity
8. favored greater interaction among my classmates	Interaction
9. the results of the activity were better because they were developed in group	Group
10. enhanced my teamwork skills	Team
11. improved my communication skills	Communication
12. made me develop my ability to use new technologies	Technology
13. helped me to develop my problem-solving skill	Problems
14. helped me to develop my leadership skills	Leadership
15. helped me to develop my planning skills	Planning
16. I felt motivated and enthusiastic about participating in this activity	Motivation
17. I consider that the project is suitable for the subject	Fitness
18. the method contains obstacles that are hard to overcome.	Difficulty
19. I felt satisfied with the results at the end of the activity.	Satisfaction
20. the method is dynamic.	Dynamism
21. provides for self-learning.	Self-learning
22. How do you rate the use of videos as a teaching-learning strategy?	Use
23. How do you rate the activity Theory in the Picture in the teaching-learning process in the subject Accounting Theory?	Activity
24. Do you recommend the further application of the activity Theory in the Picture in the subject Accounting Theory?	Recommendation

Source: elaborated by the authors.

In Table 4, the two yes-no questions and the three open-ended questions in the questionnaires have been illustrated, aiming to allow the students to describe positive and negative aspects in the development of the activity.

Table 4:

Yes/no and open-ended questions about the activity Theory in the Picture

A. If I had the opportunity, would I do this activity again? () YES () NO
B. Were you one of the characters in the video your group made? () YES () NO If yes, do you feel more uninhibited when being filmed or when presenting activities personally in the classroom? Please comment.
C. In your opinion, can the application of the video activity offer other benefits than those presented earlier in the questionnaire?
D. In your opinion, what are the positive points of applying the activity Theory in the Picture in the subject Accounting Theory?
E. This space is yours! You can use it to register your criticism and suggestions to allow us to enhance subsequent versions of this activity.

Source: elaborated by the authors.

The third part of the questionnaire was intended to analyze the students' self-assessment about their performance in the activity Theory in the Picture (Table 5). The students scored their self-assessed performance and participation between one and ten.

Table 5:

Self-assessment questions about the activity Theory in the Picture

1. Integration and relationship with the group.
2. Individual extra-class reading.
3. Search for complementary material.
4. Proactivity.
5. Commitment to my responsibilities in the group.
6. Time available for the activity.
7. Use of extra-class attendance to monitors, lecturers and Master's students.
8. The activity granted me a comprehensive view.
9. I participated in the accomplishment of all phases and activities in the project.

Source: elaborated by the authors.

The questionnaire applied in this research was elaborated based on the studies of Martin et al. (1995), Weil, Laswad, Frampton and Radford (1999), Weil, Oyelere, Yeoh and Firer (2001), Silva and Oliveira (2010), Holtzblatt and Tschakert (2011), Almeida (2013), Pereira and Rezende Filho (2013) and Engin (2014). To validate the questionnaire, a pre-test was carried out with five students and three professors from the Accountancy course of the university studied. The suggestions obtained in the pre-test were incorporated into the instrument. For ethical reasons, precautions were taken in order to preserve the image of the respondents, who freely expressed their consent to participate in the survey.

Data analysis involved factor analysis and was performed using the Statistical Package for the Social Sciences (SPSS). Factor analysis "is a multivariate technique that seeks to synthesize the relationships observed between a set of interrelated variables, seeking to identify common factors" (Fávero, Belfiore, Silva & Chan, 2009, p 235). The conduction of the factor analysis requires four steps, according to Fávero et al. (2009): 1) analysis of the correlation matrix and fitness of the factor analysis; 2) initial extraction of factors; 3) factor rotation; and 4) interpretation of factors. In addition, in the application of the factor analysis, the frequency distribution of the variables should be analyzed by means of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). KMO measures close to 0 indicate that the factor analysis may not be fit, as there is a weak correlation between the variables. On the other hand, the closer the measure is to 1, the better the use of the technique.

4. Results

The analysis of the results was divided in three sections, in line with the parts of the questionnaire. First, the perceptions about the efficacy of the method to develop skills and competencies are evidenced, collected by means of closed questions. Next, the advantages and disadvantages of video production are shown and, finally, the students' self-assessment answers about their engagement in the activity are denoted.

4.1 Concerning the contributions of the video production activity

In Table 6, the students' answers are presented for the 24 questions displayed in Table 3 on their perception of the teaching strategy that uses the creation of videos. In the students' perception, the benefits of the activity Theory in the Picture in terms of the personal search for content and knowledge, typical of active learning, rank first (Study) and third (Self-learning). The students' satisfaction with the accomplishment of the activity, indicated as the fifth most important item, and the increased knowledge acquisition (Activity), in the sixth position, reinforce the attributes discussed earlier and attest that the method can be useful to enhance the levels of learning.

Table 6:

Ranking of the perceived benefits of the video production

Rank	Attributes	Mean	Median	Maximum	Minimum	Mode	Standard Deviation
1	2. Study	7.57	8	10	2	8	2.16
2	20. Dynamism	7.48	8	10	1	10	2.29
3	21. Self-learning	7.43	8	10	1	8	2.28
4	9. Group	7.29	8	10	1	8	2.38
5	19. Satisfaction	7.25	8	10	1	8	2.02
6	23. Activity	7.09	7	10	1	7	1.97
7	22. Use	7.04	7	10	1	8	2.12
8	6. Knowledge	7.03	7	10	1	7	2.3
9	24. Recommendation	6.98	8	10	1	10	2.81
10	10. Team	6.95	8	10	1	8	2.36
11	3. Application	6.94	7	10	2	8	2.26
12	17. Fitness	6.88	7	10	1	5	2.3
13	15. Planning	6.66	7	10	1	8	2.21
14	8. Interaction	6.57	7	10	1	8	2.57
15	11. Communication	6.46	7	10	1	8	2.48
16	1. Understanding	6.44	6	10	1	8	2.51
17	4. Performance	6.35	7	10	1	6	2.37
18	13. Problems	6.12	7	10	1	7	2.43
19	12. Technology	6.11	6,5	10	1	5	2.38
20	14. Leadership	6.11	6	10	1	5	2.42
21	18. Difficulty	6.11	6	10	1	10	2.85
22	7. Creativity	5.85	6	10	1	5	2.31
23	5. Interest	5.83	6	10	1	6	2.53
24	16. Motivation	5.62	6	10	1	5	2.43

Source: elaborated by the authors.

Still about the acquisition of knowledge, the attributes that rank seventh and eighth portray the students' positive perception of the fact that the videos are valuable as a method of learning and an extension of the theoretical scope on the subject studied.

Ranking fourth and tenth on the list of the averages, the students also considered the attributes related to teamwork as positive points since, according to them, there was an improvement in the capacity to learn and create in group (Team). In addition, the fourth position in the ranking highlighted the agreement that the results of the activity were better because it was performed in groups. These results reveal, among other things, that preparing videos is an activity with the potential to improve skills and competencies, expands the possibilities for acquiring knowledge through active learning, and covers the benefits of peer collaboration and knowledge exchange. These findings confirm the studies by Almeida (2013), Engin (2014) and Vargas et al. (2007).

Regarding the application of the method in the subject Accounting Theory, questions 1, 17, 23 and 24 were intended to capture these perceptions. It is observed that the respondents judged the items positively, since the average of the scores assigned to each one of the questions is superior to five. In terms of importance, the highest averages were attributed to: a) contributes to the improvement in the teaching-learning process of the subject Accounting Theory (question 23 / sixth position); B) it is recommended that the method continues to be used in the subject Accounting Theory (question 24 / ninth position); C) the method is appropriate to the discipline Accounting Theory (question 17 / twelfth position); and d) facilitates the understanding of the discipline (question 1 / sixteenth position).

According to the students' opinion, the production of videos, even if it has scored averages superior to five, is less useful to arouse interest in the subject (question 5 / twenty-third) and, ranking last in terms of importance, it motivated them to participate in the activity (question 16 / twenty-fourth position). It is noteworthy that question number 18 (Difficulty) also presented an average superior to five (6.11), which suggests that the students realized that the method had obstacles difficult to overcome.

Thus, it is observed that the activity is an appropriate option, according to the students, to be used as teaching method in theoretical subjects, because it facilitates the understanding in a fun and creative way, causing the student to deepen the studies on the subject to better convey it to his classmates, also being responsible for his own learning. These results are in line with the research by Campos et al. (2015) and Machado et al. (2012), which asserted that, because it contains a high theoretical load, the subject Accounting Theory is fertile ground for the application of methods that make classes more dynamic and light. Still about the acquisition of knowledge, the attributes that rank seventh and eighth portray the students' positive perception of the fact that the videos are valuable as a method of learning and an extension of the theoretical scope on the subject studied.

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According to the students' opinion, the production of videos, even if it has scored averages superior to five, is less useful to arouse interest in the subject (question 5 / twenty-third) and, ranking last in terms of importance, it motivated them to participate in the activity (question 16 / twenty-fourth position). It is noteworthy that question number 18 (Difficulty) also presented an average superior to five (6.11), which suggests that the students realized that the method had obstacles difficult to overcome.

Thus, it is observed that the activity is an appropriate option, according to the students, to be used as teaching method in theoretical subjects, because it facilitates the understanding in a fun and creative way, causing the student to deepen the studies on the subject to better convey it to his classmates, also being responsible for his own learning. These results are in line with the research by Campos et al. (2015) and Machado et al. (2012), which asserted that, because it contains a high theoretical load, the subject Accounting Theory is fertile ground for the application of methods that make classes more dynamic and light.

Similarly, the activity serves for the students to interact with each other, to exchange ideas and experiences obtained in the development of the project, and to reinforce the planning and teamwork skills, because it is necessary to plan and organize the development phases of the theme, -production, filming, editing and presentation of the video, confirming the study by Vargas et al. (2007).

Although all subjects registered average scores higher than 5, those that had the highest repetition of grade 5 (Mode) were: the students became more creative after the development of the project (7. Creativity); the activity made it possible to develop the capacity to use new technologies (12. Technology); helped to develop leadership skills (14. Leadership); provoked enthusiasm in participating in the activity (16. Motivation); and considered that the project is fit for the discipline (17. Fitness). As for the question about the development of the capacity to use new technologies, the ranking can be justified by the fact that the average age of most respondents in the sample is 21 years. They belong to generation Z, also known as digital natives, who already make intensive use of technological resources (Castanha & Castro, 2010) and, therefore, this does not represent the development of a new ability.

Aspects of commitment, good relationship with the group, and solving unexpected problems corroborate Holtzblatt and Tschakert's (2011) studies, which have identified that, in order to produce videos, the student has to interact with others and work as a team in order to be successful. Almeida (2013) also noted that, when students create videos, they are developing reading, organizing, group negotiation skills and finding solutions to unexpected issues.

The aspects of responsibility to participate in the accomplishment of the work; search for complementary material and responsibility for self-learning coincide with the findings by Engin (2014), who noted that students were concerned about the search for materials with a view to the accuracy of the content presented. Pereira and Rezende Filho (2013) also identified an increase in student responsibility for the video production; and Silva and Oliveira (2010) corroborate the evidence that, by participating in all stages of the work, students construct and recreate their own knowledge. In addition, Martin et al. (1995) similarly observed that the use of the activity encourages students to take control of their learning.

By analyzing the data in descriptive terms, we tried, through the technique of factor analysis, to examine if there were dimensions underlying the variables that could be synthesized, in order to summarize the information contained therein, furthering the understanding and depth of the data analysis in the sample. The first step in conducting the factor analysis was to verify if the use of this technique is appropriate, using the KMO and Bartlett's tests. The KMO of 0.823 makes it reasonable to apply the factor analysis. The level of significance of Bartlett's test (Chi-square 53.165; p-value = 0.000) shows that there are correlations between the variables, which confirms the usefulness of this analysis.

The next step is the extraction of factors from the correlation matrix, in order to find a set of factors that constitute a linear combination of the variables in the correlation matrix. Thus, highly correlated variables will be combined to constitute a factor with the other variables in the correlation matrix. In Table 7, the main components and eigenvalues are extracted for each factor and the respective variance percentages are explained.

Table 7:

Extraction of the factors

Factor	Eigenvalues	% Variance	Accumulated Eigenvalues	% Accumulated Variance
1	11.511	47.962	11.511	47.962
2	2.189	9.121	13.700	57.084
3	1.644	6.852	15.345	63.936
4	1.244	5.183	16.588	69.118
5	1.166	4.858	17.754	73.976
6	0.871	3.631	18.625	77.606
7	0.712	2.967	19.338	80.573
8	0.585	2.438	19.923	83.011
9	0.566	2.358	20.489	85.369
10	0.540	2.252	21.029	87.621
11	0.485	2.022	21.514	89.642
12	0.477	1.988	21.991	91.630
13	0.356	1.484	22.347	93.114
14	0.291	1.214	22.639	94.328
15	0.251	1.045	22.890	95.373
16	0.240	1.002	23.130	96.374
17	0.206	0.858	23.336	97.232
18	0.179	0.746	23.515	97.978
19	0.120	0.499	23.635	98.477
20	0.097	0.405	23.732	98.883
21	0.087	0.361	23.819	99.244
22	0.081	0.336	23.899	99.580
23	0.060	0.249	23.959	99.829
24	0.041	0.171	24.000	100.000

Source: elaborated by the authors.

According to the rule to retain factors with eigenvalues superior to 1 (Fávero *et al.*, 2009), four factors were retained. Examining the eigenvalues, five factors are found with eigenvalues superior to 1, which are able to explain 73.976% of the variance in the original data. The first factor explains 47.962% of the data and the remainder 9.121%, 6.852%, 5.183% and 4.858%, respectively. The final factor analysis is displayed in Table 8.

Table 8:

Matrix of factors after the rotation

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Understanding		0.783			
Study		0.814			
Application		0.814			
Performance		0.831			
Interest		0.668			
Knowledge		0.688			
Creativity	0.538				
Interaction				0.768	
Group				0.633	
Team				0.674	
Communication	0.646				
Technology					0.489
Problems	0.653				
Leadership	0.835				
Planning	0.753				
Motivation	0.763				
Fitness			0.813		
Difficulty					0.876
Satisfaction				0.514	
Dynamism			0.619		
Self-learning				0.511	
Use			0.533		
Activity			0.743		
Recommendation			0.858		

Source: elaborated by the authors.

The results obtained through the application of the Factor Analysis technique, using the normalized varimax criterion, as observed in Table 8, showed, in the first factor, the following variables: Creativity (0.538); Communication (0.646); Problems (0.653); Leadership (0.835); Planning (0.753); and Motivation (0.763). The nature of these variables would lead one to infer that the first factor would refer mainly to relational and emotional skills. It should be noted that this factor is considered the most relevant, since it corresponds to 47.962% of the total data variance (Table 7).

The second factor revealed the following variables: Understanding (0.783); Study (0.814); Application (0.814); Performance (0.831); Interest (0.668); and Knowledge (0.688). The variables seem to be associated with the learning and practical application of the content learned. The third factor highlighted the following variables: Adequacy (0.813); Dynamism (0.619); Use (0.533); Activity (0.743); and Recommendation (0.858). The essence of these variables suggests that the third factor is related to the benefits of the discipline Accounting Theory.

The variables evidenced in the fourth factor are: Interaction (0.768); Group (0.633); Team (0.674); Satisfaction (0.514); and Self-learning (0.511). These variables are linked to collaborative learning and interpersonal relationships. In the fifth factor, the variables were: Technology (0.489); and Difficulty (0.876). The nature of these variables leads one to infer that the fifth factor is linked to what has contributed little in terms of skills or what has generated discomfort.

4.2 Analysis of yes/no and open-ended questions

In Table 9, the students' answers are presented for the two yes/no questions C and D, as to whether students would do the activity again and if they were characters in the videos developed, respectively. For those who participated in the staging of the video, they were also asked whether they felt more uninhibited being filmed or presenting work personally in the classroom.

It is observed that, in the evening class, there were more students who participated as characters than in the fulltime class. Regarding gender, 74% (23) of those who participated were girls and 26% (8) boys. The sample contained 43 girls and 22 boys though, based on which it can be assumed that girls are more enthusiastic about participating in activities like this than boys, who tend to be more timid. Of the students who were characters in the video, 81% work.

When asked if they would do the activity again, 31 students answered yes, 48% (15) from the fulltime group and 52% (16) from the evening group; and 65% of those students who would do the activity again are female and 35% male, reinforcing the idea that girls prefer such activities more than boys. It can be inferred that, when students participate actively in the video produced, having the opportunity to use the abilities aroused in the development of the activity, they perceive the positive effects and would therefore seize other opportunities to repeat tasks like this.

Table 9:

Relation between role in the video and interest in the activity

Characteristics of respondents	Were you a character in the video?				Would you repeat the activity?				
	Yes	%	No	%	Yes	%	No	%	
Period	Fulltime	11	35%	23	68%	15	48%	19	56%
	Evening	20	65%	11	32%	16	52%	15	44%
	Total	31	100%	34	100%	31	100%	34	100%
Gender	Female	23	74%	20	59%	20	65%	23	68%
	Male	8	26%	14	41%	11	35%	11	32%
	Total	31	100%	34	100%	31	100%	34	100%
Works	Yes	25	81%	26	76%	25	81%	26	84%
	No	6	19%	8	24%	6	19%	8	26%
	Total	31	100%	34	100%	31	100%	34	100%

Source: elaborated by the authors.

Table 10 shows the students' perception of the skills and competencies based on yes/no questions, in order to verify if the students who acted in the videos and recommend the reapplication of the activity score the questions in the first part of the questionnaire higher.

For all items analyzed, it is evident that those who participated as a character reveal a more positive view of the benefits of the method, and even those students who would feel comfortable performing a similar task again scored the attributes of the 24 questions higher. Thus, it is assumed that, the greater the degree of involvement in the activity, the greater the perception of benefits derived from it, and the greater the openness of interest in a new participation, like a vicious circle of active learning: the more involved, the more one learns.

Moreover, the results also indicate that the students who participated actively in the project and who would like to repeat this method attributed higher scores by recommending the continued application of the Theory in the Picture activity in the discipline Accounting Theory (24. Recommendation) and believe that it is appropriate to use video production as a teaching-learning strategy (22. Use).

Table 10:

Mean scores for active participation and willingness to repeat the activity

Abbreviation	Would you repeat the activity?		Were you a character in the video?	
	Yes	No	Yes	No
Understanding	6.97	5.97	6.67	6.24
Study	7.65	7.50	7.81	7.35
Application	7.45	6.47	7.58	6.35
Performance	7.03	5.74	6.94	5.82
Interest	7.23	4.56	6.65	5.09
Knowledge	7.55	6.56	7.39	6.71
Creativity	6.48	5.26	6.23	5.50
Interaction	6.87	6.29	7.32	5.88
Group	7.71	6.91	7.94	6.71
Team	7.45	6.50	7.77	6.21
Communication	7.19	5.79	7.32	5.68
Technology	6.55	5.70	6.43	5.82
Problems	6.58	5.71	6.55	5.74
Leadership	6.94	5.35	6.68	5.59
Planning	7.52	5.88	7.35	6.03
Motivation	6.90	4.44	6.35	4.94
Fitness	7.90	5.94	7.19	6.59
Difficulty	5.77	6.41	6.26	5.97
Satisfaction	7.61	6.91	7.90	6.65
Dynamism	7.97	7.03	8.00	7.00
Self-learning	8.03	6.88	7.77	7.12
Utilization	8.30	5.94	7.30	6.82
Activity	8.07	6.24	7.47	6.76
Recommendation	8.30	5.82	7.50	6.53

Source: elaborated by the authors.

Analyzing the second part of the questionnaire, in the open-ended question D, we asked the students who participated as characters in the video if they felt more uninhibited being filmed or when presenting works personally in the classroom. It can be noticed that 35 of them answered this question, being that: 40% (14 students) prefer the video method; 32% (11 students) prefer to present work in person in the classroom; 11% do not care about the choice of the method, since they do not experience difficulty in presenting themselves; and 17% (6 students) prefer not to present themselves because they are shy.

Some students reported that they prefer the video production method because they have the option to redo the recording and correct errors, read the script again, and edit as many times as necessary. One of the students stated: "I have no particular difficulty to present in the classroom. But I prefer filming. If you make a mistake, stutter, you can do it again. The nervousness is less." Another student commented: "I prefer to be filmed because it has no audience at the time of the recording." Hence, it is observed that the video activity can be corrected before being submitted for presentation and evaluation, and allows the students to read and reread the script as many times as necessary before recording, as they will need to master what they are talking about when acting in the videos.

This activity also favors those students with greater difficulties to speak in public in person because, when recording a video, the students feel more at ease as, at the time of the recording, they are not standing in front of many people. On the other hand, there are students who do not feel comfortable being filmed, preferring the presentation in the classroom, like in the following reports: “I prefer personal presentations, video does not make me feel at ease.” Also, expressions like “it takes a lot of work to make videos”, “I do not feel comfortable in front of a camera”, and “I do not feel good seeing myself on video and listening to my recorded voice.”

There are students whose degree of shyness does not allow them to feel calm about any of the methods, as observed in the narratives: “Neither situation. I panic about presenting anyway “and” I do not feel uninhibited being filmed, much less presenting myself personally, out of shame of being mistaken or stammering. “ For those very shy students, whatever method of public presentation represents a big challenge.

There are, moreover, students with no restrictions for public appearances, which usually occurs with extroverted people who find it easy to communicate in public, as two students report: “I have no difficulties in presenting in the classroom, so there was no difference” and “Regardless of the occasion, I do not see problems in presenting.”

In question G, shown in Table 3, it was asked if the students recommend that the activity continues to be applied in the subject Accounting Theory, assigning a score from one to ten, as shown in Table 3 (24. Recommendation), and, if no, a justification was requested for the answer. It was verified that the greatest restrictions regarding the development of the activity are related to the difficulty of physical locomotion for the group meetings, required to develop the activity. This may be related to the fact that most of the students who completed the questionnaire worked and / or studied in the evening.

The open-ended question H, presented in Table 4, asks the student to discuss other benefits that can be achieved through video production, in addition to those previously mentioned in the questionnaire. The main comments were: “other benefits would be greater interaction with the class” and others further reinforced the idea of creativity, discussed by Leal and Cornachione Júnior (2006), according to the report: “In my opinion, the main benefit is to use the imagination to apply the concepts (...) “, and, moreover:” ... another positive point is the exercise of creativity and the use of technology to develop the activity.”

Another participant also highlights the benefits: “Creativity, group work and for those who are shy, it helps with the ‘disinhibition’”. Other advantages were also highlighted, such as: “we learned how to plan, divide tasks, and study more for the presentation.” It is emphasized, then, that the most mentioned benefits in this question are related to creativity and teamwork, since this activity requires that the students use the imagination to create a different and attractive project about the concepts of the discipline, and greater interaction in the group, so that everything goes as planned. This playful side, the possibility of expression and motivation, presented in the reports collected in question H, are corroborated by the findings of Malheiros et al. (2016).

In question I, Table 4, the students were asked about the positive points of applying the Theory in the Picture activity in the discipline Accounting Theory. It could be verified that the positive points the students appreciated most were related to self-learning; Strategic planning of the group; development of creativity and oratory; interaction in the team; dynamism of the activity; highlights in the video; which remind you of the subject discussed more easily; and knowledge exchange. These points can be exemplified through the narratives “make self-learning happen with field research,” and “For the application of the subject it can be positive, because students must necessarily research, read and study for the presentation.” These reports reinforce the findings by Engin (2014) that the video production activity provides self-learning and prompts students to seek their own understanding of the topic.

The students also accentuated, as beneficial factors, didactic-methodological innovation: “it is a different work than we are accustomed to do” and “it is a different way of learning, better than theory, slides, etc.” Another important point was observed in relation to the volume of theoretical content in the subject Accountancy Theory, in which the students believe that the Theory in the Picture activity helps in understanding the discipline and facilitates the understanding of the contents, converging with the views by Campos et al. (2015) and Machado et al. (2012) that very theoretical content needs to be approached in a less tiring and more motivating way.

This idea is also reinforced in the students' statements: "Dynamic method of learning, because it is a very theoretical discipline, the application of the activity facilitates the understanding and fixation of the content", and another, in turn, quotes: "The fact that this subject is very theoretical, is addressed in the form of video work, is interesting to draw more attention from the students to the content of the subject"; also emphasizing the didactic functions of the method highlighted by Malheiros et al. (2016).

In the final open-ended question J, illustrated in Table 4, students were asked to record their criticisms and suggestions for subsequent versions of the activity. The criticism most quoted by all students was related to the choice of groups, which happened by drawing lots. It is noticeable that the students did not like the strategy of choosing the groups in statements like: "The biggest problem was the group being chosen by the teacher" and "It could be better if we could choose the group itself".

It is noticed that the students would feel more comfortable if they could choose their own group because, certainly, they would choose people whom they have more intimacy and affinity with. This fact may point to a limitation of living together or working as a team with people outside the community, a difficulty that usually occurs in professional life. Thus, the production of activities of this type in the undergraduate program can anticipate the entrepreneurial market scenario of socializing and carrying out activities with whom one does not have affinity. Nonetheless, other students argued that the teacher's choice of groups instigated interactivity among those with whom they did not have much contact, and this increased their commitment to the group, so that there was no disagreement.

It is concluded, through the students' statements and the abilities aroused during the activity, that this method is beneficial both for the discipline Accounting Theory and for the students' experience with active learning, teamwork, organization, leadership and creativity mechanisms.

4.3 Self-assessment

In Table 11, the students' answers to the nine self-assessment questions have been illustrated.

Table 11:

Students' self-assessment in the performance of the activity

Question	Mean	Median	Maximum	Minimum	Mode	Standard Deviation
Relationship with the group	7.91	8	10	1	10	2.08
Individual Extra-class reading	7.55	8	10	1	8	2.23
Search for Complementary Material	7.64	8	10	1	8	2.10
Proactivity	7.86	8	10	3	8	1.62
Commitment to the group	9.05	10	10	3	10	1.35
Time for the activity	6.83	7	10	2	7	2.01
Advice for monitors, teachers and Master's students	4.08	4	10	1	1	2.94
Comprehensive view in the activity	7.22	8	10	1	8	2.39
Participation in the development of the task	8.97	10	10	1	10	1.75

Source: elaborated by the author.

In the students' self-assessment, the performance related to the commitment to the group, the involvement in the accomplishment of all the stages and activities of the work and the relationship with the team occupy the first three positions. This reinforces the evidence that the production of videos made the students interact more with their classmates and dedicate themselves to the task.

Because it is an activity in which the students are going to explain content, it is necessary that they search for materials related to the topic addressed and study to pass on their knowledge to the class. In this sense, it is observed that they also engaged in individual extraclass reading and the search for complementary materials.

It is also noticed that there was proactivity, that is, the students had to work hard to solve unexpected problems. In addition, they devoted themselves to staying within the activity, as a whole, participating in the stages developed, and spent time to perform the task. It can be seen from Table 11 that the students did not make much use of the extra-class attendance with monitors, teachers and Master's students (question 7), because the average score was 4.08 and the most repeated score (mode) was 1 (one).

5. Final Considerations

The general objective of the study was to analyze students' perception of the usefulness of video production in the teaching-learning process of the subject Accounting Theory. Sixty-five students from two classes attending the sixth period participated in the study in the second semester of 2015.

The results allowed us to suppose that the students liked to carry out the activity and that it has great value as a teaching-learning mechanism because, when they create videos, students exercise and develop reading, interactivity; group organization and self-learning skills; seek solutions to unexpected issues; different forms of content exposure; improve oratory and the ability to develop planning and leadership; and dedicate themselves to the project. Therefore, 72% of students recommend that the activity continues to be offered in the subject Accounting Theory.

The discipline Accounting Theory is essentially theoretical, and the Theory in the Picture activity has made students leave their routine as passive agents and explore content by themselves, exercising active learning, which arouses creativity and excitement, making them use their imagination to explain the content in the format of newspaper and theater presented through the videos. The activity is methodologically different from the traditional teaching format, which engages students in researching new ideas and the responsibility for designing a project.

The size of the sample does not permit generalization of the results. Nevertheless, we hope that the results of this research may serve as a stimulus for other teachers to be encouraged to innovate in their teaching-learning processes, through the strategy of video production by students.

This research contributes to students by showing that, when they are deeply involved in processes of promoting learning through active methods, greater gains are perceived than those obtained in traditional teaching methods, based on lectures, such as: greater interaction among peers; Improvement of oral communication; Organization, planning and leadership; and creativity and responsibility for learning itself. In addition, the production of videos facilitates the absorption and learning of theoretical content, in a light and relaxed way.

For teachers, the benefits are linked to the fact that, by applying student-centered teaching-learning mechanisms, levels of involvement with the discipline and content are achieved that sometimes not achieved with those centered on the teacher. In addition, the strategy can also be used in other disciplines.

Teaching institutions take advantage of the results of this research by noting that changes are needed in the training process, which currently focuses on the teacher, shifting it to the student, which has revealed clearly positive consequences. Also, for effective changes to take place in educational processes, basically, structural changes, teacher training and technology investments are needed.

For future research, it is suggested to enlarge the sample, as well as to verify the opinion of the teachers about this method. Similarly, it would be appropriate to investigate whether the production of videos helps in the training of future distance education professionals.

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Attachment A – Evaluation Questionnaire – Theory in the Picture

This questionnaire is intended to identify the students' perception on the project Theory in the Picture. The answers provided are confidential and has didactical qualification purposes. It also serves to assess its efficacy as a teaching tool. In addition, it permits verifying whether the learning goals of the activity were achieved.

Please do not leave any question unanswered. Your opinion is very important.

Thank you for your cooperation!

CHARACTERISTICS OF THE RESPONDENT

Name: _____

Age: _____ (in years) Regular Course Term: _____

Period: () Fulltime () Evening Gender: () Female () Male

Marital Status: () Single () Married () Widowed () Separated

Works: () Yes () No

Are you taking the subject Accounting Theory for the first time? () Yes () No

THEORY IN THE PICTURE

The following questions refer to how you perceive the activity Theory in the Picture developed in the subject Accounting Theory. The objective in this questionnaire is to assess your opinion on the utility of using videos as a teaching-learning method.

Score your level of agreement with each of the questions below from 1 to 10, with 1 indicating: complete DISAGREEMENT and 10: complete AGREEMENT with each question.

I consider that the development of the Project Theory in the Picture ...	Score 1 to 10
facilitated the understanding of the subject	
made me study more to develop the project	
furthered the application of the theoretical concepts	
the activity significantly contributed to my performance in the subject	
aroused my interest in the subject	
I was able to enhance my knowledge	
I became more creative after the development of the project	
avored greater interaction among my classmates	
the results of the activity were better because they were developed in group	
enhanced my teamwork skills	
improved my communication skills	
made me develop my ability to use new technologies	
helped me to develop my problem-solving skill	
helped me to develop my leadership skills	
helped me to develop my planning skills	
I felt motivated and enthusiastic about participating in this activity	
I consider that the project is suitable for the subject	
the method contains obstacles that are hard to overcome	
I felt satisfied with the results at the end of the activity	
the method is dynamic	
provides for self-learning	

If I had the opportunity, would I do this activity again? () YES () NO

Were you one of the characters in the video your group made? () YES () NO

If yes, do you feel more uninhibited when being filmed or when presenting activities personally in the classroom? Please comment.

How do you rate the use of videos as a teaching-learning strategy?
(score between 1 and 10)

How do you rate the activity Theory in the Picture in the teaching-learning process in the subject Accounting Theory?
(score between 1 and 10)

Do you recommend the further application of the activity Theory in the Picture in the subject Accounting Theory?
(score between 1 and 10)

If no, justify your answer:

In your opinion, can the application of the video activity offer other benefits than those presented earlier in the questionnaire?

In your opinion, what are the positive points of applying the activity Theory in the Picture in the subject Accounting Theory?

This space is yours! You can use it to register your criticism and suggestions to allow us to enhance subsequent versions of this activity.

Self-assess, scoring your performance on the following items between 1 and 10. These answers will contribute to reveal the relations between the tools used and their actual contribution to the students' performance.

Item for self-assessment	Score between 1 and 10
Integration and relationship with the group	
Individual extra-class reading	
Search for complementary material	
Proactivity	
Commitment to my responsibilities in the group	
Time available for the activity	
Use of extra-class attendance to monitors, lecturers and Master's students	
The activity granted me a comprehensive view	
I participated in the accomplishment of all phases and activities in the project	