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A Management Accounting Teaching Strategy for Student Engagement

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Abstract

Traditionally, a cohort of students receives the same homework. Therefore, it is easy for them to take the solution from a colleague or website, which will have the consequence that they will not accumulate the knowledge and/or competence for the respective applications. The research question of this paper is: How can a professor determine students to engage in Management accounting and Performance measurement and control homework? The paper presents a teaching strategy that is useful for disciplines related to management accounting. It involves the creation of applications in which the amounts (variables) are missing. The students have to complete the text with some specific data for each of them. Applications for all the chapters included in the syllabus of Management Accounting and Performance Measurement and Control were created. The text and solutions to the example built for "Internal transfer price", and answers to a questionnaire are included in this paper. The study improves the literature on the strategies which can be used in teaching Management accounting, in order to ensure the student engagement with the assignment. Also, the described teaching method is useful both in an online and offline environment, as it is more likely for the students to find the motivation to solve the applications.

Keywords: teaching strategy, management accounting, deep learning, student engagement, homework, transfer pricing.

JEL Classification: A20, A22.

1. Introduction

Management accounting-related content is taught in a smaller number of classes than financial accounting. It involves some previous knowledge of economics, mathematics, and marketing (Kovar, Evans, 2001; Spraakman, Jakcling, 2014; van den Brink et al., 2003), a correlation between chapters, a degree of interpretation of data, and decisions that a student has to make on his or her own. Thus, it is considered

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difficult by many students. A tool available to teachers is homework. Starting from these ideas, the research question is as follows: How can a professor determine students to engage in Management Accounting and Performance Measurement and Control homework?

Constant learning is necessary in Management Accounting (MA) to allow students to make progress. They have to use the concepts from several chapters for a case study, and it is very difficult to do well on exams if they cannot understand the complete picture. Usually, homework is based on textbooks and is the same for the entire cohort. In addition, homework and textbooks are almost the same from one cohort to another. This means that it is easy for students to take the solutions from a peer or to find them on the Internet. The strategy described here is important because it obliges students to solve the applications themselves, as they are specific to each person. In this way, discussing about the solution with colleagues may even be considered a part of the learning process (Nnadi, Rosser, 2014). The first examples were developed during the online teaching caused by the pandemic. So, I consider that the approach is particularly useful in the online environment, when the professor cannot proctor in any way the activity of the students.

To answer the research question, I introduce a teaching strategy based on applications with variables specific to each student. They are created for each chapter taught in MA and Performance Measurement and Control (PMC), disciplines included in the second and, respectively, third year of studies at the undergraduate level in the Faculty of Accounting and Management Information Systems, Bucharest University of Economic Studies. Both disciplines are compulsory. There is no figure included in the examples, but only variables that can be replaced with data characteristic for students (e.g., birth date, number in the group or cohort in alphabetical order, mother's birth date). The examples can be solved during the class or as a homework by the students. The professor collects the data from the beginning of the semester, so that she or he can check the text and the solution of the students. Additionally, I present the results obtained on a questionnaire for one lecture (i.e., in which transfer pricing was discussed). I designed the questionnaire to encourage the students to connect what they learn with their previous knowledge.

The contribution of the study is that it provides an idea for the professors to determine the students' engagement in their learning process. It is an alternative to traditional lectures and traditional applications given to students (Lord, Robertson, 2006). It contributes to the literature in which the professor is presented as more than a person who transmits information.

2. Problem Statement

'The success with which students are able to achieve understanding [in lectures] may depend critically on the capacity of the higher education teacher to recognise and build from students' existing conceptions and to anchor new knowledge in a meaningful framework' (Hounsell, in Mulligan and Kirkpatrick, 2000, p. 312). Examples of the context with which the students are familiar increase the relevance

of the new aspects studied. Lecturers should be able to present the material in an understandable language (Lord, Robertson, 2006).

Nowaday, the lecturer has to have the abilities to help students in ways that are not available to them in other modes. For instance, a lecturer extracts the essential part, thus transmitting more than a student can learn by himself (Lord, Robertson, 2006), presents the most recent developments in the field, beyond the textbooks, "synthesises, analyses, and critiques" other perspectives (Baldwin, 1993; Isaacs, 1989). She or he constructs the lectures as a combination of passive and active learning, engaging the students (Peters, Chiu, 2022).

Recently, accounting education is directed toward problem-based learning, which is defined as "a progressive educational approach that uses complex, real-world problems as the motivation or starting point and focuses on the learning process" (Spraakman, Jakcling, 2014). The level of complexity of the case studies varies between the undergraduate and graduate level. Thus, I consider that for the undergraduate level, particularly at the first contact of the students with a specific aspect, mini-cases may be more suitable (Chu, Libby, 2010) than complex case studies.

The online education which emerged everywhere in the world at the beginning of the pandemic imposed on different types of teaching and learning, education and assessment tools. Online education is efficient in the short term, having advantages such as space savings, reduced infrastructure costs (Mardini, Mah'd, 2022), flexible schedule, and better time management. Disadvantages include poor attendance, engagement, and exam performance (Cheng, Ding, 2021), and additional stress (Mihai et al., 2020). Another issue is that online teaching requires different approaches from the tutor, including varied and meaningful assignments (Țarțavulea et al., 2020). In the long term, online learning may be more effective for theoretical than practical courses (Mardini, Mah'd, 2022) and it may have a negative impact on students' skills and learning outcomes (Sangster et al., 2020). So, research is needed to support students to overcome the difficulties of the online learning, while taking advantage of its benefits.

The MA cases presented in the literature start from familiar contexts (e.g., Kovar, Evans, 2001; Hoozée et al., 2020 – bakeries; Anctil et al., 2020 – recycling industry; Smith, 1998 – conference costs). Some of them are dedicated primarily to specific sections of the syllabus (e.g., Kovar, Evans, 2001; Smith, 1998 – cost-volume-profit analysis and decision making; Anctil et al., 2020 – joint products and decision making; Hoozée et al., 2020 – transfer pricing) or present several linked cases (e.g., Calderon et al., 2019; Peters, Chiu, 2022; van den Brink et al., 2003). The cases are sometimes focused on technologies needed to solve them (e.g., Peters, Chiu, 2022 – interactive spreadsheets). Most of the examples provided in this paragraph are long cases. In this paper we introduce smaller examples designed for all the chapters of MA and PMC. Nnadi and Rosser (2014) introduce the 'individualised accounting questions' technique. Their variables are based on the students' ID numbers, and the outcome is improved understanding and performance of the students. However, the approach described in this paper takes into account a higher number of variables.

Also, a part of the requirement is that it asks the student to create the text by themselves, part that is scored accordingly.

3. Research Questions

The research question of this paper is: How can a professor determine students to engage in Management Accounting and Performance Measurement and control homework?

4. Research Methods

Instead of a case, in this paper, I describe a strategy to create cases which can be personalised for as many students as it is necessary. Thus, the technique is useful for small and large cohorts.

5. The Description of the Applications

5.1 The Context and Development of Applications

At the beginning of the pandemic, the professor who developed the applications has had a teaching experience of 19 years at the Bucharest University of Economic Studies, Faculty of Accounting and Management Information Systems. Most of the teaching activity involved MA-related lectures and tutorials. In 2020, at the beginning of the pandemic, she started teaching in Romanian MA to a cohort of students who had the same professor at PMC, which is a related discipline included in the learning plan in the next semester. This can be an advantage because a professor gets to know the students and can build in the second discipline on the work done during the first semester.

The university applies the Bologna process, which means that the length of the study program is six semesters. The two disciplines are included in the second part of the undergraduate program. A semester lasts 14 weeks. On average, a cohort is split into five groups of approximately 25 students. Each week, the students have a lecture and a tutorial lasting each for one hour and a half. The written materials are available at the beginning of the semester. The students can download and study them anytime.

Traditionally, in the case of university, the teachers give written material on paper (such as a textbook) or online to the students at the beginning of the semester or weekly. The material includes the aspects discussed during the classes, additional examples, and homework that the students must solve. The homework is the same for the entire cohort, and it is usually checked during the class. However, when the pandemic imposed the beginning of online classes, all materials were provided online. In the case described here, lectures and tutorials were conducted in zoom, with video. The materials were posted on an online platform for students without solutions. The professor discussed with the students during the classes and solved the examples in real time, writing everything in word. At the end of the class, the students were asked to upload their notes, and after a few hours, the professor

uploaded the official solutions, too. Additionally, the students could make a print screen, as there was no technical solution for the tutor to stop them. Thus, the materials could be taken from one group to another, and the students had no incentive to pay attention to the class. After the first tutorial, all the other groups could have the examples solved. The first solution was for the tutor to solve different problems during the tutorials with each group. This, however, involves a large amount of work and the examples were created for only one class. The materials were transferred from one generation to another (even though it was specifically stated in the files that they must not be transferred), which meant that each semester everything had to be new or it was already available. As an example, there were students who came after the end of the online period to face-to-face classes, with the solved materials printed from their older peers. The students were enrolled in an undergraduate study program, meaning that the examples solved were mostly designed to help them accumulate the technical skills for the new concepts encountered. So, a solution had to be found in order for the professor to be sure that all students work for the classes.

In MA, many examples are based on linear relationships between variables. Thus, these applications were created so that they could all be solved in excel after just changing a few cells with specific amounts. In this way, the tutor can easily check the solutions sent by the students.

The applications were built in a specific context. For example, for traditional and ABC costing, the example was created for an accounting company; for target costing, the example was built for a small gelateria that introduced a new product, figs ice cream; for standard costing, the example was about manufacturing home-made chocolate based on mother's recipe. They ranged from very simple examples (e.g., from a linear equation with two variables, showing the cost behaviour), to case studies covering several aspects, such as the one dedicated to standard costing and cost variances. This means that solving an example may take between a few minutes and more than an hour. The familiar context was a supplementary incentive for students to solve the application. Also, using their own data urged them to see which is the result for their own case.

Before sending an application to the students, the professor solved it with at least two sets of figures. For instance, for the examples that involved birth dates, two dates were used: January 1, 1999, and October 25, 1978. Thus, a small and a large number were selected. For some of the variables, the minimum and maximum values were set. For instance, if a variable is set for an increase in price, it could be written as max([day of birth]; 100 %). Thus, the professor made sure that the figures for each example are realistic.

5.2 The Learning Objectives of the Applications

The learning objectives of the suggested applications are (adapted from Kovar, Evans, 2001; Peters, Chiu, 2022):
- To facilitate learning in the context of a variety of new concepts in MA and PMC;
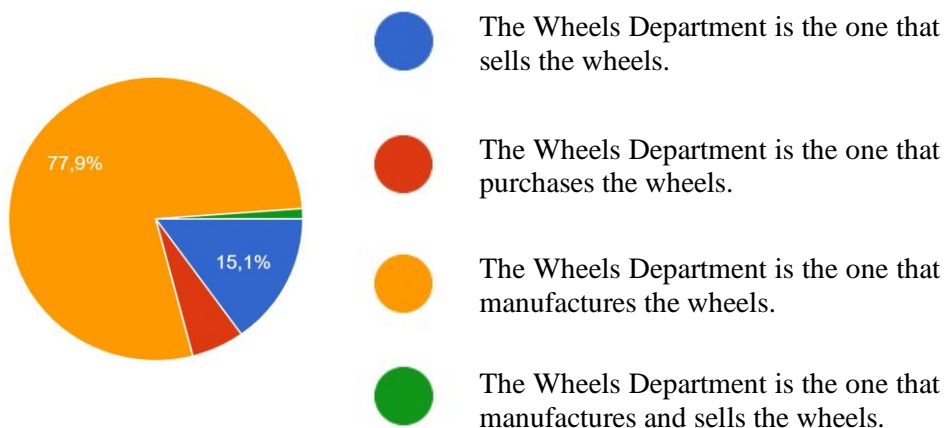- To enable students to learn actively with personalised applications;

- To offer feedback (through the score and the correct solution) to each student starting from their personalised example;
- To create a tool which facilitates face-to-face and online learning;
- To engage students in learning MA and PMC;
- To offer students a tool to practice the studied concepts;
- To improve the students' critical thinking through the interpretation of the results they reach.

5.3 Description of One Lecture

The lecture chosen as an example for this paper is "Transfer pricing." Transfer pricing is included in the syllabus of the professional organisations (e.g., ACCA) and of most of the European accounting faculties (Pistoni, Zoni, 2000), the topic having an average priority. In the case described here, the lecture was included in the PMC discipline, week 11 (out of 14), when the students were already familiar with all the types of costs which could be computed.

In line with the suggestion of Mulligan & Kirkpatrick (2000, p. 330), the lecture starts with an overview of the aspects to be discussed. The chapter includes an initial questionnaire, which contains very simple questions that are meant to encourage students to think about transfer pricing in simple terms. Of the two most recent cohorts studying PMC, 86 students answered the questionnaire. This was distributed at the beginning of the class, and it was fulfilled on a voluntary basis. The responses were anonymous. As can be seen, most of the students answered correctly to the questions two to six.

1. VSD manufactures bicycles. The company manufactures bicycles in the Assembly Department. For the bicycles, wheels are required, which are produced in the Wheels Department. In this case:

The Wheels Department is the one that sells the wheels.

The Wheels Department is the one that purchases the wheels.

The Wheels Department is the one that manufactures the wheels.

The Wheels Department is the one that manufactures and sells the wheels.

Correct answer: The Wheels Department is the one that manufactures and sells the wheels.

2. The wheels are:
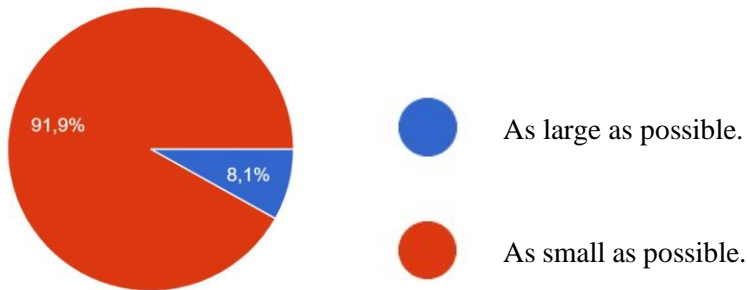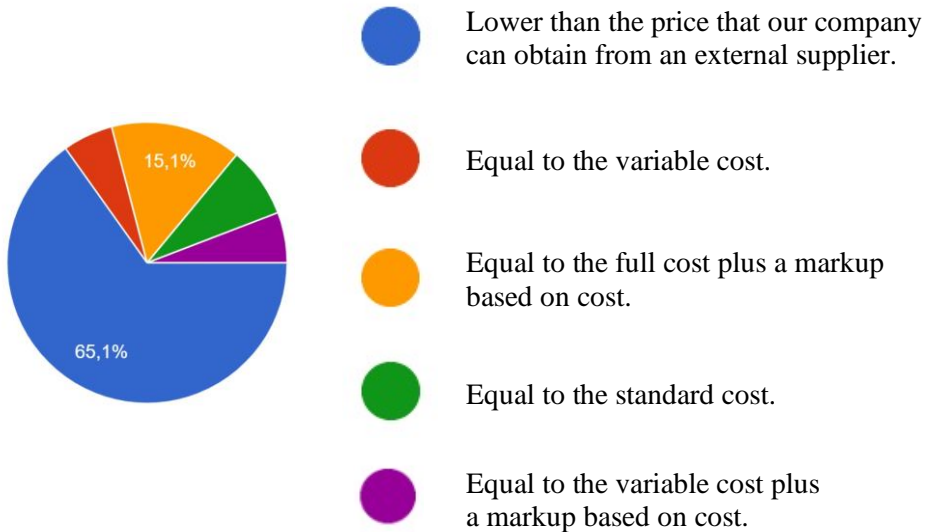
Intermediate products
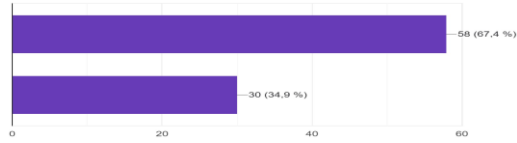
Finished goods
Correct answer: Intermediate products.

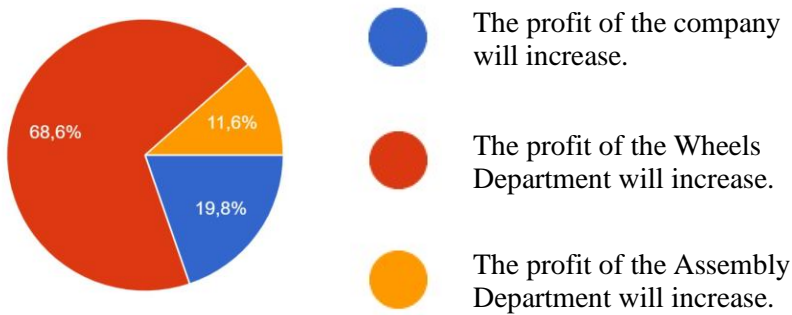**3.** The Assembly Department will prefer the wheels price to be:

As large as possible.

As small as possible.

Correct answer: As small as possible.

4. From the point of view of the Assembly Department, it is acceptable for the wheels price to be:

Lower than the price that our company can obtain from an external supplier.

Equal to the variable cost.

Equal to the full cost plus a markup based on cost.

Equal to the standard cost.

Equal to the variable cost plus a markup based on cost.

Correct answer: Lower than the price that our company can obtain from an external supplier.

5. Once the internal transfer price for the wheels (from one department to another) increases, one will notice that:


The profit of the company will increase.

The profit of the Wheels Department will increase.

The profit of the Assembly Department will increase.

Correct answer: The profit of the Wheels Department will increase.

6. The internal transfer price will represent a cost for:

The Wheels Department.

The Assembly Department.
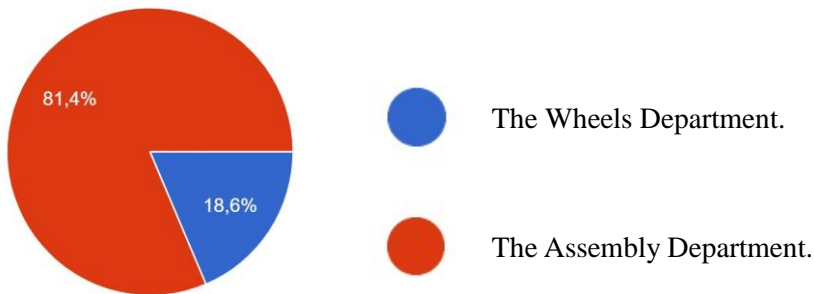
Correct answer: The Assembly Department.

7. The use of the internal transfer price has as a purpose the maximisation of the profit obtained by:

The Wheels Department.

The Assembly Department.
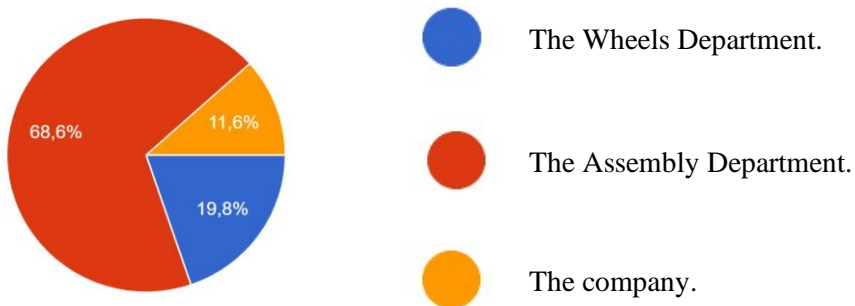
The company.

Correct answer: The company.

Source: Author's compilation.

The lecture was available to the students online from the beginning of the semester. It includes a description of the theoretical concepts and examples of setting the transfer prices starting from the variable cost, and the full cost, the standard cost.

5.4 Application with the Date of Birth for Setting the Internal Transfer Price

The application should be solved individually at home, during the week after the lecture, and uploaded on the platform by the deadline set. The students have previous experience with applications with variables. This example guides them in identifying the correct revenues and costs. Some problematic areas are the treatment of transfer price, the identification of the correct fixed cost, the change in the variable cost.

The statement of the problem is presented as follows:

Example (date of birth ....)

An enterprise producing bikes and scooters is organised in two profit centres (Wheels Department and Assembly Department). It presents the following information:

• The Wheels Department obtains [Date of birth*4] wheels/month, sold outside the enterprise at [Date of birth] monetary units (MU)/piece. The maximum production capacity of the centre is [Date of birth*5] wheels/month. The variable unitary cost is [Date of birth*40 %] MU/piece, and the fixed cost for this capacity is [Date of birth*50] MU;

• The Assembly Department manufactures scooters from the sale of which it obtains a profit of [Date of birth*30] MU, but is considering the introduction into manufacturing of [Date of birth*50 %] bicycles that incorporate wheels (two wheels for a bicycle). The selling price of the new product is estimated at [Date of birth*3] MU/piece. Additional costs for product bicycles are [Date of birth*90 %] MU variable unitary cost and [Date of birth*20] total fixed costs for the additional production capacity required for the new product.

The general manager asks you if, under the conditions of an internal transfer price for wheels equal to the unit sale price, the interests of the three parties (Wheels Department, Assembly Department, and the enterprise) are satisfied. Do the calculations and justify the answers. Will the general manager decide to produce bicycles or not?

Round down the numbers (for example: 101*50 % = 50).

The excel template with the formulas is provided in Table 1.

Table 1. Formulas for the application

	A	B	C	D	E
1	1	Available capacity	2510		
2	2	Necessary capacity	=C1		

	A	B	C	D	E
3		Result for wheels and bicycles	Wheels Department	Assembly Department	Total
4	1	Sales revenue (external)	=C1*C1*4	=C1/2*C1*3	=C4+D4
5	2	Internal transfer price	=C1*C1	=-C1*C1	=C5+D5
6	3	Variable cost	=C1*40%*C1*5	=C1/2*C1*90%	=C6+D6
7	4	Fixed cost	=C1*50	=C1*20	=C7+D7
8	5	Result bicycles	=C4+C5-C6-C7	=D4+D5-D6-D7	=C8+D8
9					
10		Initial result Wheels Department			
11	1	Revenue from external sales	=C4		
12	2	Variable cost	=C1*40%*C1*4		
12	3	Fixed cost	=C7		
14		Initial result	=C11-C12-C13		

Source: Author's compilation.

The text with data for one birth date is the following:

Example (date of birth October 25 - 2510)

An enterprise producing bikes and scooters is organised in two profit centres (Wheels Department and Assembly Department). It presents the following information:

- The Wheels Department obtains 10,040 wheels/month, sold outside the enterprise at 2510 monetary units (MU)/piece. The maximum production capacity of the centre is 12,550 wheels/month. The variable unitary cost is 1004 MU/piece, and the fixed cost for this capacity is 125,500 MU;
- The Assembly Department manufactures scooters from the sale of which it obtains a profit of 75,300 MU, but is considering the introduction into manufacturing of 1255 bicycles that incorporate wheels (two wheels for a bicycle). The selling price of the new product is estimated at 7530 MU/piece. Additional costs for product bicycles are 2259 MU variable unitary cost and 50,200 total fixed costs for the additional production capacity required for the new product.

The general manager asks you if, under the conditions of an internal transfer price for wheels equal to the unit sale price, the interests of the three parties (Wheels Department, Assembly Department, and the enterprise) are satisfied. Do the

calculations and justify the answers. Will the general manager decide to produce bicycles or not?

Round down the numbers (for example: 101 * 50 % = 50).

Solution

The solution is presented in Table 2.

Table 2. Solution for birth date October 25

1	Available capacity	2510		
2	Necessary capacity	2510		
	Result for wheels and bicycles	Wheels Department	Assembly Department	Total
1	Sales revenue (external)	25,200,400	9,450,150	34,650,550
2	Internal transfer price	6,300,100	(6,300,100)	0
3	Variable cost	12,600,200	(2,835,045)	15,435,245
4	Fixed cost	125,500	50,200	175,700
5	Result bicycles	18,774,800	264,805	19,039,605

	Initial result Wheels Department	
1	Revenue from external sales	25,200.400
2	Variable cost	10,080.160
3	Fixed cost	125.500
	Initial result	14,994,740

Source: Author's compilation.

Under these specific circumstances, it can be noticed that the interests of all the interested parties are met. Thus, the Assembly Department obtains a profit from this activity. The profit of the Wheels Department is larger than the initial one. From this, it results that the company obtains a higher profit as well.

5.5 Assessment

- All the solutions were uploaded by the students in word files. The students received written feedback for their solutions and a score. For instance, the points for the mini-case described above were awarded as it follows:
- 10 % for the correct figures included in the text;
- 30 % initial result for the Wheels Department;
- 20 % result when producing the bicycles for the Wheels Department;
- 20 % result when producing the bicycles for the Assembly Department;
- 10 % for the comment;
- 10 % default points;
- Total – 100 %.

46 students out of 102 in the first cohort (academic year 2020 – 2021) solved this mini-case. The lowest percentage obtained was 30 (out of 100 %) and the highest 100, with an average of 77.93 %.

6. Conclusions

The paper describes the design and application of a teaching strategy involving active learning. The purpose of the assignments described here is to support students' engagement with the homework by themselves, in order to acquire the necessary knowledge to graduate and eventually work in a company. The applications were already used with three cohorts of students, studying either online and face-to-face. The performance of the students in both environments was the same.

The strategy included in this paper can be used for the creation of examples in other disciplines, such as financial accounting or taxation.

Future research can be conducted in order to explore the opinion of students regarding this type of assignment.

Acknowledgment

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