Teaching mode in the PRE-COVID, COVID-19, and POST-COVID periods and students’ learning outcomes on the example of “Accounting” study program

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Abstract

The aim of the article is to assess whether the mode of conducting classes (traditional/distance) affects the differentiation in the obtained subject grades in the period preceding distance teaching (PRE-COVID), during the pandemic (COVID-19), with distance teaching, and after its end (POST-COVID). This study was conducted on the example of the subject "Accounting" taught at the University of Economics in Katowice. The grades of 278 students in the “Accounting” course were analyzed. To verify the hypothesis of this study, indicating the lack of differentiation of students’ grades depending on the mode of study (traditional/distance), it was necessary to assign the obtained grades to three distinguished research subperiods. The significance of variance in the grades of “Accounting” course students in individual sub-periods was calculated based on the one-way ANOVA analysis of variance. The conducted research allowed us to confirm the existence of a relationship between the adopted teaching formula (traditional and distance) and the grades (outcomes) of students. Based on the analyses carried out, it is necessary to reject the initial hypothesis about the lack of dependence between the mode of teaching in the PRE-COVID, COVID-19, and POST-COVID subperiods and the student’s learning outcomes in the introductory subject to accounting. The unique value of this study lies in the analysis of three consecutive comparative periods, in which traditional teaching, e-learning, and return to traditional education took place. This allows to set trends in the observed phenomena and make specific forecasts.

Key words: traditional learning; e-learning; accounting education; university; COVID-19.
JEL Classification: M49.

1. Introduction

The effectiveness of educational processes is the subject of many studies (Mappadang et al., 2022; Mishra & Agrawal, 2022; Zalewska & Trzcińska, 2022; Callaghan & Papageorgiou, 2015; Økland, 2012; Du, 2011; Mohrweis, 2010). This also applies to the effectiveness of teaching accounting (Chiu et al., 2014; Ngwenya & Maistry, 2012).
Curricula, teaching methods and conditions, learner backgrounds, demographics, and learning measures and outcomes are examined (Jordan & Samuels, 2020). Evaluation of educational processes is crucial for preparing pupils and students for professional work, developing the desired skills and attitudes. Learning outcomes may be an important factor influencing a future professional career (Mappadang et al., 2022). However, it is worth bearing in mind that grades may also be affected by the outcomes at earlier education stages (Engel, 2018; Procházka, 2016).

The effectiveness of educational processes is shaped by many factors, including those of unforeseeable and sudden nature. An example of this was the COVID-19 pandemic, which fostered distance learning, also known as e-learning, in education in a natural but imposed way. There are many concepts and ambiguities concerning defining distance learning, e-learning, or other similar notions (Sørebø et al., 2009). Their common attribute is the use of an internet connection, although in different forms of connection and interaction between the student and the teacher, such as, for example, synchronous and asynchronous classes (Du, 2011).

The combination of learning outcomes and the impact of various factors on them is the subject of many studies (Mappadang et al., 2022; Zalewska & Trzcińska, 2022; Callaghan & Papageorgiou, 2015; Økland, 2012; Du, 2011; Mohrweis, 2010), but at the same time, it sets new research directions. This article follows the trend of these studies by focusing on examining the relationship between the measures of learning outcomes and the teaching methods adopted. The unique value of this study lies in the analysis of three consecutive comparative periods, namely, the period before the COVID-19 pandemic (PRE-COVID), during (COVID-19), and after its end (POST-COVID), in which traditional (on-site) learning, e-learning, and return to traditional education took place. This allows us to set trends in the observed phenomena and make specific forecasts.

This research aims to examine how the mode of conducting classes impacts the outcomes of teaching accounting at the university level at the turn of the mentioned study periods. Focusing on an introduction to an accounting study program ("Accounting") is justified by the fact that this program requires analytical thinking and concentration but, above all, is quantitative. This, in some way, affects the path of obtaining a final grade mainly based on quantitative data, for instance, in the form of a case studies, and to some extent, on essays and papers (Michałowska, 2014).

The study focuses on assessing whether the mode of conducting classes (traditional/distance) affects the differentiation in the obtained learning outcomes (subject grades) in the period preceding distance teaching, during the COVID-19 pandemic, when the distance teaching has been introduced, and after its end.

Given the above, the following detailed research question was posed: Does the mode of conducting classes (traditional/distance) affect the outcomes (grades) obtained by students in accounting during the distinguished subperiods of the study?

This research is based on the results of students’ exams in the “Accounting” course conducted in the first year (summer semester) of undergraduate studies in the field of “Finance and Accounting.” This course is obligatory, and students gain here their first experience (during studies) in issues related to accounting. The research sample included
students’ grades, obtained from five academic year 2017/2018 to 2021/2022. This study embraces both full-time and part-time students.

The structure of the paper is composed of four main points, each of which is vital in presenting a comprehensive research study. First, the results of the literature research are meticulously discussed, and this ends with the formulation of research hypotheses that will be further explored in the study. Second, the adopted research methodology is presented, along with a detailed description of the research sample, which will provide an in-depth understanding of the study's approach. Third, the results of the conducted statistical research are presented, followed by a discussion that will analyze the outcomes of the study. Last, the research conclusions are presented, along with the contributions that the study has made to the development of science. The research limitations are also discussed, and recommendations for their further development are presented. Additionally, the implications of the results used in the area of accounting education practice at the academic level are emphasized.

2. Theoretical background and hypotheses development

Learning outcomes are the subject of research that can be conducted in many directions and at different levels as well as from the perspective of various stakeholders, including pupils and students (Eom et al., 2006), teachers, the professional environment, or other interested institutions (e.g., shaping and managing of the education system). They also cover different levels of education, ranging from primary education through high school (Økland, 2012) to university level (Eom et al., 2006; Motsoeneng & Moreeng, 2022), as well as post-graduate education and similar (Mishra & Agrawal, 2022). The factors determining the achieved learning outcomes also differ. It is also possible to consider them in complex models and regression functions, including random effects regression or structural equation modeling (Huikku et al., 2022).

The COVID-19 pandemic turned the attention of practitioners and scientists toward the study of learning outcomes under the conditions of distance learning. However, this is not a complete novelty, as this topic has been the subject of interest before but on a much smaller scale (Eom et al., 2006; Mishra & Agrawal, 2022).

Learning outcomes focus on educational results that pupils and students should achieve after completing the educational process. They concern knowledge acquisition, skill development, and social competence enhancement (Sławiński, 2013, pp. 50-54).

From the perspective of professional work, learning outcomes take the form of development from outcome-based education within the vocational sector, gaining particular competencies (Scott, 2011). From the perspective of didactics, learning results are presented mainly as the achievement of a certain degree of assumed effects. The degree of achievement of these effects is usually expressed in the form of assessments or at least information on passing/failure of a given subject or module of education. The impact of grades is diverse. In addition to the purpose of motivating students (Motsoeneng & Moreeng, 2022), they allow for assessing the degree of achievement of effects, monitoring student progress as well as verifying the effectiveness of teaching.
In turn, learning outcomes in the form of assessments enable extensive comparative research due to the use of a uniform measurement. For the research results presented in this article, the grades obtained by students in the introductory accounting course (“Accounting”) were adopted as learning outcomes. The assessment scale commonly used in studies in Poland was used, which includes grades from unsatisfactory (2.0) to very good (5.0). This form is very easy to measure and, at the same time, provides a relatively balanced measure and performance comparison between students.

When considering learning outcomes, the personal aspect of the individual achieving learning outcomes should be taken into account. Resnick et al. (2007) and Bloom (1981) noted that most learners can achieve the same performance level, but the differentiating factors are the time spent and effort involved to achieve the same outcomes. Eom et al. (2006) conducted a similar study that focused on student satisfaction factors and perceived learning outcomes. The researchers observed that online education can be a more effective mode of teaching for certain students with specific learning styles, as long as they receive proper support and feedback from their instructor.

The factors determining learning outcomes include both those related to the individual characteristics of students and teachers, as well as environmental factors, including those concerning learning processes or other external influences (Zalewska & Trzcińska, 2022; Mappadang et al., 2022; Callaghan & Papageorgiou, 2015; Økland, 2012; Du, 2011; Eom et al., 2006; Parsons & Mayer, 1990).

Amidst the COVID-19 pandemic, a series of factors compelled educational institutions to adopt distance learning as a means of ensuring learning continuity. This entailed the utilization of online classes which, as with any other mode of learning, presented both benefits and drawbacks. One of the merits of this approach is the time and scheduling flexibility it offers to learners. However, it also necessitates self-discipline and the ability to manage one’s learning as it may give rise to specific moral hazards. Moreover, the grading system can pose a challenge as it may hinder the ability of educators to monitor students’ progress and independence (Chomiak-Orsa & Smoląg, 2022). In this article, it delves into the impact of different teaching modes on the academic performance of students in an accounting study program.

It can be assumed that the teaching mode has a significant impact on the achieved learning outcomes. This area concerns the structure of the course, which includes two elements, such as objectives and infrastructure (Eom et al., 2006). The goals set out in the syllabus cover the thematic scope, workload, and form of participation in classes or tasks to be performed. The course infrastructure, in turn, focuses on online access to the course, the organization of materials, and their general availability. Meanwhile, research by Eom et al. (2006) did not reveal a relationship between the studied elements. By contrast, Du (2011) provided different results and confirmed that blended learning improves students’ final performance.

Accounting is a unique field of study with a strong empirical character, also in terms of learning outcomes. Learning accounting is related to the acquisition of unique skills, analytical thinking, teamwork, under time pressure, and above all, gaining specialized, advanced knowledge (Rydzewska-Włodarczyk, 2014; Gos & Hońko, 2011). This uniqueness indicates how teaching, learning, and assessment happen, especially since the
practical nature of accounting requires the involvement of special teaching techniques. The above also shows the strong impact of contextual factors on teaching accounting, including the process of evaluating the outcomes achieved (Ngwenya & Maistry, 2012). Meanwhile, the outcomes of accounting teaching can be important not only in terms of ranking and rewarding students but can also be a source of information about the reasons for success or failure in learning (Motsoeneng & Moreeng, 2022). As a result, they are a tool for taking corrective actions in the area of the effectiveness of educational processes.

Considering the quantitative nature of the “Accounting” course, which is the subject of this study in the empirical part, it can be assumed that the teaching and assessment mode may affect the outcomes obtained.

Chiu et al. (2014) carried out research similar to this study. The research showed that the formula of conducting accounting classes, which was the traditional mode and the distance mode in the form of pre-recorded online lectures, did not significantly affect the final students’ outcomes. At the same time, the student’s average grade from previous semesters and interest in the material were indicated as the factors determining the final grade. Similar results were achieved by A. Fortin et al. (2019), who examined the outcomes of students in the four advanced accounting subjects. The authors indicated that the choice of teaching mode, such as online platforms, blended or traditional courses, did not affect the level of student achievement. Different research results were yielded by Chen et al. (2013). The researchers indicated that the effectiveness of online accounting teaching compared to traditional teaching depends on the advancement level of the course. In more advanced study programs, the outcomes were better than in principles courses.

However, the most important is that above studies were not carried out during the COVID-19 pandemic, which created special conditions in many fields for conducting e-learning and achieving specific learning performance. Therefore, this is important justification for the presented study.

The period of the pandemic was researched by Alanzi and Alfraih (2023). They examined the relationship between the outcomes of accounting students in the period of distance and traditional teaching. To measure the results, the average grade from the semester before and during the pandemic was used. Additionally, students’ commuting distance (from the college) and academic performance before the pandemic and during the pandemic were examined. The results allowed the researchers to conclude that accounting students in the period of distance learning achieved better outcomes than in the period of traditional teaching. However, contrary to our research, this study was based on the average grades of students, not focusing solely on study programs in accounting.

Slightly different results were obtained by Aldahray (2022). The study concerned student performance in introductory and advanced accounting courses during online teaching in Saudi Arabia. In general, there is an improvement in the students’ outcomes in both qualitative and less quantitative courses, while in the case of more quantitative subjects, students’ outcomes are worse.

Under Polish conditions, studies of learning outcomes during the pandemic compared to the period before the pandemic were also conducted, although they did not strictly
concern accounting grades. The study by Ligaj and Pawlos (2022) revealed a trend of increasing the average grades of students during the distance learning period compared to traditional learning. Interesting research results were also presented by Zalewska and Trzcinaśka (2022), who, based on mathematics outcomes, revealed that the effects of distance learning in contrast to residential learning among students of finance and accounting do not show significant differences. The authors extended the study by the relationship of matriculation grades in mathematics at the elementary level, which showed a more uneven distribution during the distance learning period. Nevertheless, the predominance of positive outcomes was insignificant. In turn, J. Krasodomska et al. (2022) noticed that students’ expectations regarding the effort put into learning and the outcomes obtained significantly increase engagement in distance learning.

The presented literature review does not allow us to take a clear-cut position on the impact of the COVID-19 pandemic, and thus the teaching mode, on the learning outcomes of students. Furthermore, except for the Aldahray (2022) study, the reviewed research did not focus on accounting-related subjects, the validation of which is investigated in this study. The mentioned studies by Aldahray (2022) should be considered vital, but it has to be borne in mind that they were carried out under different geopolitical and cultural conditions (Saudi Arabia). Additionally, the presented review of research identified a research gap in evidence for shaping learning outcomes also after the end of e-learning related to COVID-19, i.e., showing characteristics of a certain adaptation to new conditions and extending the time horizon of the conducted comparative analyses. Such a period of research allows us to reveal a certain evolution of attitudes, behaviors, and competencies of students who had enough time to adapt to the proposed solutions and implement appropriate corrective actions (Chomiak-Orsa & Smołaęg, 2022).

The above gives the grounds for advancing the main research hypothesis of this study:

H: The outcomes (assessment) of accounting education at the university level do not exhibit any notable variations in the periods before COVID-19, during COVID-19, and after COVID-19 with respect to the teaching mode.

3. Research design

In the presented study, the learning outcome is assumed to be the final grade students achieved after completing classes and lectures. Learning outcomes have been adopted as the dependent variable; the typical grading scale for studies in Poland presented in the introduction will be used in this investigation. In turn, the independent variable was the period of taking measurements and contextual conditions related to educational processes, i.e., the traditional and distance modes of conducting classes. The entire research period was divided into three subperiods: before the COVID-19 pandemic, during it, and after the COVID-19 pandemic.

The period before the pandemic (PRE-COVID) expresses the time of the traditional teaching mode, devoid of the considerable impact of digital education tools. The COVID-19 period reflects the time when studying and examining students took place in distance working conditions (e-learning). The last selected research period – POST-COVID – concerns the learning outcomes achieved after the return to the traditional teaching mode.
The study period began in the academic year of 2017/2018 and ended in 2021/2022. The individual research subperiods covered the following years:
- PRE-COVID (the academic year of 2017/2018 and 2018/2019),
- COVID-19 (the academic year of 2019/2020 and 2021/2022),
- POST-COVID (the academic year of 2021/2022).

The above hypothesis was verified based on the “Accounting” course. This course was held each time in the summer semester of the first year of undergraduate studies. It is worth adding that this is the first subject in this area in undergraduate studies. Grades were obtained from students’ transcripts of the “Finance and Accounting” major at the University of Economics in Katowice. The assessment included the practical part and the lecture part. It should be noted that the numerical equivalents of the assessment were used in the study as described below:
- 2.0 – unsatisfactory,
- 3.0 – satisfactory,
- 3.5 – satisfactory plus,
- 4.0 – good,
- 4.5 – good plus,
- 5.0 – very good.

The research sample consists of the assessments of both full-time and part-time students. What is crucial, the students took the same sets of exams in each of the investigated periods. Therefore, it is possible to avoid any bias regarding the impact of the exam difficulty degree (a semester test) on the final grade in the subject, which could interfere with research on the impact of the teaching mode on the final grades of students.

Ultimately, the grades of 278 students in the “Accounting” course were analyzed. To verify the hypothesis of this study, indicating the lack of differentiation of students’ grades depending on the mode of study (traditional/distance), it was necessary to assign the obtained grades to three distinguished research subperiods. Thus, the PRE-COVID period with traditional teaching covered the grades of 100 students, the COVID-19 period with distance teaching included the grades of 90 students, and the POST-COVID period with traditional teaching coming back to the walls of the university concerned the grades of 88 students. A similar size (equivalence of samples) in individual subperiods is a desirable phenomenon for later conclusions (Pasikowski, 2015).

The significance of variance in the grades of “Accounting” course students in individual sub-periods was calculated based on the one-way ANOVA analysis of variance proposed by R. Fisher (1923), which is used to verify the hypothesis of the mean equality of the examined variable in several research periods (in this article PRE-COVID, COVID-19, POST-COVID).

4. Results and discussion

To carry out statistical inference and verify the hypothesis put forward, it seems necessary first to present the shaping of students’ grades in the “Accounting” course in the three research subperiods (PRE-COVID, COVID-19, POST-COVID). Individual
frequency, cumulative frequency, and mean score in each subperiod are shown in Figures 1-3.

**PRE-COVID**

<table>
<thead>
<tr>
<th>Grades</th>
<th>Frequency</th>
<th>Cumulative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>24</td>
<td>24%</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>39%</td>
</tr>
<tr>
<td>3.5</td>
<td>15</td>
<td>54%</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>70%</td>
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<td>4.5</td>
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<td>89%</td>
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<td>5</td>
<td>11</td>
<td>100%</td>
</tr>
</tbody>
</table>

**COVID-19**

<table>
<thead>
<tr>
<th>Grades</th>
<th>Frequency</th>
<th>Cumulative Frequency</th>
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</thead>
<tbody>
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<td>3.5</td>
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<td>4</td>
<td>22</td>
<td>63%</td>
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<td>4.5</td>
<td>22</td>
<td>88%</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Figure 1:** Distribution of students’ grades in the “Accounting” course in the PRE-COVID period (academic years 2017/2018 and 2018/2019)

*Source:* own study

**Figure 2:** Distribution of students’ grades in the “Accounting” course in the COVID-19 period (academic years 2019/2020 and 2020/2021)

*Source:* own study
When analyzing the distribution of grades in individual subperiods of the study, in which different teaching modes were implemented, a higher average in the subperiods covering the years 2019/2020 and 2020/2021 (COVID-19) is immediately evident. This average equals 3.84, while in the period just before the pandemic (PRE-COVID), it was 3.50, and in the period directly following it (POST-COVID), it recorded a lowest value of 3.45. As a result, the distance learning mode of conducting classes in the “Accounting” course was characterized by a higher average final grade obtained by students. These results are reflected in the existing literature, which indicates that accounting students achieved better results in the distance learning period than in the traditional teaching period (Alanzi & Afrah, 2023). Moreover, the research by Du (2011), conducted before the pandemic period, indicated that blended learning improves students’ final performance.

The above research findings also confirm the frequency of occurrence of individual assessments in given subperiods. In the era of the COVID-19 pandemic, as much as 79% of students obtained a grade not lower than a satisfactory plus (3.5). In the PRE-COVID subperiod, this percentage was lower and amounted to 61%, and in the POST-COVID period following the pandemic, it was only 55%. It seems reasonable to say that the distance learning mode resulted in higher grades in the “Accounting” course. To confirm this, it is worth providing the percentage of students who received an unsatisfactory grade (2.0) in individual subperiods:
- PRE-COVID-24%,
- COVID-19-10%,
- POST-COVID-27%.

More students received a good (4.0) and a good plus (4.5) grade in the COVID-19 subperiod. The obtained research results are justified in the latest literature (Ligaj & Pawlos, 2022), which verified, among other things, the shaping of students’ grades in “Logistics” at the Academy of War Arts during the COVID-19 pandemic. As in this study,
more positive assessments were observed when learning was conducted remotely. Moreover, a cautious conclusion can also be drawn that the pandemic period affected the effectiveness of full-time teaching, which is reflected in slightly worse student results than before the pandemic. It is probably related to the need to adapt to new (traditional) modes of teaching (Chomiak-Orsa & Smoląg, 2022) and, at the same time, requires further in-depth research that can be carried out over time.

The presented frequencies and mean values of the obtained grades in the “Accounting” course provide a strong basis for indicating that the teaching mode may, however, affect students’ outcomes. This would make it necessary to reject the hypothesis adopted at the beginning of the study, indicating the lack of a relationship between these variables. To finally verify whether the teaching mode affects (or not) the grades in accounting, it was necessary to carry out statistical inference.

As presented in the previous part of the article, a one-way analysis of variance (Fisher, 1923) was used to assess the significance of differences between the average grades of students in the “Accounting” course in the subperiods studied. It allowed us to indicate whether the differences in values (grades) in the studied populations were statistically significant. Test statistics calculated by one-way ANOVA are presented in Table 1.

Table 1: Test statistics of one-way analysis of variance (ANOVA) for students’ grades in the “Accounting” course in the indicated research subperiods (PRE-COVID, COVID-19, POST-COVID)

<table>
<thead>
<tr>
<th>SUMMARY (PRE-COVID, COVID-19, POST-COVID)</th>
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<tbody>
<tr>
<td><strong>Groups</strong></td>
</tr>
<tr>
<td>PRE-COVID</td>
</tr>
<tr>
<td>COVID-19</td>
</tr>
<tr>
<td>POST-COVID</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANOVA (PRE-COVID, COVID-19, POST-COVID)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source of Variation</strong></td>
</tr>
<tr>
<td>Between Groups</td>
</tr>
<tr>
<td>Within Groups</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

*p<0.05

Source: own calculations

The purpose of the variance analysis was to indicate whether the average grades obtained by students in the “Accounting” course were significantly different in the three previously distinguished research subperiods, namely PRE-COVID, COVID-19, and POST-COVID. The F (Fisher-Snedecor) test statistic calculated based on 278 grades (assigned to the appropriate subperiod) equals 4.185699 and is higher than the critical value (F=3.028605). This result gives grounds for concluding that at least one of the average grades of students in the “Accounting” course in the examined subperiods is significantly different (at the level of p<0.05) from the others. It can therefore be assumed that the varied mode of conducting classes (traditional-distance-traditional) is reflected in the
grades obtained by students (Du, 2011). This is a counter-argument to the hypothesis adopted at the beginning of the study, assuming that there is no connection between the mode of conducting classes and the outcomes of teaching accounting.

A significant result of the F test does not conclude the analysis of the variance in the student’s grades in the “Accounting” course. At the moment, it is known that at least one average of the grades is statistically significantly different from the others. However, to clarify whether the teaching mode (traditional/distance) has an impact on the learning outcomes, it seems necessary to repeat the one-way ANOVA analysis of variance. This time, however, it will be prepared for the following pairs of subperiods:

- PRE-COVID and COVID-19,
- COVID-19 and POST-COVID,
- PRE-COVID and POST-COVID.

Such a division is aimed at identifying whether the subperiods with different teaching modes adopted showed statistically significant differences in the grades obtained by students in the “Accounting” course. Test statistics computed by one-way ANOVA for the pairs of subperiods listed above are included in Table 2.

Table 2: Test statistics of one-way analysis of variance (ANOVA) for students’ grades in the “Accounting” course in the chosen pairs of research subperiods (PRE-COVID, COVID-19, POST-COVID)

<table>
<thead>
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<td>Groups</td>
<td>Count</td>
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<td>350</td>
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<tr>
<td>COVID-19</td>
<td>90</td>
<td>346</td>
<td>3.844444</td>
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<td>ANOVA (PRECOVID &amp; COVID-19)</td>
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<tr>
<td>Source of Variation</td>
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<td>Within Groups</td>
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<td>188</td>
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<td>Source of Variation</td>
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<th>SUMMARY (PRE-COVID &amp; POST-COVID)</th>
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The conducted one-way ANOVA analysis of variance for pairs of subperiods in which two modes of teaching (traditional/distance) were alternately used indicates the existence of statistically significant differences in the average grades in the “Accounting” course in the PRE-COVID and COVID-19 (p<0.05) and COVID-19 and POST-COVID (p<0.01) subperiods. Furthermore, in the two subperiods in which teaching was conducted in the traditional mode (PRE-COVID and POST-COVID), it is not possible to indicate significantly different values of average grades.

The obtained results of the one-way analysis of variance ANOVA for three pairs of subperiods indicate the subperiod combinations with significant differences in the average grades in the “Accounting” course. They imply that the mode of teaching (traditional/distance) has an impact on the grades of students of the “Finance and Accounting” major in the “Accounting” course. Therefore, the hypothesis proposed at the beginning of the study should be rejected.

5. Final conclusions

The results obtained in the presented study contribute to the limited research on educating students in the field of accounting in different modes of teaching (traditional/distance). The findings bring additional advantages in testing against the background of the COVID-19 pandemic, but above all, the possibility of examining the period following it, which in some way affects the shaping of future teaching methods and formulas. It is observable, especially under the influence of the pandemic period, that e-learning is becoming a more and more commonly used mode of teaching (Chomiak-Orsa & Smolań, 2022). Thus, it can be concluded that this form of teaching may permanently become part of the canons of the education system, which emphasizes the usefulness of the results obtained in this study. Testing the results at the turn of the three indicated subperiods is a significant contribution to the development of research on accounting education.

The conducted research allowed us to confirm the existence of a relationship between the adopted teaching formula (traditional and distance) and the grades (learning outcomes)
of students. Based on the analyses carried out, it is necessary to reject the initial hypothesis about the lack of dependence between the mode of teaching in the PRE-COVID, COVID-19, and POST-COVID subperiods and the student’s learning outcomes in the introductory subject to accounting. The research question posed: Does the mode of conducting classes (traditional/distance) impact the outcomes (grades) obtained by students in accounting during the distinguished subperiods of the study? The answer must therefore be in the affirmative.

The findings may be applied in various ways. First of all, in the practical area, they can be used by those who create study programs to develop them in such a way that, at least in the area of determining learning outcomes, they are properly adjusted to the teaching mode. At the same time, for lecturers, it is a guide to specify the content and methods of teaching and evaluation concerning the teaching mode used. This study brings practical implications in the form of information that a change in the way of evaluating effects in accounting should be considered, taking into account e-learning and traditional learning. The results of the first degree of accounting teaching affect overall academic performance (Alanzi & Alfraih, 2017), which is why results are useful for shaping teaching, exams, and tests in such a way as to motivate students to acquire and consolidate knowledge.

Authors are aware of the existing limitations of the study. It is possible that other factors affect the student’s grades, such as personal situation, gender, examination requirements of individual lecturers, and previous learning outcomes, which were not studied. This research is also limited by narrowing the research field to the study of motivation; however, results may be the basis for expanding future research with the motivational factor. It can be considered that incentives related to striving to be the best and performance-approach goal together allow for better final grades (Dull et al., 2015). For example, research can be deepened by concerning test-taking time, as Fogarty and Jonas (2019) did, who noted that students achieve the best results in the average period of taking tests, while the relationship between the order of returning exams and scores also differs depending on the type of exam and the results of the Matura exam. Another limitation is the focus on the research sample of only one university. However, authors believe that the obtained results can be a comparative basis for their further evaluation in time and space. In further research, the main goal will be to expand the material scope of the research to include students of other economics universities and the subjective scope to include other courses from the discipline of social sciences.

Despite the indicated limitations, considering that authors are not aware of comparable results of teaching accounting in Poland, it can be considered that the presented results broaden the knowledge regarding the modes and processes of teaching accounting and the acquisition of skills and professional qualifications in this field.

References


• Gos, W. and Hońko, S. (2011) “Propozycja modyfikacji programu kształcenia księgowych w wyższych uczelniach w świetle Krajowych Ram Kwalifikacji,”


