

# The Use of Excel and Its Impact on Student Performance in a Finance Course at a Mexican University

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**Abstract.** This study analyses business students' decision to use Excel or not to complete assignments in a finance course at a Mexican University, and the affect on exam performance. The study adds to current literature in that there is a lack of such research on finance students in developing nations. After quantitative data was collected, qualitative information was obtained via interviews with some of the students to understand more about their decisions. The quantitative data showed that there was no effect on student exam performance between using Excel or not in completing assignments, and completing all assignments, regardless of whether Excel was used or not, improved the students' exam performance. The qualitative information showed that students had different responses to having a choice of using Excel, and different approaches to using it. The implications for Finance instructors in Mexico and other developing nations are discussed.

**Keywords:** assignments, Excel, software, decision making, developing nations.

## 1. Introduction

There is an ongoing debate in the current literature on whether using software in the class improves or hinders the performance of students in exams. As technology and software become more relevant in the current business environment, universities are starting to question if students benefit from using software when completing their assignments. On the one hand, students gain experience of using the software, which is relevant to their future professional careers. On the other hand, relying on software to complete assignments may constrain the learning process since the use of software can automatise how students learn. The problem is further exacerbated in developing nations where some students have a cultural apprehension to using software due to a lack of experience and instructors may have a tendency to prefer more traditional teaching methods. This dilemma is particularly acute in finance education, where software is necessary for practice but where students have typically used more traditional learning methods.

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In general, the theoretical debate emerged on the premise that technology would improve the performance of students (Lethbridge 1998; Rico and Sayani 2009). However, several studies present contradictory findings (Barrera-Osorio and Linden 2009; Belo *et al.* 2013; Bonham *et al.* 2003; Psacharopoulos and Patrinos 2018; Mburu and Bonaparte 2019). Bonham *et al.* (2003) suggest that investments in technology are not the critical factor that foster student performance. They argue that improving the course methodology is more relevant. Barrera-Osorio and Linden (2009) found that incorporating the use of software had no short-term impact on the performance of students. Similarly, Belo *et al.* (2013) concluded that the use of software without any regulation actually had a negative effect on student performance. Despite this, when the use of software has established boundaries and limitations, students tended to perform better. Mburu and Bonaparte (2019) claim that the use of software should be a conscious choice based on the type of course, demographics of the students and pedagogical skills of the teachers. Such practical and theoretical concerns motivate the present study.

This paper differentiates from previous research on the use of technology in finance education by focusing on a Mexican University and analysing a sample of predominantly Mexican students. This specific sample is of interest due to its particular cultural characteristics, such as a tendency towards more traditional education tools (Umans *et al.* 2008). Mexican business education has historically been associated with rejecting technology use (Pedroza-Zapata and Silvia-Flores 2020). University educators have claimed that finance courses require traditional tools, where students learn step-by-step calculations rather than software which tends to automatise such processes (Torres-Ruiz and Moreni-Ibarra 2019). Due to the traditional views that exist in secondary education and business schools in Mexico, students typically have limited experience of using Excel for finance courses (Macias Teran *et al.* 2017). Thus, it becomes relevant to study further the effect of using Excel in a finance course on the performance of students who culturally may prefer not to use software.

This research analysed a sample of 243 students who had completed an International Financial Management course given by the author from August 2018 to May 2019. The course provided a suitable context to carry out the research, since the students had the freedom of using Excel to complete their assignments, but the exams (two mid-terms and one final) were paper-based. A statistical analysis was used to support or reject the hypotheses. In addition, six selected students were interviewed to understand their reasoning for choosing Excel or not to complete the assignments. The qualitative investigation enabled a deeper understanding of some of the student's decision making.

This paper is organised as follows. The next section contains the literature review where the current assumptions are highlighted and gaps sighted, with the hypotheses for the research thus determined. The third section presents the methodology used in the research which is followed by the quantitative and

qualitative findings. The results in the next section are then discussed along with the contribution. The paper concludes with the implications and limitations.

## 2. Literature Review

The use of Excel in business courses has become a relevant topic in education literature. It is generally assumed that younger students are more familiar with technology and software (Kamel Boulos and Wheeler 2007; Kondracki *et al.* 2002). Some studies claim that students can exploit such knowledge to improve their course performance (Lethbridge 1998; Rico and Sayani 2009). It is also assumed that such students are highly motivated to use technology in their course work (Carrillo *et al.* 2011). Such motivation is expected to increase their commitment to the course and improve their performance (Mestre *et al.* 2002). However, these assumptions have limitations in practice. For instance, many university courses have still not implemented specialised software or technology in their methodologies, and students still appear to perform well (Bonham *et al.*, 2003; Bowen *et al.* 2014). Other studies have shown that students using technology actually performed worse than those who did not (Bulman and Fairlie 2016).

Most of the previous studies have been carried out in developed nations. The empirical context of this study is of importance for understanding the effect on the performance of students using Excel in business courses in a developing nation where the cultural background is different. It has been documented that business education in Mexico tends to neglect the use of technology in courses (Pedroza-Zapata and Silvia-Flores 2020). Moreover, some studies have shown that Mexican business students typically have little experience of using software such as Excel, due to teachers' preference for more traditional pedagogical methods (Macias Teran *et al.* 2017). By analysing a sample of primarily Mexican students enrolled in a finance course, the research aimed to see to what extent choosing to use Excel or not, improved their performance in assignments and subsequently, in exams.

### 2.1. Use of Software and Student Assignments

Regarding finance courses, current literature has found contradictory evidence. For example, in a study on financial courses by Cagle *et al.* (2010: 47), the results indicated “*a positive effect for students' exam scores on the topics of portfolio risk and return and cash flow estimation for a capital budgeting project, but not for bond valuation and interest risk*”. Similarly, another study concluded that structured computer-based assignments were helpful for undergraduate students when completing exams using a scaffolded type design. Still, the results were not

significant for open-question exams (Peng 2015). Smolira (2008) found that undergraduate and MBA students prefer online-based assignments over traditional paper-based tasks. The paper highlighted the importance of the students preferring the online alternative, but there was no direct relationship with the overall course performance. Some studies have found that using software to complete assignments in the classroom facilitates student motivation as it makes the learning process more dynamic (Angrist and Lavy 2002; Carrillo *et al.* 2011; Maheshwari 2019). Such studies have shown that students found it easier to complete their assignments using online resources by taking advantage of specialised software (Zengin *et al.* 2012). Other studies have reported that by using software, the students improved their assignment completion rate (Bettinger *et al.* 2015; Bulman and Fairlie 2016).

The majority of studies mentioned have been carried out in developed nations. There is a lack of such studies in developing nations. Specifically, there is a lack of studies done in Mexico on finance students using Excel to complete assignments:

H1 = The use of Excel to complete assignments has no effect on the performance of students in exams

Completing assignments and its relationship with the performance of students in exams

Studies have focused on understanding the relationship between grades in assignments and the performance of students in exams (Kalinowski and Toper 2007; Peters *et al.* 2002.). The research has mostly concluded that the grades of the student in the assignments have a statistically significant effect on exam performance. This finding has also been noted in other studies, where they found that the performance of the students in assignments was a good predictor of their overall learning performance (Natriello and McDill 1986). Nevertheless, it is assumed that the improvement in the performance of students is associated with students completing all their assignments, and assignment grades are a reflection of such student engagement (Carver *et al.* 2004).

As regards finance education, Biktimirov and Klassen (2008) found that the completion of online homework assignments and the level of online interaction with course materials had a positive effect on the outcome of the students in a paper-based exam in an introductory finance course. Similarly, where the authors tested the impact of completing assignments on the performance of students in short and long-term management accounting courses, the results indicated “*that students who consistently completed homework performed better than those who did not for each class length*” (Rayburn and Rayburn 1999: 331).