Academic Performance in Distance Education: Quizzes as a Moderator Variable and Students' Perception and Expectation through Linguistic Analysis

Laura Parte
Lucía Mellado
Universidad Nacional de Educación a Distancia (UNED), Spain

Abstract
This study sheds light on the relation between assessment modalities and student behavior through linguistics styles, and academic performance. First, we examine the effect of assessment modalities (self-evaluation quizzes and summative quizzes) on academic performance. Using two modalities of online quizzes, we mainly focus on the student participation, student behavior (the work pacing and time management), type of assessment, and student characteristics. Second, we analyze the student behavior through linguistic styles and third, we examine the levels of anxiety and the expectation of success during the course. Specifically, we compare the linguistic styles of high performing students and low performing students and changes in anxiety levels and expectation of success. Methodologically, this study includes a static and dynamic perspective and combines quantitative analysis with a qualitative approach. The participants are students enrolled in Managerial Accounting for Tourism course in the academic year 2019–2020. The results show that both quizzes modalities are positively associated with academic performance. The linguistic analysis shows differences in the language between high performing students and low performing students. Finally, a pattern of changes on the students' expectations of success and levels of anxiety are identified during the course.

Keywords: academic performance, learning virtual platform, linguistic analysis, quizzes

Parte, L. & Mellado, L. (2022). Quizzes as a moderator variable and students' perception and expectation through linguistic analysis. *Online Learning, 26*(2), 124-147.

Blended and online models of learning in higher education are rapidly expanding worldwide. The report published by U.S. National Centre for Education Statistics in 2020 reveals an increasing trend in institutions and schools offering online courses at different levels, in addition to the number of students enrolled in this educational modality. In particular, the report shows 6.0 million of students enrolled in distance education modality in at least one distance education course in 2019. Kumar et al. (2019) pointed out that online education system is not merely a passing trend but a widely prevalent learning system worldwide. Furthermore, the COVID-19 pandemic forced a transition from traditional classes to online classes worldwide to guarantee student learning during the pandemic, which can create new opportunities for a wide variety of educational institutions.

Given the increasing importance of online and blended models in higher education, a fruitful area of research has emerged, especially in the last decade. Some crucial research questions are related to learning quality, interactions between instructor and students and with peers, teaching models, and student satisfaction. Student engagement and student motivation during the course are crucial variables in online learning to prevent dropouts (Alyahyan & Düştegör, 2020; Inkelaar & Simpson, 2015). Kumi-Yeboah et al. (2020) highlight the importance of digital technologies in online settings because enhances the learning experiences, including student engagement and student performance. Consequently, instructors have the responsibility to implement appropriate strategies that promote students' active participation, engagement, and motivation during the course, which also may enhance learning outcomes.

Although online learning permits a variety of asynchronous and synchronous strategies, we believe that quizzes (both self-evaluation quizzes and summative quizzes or tests that contribute to their final grade) are a valuable tool to measure students' progress and allows a constructive learning. At the same time, quizzes contribute to students' engagement and motivation, active participation during the course, provide a quick and useful feedback during the semester (Bälter et al., 2013; Cook & Babon, 2017; Gibb & Simpson, 2005; Ross et al., 2018) and have a positive impact on grades (Förster et al., 2018). However, some research finds that quizzes are not useful in all the cases. For example, Ross et al. (2018) showed that adaptative quizzes contribute to student motivation and engagement, but they do not contribute to the final output.

This research seeks to go a step forward in the field by analyzing the effectiveness of tests and quizzes to enhance student learning and retention in distance education. We complement previous studies in the field (Bälter et al., 2013; Cook & Babon, 2017; Parte & Mellado, 2014) by including different testing modalities to analyze the students' behavior, motivation, engagement, and its association with academic achievement, in addition to a linguistic analysis of the students' expectations and perception about the success.

The first objective is to examine the effect of voluntary quizzes on academic performance, regarding a test that affect the final grade (summative quizzes) and quizzes that do not affect the final grade (self-evaluation quizzes). Specifically, the study examines the participation of students in both quiz modalities during the online course and its association with academic achievement; the student behavior (work pacing and time management) when they access and complete the task and its association with academic achievement; the association between both quiz modalities

(also accumulative quizzes) and academic achievement; and finally, the association between student characteristics and academic achievement. In terms of methodology, we used descriptive statistics, contingency tables, correlation analysis, t-tests and Mann-Whitney U tests, and regression analysis.

In an online setting, the communication and interaction between instructors and students and between peers are key variables. Psychological studies suggest that individual linguistic styles and linguistic constructions enable an understanding of personality features and traits, attitudes, thinking styles, and moreover predict the academic performance (Pennebaker et al., 2014; Tausczik & Pennebaker, 2010). Focusing on online setting, most previous research relies on the Community of Inquiry (CoI) framework to understand the dimensions of online learning (Choy & Quek, 2016; Garrison et al., 2001; Joksimovic et al., 2014; Zhu et al., 2019). Using this robust framework, several papers find associations between student linguistics styles and learning outputs (Joksimovic et al., 2014; Zhu et al., 2019).

Other traditional lines of research on psychological and educational field focuses on self-efficacy and self-determination as a strong predictor of academic performance (Bandura, 1989). Jacobi (2018) shows that self-determination theory is important to explain the needs of online students. Indeed, previous empirical studies suggest that the online tools (like quizzes) are important to enhance students' learning but also their self-efficacy, confidence and levels of anxiety influencing their learning and the outcome (Bandura, 1989; Butz et al., 2015; Pekrun, 2006). The control-value theory (CVT) explains that achievement emotions predict subsequent achievement. Based on this theory, several studies examine emotions (enjoyment, anxiety, pride, boredom, etc.), perceptions of control, value, and success in learning environments (e.g., Butz et al., 2015; Pekrun, 2006). Research suggests that regarding pre-exam anxiety, students having greater anxiety perform worse than students with less anxiety or higher levels of self-determination (Pekrun, 2006). It is noted that emotions in distance learning are mainly unexplored (Butz et al., 2015).

Building directly upon the first objective of this research, the second and the third objective of this study is to analyze student behavior through linguistic styles when they complete the quizzes and the levels of anxiety and the expectation of success during the course. First, we compare the linguistic styles of high performing students and low performing students. Second, we examine changes in anxiety levels and the expectation of success during the course. Finally, we manually read all the student answers to make additional inferences. To capture and examine the linguistic styles and draw inferences of student behavior during the semester, we use the Linguistic Inquiry and Word Count (LIWC) software that provides several categories to measure emotional, cognitive, structural, personality features and process components both in written text and verbal speech (see e.g., Pennebaker et al., 2014; Tausczik & Pennebaker, 2010).

Given the calls in academia for more research addressing critical issues in an online setting, this paper sheds light on learning assessments, linguistic styles, and student emotions and expectations during the course. To our knowledge, no research has specifically examined the relations among these together in distance learning.

Literature Review

Assessment and academic performance

Academic performance is understood as the final output of the learning process. In general, the academic performance is an indicator of the student's learning progress, the skill acquisition, and the ability and knowledge in the subject. Many researchers have focused on the factors associated with academic achievement, student academic success and student academic failure. York et al. (2015) pointed out that academic success is driven by five factors: academic achievement, attainment of learning objectives, acquisition of desired skills and competencies, satisfaction, persistence, and post-college performance. In a revision of the literature, Alyahyan and Düştegör (2020) find that most studies have focused on five factors when studying academic success: prior academic achievement (measured mainly by grades and cumulative grade point average), student demographics, e-learning activity, psychological attributes, and environments. It is also noted that student e-learning activity information and psychological attributes are less studied compared with prior academic achievement and student demographics (Alyahyan & Düştegör, 2020).

Howard (2020) focuses on assessments regarding three modalities: unproctored online students, testing-center-proctored, and software-proctored. The results show that the exam scores of the unproctored online students are not different to the means of the exam scores of the testing-center-proctored and software-proctored. However, unproctored online students spent more time compared with the other two groups. Using a sample of students from Distance University, Herrador-Alcaide et al. (2019) find that academic success depends on the student attitude toward the virtual learning environments, self-perception about generic skills, and satisfaction with the learning process.

Several authors point out the effectiveness of testing to enhance student learning, improve the memory and retention, motivate students, or boost academic performance (Adesope et al., 2017; Bälter et al., 2013; Cook & Babon, 2017; Gibb & Simpson, 2005; Parte & Mellado, 2014). The excellent meta-analysis published by Adesope et al. (2017) provides a comprehensive analysis to understand the benefit from the tool, the conditions where tests outperformed other tools (such as fillers, readings, rereading, etc.), the main advantages for students that take tests, and offers some guides to design and implement tests (in terms of number, time, formats, settings, etc.).

Regarding the online setting, Gibb and Simpson (2005) remark on the importance of formative assessment with proper feedback in Open University to motivate and engage students. Bälter et al. (2013) find that online quizzes with generic questions related to previous lectures to test the knowledge of the subject and limited feedback (in terms of short answers, right or wrong) are helpful for the students to test their knowledge and can change certain students' habits.

Gibbs and Simpson (2005) explain that tests and quizzes with timely feedback and assessment contribute to reinforce and enhance student learning. The importance of motivation for the learning itself and not just for a reward is also mentioned. Cook and Babon (2017) analyze online quizzes as a mechanism to motivate students with the material, to engage them in the course, to promote the knowledge of the subject, and finally to connect the students' effort with their grade. The results show that online quizzes that affect their grades are regarded positively by students. Hence, most students

highlighted that quizzes helped to understand the readings. Förster et al. (2018) show that student participation in quizzes in online setting contributes to final exam. They also detected that quizzes contributed more to grades for those students who participated less compared to student who participate more. They also find differences in gender variable. Ross et al. (2018) detected that students perceive that quizzes, in particular adaptive quizzes, is a tool that support their learning. That is, adaptative quizzes enhance student motivation and engagement but the academic achievement does not increase significantly with quizzes.

Self-efficacy, linguistic style, and academic performance

One interesting area of research examines the association between students' linguistic styles and academic performance. Psychological theories posit that linguistic styles (the words and sentences that people choose and the meaning behind the sentences) enable an understanding of personality features, attitudes, cognitive process, thinking styles, etc. In educational field, one of the most popular programs to capture the linguistic styles is Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al., 2014; Tausczik & Pennebaker, 2010). The text analytic of the program is based on term frequency, which measures the number of times a word appears in a document. Pennebaker et al. (2014) identified eight standard function word categories in 50,000 student admissions essays, which correspond to more than 25,000 entering students, and predicted grades over four years. The categories selected combine students' abstract thinking and their cognitive complexity. Also, Robinson et al. (2013) confirm the results obtained by Pennebaker et al. (2014), adding more linguistics categories extracted from LIWC. Subsequent papers have also examined the relationship between students' linguistic styles and different learning strategies and learning output (e.g., Abe, 2020; Joksimovic et al., 2014; Yoo & Kim, 2013; Zhu et al., 2019), as well as its associations with students' characteristics such as gender (Robinson et al., 2013; Schwartz et al., 2013) and age (Schwartz et al., 2013).

Focusing on online setting, most recent research relies on the Community of Inquiry (CoI) model that is a robust framework to understand the dimensions of online learning in communities of inquiry (e.g., Choy & Quek, 2016; Garrison et al., 2000, 2001; Zhu et al., 2019). CoI is based on social constructivism and explains that the learning occurs when students interact with others in a sociocultural context. Considering this framework, online learning is explained through three constructs: teaching presence, cognitive presence, and social presence; the second construct becomes the most important (Abe, 2020; Choy & Quek, 2016; Garrison et al., 2000, 2001; Joksimovic et al., 2014; Zhu et al., 2019). For example, Choy and Quek (2016) find that the cognitive element is directly and positively associated with the continuous achievement and output performance in blended learning while teaching presence and social presence are indirectly associated with continuous achievement.

Furthermore, Joksimovic et al. (2014) analyzed the linguistic features through students' online discussion transcripts. They use four levels of cognitive presence according to the sociocognitive process: triggering, exploration, integration, and resolution phases. Findings reveal a pattern of linguistics style through the four levels of cognitive presence, and word count is a strong predictor of the cognitive presence. Moreover, Abe (2020) finds that word count, which is a proxy of cognitive presence, predicts academic performance using a sample of undergraduate psychology in online classes. Zhu et al. (2019) emphasize the need to promote social presence in online setting from instructors and students. The study suggests that students exhibiting higher

social presence used greater number of positive words and positive tone, which reflect their satisfaction with the course. Other signals include posted comments and claims. They also find an increase in the use of clout words (causality words), which could be indicative of confidence with their communication abilities and with the course, but at the same time could be a signal that students' cognitive processes in terms of social presence decrease at the end of the semester.

Yoo and Kim (2013) focus on students' online discussions to predict student performance. The results show that the number of answers provided to others, expressions of positive emotion, and communication about problems in an early phase are linked to student grades. Ross and Wright (2020) find that "work" words provides an indirect measure of math attitude and it is associated with the student's academic performance in an introductory finance course. According to these authors, this category is particularly interesting in Finance, because it is associated with conceptual framework and professional context, and it also reflects the effort. Although this category is not well analyzed in Education, we consider it interesting to include in business disciplines such as Accounting.

Based on previous empirical studies in online setting, this study focuses on students' linguistic styles during the course and its association with academic achievement in distance university. Specifically, this paper focuses on three objectives:

Objective 5. Linguistic style and academic performance.
Objective 6. Categorial language and academic performance.
Objective 7. Narrative language and academic performance.

Self-efficacy, emotions, and expectation of success

A traditional line of research on psychology and education field focuses on self-efficacy and self-determination as a strong predictor of academic performance (Bandura, 1989; Christensen et al., 2002). Self-efficacy refers to student expectations about how well they can perform (Bandura, 1989). In an interesting study, Christensen et al. (2002) show that self-efficacy beliefs influence accounting students' academic performance and is conditioned to the student expectation (optimistic or pessimistic) about their success. Based on robust theories such as self-determination, achievement goal theory (AGT), students' approaches to learning (SAL), and social cognitive theory, extensive research examines student self-efficacy, goal orientation, intrinsic and extrinsic motivations, and self-determination, and the moderating factors that impact the relationship using different settings.

Other interesting areas of research focus on achievement emotions and achievement outputs. Control-value theory (CVT) provides a solid framework to explain achievement emotions and academic performance and successful outcomes (Pekrun, 2006). Researchers suggest that students with high levels of pre-exam anxiety perform worse than students with less anxiety or more levels of self-determination (Pekrun, 2006). Also, the literature has focused on examining emotions as a moderator factor and the relations between performance goals, achievement, self-efficacy, self-regulation, academic expectations, among others (see e.g., Butz et al., 2015). In an interesting study, Butz et al. (2015) examine the role of students' emotions (enjoyment, anxiety, and boredom), perceptions of control, value, and success in synchronous hybrid learning environments that includes traditional classes and online teaching using web

conferencing. The results of this study can be used as a baseline for future research in online setting and distance learning. Although this study focuses on hybrid learning model, to date most empirical research is based on traditional classes, leaving room for research in the online setting.

Based on previous empirical studies in online setting, this paper focuses on student anxiety levels and expectation of success. Our last objectives are as follows:
Objective 8. Changes in anxiety levels during the course.
Objective 9. Changes in success expectations during de course.
Objective 10. Student concerns about the subject.

Research Design

Context

The study was conducted in a sample of students enrolled in an accounting subject at Universidad Nacional de Educación a Distancia (UNED). UNED has a long history of offering blended and online education. It was created in 1973 through the modality of distance education and it is the main hybrid and distance learning university in Spain and one of the largest universities in Europe. In general, the students work and study at the same time. Indeed, they have limited time to be involved in the subjects, so they require a set of learning materials that allow them to take an advantage of their study time (Herrador-Alcaide et al., 2019). The language used at the university is Spanish.

The subject chosen for the study is Managerial Accounting for Tourism as students normally perceive the subject as difficult and, in general, the student motivation is low (see e.g., Holmes & Rasmussen, 2018; Parte & Mellado, 2021). Cost and Management Accounting normally is a compulsory subject for students enrolled in economics and business administration degree and for students studying Tourism. As mentioned before, the subject is a matter of considerable interest due to its application to real world. The syllabus requires both theoretical concepts and application of formulas and cost models to take decision in business scenarios. Goh and Scerri (2006) explain that hospitality students, in general, have a negative preconception toward accounting subject, described as "boring," "numbers related," and "difficult to understand." However, the positive attitudes toward accounting increases when the student understand the concepts and the exercises.

The participants were students enrolled in the subject during the 2019–2020 academic year. Our role are course designers and teachers. At the beginning of the semester, we announced several online activities through the Blackboard Learn program. All the students have access to the resources provided in the learning management system. The students voluntarily attended the online activities according to the schedule announced at the beginning of the semester. In this study, students decide freely to participate in the online quizzes. That is, we do not assign student randomly to different groups (treatment and control group), because of ethical restrictions. The student responses are treated anonymously. The data from the analysis are obtained from the Blackboard Learn program and the grade program that collects students' grades.

Assessment and academic performance

During the semester, we conducted three voluntary online quizzes that did not affect their grade and a test that did affect their grade. The objective of the online formative quizzes is to provide a self-evaluation of the subject rather than an assessment with a mark. The content of the quizzes is directly related to the syllabus of Managerial Accounting for Tourism subject: quiz 1 contains basic concepts, quiz 2 comprises questions related to traditional cost models, and quiz 3 contains questions related to alternative cost models, cost-volume-profit analysis, and tools for planning and control. Cook and Babon (2017) suggest linking the quizzes with the student's grades and to focus on core materials to prepare student for the final exam. Consequently, we also provided an online test with contribution to the grade (summative quizzes) that contains questions for the eight chapters of the syllabus. Then, our project comprises both modalities of quizzes: self-evaluation and summative. In addition, we include an open question in each quiz related to student expectation of success in the subject. Specifically, we ask students about their confidence in the subject, challenges, motivations, and future perspectives. As we offer three quizzes, we have three open questions at three different times.

The self-evaluation and summative quizzes require not only a recollection of concepts but also a practical application to real world, where the students have to apply the concepts to short case studies where they need to apply cost models to find the final cost of products and services, determine margins by products and firm performance, take decisions to find the best solution for real business, etc. The quizzes are open over several weeks, and the student can choose a convenient time to complete the assessment through the Blackboard learning program, while for the test, the exact date and time is announced at the beginning of the course.

Several stages are defined to measure the effectiveness of quizzes and test in the course. First, we examine the student participation in the test and the quizzes during the course: frequency of the participation and number of quizzes attended (accumulative quizzes). As we offer two modalities, quizzes that have no effect on the grade and a test that affects the grade, the student participation could be different. Second, we analyze the student behavior when they access the Blackboard learning program and complete the task because the pacing and time management is important in distance learning. Third, we measure the contribution of the test and quizzes to the final exam grade, considering different levels of student success. Finally, we include prior academic achievement in the subject and students' demographic factors as prior studies in the field (see Alyahyan & Düştegör, 2020 for a literature review).

Methodologically, we used the SPSS version 25 software package. For the data analysis, we used descriptive statistics, contingence tables, correlation analysis, t-test and U-Mann Whitney tests, and regression analysis. The regression analysis includes the students' final grade as the dependent variable and Test and Quizzes (number of quizzes attended) as independent variables. The regression also introduces three control variables: Repeater, Gender, and Location. The regression model is:

$$\text{Exam Grade} = \alpha + \beta 1\ \text{Test} + \beta 2\ \text{Quizzes attended} + \beta 3\ \text{Repeater} + \beta 4\ \text{Gender} + \beta 5\ \text{Location} + e$$

Prior research that included some of these control variables are Parte and Mellado (2014, 2021), Robinson et al. (2013), Schwartz et al. (2013), Tausczik and Pennebaker (2010), among others. It is also noted that most previous studies used Grades and Cumulative Grade Point Average in their models (see e.g., Alyahyan & Düştegör, 2020; York et al., 2015). Future studies can include these variables.

Linguistic style and academic performance

As explained before, we included an open question in each quiz related to student expectation of success in the subject. Specifically, we asked students about their confidence in the subject, challenges, motivations, and future perspectives. As we offer three quizzes, we have three open questions at three different times: at the beginning, midterm, and at the end of the semester. The open questions allow a better understanding of student learning engagement and expectations. We processed the text using LIWC and read every answer individually.

LIWC was originally developed for the analysis of narrative of writing text but today it is also applied for call conferences, speech, etc. LIWC is based on word frequencies collected from word lists and calculates the relative frequency per word list in given texts. The main categories provided in LIWC are linguistic processes such as articles and pronouns, psychological processes (e.g., positive and negative emotion), cognitive processes (e.g., cause, etc.), personal concerns like work and leisure, as well as other parts of the text as assent and fillers, periods, punctuations, etc.

The first step to use LIWC is to provide the text in .txt file. Our Blackboard learning program provided the student answers in another format. Specifically, the original text is in .csv format file. We convert the .csv to a word and text file. We also reviewed manually each answer to make sure that the text is correctly translated to .txt file. Following Robinson et al. (2013), we review the misspelled words to ensure that every student's words in the text are codified in software. Later, the text files were processed using the LIWC software (Spanish version).

LIWC provide several categories according to the text introduced in the software. To select the categories associated to student performance, we relied on prior educational studies in the field (Abe, 2020; Pennebaker et al., 2014; Robison et al., 2013; Ross et al., 2018; Ross & Wright, 2020). According to these studies, linguistic style can reflect students' psychology and can be associated to student success. For example, Pennebaker et al. (2014) detect that more categorical language, thinking logically and hierarchically are associated with the use of more articles and prepositions. Yoo and Kim (2013) reveal differences in the emotions used by students: more positive emotions for successful students and more negative emotions for non-successful student. Robison et al. (2013) detect that the number of quotations also reveals differences between groups. Ross and Wright (2020) find that work words are part of an interesting category in business and can correlate in math courses and finance and accounting courses. In contrast, weak performing students use more pronouns, conjunctions, and negations, which indicate more dynamic language, intuitive and narrative thinking (Pennebaker et al., 2014), negative emotions, verbosity (present verb tense), social dimensions related to family and ingested dimensions (Robison et al., 2013).

In this study, we are interested in examining the linguistic analysis according to student academic performance. Then, we analyzed the linguistic analysis of student in two groups: students who passed the final exam (high performing students) and students who did not pass the final exam (low performing students).

Student behavior changes: emotions and expectation of success

Our last objective is to examine a pattern of change in student behavior during the semester. To address this objective, we examine the student answers in the open questions through LIWC program. That is, we use an indirect measure of anxiety and student academic expectations. We rely on LIWC to capture the levels of positive and negative expression, particularly the anxiety score and the cognitive dimension. The evolution in the variables allows us to examine the changes in student behavior. Finally, we manually analyze the students' writing to deeply examine the responses and capture the students' expectations and other dimensions.

Results

Table 1 presents the descriptive statistics. The total number of students enrolled in the course is 358. The final exam, in an ordinary session, is attended by 165 students (46.09%). The student participation and response rate to the voluntary assessments are as follows: 110 (30.73%) attended the test with contribution, 59 (16.48%) attended Quiz 1, 62 attended Quiz 2 (17.32%) and 51 (14.25%) attended Quiz 3. The descriptive statistic shows that the participation in the test is higher than the participation in the quizzes. This means that rewards and incentives are important for students. A decrease in student participation in the last quiz was noted. Only students who attended the final exam or participated in at least one quiz are included in the study.

Table 1

Descriptive statistics

	Test and Quizzes					
	Total	%	Yes	%	No	%
Exam	358	100%	165	46.09%	193	53.91%
Test	358	100%	110	30.73%	248	69.27%
Quiz 1	358	100%	59	16.48%	299	83.52%
Quiz 2	358	100%	62	17.32%	296	82.68%
Quiz 3	358	100%	51	14.25%	307	85.75%

	Gender					
	Total	%	Female	%	Male	%
Gender over total students	358	100%	234	65.36%	124	34.64%
Gender over exam	165	100%	108	65.45%	57	34.55%

	Location									
	Total	%	G1	%	G2	%	G3	%	G4	%
Location over students in Blackborad	315	100%	80	25.40%	106	33.65%	70	22.22%	59	18.73%
Location over exam	164	100%	42	25.61%	60	36.59%	35	21.34%	27	16.46%

In general, prior studies indicated that dropout rates in e-learning are higher than in traditional education. For example, Simpson (2010) shows that the dropout rate at the British Open University is around 78%. The UNED reports a lower dropout rate in comparison to other Distance Universities, but it is also a concern.

Table 1 shows that the percentage of females is around 65% and that of males is around 35%. The university also allocates student by geographical location. Further inspection reveals that the percentage of students enrolled in the subject for the first time are 66.06%, while 33.94% the students enrolled in the subject more than once, of whom 67.86% attended the exam in the preceding year, in ordinary or extraordinary session.

Table 2 shows the contingence analysis. The first row presents the quizzes attended and the accumulative quizzes during the course. The results reveal that 86 students attended one quiz, 53 students attended two quizzes, and 33 students attended all the quizzes. The second row shows that most students prefer to attend the quizzes at the end of the period; that is, near the deadline. Procrastinator students versus early completers is an interesting variable to study in Distance University. Also, the students prefer to attend the quizzes in the afternoon and evening instead of mornings or nights. This is logical because our students are working and studying at the same time and may found it difficult to attend the quizzes in the morning. It is also noted that the majority prefer to attend the assessment during the week instead of on weekends.

Table 2

Contingence analysis

		Individual quizzes					Acumulative Quizzes (at least)			
		Quiz 1	Quiz 2	Quiz 3	Total		One	Two	Three	Total
Quizzes attended	Frec	59	62	51	172	Frec	86	53	33	172
	%	34.30%	36.05%	29.65%	100%	%	50.00%	30.81%	19.19%	100%
		Quiz 1					Quiz 3			
		1	2	3	Total		1	2	3	Total
Week	Frec	15	8	36	59	Frec	4	8	39	51
	%	25.42%	13.56%	61.02%	100%	%	7.84%	15.69%	76.47%	100%
		Morning	Aft/Even	Night	Total		Morning	Aft/Even	Night	Total
Day time	Frec	15	31	13	59	Frec	20	22	9	51
	%	25.42%	52.54%	22.03%	100%	%	39.22%	43.14%	17.65%	100%
		No	Yes	Total			No	Yes	Total	
Weekend	Frec	46	13	59		Frec	39	12	51	
	%	77.97%	22.03%	100%		%	76.47%	23.53%	100%	

Table 3 presents correlation coefficients (Pearson is reported above and Spearman is reported below the diagonal). The results indicate a positive and significant correlation between the student academic performance (*Exam*) and the Test and the Quizzes ($p < .05$) and the number of times that the student attended the quizzes ($p < .05$). These results suggest that both individual quizzes and accumulative quizzes are associated to academic performance. The results also showed a negative correlation

between academic performance and the coefficient of the variable Repeater ($p < .05$). The coefficients on Gender and Location are positive but not statistically significant ($p > .05$).

Table 3

Pearson and Spearman correlation

	Exam		Test		Quiz 1		Quiz 2		Quiz 3		Quizzes attended	
Exam			0.298	***	0.318	***	0.260	***	0.170	**	0.293	***
Test	0.308	***			0.399	***	0.423	***	0.241	***	0.422	***
Quiz 1	0.312	**	0.399	***			0.629	***	0.523	***	0.853	***
Quiz 2	0.262	***	0.423	***	0.629	***			0.546	***	0.864	***
Quiz 3	0.162	**	0.241	***	0.523	***	0.546	***			0.811	***
Quizzes attended	0.314	***	0.421	***	0.835	***	0.853	***	0.778	***		

Note: Pearson correlation is reported above the diagonal and Spearman correlation is reported below the diagonal. * p <.10. ** p <.05. *** p <.01.

Table 4 provides the student performance conditioned to Quizzes modalities (Panel A) and Student behavior (Panel B). The last column shows the t-test and U Mann-Whitney test. In Table 4, Panel A, the variable Test (Quiz) takes the value 1 if the student attended the Test (Quiz) and 0 if they did not attend. The results show that the mean grade is higher for students who attended the Test (Quiz) compared to students who did not attend the Test (Quiz). Both t-test ($p < .05$) and U Mann-Whitney test ($p < .05$) reveal statistically significant differences.

Table 4, Panel B shows the student behavior when they complete the quizzes. The first line shows the differences between student categories: progressors, non-progressors, and non-completers. The variable accumulative quizzes take the value 0 if the student did not attend any quizzes during the course, the value 1 if the student attended one quiz during the course, the value 2 if the student attended two quizzes during the course, and the value 3 if the student attended three quizzes. An alternative measure is a dummy variable that takes the value 0 if the student did not attend any quizzes and the value 1 if the student attended one or more quizzes. The results show that students with accumulative Quizzes (both measures) earn higher grades in the final exam. In all cases, the mean grade is higher for students who attended the Test (Quiz) compared to students who did not attend the Test (Quiz), and the mean grade increases with the number of quizzes attended. The statistical test shows statistically significant differences ($p < .05$). This means that progressors perform better than non-progressors and non-completers. It is also noted that non-progressor perform better than non-completers.

Table 4

T-test and U Mann-Whitney test

Panel A. Quizzes modalities and academic performance

					t-mean		U Mann Whitney	
Exam		N	%	Mean	t	p-value	z	p-value
Test	Yes	85	51.52%	5.911	3.990	0.000	-3.940	0.000
	No	80	48.48%	4.181				
	Total	165	100%					
Quiz 1	Yes	50	30.30%	6.468	4.278	0.000	-3.993	0.000
	No	115	69.70%	4.465				
	Total	165	100%					
Quiz 2	Yes	52	31.52%	6.183	3.563	0.001	-3.352	0.001
	No	113	68.48%	4.561				
	Total	165	100%					
Quiz 3	Yes	43	26.06%	5.902	2.204	0.029	-2.079	0.038
	No	122	73.94%	4.780				
	Total	165	100%					

Panel B. Student behaviour and academic performance

Exam		N	%	Mean			z	p-value
Quizzes attended	0	94	56.97%	4.252				0.000
	1	26	15.76%	5.873				
	2	16	9.70%	6.719				
	3	29	17.58%	6.103				
	Total	165	100%		t	p-value	z	p-value
Quizzes attended	1 or more	71	43.03%	6.158	4.397	0.000	-4.171	0.000
	None	94	56.97%	4.252				
	Total	165	100%					
Week - Quiz 1	Early	18	36.00%	7.128	1.331	0.190	-1.779	0.075
	At the end	32	64.00%	6.097				
	Total	50	100%					
Week - Quiz 2	Early	22	42.31%	6.205	0.051	0.960	-0.241	0.810
	At the end	30	57.69%	6.167				
	Total	52	100%					
Week - Quiz 3	Early	11	25.58%	6.555	0.921	0.363	-1.719	0.086
	At the end	32	74.42%	5.678				
	Total	43	100%					
Week panel	Early	4	26.67%	8.775	2.685	0.019	-2.225	0.026
	At the end	11	73.33%	5.736				
	Total	15	100%					

Table 4, Panel B also shows the student behavior in terms of early completers and late completers. The variable week takes the value 1 for early completion of the quizzes and 0 for completion near the deadline. The results show that students who chose to complete the quizzes at the beginning of the period (Early) obtained higher mean grades in the final exam than students who chose to complete the quizzes towards the end of the deadline. In Quiz 2, the mean grade is very similar between both groups

because the deadline for Quiz 2 is close to the test affecting the final grade, and students are interested in this test. It is also noted that the mean grade for students who complete all the quizzes at the beginning (Early) is 8.77 while the mean grade for students that complete all the tests at the end of the period is 5.74. The t-test ($p < .05$) and U Mann-Whitney-test ($p < .05$) reveal statistically significant differences. This means that early completers earn better grade than late completers.

In terms of students enrolled in the course for the first time and students enrolled in the subject more than once the mean grade is higher for the former group and the t-test ($p < .05$) and U Mann-Whitney test ($p < .05$) show statistically significant differences. In contrast, we do not find statistically significant differences due to the fact that the students attended the exam in the preceding year ($p > .05$). Also, the Gender and Location variables do not show statistically significant differences, using t-test ($p > .05$) and U Mann-Whitney test ($p > .05$).

Complementary to the previous results, Table 5 disaggregates the student grade in four levels: fail, pass, notable, and outstanding. The results indicate that in all the levels, students who attended the test and quizzes obtained higher mean grades compared to students who did not attend the assessments.

Table 5
Grade disaggregation

		Test		Quiz 1		Quiz 2		Quiz 3		Quizzes attended	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Failed	Yes	29	2.552	12	2.450	15	2.720	14	2.486	21	2.557
	No	47	2.053	64	2.205	61	2.126	62	2.189	55	2.124
	Total	76		76		76		76		76	
Pass	Yes	19	5.905	11	5.927	13	5.892	10	6.060	15	5.940
	No	10	5.690	18	5.772	16	5.781	19	5.711	14	5.714
	Total	29		29		29		29		29	
Notable	Yes	23	7.970	17	7.859	14	7.736	13	7.762	23	7.835
	No	19	7.563	25	7.736	28	7.811	29	7.797	19	7.726
	Total	42		42		42		42		42	
Outstanding	Yes	14	9.493	10	9.520	10	9.580	6	9.583	12	9.517
	No	4	9.350	8	9.388	8	9.313	12	9.400	6	9.350
	Total	18		18		18		18		18	

Table 6 presents three regression models: the first introduces the variable test, the second includes the variable quizzes attended and the third considers both variables. The regression results show that self-evaluation quizzes and summative quizzes are positive and significantly associated with good academic performance ($p < .05$). The coefficient on Repeater is negative and significantly associated with good academic performance ($p < .10$). In contrast, the coefficients on Gender and Location do not present statistical significance ($p > .05$). The evidence suggests that students who attend

summative quizzes and the self-evaluation quizzes more times perform better than those who do not attend the assessments.

Table 6

Regression results

	Coef. Est. Beta	Sig.	Coef. Est. Beta	Sig.	Coef. Est. Beta	Sig.
c		0.000		0.000		0.000
Test	0.249	0.002			0.169	0.054
Quizzes attended			0.246	0.002	0.165	0.061
Repeater	-0.155	0.044	-0.150	0.053	-0.134	0.081
Gender	0.061	0.423	0.074	0.328	0.057	0.451
Location	0.040	0.591	0.040	0.592	0.039	0.597
R^2 adjusted	0.092		0.090		0.106	

Table 7 presents the results of linguistic analysis dividing the students in two groups: students who passed the final exam (high performing students) and students who did not pass the final exam (low performing students). As expected, the results show that high performing students used more articles, prepositions, quotations, positive emotions, work accounts and work words in the quizzes. The work account is the variable with more differences. Students who did not pass the final exam used more pronouns, conjunctions, negations, negative emotions, verbosity (present verb tense), social dimensions related to family and ingested dimensions in the quizzes. The results confirm prior evidence in the field (Abe, 2020; Pennebaker et al., 2014; Robison et al., 2013; Ross et al., 2018; Yoo & Kim, 2013).

Table 7

Linguistic analysis for high performing student and low performing student

	High performing students	Low performing students
Articles	11.11	10.25
Prepositions	14.42	12.92
Quotation	0.06	0.00
Work words	1.77	1.68
Work account	6,670	2,555
Positive emotions	4.00	3.72
Pronouns	7.05	8.18
Negation	1.05	1.06
Conjunctions	4.54	4.89
Negative emotions	0.58	0.94
Verbs	2.86	3.87
* Present tense	7.69	8.57
Social	4.09	4.58
* Family	0.15	0.20
Ingestion	0.40	0.55

Table 8 shows a summary of student emotions in three instances. The results indicate that the anxiety level increases during the course and prior to the final exam. Regarding their optimism, the results indicate that the expectation of success and confidence to overcome the subject is higher in Quiz 1 than in the Quiz 2, while it was higher in Quiz 3 than in Quiz 2. This is logical because at the beginning of the course, students are generally optimistic about their success. However, in midterm, some students became less confident and some of them dropped out. The deadline of Quiz 3 is close to the final exam and most students who attend Quiz 3 expect to attend the final exam. This shows that they have studied the subject and they have a positive expectation about their success.

Table 8
Emotions

	Quiz 1	Quiz 2	Quiz 3
Negative emotions	0.55	0.70	0.94
* Anxiety	0.16	0.25	0.35
Negation	0.97	1.09	1.18
Optimism	2.17	1.78	1.84
Achieve	3.04	2.56	2.63

Closer inspection of the students' open questions reveals interesting comments. First, we identify the main areas of interest according to keywords, coincidences in short expressions, and sentences with the same meaning. Students' comments mainly focused on four topics: (1) positive comments about their expectation to success, self-efficacy and confidence to overcome the subject, (2) high motivation to study the subject, (3) practical application to the subject for real business and future work, and (4) appropriate materials to follow the course, mainly the textbook (they also appreciated the tutorials and the instructors attending the virtual forums immediately after being asked).

Approximately 72% in Quiz 1 emphasized a positive perception to success the subject. The percentage decreases in Quiz 2 but increases in Quiz 3. Representative comments about students' perceptions of their success and high motivation are as follows:

> Since the beginning of the course, I am trying to follow the schedule conscientiously in order to pass the subject, possibly with a good score. I feel qualified for this and I am confident that with effort and perseverance, I will be able to reach my goal.
>
> It has been a pleasant surprise to see that this accounting course has a different focus than the rest of the subject. I am a schoolteacher, while also studying Tourism simultaneously. I am very motivated as I am about to finish my studies. I am confident of passing this subject, although I am aware that it requires effort. I hope to achieve my goal.
>
> I am attending the subject with a lot of confidence and encouragement.

> I like the subject and I am very motivated to overcome it.
>
> My expectation for this subject is high. I am confident that I will be able to pass the subject in the first attempt as I am quite motivated.

Approximately 25% in Quiz 1 emphasized the practical application of the subject in real world and future profession. The percentage decreases in Quiz 2 but increases in Quiz 3 (approximately 34%). Representative comments in this area of interest are the following:

> I believe that it is a subject whose contents are widely applicable to real world where there is always a high labor demand. It is becoming common to find job offers, in which people need accounting knowledge and skills.
>
> At first glance, it seems like a boring subject, a traditional accounting discipline with traditional accounting entries and account numbers, but I find it eminently practical and useful in the real world. I would like to focus on it and get a good score, which means I have understood it.
>
> It is an interesting subject, which will be useful for future work. One of my goals is to be an entrepreneur in the tourism industry.

Approximately 32% in Quiz 1 emphasized the importance of appropriate materials to follow the course, mainly the textbook, and attention by instructors. Representative comments about students' perceptions of the materials include:

> I find the book very practical because it explains all the processes step by step and applies the concepts and the theory to the case studies. At the moment, I think it can be very useful for the professional activity related to cost management, cost control, and budget in industrial and service companies. The book is one of the best for the tourism course. I agree with many of my colleagues.
>
> Congratulations for the book because it really introduced the subject very well and with enough detail.
>
> First of all, I would like to congratulate you for the book, it is difficult to find a book that explains the content so clearly and concisely. The structure is good. I think that in general, it is very well written, and the content is clearly explained with some very concise examples that cleared up all doubts regarding the concepts.

Negative comments mainly addressed the difficulty in understanding accounting concepts, the significant effort required, the challenges and the effort with the case studies and the difficulty to study and work at the same time.

Discussion

This study examines the relation between assessment modalities and student behavior through linguistics styles, and academic performance. The first objective of this research is to examine the effect of assessment modalities on academic

performance. The results indicate that students who attend voluntary online quizzes perform better than students who do not attend the online quizzes. In all cases, the mean grades for the former are higher compared to the latter. Furthermore, students who attend more quizzes (accumulative quizzes) performed better. A decrease in participation in the last quiz was also noted. This is logical because the students who expect to attend the exam are the most interested in the last quiz, and some students dropped out of the subject for the extraordinary session or the next year. The participation in summative quizzes is higher than self-evaluation quizzes because students are rationally motivated by a reward. The results also indicate that students who attend summative quizzes perform better than students who did not attend summative quizzes.

In terms of the student behavior, we find that early completers performed better than late completers. A preference for taking the online self-evaluation quizzes and summative quizzes in the afternoon and evening instead of at mornings and nights was also noted, due to the fact that most students simultaneously work and study at the university. The majority of students choose the weekdays and last days of the period to complete the quizzes. The results also show that progressors earn higher final course grades compared to non-progressors and non-completers.

The second objective of this study is to analyze student behavior through their linguistic styles when they complete the quizzes. Findings reveal that successful students, in terms of academic performance, use more articles, prepositions, and work words, indicating more categorical language. In contrast, unsuccessful students, in terms of academic performance, use more pronouns, adverbs, conjunctions, negations, negative emotions, verbosity (present verb tense), social dimensions related to family and friends, and ingested dimensions, which indicate more dynamic language.

Finally, the results indicate that anxiety levels increase during the course, and prior to the final exam. The results also show a pattern of change in the expectation of success and confidence to overcome the subject during the course. Further inspection of the students' answers reveals the main student concerns related to the subject and their main areas of interests.

Research Implications

To date, little research has examined the relation between several variables related to assessment and students' perception and expectation through linguistic analysis, and academic performance. Hence, the evidence in online learning systems, especially in Blackboard Learn, is in an incipient phase (Abe, 2020; Butz et al., 2015). As there is rapid growth in blended and distance learning in higher education worldwide, there are calls for more empirical evidence in student motivation, emotions, communication, and interaction, and learning styles. To fill this gap, we designed a study with implications in three different streams to the literature, assessments, linguistic style, emotion analysis, and student perception about expectations and concerns, within the context of distance education. Taken together, we consider that the study is relevant and timeless.

To address the objectives, the study uses a static and dynamic perspective, and combines quantitative analysis with a qualitative approach. The static perspective permits an early diagnosis of the student and creates opportunities for instructors and

institutions to find solutions during the early phase of the course. The research also offers a dynamic perspective by studying different modalities of assessment and students' expectation at different times. The dynamic perspective allows the revision of different strategies defined in an early stage of the course in order to enhance the learning and achieve the outputs of the course. The evidence is valuable for instructors and institutions to find solutions not only in an early phase of the course but also during the course.

Our results suggest different effects on the grades for online quizzes modalities (formative and summative) and student behavior (progressors versus non-progressor or non-completers and early completers versus late completers). We also find some different effects related to students' linguistic styles and changes in students' expectations and anxiety level. Taken together, the results could help to implement active and successful learning strategies, and continuously assess the potential problems to find solutions and conduct and redirect the situation when necessary.

Furthermore, according to the systematic review in online business education research provided by Kumar et al. (2019), the majority of the studies were conducted in the U.S. Looking at business disciplines, information systems and management and business are the most studied while accounting, finance, marketing are less explored. It is also important to mention that students normally perceive Cost and Managerial Accounting as a difficult subject and the engagement and motivation are low (Holmes & Rasmussen, 2018; Parte & Mellado, 2021). Compared to other business subjects, Cost and Managerial Accounting may create additional levels of anxiety both during the semester and before the exam, and low levels of expectation to pass the exam since the beginning of the course. Hence, accounting undergraduate students still have a traditional view of the accounting profession, excluding a social dimension that is a desirable competence according to the majority of business syllabus (Mellado & Parte, 2020). Consequently, this paper sheds light on students' perception and expectation on accounting discipline in a university with long tradition in online and blended modalities.

Practical Contribution

A key practical takeaway for educators from this paper is the finding that voluntary online quizzes are valuable in distance education. One of the main advantages of online quizzes is that they provide a quick answer to students about the formative assessment and also allows an analysis of student behavior. The study identifies some habits when students complete the quizzes that could be useful for instructors to design learning strategies and activities in the course. In particular, quizzes at the beginning of the course allow an early student diagnosis to take actions and mitigate potential problems related to previous knowledge, skills, progress in the subject, or even prevent early drop-out. Quizzes at midterm allow a revisit of previous diagnosis in order to continue to take actions and mitigate potential problems. Quizzes at the end of the course and prior to the final exam allow the instructor to measure the level of anxiety before the final exam and understand student strategies and student learning during the course that helps in preparing for the syllabus of the next course.

The study also identifies some differences in the linguistic styles between high-performing students and weak-performing students that could be used for an early student diagnosis. The evidence also shows that the students' optimism declines as the

course progresses and the anxiety levels increases during the semester. Consequently, instructors need to design active learning strategies during the semester and increase the intensity in the last weeks of the semester. Moreover, special attention is needed in the group of inactive students or offline students (Parte & Mellado, 2021). Although online courses, in general, have a passive group of students, with low rates of participation during the semester that feel comfortable attending only the final exam, we encourage educators to take action to engage this group of students in learning from the beginning itself and promote their participation. The engagement is crucial in preventing dropouts, which is an important issue in online learning system.

Another practical contribution from this research is that linguistic style allows identification of students' profile and behaviors during the semester, not only from a static point of view but also from a dynamic perspective. Consequently, instructors can benefit from the students' communication and interactions to identify students' profiles in an early phase to help students achieve their objectives. It is also important to examine how student motivation and expectation changes during the semester. The more complete the information about the student is, the easier it is for instructors to identify learning problems and redirect the strategy to help students. Considering the challenges that blended learning and distance learning in higher education create for instructors, researchers, institutions and policymakers in the post-COVID-19 era, the results of this study could be valuable to academia and future research in the field.

Limitations and Future Works

Like any research, the empirical part of this study has its limitations, as the sample used in this study comprised one class during an academic year. Future studies could increase generalizability considering students from more than one class and across more than one academic year. The current study relied on students that voluntarily completed the quizzes and tests. That is, all the students have access to the resources provided in the learning management system due to ethical restrictions instead of being randomly assigned to treatment and control groups. The response rate in e-learning is a critical point because not all the students participate in the activities or used the resources of the virtual platform. Future studies should consider implementing different strategies to motivate inactive students to participate more actively in the course. It would be also interesting to include student grades and cumulative grade point average in the models.

In addition, an interesting avenue is to examine the relationships between the self-determination construct and other dimensions, considering the reciprocal effects in online setting. The evidence could go a step further for a better understanding of students in online distance education. It could also be valuable to explore the students' linguistic styles in an online setting collecting information from different channels as discussion groups, collaborative tasks, individual messages, etc. The results can be complemented with students interviews or focus groups to better understand the usefulness of the quizzes.

Declarations
The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

The study was conducted according to the guidelines approved by the UNED (Spain). The study meets the ethical requirements set by the University.

The authors acknowledge the financial contribution from GID_2016_2 ("e-ConTIC") and UNED/Santander, Ref project 2020V/EU-UNED/04.

References

Abe, J. A. A. (2020). Big five, linguistic styles, and successful online learning. *The Internet and Higher Education, 45*(2). https://doi.org/10.1016/j.iheduc.2019.100724

Adesope, O. O., Trevisan, D. A., & Sundararajan, N. (2017). Rethinking the use of tests: A meta-analysis of practice testing. *Review of Educational Research, 87*(3), 659–701. https://doi.org/10.3102/0034654316689306

Alyahyan, E., & Düştegör, D. (2020). Predicting academic success in higher education: Literature review and best practices. *International Journal of Educational Technology in Higher Education, 17*(3), 1–21. https://doi.org/10.1186/s41239-020-0177-7

Bälter, O., Enström, E., & Klingenberg, B. (2013). The effect of short formative diagnostic web quizzes with minimal feedback. *Computers and Education, 60*(1), 234–242. https://doi.org/10.1016/j.compedu.2012.08.014

Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology, 25*(5), 729–735. https://doi.org/10.1037/0012-1649.25.5.729

Butz, N., Stupnisky, R., & Pekrun, R. (2015). Students' emotions for achievement and technology use in synchronous hybrid graduate programmes: A control-value approach. *Research in Learning Technology, 23*(1), 1–16. https://doi.org/10.3402/rlt.v23.26097

Choy, J. L. F., & Quek, C. L. (2016). Modelling relationships between students' academic achievement and community of inquiry in an online learning environment for a blended course. *Australasian Journal of Educational Technology, 32*(4). https://doi.org/10.14742/ajet.2500

Christensen, T. E., Fogarty, T. J., & Wallace, W. A. (2002). The association between the directional accuracy of self-efficacy and accounting course performance. *Issues in Accounting Education, 17*(1), 1–26. https://doi.org/10.2308/iace.2002.17.1.1

Cook, B.R., & Babon, A. (2017). Active Learning through Online Quizzes: Better Learning and Less (busy) Work. *Journal of Geography in Higher Education, 41*(1), 24–38. https://doi.org/10.1080/03098265.2016.1185772

Förster, M., Weiser, C., & Maur, A. (2018). How feedback provided by voluntary electronic quizzes affects learning outcomes of university students in large classes. *Computers & Education, 121*, 100–114. https://doi.org/10.1016/j.compedu.2018.02.012

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2), 87–105. https://doi.org/10.1016/S1096-7516(00)00016-6

Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1), 7–23. https://doi.org/10.1080/08923640109527071

Gibbs, G., & Simpson, C. (2005). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education, 1,* 3–31. https://doi.org/10.1007/978-3-8348-9837-1

Goh, E., & Scerri, M. (2016). "I study accounting because I have to": An exploratory study of hospitality students' attitudes toward accounting education. *Journal of Hospitality & Tourism Education, 28*(2), 85–94. https://doi.org/10.1080/10963758.2016.1163498

Herrador-Alcaide, T. C., Hernández-Solís, M., & Sanguino Galván, R. (2019). Feelings of satisfaction in mature students of financial accounting in a virtual learning environment: An experience of measurement in higher education. *International Journal of Educational Technology in Higher Education, 16*(20), 1–19. https://doi.org/10.1186/s41239-019-0148-z

Holmes, A. F., & Rasmussenb, S. J. (2018). Using Pinterest to stimulate student engagement, interest, and learning in managerial accounting courses. *Journal of Accounting Education, 43*, 43–56. https://doi.org/10.1016/j.jaccedu.2018.03.001

Howard, D. (2020). Comparison of exam scores and time taken on exams between proctored on-campus and unproctored online students. Online Learning, 24(4), 204–228. https://doi.org/10.24059/olj.v24i4.2148

Inkelaar, T., & Simpson, O. (2015). Challenging the "distance education deficit" through "motivational emails." *Journal Open Learning: The Journal of Open, Distance and e-Learning, 30*(2), 152–163. https://doi.org/10.1080/02680513.2015.1055718

Jacobi, L. (2018). What motivates students in the online communication classroom? An exploration of self-determination theory. *Journal of Educators Online, 15*(2). https://www.thejeo.com/archive/2018_15_2/jacobi

Joksimovic, S., Gasevic, D., Kovanovic, V., Adesope, O., & Hatala, M. (2014). Psychological characteristics in cognitive presence of communities of inquiry: A linguistic analysis of online discussions. *Internet and Higher Education, 22*(3), 1–10. https://doi.org/10.1016/j.iheduc.2014.03.001

Kumi-Yeboah, A., Sallar, A. W., Kiramba, L. K., & Kim., Y. (2020). Exploring the use of digital technologies from the perspective of diverse learners in online learning environments. *Online Learning, 24*(4), 42–63. https://doi.org/10.24059/olj.v24i4.2323

Kumar, O., Kumar, A., Palvia, S., & Verma, S. (2019). Online business education research: Systematic analysis and a conceptual model. *The International Journal of Management Education, 17*(1), 26–35. https://doi.org/10.1016/j.ijme.2018.11.002

Mellado, L., & Parte, L. (2020). Perceptions of the accounting profession based on an analysis of metaphors by undergraduate accounting students. *Accounting Education, 29*(6), 572–604. https://doi.org/10.1080/09639284.2020.1833227

National Center for Education Statistics (2020). The Condition of Education 2020: Undergraduate Enrollment, https://nces.ed.gov/programs/coe/indicator/cha

Parte, L., & Mellado, L. (2014). La evaluación continua en la enseñanza a distancia: una experiencia en la asignatura de Contabilidad de Costes *en Fórmulas renovadas para la docencia superior* (pp. 357–374). Asociación Cultural y Científica Iberoamericana (ACCI).

Parte, L., & Mellado, L. (2021). Motivational emails in distance university. *Journal of Educators Online*, *18*(3), 1-14. 10.9743/jeo.2021.18.3.5

Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review, 18*(4), 315–341. https://doi.org/10.1007/s10648-006-9029-9

Pennebaker, J. W., Chung, C. K., Frazee, J., Lavergne, G. M., & Beaver, D. I. (2014). When small words foretell academic success: The case of college admissions essays. *PLoSONE, 9*(12). https://doi.org/10.1371/journal.pone.0115844

Robinson, R. L., Navea, R., & Ickes, W. (2013). Predicting final course performance from students' written self-introductions: A LIWC analysis. *Journal of Language and Social Psychology, 32*(4), 469–479. https://doi.org/10.1177/0261927X13476869

Ross, B., Chase, A. M., Robbie, D. Oates, G., & Absalom, Y. (2018). Adaptive quizzes to increase motivation, engagement and learning outcomes in a first-year accounting unit. *International Journal of Educational Technology in Higher Education, 15*(30), 1–14. https://doi.org/10.1186/s41239-018-0113-2

Ross, M.M., & Wright, A.M. (2020). Quantitative Skill and Introductory Finance: Does Ability Dominate Attitude? *Journal of Financial Education*, 46(2), 193–220 https://www.jstor.org/stable/48646931

Schwartz, H. A., Eichstaedt, J. C., Kern, M. L., Dziurzynski, L., Ramones, S. M., et al. (2013). Personality, gender, and age in the language of social media: The open-vocabulary approach. *PLoSONE, 8*(9), e73791. https://doi.org/10.1371/journal.pone.0073791

Simpson, O. (2010). 22% Can we do better? *CWP retention literature review*. *Report to the centre for widening participation.* Open University. doi: 10.13140/RG.2.2.15450.16329

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology, 29*(1), 24–54. https://doi.org/10.1177/0261927X09351676https://doi.org/10.1177%2F0261927X09351676

Yoo, J., & Kim, J. (2014). Can online discussion participation predict group project performance? Investigating the roles of linguistic features and participation patterns. *International Journal of Artificial Intelligence Education, 24*, 8–32. https://doi.org/10.1007/s40593-013-0010-8

York, T. T., Gibson, C., & Rankin, S. (2015). Defining and measuring academic success. *Practical Assessment, Research, and Evaluation*, *20*(5), 1–20. https://doi.org/10.7275/hz5x-tx03

Zhu, M., Herring, S. C., & Bonk, C. J. (2019). Exploring presence in online learning through three forms of computer-mediated discourse analysis. *Distance Education, 40*(2), 205–225. https://doi.org/10.1080/01587919.2019.1600365