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The Interaction between Accounting Students' Preference, Teaching Methodology and Performance

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***Abstract*—**This paper examined the influence of matching students' learning preferences with the teaching methodology adopted, on their academic performance in an accounting course in two types of learning environment in one university in Lebanon: classes with PowerPoint (PPT) vs. conventional classes. Learning preferences were either for PPT or for Conventional methodology. A statistically significant increase in academic achievement is found in the conventionally instructed group as compared to the group taught with PPT. This low effectiveness of PPT might be attributed to the learning preferences of Lebanese students. In the PPT group, better academic performance was found among students with learning/teaching match as compared with students with learning/teaching mismatch. Since the majority of students display a preference for the conventional methodology, the result might suggest that Lebanese students' performance is not optimized by PPT in the accounting classrooms, not because of PPT itself, but because it is not matching the Lebanese students' learning preferences in such a quantitative course.

***Keywords*—**Accounting education, learning preferences, learning/teaching match, Lebanon, Student performance.

I. Introduction

A shift from a traditional to a more technologically oriented model of education has led to an increased interest in testing the impact of the PowerPoint (PPT) on students' performance. The debate in using computer technology based tool such as PPT in teaching for improving students' performance remains uncertain for university instructors. However, many studies ignored learners' individual preferences. Students' learning can be influenced by their learning preference for different teaching methodologies. The learning styles shape the way people learn and recognize that people learn differently [1]. Students "preferentially focus on different types of information, tend to operate on perceived information in different ways, and achieve understanding at different rates." [2] (p. 286) Educators must be aware of the fact that some students prefer certain methods of learning over others; therefore, the usage of students' most preferable methodology might aid teachers in increasing their efficiency..

Reference [3] suggested that in order to enhance the learning process, teachers need to realize that there are diverse learning preferences in the student's population:

"There are probably as many ways to teach as there are to learn. Perhaps the most important thing is to be aware that people do not all see the world in the same way. They may have very different preferences than you for how, when, where and how often to learn."

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Every person processes learning differently and has his/her own personal preference for the ways problems are solved. These personal preferences may be dependent on gender, age, and culture. National culture is one of the important factors that can affect students' learning preferences [4]-[6] through the determination of the degree to which individualism is favored over collectivism, which in turn determine what students expect in an educational situation, including teachers' interaction with the students. Students in some culture, such as the Greek one, are more comfortable with structured learning environment, where the distance between the teacher and the students is maintained, while students in other cultures give higher value for individualism and expect a lower position of authoritative from the teacher's perspective with less psychological distance between teacher and student. Some students prefer a teacher-centered classroom where the teachers exhibit an authority teaching style without being open to students' evaluation. Other students prefer a more student-centered approach that involves more interaction from their part [7].

Since the learning style varies between students, it is necessary to find out first, the learning preference within a specific group and second, whether the students' positive academic performance is dependent on their learning preference. This study reported the distribution of learning preferences among students enrolled in the Financial Accounting II course (ACO202) at one university in Lebanon and investigated the impact of matching students' learning preference with the appropriate teaching methodology, on their performance. Learning preferences were measured by asking the students which teaching methodology (traditional or PPT) they would like to be taught the ACO202 course with. Students who prefer PPT are classified as 'PPT Supporters' while those who prefer the conventional methodology are classified as 'White Board Supporters'. "Students whose learning styles are compatible with the teaching style of a course instructor tend to retain information longer, apply it more effectively, and have more positive post-course attitudes toward the subject than do their counterparts who experience learning/teaching style mismatches." [2] If the results show a relationship between the learning/teaching match and the overall course score, then teaching methodology's effectiveness will depend on the learners' preference, which can be shaped by the culture and by many other factors as well. Therefore, instructors should use the appropriate teaching methodology for such culture or context, or students should be advised on how best to adapt to the teaching methodology that does not match their learning preferences.

II. Literature Review

Students are different and individual differences with respect to the ways of assessing meaning and acquiring information may vary too. One of these individual specific differences is, the learning preference: an issue highlighted in this study. Since people have different learning preferences, understanding the differences is an important step in designing an appropriate teaching methodology.

Learning style is the way students prefer to "receive and process information." [8] (p.674) within a learning environment. Reference [9] explains that the "different ways used by individuals to process and organize information or to respond to environmental stimuli refer to their learning styles." Students with different types of learning preferences tend to respond differently to different modes of instruction. Reference [10] stated that "teachers should try to ensure that their methods, materials, and resources fit the ways in which their students learn and maximize the learning potential of each student." (p.2) Furthermore, it is reported that an alignment between the students' learning styles and the instructor's teaching style leads to a better recall, understanding, and more positive post-course attitudes [2]. Moreover, teaching is most effective when it caters for a range of learning styles [11] and students' grades were higher when students' preferred methods were used in the classroom [12]. Reference [13] found that multimedia pedagogy improved recall for individuals who prefer to represent information through nonverbal means but hindered recall for highly verbal individuals, and concluded that students' preferred representation schemes play an important role in the effectiveness of multimedia. Reference [14] found that personality types explained variations in student performance. Furthermore, reference [15] suggests that the capabilities of a particular medium interact with the learners' preferences and may result in more or less learning.

It is often argued that students' national culture can shape their learning style [4], [5] and many studies have linked various aspects of national culture to different dimensions of learning style. For example, reference [16] found that accounting students in collectivist cultures of Hong Kong and Taiwan prefer abstract and reflective learning style, while students from more individualistic culture such as Australia prefer more concrete, active, and less reflective learning styles. Moreover, reference [17] found that Spanish and East European learners have a strong preference for practical learning as compared to management students from other nations. Reference [18] found that German students prefer theoretical stimuli and logical orientation more than French students. However, culture is not the only factor that affects the learning style; the latter might be influenced by other factors such as gender, age, and ethnicity. For example, reference [19] found a difference between men and women with respect to their preferences for abstract conceptualization.

III. Materials and Methods

A. Rationale and Hypothesis

This study's major objective is to find out if there is a positive effect of meeting students' preference on students' learning as measured by their academic achievement. More specifically, it looked at the effect of matching learner's preference with the teaching methodology, on learning outcomes. If learner's preference does count, the hypothesis is that learners will benefit more from the lecture if the teaching methodology adopted by the instructor matches their preferences. Thus, PowerPoint will be more effective for 'PPT Supporters' and traditional methodology will be more effective for 'White Board Supporters'.

Hypothesis 1: There is a significant difference in students' performance between students with learning/teaching match and those with learning/teaching mismatch. Students with learning/teaching match outperform those with learning/teaching mismatch.

Hypothesis 1a: 'PPT Supporters' significantly outperform 'White Board Supporters' in the PPT group.

Hypothesis 1b: 'White Board Supporters' significantly outperform 'PPT Supporters' in the conventional group.

B. Participants

The study took place in undergraduate accounting classrooms in the Faculty of Business Administration and Economics (FBAE) at one university in Lebanon. Students with missing observations and those who dropped or failed the course were excluded from the sample, leaving 399 observations for analysis. Students, regardless of their preferences, were exposed to one of the following two teaching methodologies: PowerPoint or traditional. The first group of respondents (n=166) were taught ACO202 using PowerPoint, while the second group of students (n=173) were taught the same course using the traditional methodology, with the teachers explaining the materials using a marker on a whiteboard. Introducing PPT in the ACO202's classrooms came in compliance with the university's trend to encourage the use of new teaching methodologies, mainly those benefiting from the advancement in computer technology

C. Procedure

Due to the large number of students enrolled in the FBAE and wishing to register for the ACO202 course, many sections are opened each semester and many instructors are teaching the same course. It is worth noting here that the course materials have been prepared collaboratively so that no course components could be perceived as designed to intentionally favor one teaching methodology over the other one. Both groups followed the same syllabus, used the same textbook, and had similar assessment schemes and same exams. These factors, held constant, made the comparison of performance between all students possible.

D.Measurement

To analyze the data, an independent t-test comparison of the mean of the students' ACO 202 grades with learning/teaching match with those with a mismatch is conducted. To help test the hypotheses, a measure of prior academic performance was compiled from the university database (more specifically, the Student Information System: SIS). To benchmark the academic performance of each student prior to the registration in the course in which the study is taken place, students' grades in a pre-requisite course (the Principles of Financial Accounting I course (ACO201) and Grade point Average (GPA) were accessed from the university's database. Thus, using the course grade as the dependent variable, an Ordinary Least Square (OLS) regression was performed using gender, assessment score on the pre-requisite accounting course, GPA, gender, and the learning/teaching match or mismatch as independent variables to investigate the latter's effect on student's learning outcome in this course.

The dependent variable is the student's grade in the ACO202 course, which is the weighted average of attendance, 2 midterms, and one final exam, with weights of 10%, 25%, 25%, and 40% respectively. As per university rules, students are not allowed to miss more than 6 hours of classes, otherwise, they will be asked to drop the course.

In order to assess students' learning preferences, a questionnaire was distributed in the Faculty of Business Administration and Economics (FBAE) in that university and students were directly asked to state the teaching methodology (traditional or PPT) they would like the accounting courses to be taught with. Data was coded as 1 if the preferred teaching methodology is PPT ('PPT Supporters') and 0 otherwise ('White Board Supporters').

IV. Results and Discussion

A. Descriptive Statistics

The quantitative data collected to test this research's hypotheses was analyzed using SPSS version 18 and computed at 95 % level of confidence.

Descriptive statistics were calculated for the variables. Table I shows the mean score of ACO202's grades for the PPT group, it is 3.2470 compared to 3.6994 for the traditional group, which means that students in the PPT group have lower grade in ACO202. Similarly, students in the PPT group have lower grade in ACO 201 (2.4096 versus 2.8035) and lower GPA (2.4096 versus 3.0694)

Table II reports the learning preferences descriptive statistics for both groups. Students in this study fall into two groups. The first one is consisting of 94 students declaring their preference for PPT as a medium in learning accounting and the second group involves 245 students confirming their preference for the traditional methodology. As this second table illustrates, 51.2% of the students in the PPT group reported their preferences for PPT, so they experienced a teaching methodology that matches their preferences, while 48.8% of students have a learning/teaching mismatch. Table II also shows that the traditional methodology was the most frequently selected preference in sections taught with the traditional methodology. More specifically, 94.8% of students have a learning/teaching match for the traditional group. The survey results indicated a strong preference for the traditional methodology for this course as shown in Table II; 72.3% of students prefer the traditional way of teaching, while only 27.7% prefer PPT. This preference for conventional methodology among Lebanese students contradicts previous researchers' findings in the United States and the United Kingdom where students stated their preference for technology-enhanced means of instruction such as PPT. This finding might suggest that Lebanese students are not yet well prepared for this change: the shift from conventional ways of teaching to a more advanced teaching style; specifically for a quantitative course such as accounting.

TABLE I
Descriptive Statistics for the Variables

	ACO202	ACO201	GPA	Gender	Repeat
PPT group (N=166)					
Mean	3.2470	2.4096	2.4096	1.0783	0.3916
Standard Deviation	0.9370	0.6137	0.8674	0.6129	0.4896
Traditional Goup (N=173)					
Mean	3.6994	2.8035	3.0694	1.2832	0.2428
Standard Deviation	0.7864	0.7444	1.0376	0.6058	0.4300

B. Independent samples t-test

Table III and IV report the results of the independent samples t-test on the differences between the PPT group and the Traditional one and between the PPT group of students with learning/teaching match and the other group with learning/teaching mismatch, respectively. To note here that due to the small sample of students with learning/teaching mismatch in the traditional group, the comparisons between the two types of students' performance under traditional methodology cannot be conducted. Therefore, hypothesis 1.b will not be addressed in this paper. Moreover, the comparisons between the 'PPT Supporters' in the PPT and the traditional group, as well as between the 'White board Supporters' in both groups are not the scope of this paper.

TABLE II
Learning Preferences

	PPT Group (N =166)		Traditional Group (N=173)		Total (N=399)	
	Frequency	%	Frequency	%	Frequency	%
Traditional	81	48.8	164	94.8	245	72.3
PowerPoint	85	51.2	9	5.2	94	27.7
Total	166	100.0	173	100.0	399	100.0

Table III shows a statistically significant difference in students' performance between the two groups assuming the two teaching methodologies (t-statistic= 4.806; p-value=0.000). More specifically, students in the traditional group outperformed those in the PPT one (3.6994 vs. 3.2470),

suggesting a negative impact of PPT on students' performance.The results in Table IV clearly revealed a significant difference in students' grade in ACO202 between the two groups. Although the two types of students taught with PPT do not differ significantly in terms of their performance in the introductory accounting course (ACO201), as a variable used to measure their specific ability in the accounting subject (t-statistic= -0.298; p-value=0.766), in their GPA (t-statistic= 1.042; p-value= 0.299), and in the gender (t-statistic=-0.087; p-value= 0.931), they do differ significantly in terms of their performance in ACO202 (t-statistic= -2.180; p-value= 0.031, significant at $p<0.05$).

TABLE III
INDEPENDENT SAMPLE T-TEST: COMPARISON OF STUDENTS' PERFORMANCE IN TRADITIONAL SECTION AND PPT SECTION

	Traditional Group (N=173)	PPT Group (N=166)	t-Statistic	P-value
ACO202	3.6994	3.2470	4.806	0.000*

*indicate significance at 5% level.

Significantly better final grades were observed with students who prefer PPT as compared to students who prefer Traditional Methodology. The hypothesis stating that matching students' preferences enhances their academic performance was confirmed. The results suggest that the efficiency of the PPT depends on students' learning preferences. A mismatch between the teaching method and the students' learning preferences can lead to poor student performance, a finding supported by previous literature [2], [20]. The results suggest that the technologically intensive instruction methodologies, for the accounting subject mainly, do not accommodate all students' needs equally. In the technology-intensive group, it appears that PPT was effective when it matches students' learning preference.

TABLE IV
INDEPENDENT SAMPLE T-TEST: COMPARISON OF STUDENTS' PERFORMANCE WITH LEARNING/TEACHING MISMATCH AND LEARNING/TEACHING MISMATCH UNDER PPT GROUP (N=166)

	Learning/teaching Mismatch (N=81)	Learning/teaching Match (N=85)	t-Stat	P-value
ACO202	3.0864	3.4000	-2.180	0.031*
ACO201grade	2.3951	2.4235	-0.298	0.766
GPA	2.4815	2.3412	1.042	0.299
Repeat	.4074	0.3765	0.406	0.685
Gender	1.0741	1.0824	-0.087	0.931

*indicate significance at 5% level.

C. OLS regression

In an attempt to obtain a more complete picture of the effect of the learning preference on students' performance, an ordinary least square regression was performed. Table V lists the results for the OLS regression estimates with the student's grade as the dependent variable at the p-value of 0.05 level for the whole sample (Model 1), for the PPT group (Model 2), and for the traditional Group (Model 3). Model 3 will be disregarded due to the reasons mentioned before. MATCH variable is included all models, a dummy variable equals to 1 if there is a match between learner's preference and the teaching methodology, and 0 if there is a mismatch. If learner's preference does count, students who have learning/teaching match should outperform those with learning/teaching mismatch. The variable MATCH in testing our hypothesis should be positive and significant.

Models 1 and 2 explain 38.7% and 25.2%, of the variability in the dependent variable, respectively. In the two models, as shown in Table V, the variable ACO201 (t-statistics = 3.721 in Model 1 and 1.601 in Model 2) has the predicted positive sign but is statistically significant only in Model 1 with a p-value of 0.000 (Table V). While the variable GPA is significant in all models, the variable Gender is insignificant in all models. Of a particular interest is the coefficient of the variable MATCH. In Model 1, the coefficient is positive and significant (t-statistics= 3.725; p=0.000), indicating that matching students' preference appears to have a positive impact on student performance. To further elaborate on this finding, it is important to test the impact of matching students' preference on the effectiveness of each teaching methodology separately. Therefore, Model 2 estimates the OLS regression for the PPT group for the two types of students. If learning preferences count, 'PPT Supporters' should outperform 'White Board Supporters'. The variable MATCH in testing Hypothesis 1.a (t-statistic=2.577, p=0.011) has the predicted positive sign, and is statistically significant. Therefore, students' preference is relevant to the effectiveness of the PPT.

Overall, the results suggest that using PPT to teach Lebanese students their accounting course can positively impact their performance if it is matching their learning preference. Moreover, since the majority of Lebanese students display greater preference for the traditional methodology, the PPT use in accounting classroom might not optimize students' achievement.

V. CONCLUSION

The study has shown a negative impact of PowerPoint on students' performance in the ACO202 course. This finding differs from [21] who found that computer-assisted teaching resulted in higher grade for the students and [12] who found no difference in students' performance among three pedagogical approaches: chalkboard, overhead projector, or computer-projected software.

This study has also emphasized the importance of considering the students' learning preference in assessing the effectiveness of the teaching methodology used in the classroom. Students' learning preferences and the teaching methodology used are correlated with students' overall performance as measured by the students' final grade. This paper reveals that when a student's preferred teaching

technique is used in the class, his/her performance may be higher than when a less preferred method is used. Although this finding contradicts [22] that media do not influence learning under any condition and that students prefer a methodology that result in less learning, this result is in alignment with other studies which reported that students' performance is affected by the interaction between pedagogy and students' preferences [13]-[15] . This finding suggests that knowledge of the students' learning preferences could be used to develop improvements in teaching's effectiveness. A possible administrative implication is for the students to determine their pedagogical preferences and register in the course's section where their preferred teaching method will be in use. However, this implication would involve offering multiple course sections, and asking instructors to use different methodologies. The study suggests that, for the accounting courses, Lebanese students do not benefit as much from PPT as they do from conventional techniques.

Since the majority of business students surveyed stated their preference for the traditional methodology in the accounting classrooms, using PowerPoint as a medium of instruction is creating a mismatch between the students' learning preferences and the teaching method, which may result in less learning for many students, thus explaining the negative impact of PPT on their performance. As a practical issue, this finding might discourage accounting lecturers to deliver the materials with the aid of PowerPoint, or might raise the question of how PowerPoint should be adjusted to match the Lebanese students' learning preference. This negative impact of PPT on students' performance is not because of PPT itself, but because it is not matching the Lebanese students' preference. The use of PowerPoint might engender a better educational outcome if it matches students' learning preferences.

Although the results of this study are interesting, they should be treated with care because of several limitations. First, this study was conducted at one private university in Lebanon, thus, extension of the findings to other universities may be inappropriate. Therefore, spreading this research to include multiple universities might give different results or boost the present ones. Second, this study was conducted only for the ACO202 course and findings may apply only to courses with similar content and setting.

TABLE V
OLS REGRESSION WITH ACO202 AS DEPENDENT VARIABLE

	Model 1			Model 2			Model 3		
	The whole sample (N=399)			PPT Group (N=166)			Traditional Group (N=173)		
Model	Beta	T	Sig.	Beta	T	Sig.	Beta	T	Sig.
Constant		8.851	0.000*		3.947	0.000*		6.238	0.000*
ACO201 grade	0.198	3.721	0.000*	0.123	1.601	0.111	0.334	4.931	0.000*
GPA	0.450	8.390	0.000*	0.409	5.356	0.000*	0.458	6.718	0.000*
Gender	-0.010	-0.223	0.824	0.039	0.545	0.587	-0.086	-1.564	0.120
MATCH	0.161	3.725	0.000*	0.177	2.577	0.011	0.073	1.369	0.173
ACO202 instructor	-0.002	-0.040	0.968	0.147	2.023	.045*	-0.108	-1.977	0.050*
F-statistic		43.603			12.100			38.670	
Adjusted R^2 (%)		38.7			25.2			52.3	

*indicate significance at 5% level.

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