THE MOST EFFECTIVE STUDY METHODS FOR PASSING THE CPA EXAM:

A RESEARCH NOTE

By:

Denise Dickins, Ph.D., CPA, CIA
Professor
East Carolina University
dickinsd@ecu.edu

Rachel Hull
Graduate Student
East Carolina University
hullr16@students.ecu.edu

Linda Quick, Ph.D., CPA*
Associate Professor
East Carolina University
quickl@ecu.edu

* Corresponding author

THE MOST EFFECTIVE STUDY METHODS FOR PASSING THE CPA EXAM:

A RESEARCH NOTE

ABSTRACT

In 2017, the CPA exam added task-based simulations that require candidates to demonstrate analytical, critical thinking, and problem-solving skills. In addition, there has been an evolution in training and learning from face-to-face, synchronistic, group study, to online, asynchronistic, independent study. These changes suggest the need to reexamine the effectiveness of CPA exam candidates' study methods. In this study, we analyze the degree of use and effectiveness of various study methods (e.g., instructor-led study programs, self-study review courses, flashcards, study notes, practice problems). Based on a survey of candidates taking the CPA exam in 2018 and 2019, we find that the most effective method of study is practicing problems. Opposite the results of some extant research, using an instructor-led study program does not appear to increase the likelihood of passing. Because ours is the only study to examine a variety of CPA exam study methods since the 2017 exam changes, its results serve as a benchmark for researchers interested in investigating future changes in study habits.

Keywords: CPA exam; study methods; critical thinking skills; Bloom's taxonomy

THE MOST EFFECTIVE STUDY METHODS FOR PASSING THE CPA EXAM: A RESEARCH NOTE

INTRODUCTION

In 2017, the CPA exam added task-based simulations that require candidates to demonstrate analytical, critical thinking, and problem-solving skills. For example, the auditing and attestation (AUD) section of the exam now includes working paper extracts and source documents (e.g., sales invoices, shipping documents) and requires candidates to identify transactions that represent potential accounting period cut-off errors. The business, environment, and concepts (BEC) section of the exam now requires candidates to interpret data trends. The new simulations include both relevant and irrelevant information. In addition, facilitated by changes in technology, there has been an evolution in training and learning from face-to-face, synchronistic, group study, to online, asynchronistic, independent study. These changes suggest the need to reexamine the effectiveness of CPA exam candidates' study methods. While numerous studies have examined various aspects of the CPA exam (Calderon and Nagy, 2020), this research note focuses on an issue that has not been previously addressed and it is consistent with the spirit of Calderon and Nagy's (2020) call for additional research in the area.

The CPA exam is a high-stakes, standardized test. Stobart and Eggen (2012) define high-stakes tests as those that have consequences for the prospects or lifestyles of the exam taker. High-stakes tests serve to protect the public from others who fail to meet an established standard of knowledge. College entrance exams, professional certifications, and driver's licenses are examples. Passing a high-stakes test grants special privileges that frequently have positive personal financial consequences. Only a CPA can audit financial statements filed with the Securities and

Exchange Commission and CPAs, along with attorneys and enroll agents, can represent clients in front of the Internal Revenue Service.[1]

Eligibility to take the CPA exam varies by state, but candidates generally must at least have a bachelor's degree and a total of 150 university credit hours, a subset of which are earned in accounting topics. There are four parts to the CPA exam: AUD, BEC, Financial Accounting and Reporting (FAR), and Regulation (REG). Each section takes about four hours to complete. Passing the CPA exam requires test takers to earn a score of at least 75 on each of the four parts (American Institute of Certified Public Accountants – AICPA, 2017a).

In the year prior to full implementation of the analytical, critical thinking, and problem-solving task-based simulations, approximately 49 percent of candidates passed the AUD section, 52 percent passed BEC, 45 percent passed FAR, and 48 percent passed REG (AICPA, 2017b).[2] Although pass rates increased slightly in the first year of implementation to 51 percent for AUD, 59 percent for BEC, 46 percent for FAR, and 53 percent for REG, the pass rate of the CPA exam remains one of the lowest among professional exams (e.g., Professional Engineering, American Bar) (AICPA, 2017a). Repeat testing is permitted but is time consuming and not free. In addition to being important to exam candidates, these outcomes are important to college and university administers whose accounting programs may be judged on their ability to adequately prepare students to pass the CPA exam. *Ergo*, it is important to understand why some candidates pass and others do not.

One factor that influences pass rates is preparatory study practices. In this study, we analyze candidates' degree of use and effectiveness of various study methods (e.g., instructor-led

---

[1] See Internal Revenue Service Publication 947, Practice Before the IRS and Power of Attorney. Available at: https://www.irs.gov/publications/p947.
[2] Available at: https://www.gleim.com/cpa-review/exam-pass-rates/.

study programs, self-study review courses, flashcards, study notes, practice problems) since the addition of task-based simulations focused on analytical, critical thinking, and problem-solving skills. Our analyses are intended to help CPA exam candidates allocate their study time and help educators mentor accounting students. In addition, because ours is the only to examine CPA exam study methods since the 2017 exam changes, its results serve as a benchmark for researchers interested in investigating future changes in study habits.

Based on survey data of recent CPA exam takers, we find that the most effective method of study is practicing problems.[3] Opposite the results of some extant research, using an instructor-led study program does not appear to increase the likelihood of passing. This is good news considering the evolution in training and learning from face-to-face, synchronistic, group study, to online, asynchronistic, independent study. Our data suggest the optimal study plan is to independently study primarily by practicing problems.

In the next section we present extant research, theory, and the study's research question. Sections that follow describe the study's methodology, results, and conclusions.

EXTANT RESEARCH, THEORY, AND RESEARCH QUESTION

There is a wealth of extant CPA exam-related research (Calderon and Nagy, 2020). For example, Howell and Heshizer (2008) studied the effects of grade point average (GPA), college entrance exam scores, graduate education, program accreditation, and instructor-led classroom or self-study CPA review programs on CPA exam outcomes. Their results showed that students with higher GPAs and college entrance exam scores tended to require fewer attempts to pass the CPA exam compared to people with lower scores. Program accreditation and graduate degrees were also

---

[3] The survey was approved by our Institutional Review Board prior to distribution.

found to be positively associated with pass rates, and a self-study review course was not as effective as an instructor-led classroom review course.

Rau, Nagle, and Menk (2019) found that students completing the education requirements necessary to take the CPA exam by earning graduate degrees outperformed students that satisfied the requirements by taking additional undergraduate elective courses. Bunker and Harris (2014) conducted a study that compared CPA exam scores to type of schooling: online degree program, accredited business school, or non-accredited business school. They concluded that individuals who attended an accredited business program do better on the CPA exam compared to individuals who took non-accredited and online programs.

Kollar and Williams (2017) examined the impact of classroom review courses on CPA exam scores. They designed a pilot program that integrated the Surgent CPA Review course into an undergraduate auditing class. The program included the use of a textbook, homework, classroom simulations, CPA exam questions, and simulations from Surgent CPA Review material. They found a 25 percent increase in students' AUD section CPA exam pass rates.

Research on the study practices of candidates for other high-stakes exams is also informative. McGaghie, Downing, and Kubilius (2004) found that for the Medical College Admissions Test (MCAT), unlike the results of Howell and Heshizer (2008), there was no statistically significant benefit of instructor-led preparation courses. Jordan (1992) surveyed individuals passing the Certified Management Accounting (CMA) exam about their study methods and found 71 percent perceived self-study review books were very important. Kaufman, LaSalle-Ricci, Glass, and Arnkoff (2007) found completing practice tests had a positive impact on performance on the Bar exam.

In 2017, the CPA exam added task-based simulations that require candidates to demonstrate analytical, critical thinking, and problem-solving skills – skills that require candidates master increasingly difficult levels of thinking. Bloom's (1956) taxonomy of learning objectives as modified by Anderson and Bloom (2001), describes the stepwise process of learning as remembering, understanding, applying, analyzing, evaluating, and creating. The taxonomy has been repeatedly validated (e.g., Madaus, Woods, & Nuttall, 1973; Roberts 1976; Kunen, Cohen, & Solman, 1981); it is also promoted as a tool for assessment of learning by the Association to Advance Collegiate Schools of Business (AACSB – e.g., Module 7 of Online Teaching Effectiveness Seminar).

Achieving the first level, *remembering*, requires concepts be recalled in the same form they are initially encountered. In the next level, *understanding*, individuals must demonstrate an ability to restate a problem. *Applying* requires using remembering and understanding to solve a problem; and *analyzing* requires individuals separate what is relevant to a problem from what is not. *Evaluating* and *creating* require the ability to rearrange and merge component ideas and develop new ideas and solutions. To master the new task-based simulations, candidates must at least be able to achieve the *analyzing* level of Bloom's taxonomy. This may or may not require a change in study strategies as compared to studying for the previous version of the CPA exam.

We investigate the degree of use and effectiveness of five study methods: instructor-led study programs, self-study review courses, flashcards, study notes, and practicing problems. We chose these study methods as they were all the methods identified by students enrolled in their final semester of a graduate-level accounting program who were currently preparing to take the CPA exam. An "other methods" option was also provided. Table 1 presents an alignment of each study method with the first four levels of Bloom's taxonomy.

[Insert Table 1]

As depicted, we argue that using flashcards to help memorize facts, terminology, rules, classifications, and principles primarily aligns with the *remembering* level of Bloom's taxonomy. Study notes are helpful with *remembering* and *understanding* (rearranging formulas and interchanging words). Reading the study guide or viewing online presentations of a self-study review course facilitates *understanding*. Consistent with the findings of Agarwal (2019), practicing problems is more effective than simply studying material to improve scores on higher-level tests (versus fact-based tests); practicing problems helps *apply* and, dependent on the problems, potentially *analyze* principles learned.

An advantage to instructor-led study programs over self-study review courses is they allow for timely instructional feedback to help improve *analysis* skills like identifying inconsistencies and separating what is relevant to a problem from what is not. Instructor-led programs are conducted face-to-face, are typically less technology dependent, and may be conducted in group settings or one-on-one (e.g., tutoring). Some universities and other providers (e.g., Becker) offer instructor-led CPA exam study programs.[4] In contrast, self-study review courses like those offered by Becker, ExamMatrix, Gleim, Roger, Wiley, and Yaeger, are more technology dependent and are typically completed independently. Although most self-study review course providers have help desks of some type, interaction between instructors and students is less fluid.

Messick (1982) equates directed study programs to coaching which may be superior to other types of study in that they can both improve the test taker's abilities and understanding of the test material and reduce anxiety by familiarizing them with the test format and the types of questions. This suggests candidates using instructor-led study programs may outperform others on

---

[4] For example, Becker offers Live Online or Live courses and five one-hour tutoring sessions for personalized attention.

the CPA exam post-2017. It is also a proposition consistent with the findings Howell and Heshizer (2008) about instructor led programs outperforming self-study methods. On the other hand, studying the impact of active (i.e., completing exercises) versus passive (i.e., lectures) teaching methods, Michel, Cater, and Varela (2009) found no difference in students' subject mastery. We question,

RQ. Is a CPA exam candidate's method of study associated with earning a passing score on the CPA exam?

METHODOLOGY

During the fall of 2019, we distributed a survey to approximately 200 individuals believed to have taken the CPA exam in 2018 or 2019.[5] This period was chosen as it follows the addition of task-based simulations. It also precedes the societal impacts of the COVID-19 pandemic (e.g., a large part of the population was required to self-isolate, most face-to-face teaching moved online in Spring 2020) which could confound both candidates' choice of study methods and exam outcomes.

The survey was developed by reviewing CPA exam review materials and discussions with students enrolled in their final semester of a graduate-level accounting program who were actively preparing to take the CPA exam. It was comprised of three sections (Appendix). Section 1 asked participants to provide data about exam parts taken and the number of equivalent days spent preparing to take each part. Section 2 asked about the timing of taking each part, methods of study, and outcome (i.e., score). The method, instructor-led study program (*ILP*), was described as "any type of organized review course, including tutoring, that is led by a professor or other professional." Self-study review course (*RC*) was described as one of "Becker, ExamMatrix,

---

[5] Potential participants were sourced from data provided by a state CPA society, a Big 4 accounting firm, and recent graduates known to the researchers. As a result, all our participants have Mid-Atlantic US ties either through current or one-time residence.

Gleim, Roger, Wiley, Yaeger, or other." Flashcards (*FC*) were described as "self-prepared or review course-provided." Study notes (*SN*) were described as "personal or review course-provided," and practicing problems (*PP*) was described as "attempting prior CPA exam multiple choice problems and simulations."[6] Section 2 also asked about the form of study in group settings (*Group*) or individually (*Individual*). If participants took more than one section of the CPA exam, they were given the option to answer questions regarding additional exam sections they had taken. Section 3 requested demographic information including GPA, education, gender, age, and number of times each part of the exam was attempted.

The study methods are likely not independent. Instructor-led study programs include face-to-face lectures or instruction. They also typically direct candidates to study notes and practice problems. Self-study review courses typically include readings about CPA exam topics, presentations that can be viewed or listened to, practice problems, and flash cards. The regression equations used to inform the study's research question take these interrelationships into account. They are:

$$Pass = \beta + ILP + RC + \text{Control Variables} + e \qquad (1)$$

$$Pass = \beta + FC + SN + PP + \text{Control Variables} + e \qquad (2)$$

$$Pass = \beta + Group + Individual + \text{Control Variables} + e \qquad (3)$$

where, *Pass* is an indicator variable equal to one is the participant reported a score of at least 75, otherwise it is equal to zero. *ILP*, *RC*, *FC*, *SN*, and *PP* are the independent variables of interest representing either (1) degree of use, or (2) hours devoted to the study method. "Degree of use" is a scale anchored by one (never) to five (always). "Hours" is a continuous variable. For independent

---

[6] "Other methods" were attributed to 24 exam attempts. As these were all described audio resources provided by a self-study review course they are not separately evaluated in our analyses.

variables *Group* and *Individual*, "degree of use" is measured as the percentage of time devoted to each method.

The equations control for the effects of characteristics or experiences that have been found to be highly correlated with passing the CPA exam or that logically likely influence candidates' ability to pass the CPA exam, all of which are predicted to have positive coefficients. These are:

GPA, a continuous variable equal to the participant's bachelor's degree grade point average,

Graduate, an indicator variable equal to one if the participant earned a graduate degree, otherwise is equal to zero,

Hours, a continuous variable equal to the number of hours devoted to all study methods for the reported exam section attempt, and

Times, a continuous variable equal to the total number of times the reported exam section has been attempted.

RESULTS

We received 55 responses to our survey, five of which did not include data sufficient to estimate any of the regression equations and one of which reported taking the CPA exam more than two years ago (prior to the 2017 exam changes). These responses were not used in the study's analyses. The remaining 49 participants reported study methods related to their last two, if applicable, attempts. A total of 89 attempts (average 1.82 per participant) were reported, of which 28 were FAR attempts, 26 were AUD, 19 were REG, and 16 were BEC). Scores for 75 of the attempts were available and reported, of which 63 percent were successful.[7] For our participants, passing BEC took the fewest number of attempts (mean = 1.07), and AUD took the most (mean = 1.45).

---

[7] Although 63 percent is higher than the average pass rate of the CPA exam, in many cases, these are second (or more) attempts. Our analyses control for the number of exam section attempts.

There were 14 attempts with exam scores pending. As an alternative for the dependent variable, we asked participants how confident they were that they had passed that part of the CPA exam. Using a scale of one (low confidence) to five (high confidence), none of the participants reported being highly confident. We therefore assumed that none of these attempts were passing scores.

Demographic data are presented in Table 2. Of the participants, 48 percent are female, their average age is 25, and their average GPA is 3.6. Sixty-three percent of participants have graduate-level degrees, and they attended 20 different universities. Supplemental correlation analyses suggest none of these variables or the control variables is highly correlated with the dependent variable, *Pass*, but *GPA* is highly correlated with the participants' reported scores (n = 68, r = 0.368, $p < 0.01$).

[Insert Table 2]

Univariate tests

Descriptive statistics of participants' study methods and other CPA exam-related data are presented in Table 3. Using a Likert scale (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always) to measure the degree of use, the most used study method is a self-study review course (mean = 3.85, participants reporting at least 1 = 89), followed by practicing problems (mean = 3.29, participants reporting at least 1 = 85), study notes (mean = 2.35, participants reporting at least 1 = 76), flash cards (mean = 1.08, participants reporting at least 1 = 54), and an instructor-led study program (mean = 0.49, participants reporting at least 1 = 16). The low use of instructor-led programs may be the result of online education and training becoming more ubiquitous. Where once many CPA exam review programs offered face-to-face instructional options, nearly all are now fully online with the result being candidates have fewer synchronistic options. Finding that

all participants use *RC* requires that we modify equation 1 to be, *Pass* = β + *ILP* + Control Variables + *e*.

In terms of degree of use, two study methods are associated with CPA exam pass rates. Individual study is positively associated with passing ($p < 0.001$) and using an instructor-led study program is associated with not passing ($p < 0.05$). It may be that candidates view an instructor-led study method as a substitute for independent study and over rely on the method.

Hours reported as being devoted to each study method generally align with participants' reported use of each method; other than self-study review courses, use and hours are highly correlated, $p < 0.01$, not tabulated). The most hours are devoted to self-study review courses (mean = 239.21) and practicing problems (mean = 117.70). The number of hours devoted to any one method generally has no impact on passing a section. The one exception is using an instructor-led study program where the relationship between time devoted and likelihood of passing is significantly negative ($p < 0.05$).

Given these data, it is not surprising that the participants rank a self-study review course as the most effective study method (mean = 1.42 on a scale of 1 = most effective, 5 = least effective), followed by practicing problems (mean = 1.86), and an instructor-led study program was ranked as least effective (mean = 4.69). Although rankings may be biased by the study methods most frequently used, the ranking of an instructor-led study program as last is not inconsistent with finding that this method also appears to be ineffective.

The total number of hours devoted to all methods appears to have no impact on passing a section of the CPA exam.[8] More detailed examination of these data reveals the relationship

---

[8] Participants were asked to report the total number of days, based on an eight-hour day, that they devoted to *all* study methods for each exam section attempted. They were also asked to report hours devoted to *each* study method for each exam section attempted. We use the average of the two reports in the study's analyses.

between a CPA candidate's score and total hours of study is nonlinear; there is a statistically significant relationship between earning a passing score (i.e., 75) and studying between 100 and 160 hours ($r = 0.314$, $p < 0.01$).

[Insert Table 3]

Of the participants, 71 percent use Becker, followed by Wiley (8 percent), and Roger (7 percent). The study methods used are consistent among sections of the exam (i.e., AUD, BEC, FAR, REG – not tabulated). We also asked participants to report the source of study notes, flash cards, and practice problems. All participants reported that self-study exam review courses are the source of practice problems and of the 54 reporting using flash cards, 37 (68 percent) reported they were sourced from a self-study review course. All study notes were reported as self-made. Statistical analyses of the five methods confirms that participants' reports of the degree of use of self-study exam review courses and practice problems are highly correlated ($r = 0.27$, $p = 0.01$). Using flash cards is also correlated with self-study exam review courses ($r = -0.21$, $p = 0.05$).

These data confirm the lack of independence of the independent variables *RC*, *PP*, and *FC*. It also suggests that the hours participants reported as being devoted to a self-study review course includes the time spent practicing problems and using flash cards. In other words, the hours reported as practicing problems and using flash cards may be double counted as using a self-study review course. This finding supports the design of the study's regression equations.

Multivariate tests

The estimation of the regression equations is presented in Table 4. As presented in Column A, results of equation 1 confirm that using an instructor-led study program reduces the likelihood of passing the CPA exam. The coefficient on *ILP* is significantly negative when measured as participants' reports of degree of use ($p = 0.05$). When measured as hours devoted to the method,

the coefficient on *ILP* is only moderately significant ($p = 0.06$, not tabulated). The coefficients on the control variables are all insignificant.

Results of equation 2 presented in Column B are also consistent with the study's univariate results. Practicing problems increases the likelihood of passing; the coefficient on *PP* is significantly positive ($p < 0.05$). Replacing degree of use with hours for each study method reveals none of the independent variables are a significant predictor of earning a passing score (not tabulated).

Results of equation 3 presented in Column C confirm the benefits of independent study; the coefficient on *Independent* is significantly positive ($p < 0.01$). Replacing "degree of use" as the measure of the independent variable with "hours" reveals that group study decreases the likelihood of passing ($p < 0.01$, not tabulated).

[Insert Table 4]

Recall that for 14 observations, exam scores were pending and based on each participant's reported (lack of) confidence, we assumed they were not passing scores. As a test of the robustness of the study's results, we estimated the regression equations (1) coding the attempts of participants reporting confidence of higher than the midpoint of the scale (i.e., 3) as passing (n = 2), and (2) excluding these 14 observations. For the first sensitivity test, the direction and significance of the coefficients on all the independent variables are unchanged. For the second sensitivity test, the coefficient on *IS* becomes insignificant in equation 1, which we attribute to the 15 percent reduction in sample size and resulting decrease in statistical power, and the direction and significance of the coefficients on all the independent variables in equations 2 and 3 are unchanged.

14

Also recall that one response was not used in the study's analyses because it reported data of exam attempts prior to the 2017 exam changes. As a test of the sensitivity of the study's results, we included data of this participant's two attempts (FAR and BEC) and an indicator variable equal to one if the attempt was prior to 2017 (otherwise equal to zero) and re-estimated the regression equations. Results were unchanged.

DISCUSSION

Our results suggest that individually practicing problems is the optimal study plan to pass the CPA exam. This finding is consistent with the idea that practicing problems is more effective than simply studying material (e.g., notes, flashcards, presentations) to improve scores on higher-level tests. Practicing problems helps achieve higher levels of Bloom's taxonomy of learning. Our results also suggest that instructor-led study programs may be an ineffective method to pass the CPA exam. It may be that candidates participating in instructor-led study programs over rely on the methodology. Other than using flashcards, no other method had so little time devoted to it. All participants reported that the source of practice problems is a CPA review course, the most popular of which is Becker.

Interestingly, a candidate's study method appears to be more important than the number of hours spent studying. Of our participants, those more likely to earn a passing score studied between 100 and 160 hours for each section. Studying outside of this range reduced the association between hours of study and passing. These results may inform the study methods of other types of education.

In some ways finding a lack of association between instructor-led, face-to-face study programs and earning a passing score is not surprising given how ubiquitous online education and training have become. It is also good news given the recent COVID-19 pandemic that has limited

much face-to-face training and learning. It may also be that the study's small sample size limits the power of its tests to detect significance. Additional research is indicated.

Since successful completion of the CPA exam is a prerequisite to promotion in most public accounting firms and generally allows accountants in other careers to command higher salaries, determining factors that impact candidates' ability to pass is critical to professional success. It is also likely that university accounting programs are at least partly judged on their ability to prepare students to take the CPA exam.

Pass rates increased somewhat after the 2017 changes to task-based simulations. It may be that candidates had always heavily relied on practicing problems to prepare for the CPA exam, or it may be than in anticipation of the changes that there was a shift in study habits to practice problems. Because study habits will likely continue to change and evolve, repeated analysis of study methods and modes would benefit candidates and academics. Our results provide a baseline for future research.

REFERENCES

Agarwal, P. K. (2019). Retrieval practice & Bloom's taxonomy: Do students need fact knowledge before higher order learning? *Journal of Educational Psychology, 111*(2), 189-209.

AICPA. (2017a). How is the uniform CPA examination scored? *Association of International Certified Public Accountants.* Retrieved from http://www.aicpa.org/BecomeACPA/CPAExam/PsychometricsandScoring/ScoringInformation/DownloadableDocuments/How_the_CPA_Exam_is_Scored.pdf.

AICPA. (2017b). Uniform CPA examination passing rates 2017. *Association of International Certified Public Accountants*. Retrieved from http://www.aicpa.org/BecomeACPA/CPAExam/PsychometricsandScoring/PassingRates/DownloadableDocuments/pass-rates-2017.pdf.

Anderson, L. W., & Bloom, B. S. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Bloom, B. (1956). Bloom's taxonomy.

Bunker, R., & Harris, D. (2014). Online Accounting Degrees: An empirical investigation of CPA exam success rates. *Journal of Business and Accounting*, *7*(1), 92-99.

Calderon, T. G., & Nagy, A. K. (2020). A closer look at research on CPA exam success. *Advances in Accounting Education: Teaching and Curriculum Innovations*, 24, 165-178.

Howell, C., & Heshizer, B. (2008). Characteristics that assist future public accountants pass the CPA exam on fewer attempts. *The Journal of Applied Business and Economics*, *8*(3), 57-66.

Jordan, R. E. (1992). What does it take to pass the CMA exam? *Management Accounting*, 73(10), 38-40.

Kaufman, K. A., LaSalle-Ricci, V. H., Glass, C. R., & Arnkoff, D. B. (2007). Passing the Bar Exam: Psychological, Educational, and Demographic Predictors of Success. *Journal of Legal Education*, 57 (2), 205-223.

Kollar, R. J., & Williams V. T. (2017). Strategies for passing the CPA exam and filling the pipeline [Special Edition]. *Pennsylvania CPA Journal*, 11.

Kunen, S., Cohen, R., & Solman, R. (1981). A levels-of-processing analysis of Bloom's taxonomy. Journal of Educational Psychology, 73(2), 202.

Madaus, G. F., Woods, E. M., & Nuttall, R. L. (1973). A causal model analysis of Bloom's taxonomy. *American Educational Research Journal*, 10(4), 253-262.

McGaghie, W.C., Downing, S. M., & Kubilius, R. (2004). What is the impact of commercial test preparation courses on medical examination performance? *Teaching and Learning in Medicine, 16*(2), 202- 211.

Messick, S. (1982). Issues of effectiveness and equity in the coaching controversy: Implications for educational and testing practice. *Educational Psychologist*, *17*(2), 67-91. http://dx.doi.org/10.1080/00461528209529246

Michel, N. Cater III, J. J., & Varela, O. 2009. Active versus passive teaching styles: An empirical study of student learning outcomes. *Human Resource Development Quarterly*. https://doi.org/10.1002/hrdq.20025

Rau, Stephen E., Nagle, Brian M., & Menk, K. Bryan. (2019). CPA Exam Performance: The Effect of Graduate Education and Accounting Faculty Credentials. *The CPA Journal*. Retrieved from https://www.cpajournal.com/2019/10/02/cpa-exam-performance/

Roberts, N. (1976). Further verification of Bloom's taxonomy. *The Journal of Experimental Education*, 45(1), 16-19.

Stobart, G., & Eggen, T. (2012). High-states testing – values, fairness, and consequences. *Assessment in Education: Principles, Policy & Practice*, *19*(1), 1-6. http://dx.doi.org/10.1080/0969594X.2012.639191

Table 1: First Four Levels of Bloom's Taxonomy Aligned with the Investigated CPA Exam Study Methods

Level	Definition	Study Method
Remembering	Memorization of facts, terminology, rules, classifications, principles	Flashcards, study notes
Understanding	Rearranging a formula, interchanging words or descriptions	Study notes, self-study review courses
Applying	Taking principles learned and applying to a problem	Practicing problems, self-study review courses
Analyzing	Identifying inconsistencies, separating what is relevant to a problem from what is not	Practicing problems, instructor-led study programs

Table 2: Participant Demographic Data (n = 49)

Demographic	Frequency or mean (range)
Gender	Female = 48% Male = 52%
Age	25 (22 to 35)
GPA	3.6 (2.9 to 4.0)
Degree	Masters = 63% Bachelors = 37%
CPA Exam outcome	Pass = 63% Fail = 37%

Table 3: Descriptive statistics of study methods and CPA exam-related data (n = 89)

Description	All attempts (n = 89) Mean or frequency	Pass (n = 56) Mean or frequency	Fail (n = 33) Mean or frequency	Difference
Degree of use (scale of 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always):				
• Instructor-led study program	0.49	0.27	0.88	-0.61*
• Self-study review course	3.85	3.91	3.76	0.15
• Flashcards	1.08	1.14	0.97	0.17
• Study notes	2.35	2.36	2.33	0.03
• Practicing problems	3.29	3.45	3.03	0.42*
Degree of use (percentage of time):				
• Individual	95.82	99.25	90.00	9.25**
Hours devoted to one part of the CPA exam:				
• Instructor-led study program	20.56	10.71	37.27	-26.56*
• Self-study review course	239.21	242.38	233.85	3.40
• Flashcards	8.44	9.70	6.30	7.98
• Study notes	54.07	58.54	46.48	12.06
• Practicing problems	117.70	118.46	116.39	2.07
• Individual	244.63	245.31	243.36	1.95
Average hours of study for one part of the CPA exam	256.60	248.41	270.50	-22.09
Perceived effectiveness (rank order with 1 = most effective, 6 = least effective):				
• Instructor-led study program	4.69	4.82	4.45	0.37
• Self-study review course	1.42	1.36	1.55	-0.19
• Flashcards	3.94	3.84	4.14	-0.30
• Study notes	3.51	3.57	3.38	0.19
• Practicing problems	1.86	1.91	1.76	0.15
Most effective:				
• Individual	0.92	1.00	0.79	0.21***

*, **, *** Difference is significant at $p < 0.05$, $p < 0.01$, or $p < 0.001$, respectively, two-tailed.

Table 4: Results of Estimation of the Regression Equations: *Pass = β + Study Method + Control Variables + e*
(n = 89)

	Predicted Sign	Coefficients		
		Column A	Column B	Column C
Constant		0.363	-1.048	-0.895
ILP	?	-0.094*		
FC	?		0.032	
SN	?		-0.013	
PP	?		0.162*	
Individual				0.009**
GPA	+	0.076	0.304	0.145
Graduate	+	-0.005	0.050	0.063
Hours	+	0.000	0.000	0.000
Times	+	0.037	0.040	0.083
Adj-R^2		0.015	0.028	0.066

*, ** significant at $p < 0.05$, or $p < 0.01$, respectively, two-tailed.

Pass is an indicator variable equal to one is the participant reported a score of at least 75, otherwise it is equal to zero.
ILP is an instructor-led study program measured on a scale of one (never) to five (always) as being devoted to the study method.
FC is flash cards measured on a scale of one (never) to five (always) as being devoted to the study method.
SN is study notes measured on a scale of one (never) to five (always) as being devoted to the study method.
PP is practicing problems measured on a scale of one (never) to five (always) as being devoted to the study method.
Individual is the percentage of study hours devoted to studying individually.
GPA is a continuous variable equal to the participant's bachelor's degree grade point average.
Graduate is an indicator variable equal to one if the participant earned a graduate degree, otherwise is equal to zero.
Hours is a continuous variable equal to the number of hours reported as being devoted to all study methods for the reported exam section attempt.
Times is a continuous variable equal to the total number of times the reported exam section has been attempted.

Appendix: Survey Instrument

Dear Participant,

The purpose of this survey is to help other students find the best way to prepare for the CPA exam, and potentially for other high-states professional tests. You are being invited to take part in this research because as someone that has recently taken the CPA Exam you are uniquely positioned to answer these questions. The decision to take part in this research is yours to make. If you volunteer to take part in this research, you will be one of about 400 individuals to do so.

Who are the Principal Investigators?
Redacted

Are there reasons I should not take part in this research?
You should not volunteer for this research is you are under 18 years of age.

Where is the research going to take place and how long will it last?
The research will be completed on-line by individuals who agree to participate in the study. Completing the on-line questions is expected to take 20-35 minutes.

What will I be asked to do?
You will be asked to respond to several questions that concern: (a) your background, (b) your experience studying for the CPA exam, and (c) any concluding comments. You should reflect on your experience preparing for the CPA Exam when responding to the questions.

What risks do I incur if I take part in the research?
We don't know of any risks (the chance of harm) or personal benefits that will accrue to you from participating in this research.

Will I be paid for taking part in this research?
No. At the end of the study, you will have the opportunity to provide your email address to enter a raffle to win one of four $25 Amazon gift cards.

Will it cost me to take part in this research?
It will not cost you any money to be part of the research.

Who will know that I took part in this research and learn personal information about me?
Although the responses of participants in the study will be aggregated and individual responses will not be attributed to any individual. We will not know the names of individuals that participate in the study unless you choose to enter the raffle. If you provide your email address, it will not be associated with your responses to the survey or disclosed.

How will you keep the information you collect about me secure? How long will you keep it?
Your responses to the questions will be retained electronically on a secure laptop computer. Personal identifying information will not be associated with your responses. Responses will be

retained for approximately seven years.

What if I decide I don't want to continue in this research?
You may choose not to answer any or all questions, and you may stop at any time. There is no penalty for not taking part in this research study.

Who should I contact if I have questions?
We are available to answer any questions concerning this research now or in the future. Our contact information is included at the top of this consent form. If you have questions about your rights as someone taking part in research, you may contact the ECU Office of Research Integrity & Compliance (ORIC) at phone number 252-744-2914 (days, 8:00 am-5:00 pm).

I have decided I want to take part in this research. What should I do now?
By advancing to the survey questions, you are agreeing:
• I have read the above information.
• I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.

Section 1

If you have taken the Auditing Section (AUD) of the CPA Exam, what was the approximate number of days you spent preparing? For this purpose, you should consider a day to be the equivalent of 8 hours.

_____

If you have taken the Financial Accounting and Reporting Section (FAR) of the CPA Exam, what was the approximate number of days you spent preparing? For this purpose, you should consider a day to be the equivalent of 8 hours.

_____

If you have taken the Regulation Section (REG) of the CPA Exam, what was the approximate number of days you spent preparing? For this purpose, you should consider a day to be the equivalent of 8 hours.

_____

If you have taken the Business Environment and Concepts Section (BEC) of the CPA Exam, what was the approximate number of days you spent preparing? For this purpose, you should consider a day to be the equivalent of 8 hours.

_____

Section 2

Which part of the CPA exam did you take most recently?

- ○ AUD

- ○ BEC

- ○ FAR

- ○ REG

Please complete the remainder of the survey thinking only about the section of the CPA exam you selected in the previous question.

When did you take this part of the CPA exam?

- ○ Less than 6 months ago

- ○ 6-12 months ago

- ○ 1-2 years ago

- ○ More than 2 years ago

State where you took the exam:

_____

A directed study program is any type of organized review course, including tutoring, that is led by a professor or other professional. Please rate how often you used a directed study program.

1	○ Never	○ Rarely	○ Sometimes	○ Often	○ Always

What topics did you study in the directed study program? (For example: Non-profit accounting; corporate governance frameworks; cost accounting; etc.) This could include general topics and/or specific lecture topics.

_____
_____
_____
_____
_____

How did you pay for the directed study program?

- ☐   Free

- ☐   Self paid

- ☐   Firm paid

- ☐   Other _____

How many weeks did you attend the directed study program?

_____

Please enter what percent (out of 100) of the time you spent studying individually or in a group.

Individual: _____
Group: _____
Total: _____

Approximately how many hours did you study individually?

_____

Approximately how many hours did you study in a group?

_____

Which method of studying did you find most effective?

○ Individual

○ Group

○ Both equally effective

Please rate how often you used a CPA review course.

| 1 | ○ Never | ○ Rarely | ○ Sometimes | ○ Often | ○ Always |

Which CPA review course did you use?

☐ Becker

☐ ExamMatrix

☐ Gleim

☐ Roger

☐ Wiley

☐ Yaeger

☐ Other (please specify)

☐ N/A - didn't use CPA review course

How did you pay for the CPA review course?

☐ Free

☐ Self paid

☐ Firm paid

☐   Other _____

☐   N/A - did not use a CPA review course

Approximately how many hours did you study using the CPA review course?

_____

Please rate how often you used flashcards (self-prepared or review-course provided)

1	○ Never	○ Rarely	○ Sometimes	○ Often	○ Always

How did you pay for the flashcards?

☐   Self-made

☐   Self paid

☐   Firm paid

☐   Other _____

☐   N/A - did not use flashcards

Approximately how many hours did you study using flashcards?

_____

Please rate how often you studied using notes.

1	○ Never	○ Rarely	○ Sometimes	○ Often	○ Always

What kind of notes did you use?

- ☐   Personal

- ☐   College course

- ☐   Other (please specify)

  _____

- ☐   N/A - did not use notes

Approximately how many hours did you study from notes?

_____

Please rate how often you studied by practicing problems (e.g., prior CPA Exam multiple choice problems and simulations).

1	○ Never	○ Rarely	○ Sometimes	○ Often	○ Always

Approximately how many hours did you study by practicing problems?

_____

Where did you get your practice problems from? (e.g. - CPA review course, textbook, online)

_____
_____
_____
_____
_____

Are there any other study methods you used to prepare for the exam (e.g. - phone app)? If yes, please specify. If no, write N/A.

_____
_____
_____
_____
_____

Please rate how often you used other study methods listed above.

1	○ Never	○ Rarely	○ Sometimes	○ Often	○ Always

Please rank how effective you thought these study methods were in preparing for the exam with the first choice as most effective.

_____ Flashcards

_____ Directed Study Program

_____ CPA Review Course

_____ Practice Problems

_____ Notes

_____ Other Study methods

What is the total number of hours you spent studying for this section of the exam?

_____

If you received your score on this part of the exam and are willing to share that information, please enter your score below.

_____

If you have not received your score, please rate on a scale of 1-5 how confident you are that you passed with 1 being least confident and 5 being most confident that you passed.

	1	2	3	4	5

If you have taken more than one part of the exam, are you willing to answer additional questions related to another part of the exam?

○ Yes

○ No

○ N/A - I have only taken one part of the exam

Section 3

What is your college bachelor's GPA (out of 4.0)?

_____

What is the highest level of education you have completed?

○ Bachelors

○ Masters

○ PhD

If you are currently enrolled in a university, what degree are you pursing?

○ Bachelors

○ Masters

○ PhD

○ N/A - not currently enrolled

What institution(s) did you get your degree(s)?

_____

Do you have any accounting work experience, including internships? If so, where did you work and what were your responsibilities?

_____
_____
_____
_____
_____

Do you have a job offer?

- ○ Yes - Big Four

- ○ Yes - non Big Four international accounting firm

- ○ Yes - national accounting firm

- ○ Yes - regional accounting firm

- ○ Yes - local accounting firm

- ○ No job offer

- ○ No - currently working

How many times have you taken each part of the exam?

- ○ AUD _____

- ○ BEC _____

- ○ FAR _____

- ○ REG _____

Gender:

- ○ Male

- ○ Female

Age:

_____

Do you have any additional comments regarding your CPA exam studying and preparation methods that you would like to share with us?

_____
_____
_____
_____