

The Incremental Benefit of a Forensic Accounting Course to Creativity

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Introduction

A recent study indicates that, compared to a decade ago, more universities offer courses in forensic accounting and these courses are typically offered as upper-level electives (Seda and Kramer 2013). The increase in the number of universities offering courses in forensic accounting raises some interesting questions. What are the benefits of a forensic accounting course? What are some of the skills developed in such a course? The purpose of this paper is to contribute to the literature by investigating the impact of a forensic accounting course on students' creativity.

The average undergraduate accounting curriculum at a large university contains two courses in auditing (Carpenter et al., 2011). A forensic accounting course extends the concepts presented in the auditing courses by focusing more on fraud detection and quantification. The goal of the forensic accounting curriculum is to enhance the student's ability to think from a fraudster's point of view. This requires a creative problem-solving approach to deciphering fraud cases.

According to the ACFE's Report to the Nations (2014), fraud costs \$3.7 trillion annually on a global scale, up from \$3.5 trillion in 2010 ACFE (2012). In addition to being costly, fraud may be difficult to detect. Management reviews, internal auditors and external auditors detect only about 35.5 percent of all fraud cases (18.4, 13.1, and 4.0 percent respectively) (ACFE 2014). External audit standard AU-C 240¹ *Consideration of Fraud in a Financial Statement Audit* paragraph .06 notes that detecting fraud on an audit may require different procedures from those used to detect misstatements due to errors (AICPA 2012). The Institute of Internal Auditors (IIA) also released *Practice Guide: Internal Auditing and Fraud* which notes that the intentionality with which fraud is committed makes it more difficult to detect than other mistakes such as errors (IIA 2009). In fact, internal auditors are tasked with "identifying relevant fraud risk factors" and "mapping existing controls to potential fraud schemes and identifying gaps" (IIA 2009, p. 17). To effectively consider the vulnerability of a control system and a company's financial reporting process to fraud, one must imagine all the different methods by which fraud may be committed. The auditor is tasked with generating numerous ideas regarding the potential for fraud and creativity is key to idea generation.

A description of creativity includes references to idea generation, problem-solving and identifying possibilities (Franken 2007). Each of these tasks assists auditors and ultimately forensic accountants in their work to detect and quantify fraud. Creativity research finds that individuals' experiences affect their level of creativity (Maddux and Galinsky 2009). Forensic accounting education focuses on problem-

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¹ AU-C 240 is consistent with SAS 99.

solving tasks and idea generation to educate participants on the many forms by which fraud may manifest itself. This educational experience may impact participants' creativity.

Prior research shows that a forensic accounting course increases students' ability to assess fraud risk and evaluate the relevance of fraud risk factors (Carpenter et al., 2011). Our study extends this line of research by examining the impact of a forensic accounting course on students' creative problem-solving abilities. We investigate the impact of a forensic accounting course on students' creativity by conducting two studies. The first study utilizes a between-participants design to compare the creative problem-solving abilities of students who have taken a forensic accounting course (forensic group) with those of students who have not taken a forensic accounting course (non-forensic group). The second study uses a within-participants design to conduct a pre- and post-test of students' creative problem-solving abilities before and after taking a forensic accounting course.

Our results indicate that a forensic accounting course does impact participants' creativity. In Study One, consistent with the finding of Maddux and Galinsky's (2009), we expect to find, and indeed did find, that the forensic group exhibits a higher level of creativity than the non-forensic group. In Study Two, we predict that students' creativity would increase after participating in a forensic accounting course. We measure creativity before and after participation and find that students' creativity was higher after participation. Therefore, the results of both Study One and Study Two indicate that a forensic accounting course positively impacts students' creativity.

Our study provides several contributions. First, we provide evidence that forensic accounting education has a positive impact on participants' creativity; thereby, substantiating the value of forensic education in accounting programs. Second, as noted in prior literature, research on the value of forensic accounting education and fraud training is sparse (Carpenter et al., 2011; Nieschwietz et al., 2000). We therefore extend prior literature linking forensic accounting education to improved fraud risk assessments by linking forensic accounting education to increased creativity.

Our study also contributes to the accounting profession because creative problem-solving is imperative in conducting fraud investigations. One implication of our findings is that individuals with training in forensic accounting are more likely to detect fraud. Better fraud detection will improve the representational faithfulness of financial statement data thus improving financial reporting quality. Higher quality financial information will lead to more efficient capital markets. Viewed in conjunction with the findings of prior literature, our study adds to the value proposition of offering a forensic accounting course to undergraduate accounting students.

The remainder of this paper is organized as follows. The next section provides background and development of hypotheses. The third section presents the research method and results of both Study One and Study Two. In the final section, we provide our conclusions.

Background and Hypotheses

Background

A forensic accounting course expands students' audit knowledge into the specialty area of fraud investigation. The recent evolution of fraud theory provides a valuable tool that the forensic educator may use to enhance students' creativity. For example, Dorminey et al., (2012) extend fraud risk assessment procedures by going beyond the traditional fraud risk triangle and presenting a fraud model that improves our understanding of the mindset and personality of the fraud perpetrator. They present a fraud diamond that forensic accountants may use in the field and forensic educators may use in the classroom to improve students' understanding of how a fraudster thinks. An increased understanding of the fraudster should increase the forensic accountant's ability to catch frauds in a timely manner thus stemming fraud losses. Using the fraud diamond in the classroom prepares students for its application in the business world.

Additionally, there are resources available to forensic accounting educators that may be used to enhance students' problem-solving skills. These include numerous fraud cases that may be analyzed by students (see Dickins and Reisch 2012, Higgins 2012, or Knapp and Knapp 2013 for recent examples). Exposure to these resources in a forensic accounting course presents additional opportunities for the acquisition of the knowledge needed for fraud detection and may lead to an increase in participants' creativity because of the problem-solving skills that are required to complete the cases.

Forensic Accounting Course Experience

Students with forensic accounting experience in this study complete a three-credit hour, semester long, senior/graduate level course in forensic accounting. As part of the course, they learn to perform data analytics to identify fraud risk factors and fraudulent transactions using computer-assisted audit techniques (CAATs) such as the audit software package Audit Command Language (ACL). ISACA notes that the use of CAATs on audits is not limited to traditional auditors. IS auditors also use CAATs to support data analysis (Sayana 2003).

Additionally, to develop students' forensic accounting abilities using a hands-on approach, students complete several case studies and one four-week-long problem-based learning case (see Dee and Durtschi 2010; Durtschi 2003). Prior research notes the value of problem-based learning and finds that the knowledge gained through such educational experiences persists over time (Carpenter et al., 2011; Norman and Schmidt 1992). Fraud cases that employ problem-based learning are available in the literature (see Dee and Durtschi 2010; and Durtschi 2003). For the project completed as part of the forensic accounting course in our study, students are given limited information to start their investigation. During the investigation, they collect additional evidence based on their fraud hypotheses (a brainstorming session is required for students to generate fraud hypotheses). Students must determine the best way to obtain the evidence they need to support their cases.

Cultivating students' problem-solving abilities through forensic accounting education encourages the development of future professionals who have the ability to identify patterns in data that suggest fraud risk and subsequently assess fraud risk appropriately in the field. We recognize that students exposed to case work in other disciplines may also be able to cultivate their creativity and problem-solving skills. In this study, we discuss the impact of cases used in forensic accounting classes on students' creativity, but we maintain that our results are generalizable to other disciplines that employ case studies to enhance students' creativity.

Hypotheses Development

Assessing and detecting fraud require a variety of attributes and skills. Prior research shows an association between professional skepticism and appropriate fraud risk assessments (Carpenter 2007; Nelson 2009). Forensic accounting literature reports that to be effective, forensic accountants need to: (1) be critical/strategic thinkers; (2) have investigative abilities and intuitiveness; (3) be able to organize an unstructured situation or problem; (4) solve unstructured problems (Davis et al., 2010); and (5) assimilate large amounts of information quickly (Fitzgerald 2011). Forensic accounting education positively impacts participants' fraud risk assessment and risk revision abilities. It also improves their risk factor relevance assessments (Carpenter et al., 2011). The value of forensic accounting education therefore rests in its ability to nurture the skills necessary to assess fraud risk and solve forensic accounting problems.

Creativity

Franken (2007, p. 348) defines creativity as "the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others". Franken (2007) also notes that there are three instances in which people are motivated to be creative: (1) to experience novel, varied, or complex stimulation; (2) to communicate ideas and values; and (3) to solve problems. Since, during fraud investigations, auditors and forensic accountants need to solve problems, they are therefore motivated to engage their creative abilities. We

posit that courses in which students are presented with opportunities to engage their creative abilities by solving problems, experiencing new or complex situations and, subsequently, communicating their ideas, help students to increase their creativity. We, however, recognize that forensic accounting is not the only course that may be used to develop students' problem-solving skills and improve their creativity.

The term creative process conveys that generating ideas is a process. People generate new ideas by considering a problem from many different angles and generating a number of possible solutions or alternatives. Creativity may be measured by the number and/or quality of the ideas generated. Prior research suggests that an individual's creative ability is influenced by a number of factors including personality traits, living abroad, traveling abroad (Maddux and Galinsky 2009), intelligence, self-image and experiences (Franken 2007). We can infer from these studies that individual experiences may impact creativity. One such experience that may impact individual's creativity is the exposure to a course in forensic accounting.

Forensic Accounting Education

Frauds are sometimes complex and fraud schemes often incorporate an element of creativity in order to conceal the fraud from auditors, forensic accountants, and audit committee members. External audit guidance (AU-C 240.15) notes that when management perpetrates a fraud, they will scheme to conceal the fraud (AICPA 2012). Uncovering a fraud that has been purposefully concealed requires an auditor to consider incorporating unpredictable audit procedures (AU-C 240.A13, AICPA 2012) and introduces a need for creativity on the part of the auditor. In fact, auditors are required to conduct team brainstorming sessions as part of an external audit (AU-C 240, AICPA 2012). During such sessions, they are required to consider the different fraud risks the team may face from the particular audit client under review.

As Franken (2007) explains, individuals engage their creative abilities in order to solve problems. Forensic accounting courses employ instructional cases and imbed hands-on learning experiences to engage and foster the development of students' problem-solving abilities; thereby, developing students' creative abilities. In light of the experiences a forensic accounting course affords students, we maintain that a forensic accounting course will enhance students' creative abilities. Therefore, we posit the following hypotheses.

H1: Students with forensic accounting education will exhibit higher levels of creativity than students without forensic accounting education.

H2: Forensic accounting education will increase students' creative problem-solving abilities.

Research Method

We conduct two studies to assess the effect of forensic accounting education on students' creativity. Both studies use the same instrument. Study One compares the students in the forensic group with the students in the non-forensic group (between-participants design). Since students who choose to take a forensic accounting class may be different in certain personality traits from those who choose not to take a forensic accounting class, it is possible that a selection bias exists. In order to rule out selection bias, Study Two adopts a pre-test/post-test experimental design to measure the improvement in students' creativity from the beginning to the end of the semester (within-participants design).

Study One

Study One is designed to compare the creativity of the students in the forensic group with that of the students in the non-forensic group. We use Study One to examine H1.

Creativity Task

The creativity task we use in Study One is the Remote Associates Test (RAT; Mednick 1962). In the task, participants are presented with three words (a triad) and asked to come up with a fourth word that is

logically associated with them. To clarify the task, participants are given two examples. An example of a triad is “soap, shoe, and tissue”. Participants are told that the correct answer is “box”. The task requires participants to solve twelve triads. Consistent with Maddux and Galinsky (2009), we use the number of correct responses from twelve triads as a measure of our dependent variable creativity.

Participants

The participants are undergraduate seniors and graduate level accounting students at a Midwest state university.

Procedure

We invite students, by email, to complete an online survey for extra course credits. We inform participants that the purpose of the survey is to examine accounting students’ problem-solving abilities. The invitation email includes a link to the online survey. In the survey, we first ask participants to complete the twelve triads of the Remote Associates Test. Next, to control for individual differences, participants are given the Big Five personality traits test (e.g., Costa and McCrae 1985). The Big Five are: (1) extroversion, (2) agreeableness, (3) emotional stability (neuroticism), (4) conscientiousness, and (5) openness to experience. We include the Big Five since prior research shows a link between these personality traits and creativity (Feist 1998, 1999). Previous research also shows a link between living abroad and creativity. We therefore include questions regarding participants’ living and travelling abroad experiences. Additionally, the survey includes questions about participants’ gender, age, and ethnic group, whether they are graduate students and whether English is their native language.

Study Two

Study Two is designed to compare the creativity of students before and after they take a forensic accounting class. We use Study Two to examine H2.

Creativity Task

We also use the Remote Associates Test (RAT) in Study Two. We use twelve different triads of words in the pre-test and post-test.

Participants

The participants are students enrolled in a forensic accounting class at a Midwest state university.

Procedures

We solicit students via email containing a link to an online survey during the second week of the semester. We give students one week to complete the task (pre-test). We send a second email containing a link to the second online survey to students during the last week of the semester (fifteenth week of the semester). We again allow students one week to complete the task. Similar to Study One, the first survey contains twelve triads of words, measures of the Big Five personality traits and other questions designed to collect background information on the participants. The second survey contains twelve triads of words that are different from the twelve triads we include in the pre-test. We match the pre- and post-test RAT items on the basis of their individual levels of difficulty.

Results

Study One

We collect seventy-six usable responses from students in the forensic group and fifty-eight from students in the non-forensic group; a total of 134 students. Of the 134 participants, twenty-two are not native English speakers. Since the RAT is related to verbal and language abilities (Mednick and Andrews 1967), we collect information about the participants’ native tongue and exclude participants who are non-

native English speakers. The remaining participants include seventy from the forensic group and forty-two from the non-forensic group.

Of the 112 participants, eight (seven percent) have the experience of living in a foreign country and 104 do not. Sixty-seven participants (sixty percent) have travelled to one or more foreign countries. Table 1 (see page 165) reports that students in the forensic group are more extroverted ($M = 30$ vs. 27 , $t = 2.4$, $p = .017$) and more agreeable ($M = 46.8$ vs. 44.1 , $t = 1.82$, $p = .071$), but less emotionally stable (neuroticism) ($M = 27.6$ vs. 31.7 , $t = -2.5$, $p = .013$) than students in the non-forensic group. Table 1 also reports that there are no significant differences between these two groups based on age, conscientiousness and openness to experience. There are no significant differences between the two groups based on sex ($\chi^2 = .045$, $p = .832$), foreign living ($\chi^2 = 2.3$, $p = .13$) and foreign traveling ($\chi^2 = .72$, $p = .40$) (not reported).

There are more graduate students in the forensic accounting group ($\chi^2 = 3.6$, $p = .06$). Graduate students are however not better performers than undergraduate students in the creativity task (RAT) ($M = 67.04$ vs. 7.68 , $t = -.894$, $p = .37$). Hypothesis 1 posits that students with forensic accounting education will exhibit higher levels of creativity than students without forensic accounting education. To test Hypothesis 1, we use a one-way between-groups analysis of covariance (ANCOVA) to examine the effectiveness of forensic accounting education in improving students' creativity. The dependent variable, creativity, is measured as the number of correct RAT items, and the independent variable is whether participants have forensic accounting education. We use participants' Big Five personality traits as covariates in our analysis. Table 2 (see page 166) reports the means of the RAT score and the Big Five personality traits. We conduct preliminary checks to ensure that there are no violations of the assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliability measurement of the covariates. Table 3 (see page 167) reports that, after controlling for the Big Five personality traits, forensic accounting education has a significant effect on creativity [$F(1, 120) = 6.01$, $p = .016$]. Among covariates, extroversion and agreeableness are significant [$F(1, 120) = 5.03$, $p = .027$; and $F(1, 120) = 3.2$, $p = .076$] respectively. Overall, we find support for H1.

Study Two

We collect thirty-four usable responses from students who are taking a forensic accounting class. The participants' ages range from twenty to thirty-five and the average age is 23.1 years. There are twenty-five undergraduate seniors and nine graduate students. There is no significant difference between the performance of undergraduate and graduate students.

To test H2, we use a one-way repeated measures ANOVA to compare subjects' RAT scores at the beginning and end of the semester. The mean RAT score is 6.24 at the beginning of the semester and 7.50 at the end of the semester. Participants exhibit an improvement in their RAT scores (Wilks' Lambda = .835, $F(1, 33) = 6.535$, $p = .015$, multivariate partial eta squared = .165 (which suggests a large effect size according to the guidelines proposed by Cohen (1988, pp. 284-7)). Our results therefore support H2.

Conclusion

In this paper, we examine the effect of forensic accounting education on students' creativity. We investigate our research question by performing two studies. In the first study, we compare the creativity of students who are taking/have taken a forensic accounting course with the creativity of students who are not taking/have not taken a forensic accounting course. In the second study, we employ a pre- and post-test format to compare the creativity levels of students before and after they take a forensic accounting course. Our results from Study One indicate that students who participate in a forensic accounting course exhibit higher levels of creativity than students who do not participate in a forensic accounting course. Additionally, from Study Two, we find that the creative ability of students increases after participating in a forensic accounting course.

We use performance on the Remote Associates Test as a measure of students' creative ability. Our results provide evidence that a forensic accounting class supports the development of creative ability. Creative ability is an imperative skill for forensic accountants and auditors in assessing fraud risk and identifying fraud in a timely manner. We believe our findings provide evidence that forensic accounting education improves the skills necessary for students to become effective forensic accountants and auditors.

In the AICPA's Core Competency Framework, problem-solving is identified as a personal competency. Our results indicate that a forensic accounting course may be used to support the development of the personal competency of problem-solving. From a pedagogical perspective, forensic accounting supports the development of critical thinking as a learning outcome of an accounting curriculum that includes such a course. Because the nature of our experimental task is not audit specific, we provide evidence that offering a forensic accounting course enhances students' overall creativity which helps to develop their critical thinking ability. Forensic accounting therefore supports not only the development of skills critical to accounting, but also, supports skills (i.e., creativity, problem-solving) that may be applied outside of a forensic accounting context.

We build on the research of Carpenter et al., (2011) by showing that, in addition to professional skepticism and fraud risk judgments, participants' creative ability benefits from forensic accounting education. Our research identifies an additional benefit of forensic accounting education that may be used to substantiate offering a forensic accounting course within the accounting curriculum of a university. It also, justifies offering such training opportunities to practitioners. AU-C 240 suggests incorporating unpredictability into audit testing. Creative ability in auditors supports the development of audit procedures that are unpredictable and designed to efficiently identify fraud. Increasing auditors' creative ability should therefore enhance their effectiveness in applying the requirements of AU-C 240.

As a study that employs an experimental design, our work is subject to some inherent limitations. First, our study captures data from students over several semesters. We recognize that the passage of time may introduce influences other than forensic accounting education. However, consistent with prior researchers, we too maintain that the impact of classroom learning may best be measured using students engaged in a true university course setting as opposed to a controlled setting (Carpenter et al., 2011). Second, we appreciate that students may differ from one semester to the next. In an effort to address these differences, we control for the Big Five personality traits that have been proven to impact creativity. Third, we use an online survey. Although an online survey saves class time, it does introduce a concern for the study. We have considered that it is possible for students to use online search engines, like Google, to search for the correct answers. After examining students' performance, however, we do not believe that this is a major concern. For Study One, the average score is seven out of twelve and only fourteen students out of 147 received perfect scores (12/12). For Study Two, the pretest average score is 6.24 with five out of thirty-four students receiving perfect scores. The post-test average score is 7.5 with only four out of thirty-four students receiving perfect scores. It is possible that there are other differences not controlled in our study; however we control for the differences that prior research has identified.

Our study provides evidence that forensic accounting education can enhance participants' creative abilities and therefore, extends prior research that demonstrates the benefits of forensic accounting education (Carpenter et al., 2011). Future research may address the impact of professional experience or experience with group work, such as fraud brainstorming sessions in audit, on creative abilities.

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Table 1: Analysis of Forensic and Non-forensic Groups and Variable Definitions

Panel A Means, Standard Deviations, and Independent Samples T-Tests

Variable	Group	Mean	Standard deviation	t	p
Age	Forensic	24.07	4.50	.107	.92
	Non-forensic	23.98	4.66		
Extroversion	Forensic	30.24	7.23	2.43	.02**
	Non-forensic	26.69	7.88		
Agreeable	Forensic	46.81	8.07	1.82	.07*
	Non-forensic	44.14	6.49		
Conscientious	Forensic	46.54	6.78	.95	.34
	Non-forensic	45.38	5.28		
Emotional stability	Forensic	27.59	7.68	-2.52	.01***
	Non-forensic	31.67	9.25		
Openness	Forensic	44.66	8.62	1.23	.22
	Non-forensic	42.52	9.36		

Note: *, **, *** significant at the 10 percent, 5 percent, and 1 percent significant levels, using two-tailed test, respectively. All variable definitions are summarized in Table 1 Panel B.

Panel B Variable Definitions

Variable	Table(s)	Definitions
Age	1	Age of the participant in years.
Extroversion	1, 2, 3	Measure of sociability and how gregarious one is.

Agreeable	1, 2, 3	Measure of cooperation, trust, and tolerance.
Conscientious	1, 2, 3	Measure of self-discipline, consistency, and order.
Emotional stability	1, 2, 3	Measure of calmness, confidence, and lack of worry or insecurity.
Openness	1, 2, 3	Openness to experiences associated with curiosity (Maddux and Galinsky, 2009).
RAT Score	2	Remote associates test score out of a total possible score of 12.
Forensic Education	3	Students who have had a forensic accounting course.

Table 2: Mean (Standard Deviation) of RAT Score and Big Five for Forensic and Non-forensic Students

	Forensic	Non-forensic
RAT score	8.06 (3.27)	6.69 (2.65)
Extroversion	30.24 (7.23)	26.69 (7.88)
Agreeable	46.81 (8.07)	44.14 (6.49)
Conscientious	46.54 (6.78)	45.38 (5.28)
Emotion stability	27.59 (7.68)	31.67 (9.25)
Openness	44.66 (8.62)	42.52 (9.36)
	N=70	N=42

Table 3: Analysis of Covariance

Source of Variation	df	SS	MS	F-statistic	P-value
Forensic education	1	53.86	53.86	6.01	.016**
Extroversion	1	45.08	45.08	5.03	.027**
Agreeable	1	28.88	28.88	3.22	.076*
Conscientious	1	.194	.194	.02	.883
Emotional Stability	1	2.53	2.53	.28	.597
Openness	1	7.14	7.14	.80	.374
Error	105	941.39	8.97		

Note: *, **, *** significant at the 10 percent, 5 percent, and 1 percent significant levels, using two-tailed test, respectively. All variable definitions are summarized in Table 1 Panel B.