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# Brainstorming and auditor education background on internal control: Assessing fraud opportunity

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## Abstract

Various efforts have introduced to the government auditors in improving the fraud risk assessment performance and at the same time enhancing audit quality as well as increasing public confidence. The provision of standards and guidelines have encouraged the government auditors to perform a brainstorming during the preliminary analysis of a fraud risk assessment. Due to the diversity of the government auditors education backgrounds, brainstorming improve a performance of internal control review by government auditor. The inability of the government auditor to detect any misstatement, especially fraud risk may expose auditors to lawsuits which consequently lead to a bad reputation to the public. The purpose of this study is to examine the direct and interaction effects of the brainstorming and education background against an internal control review performance. The 2 X 2 factorial designs were employed and a total of 151 government auditors participated in this study. The government auditors were assigned to assess the internal control based on individual or in groups. The results show that brainstorming and education background impact the internal control review performance. The results also show a significant interaction between brainstorming and education background. The findings in this study provide insights into the importance of brainstorming for government auditors with various education backgrounds.

**Keywords:** Fraud Risk Assessment, Internal Control Review, Brainstorming, Education Background

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## 1. INTRODUCTION

Irrespective of the industry that an organization is involved, the organization is vulnerable to fraud risk. Each type of industries has different fraud risks and required different prevention actions. Fraud is an intentional act conducted by one or more individuals among the management, those charged with governance, employees, or third parties that are involved in the use of deception to obtain an unjust or illegal advantage. Management fraud and employee fraud are two types of frauds that are relevant to the auditor. The management fraud relates to financial statement fraud whilst an employee fraud relates to the misappropriation of assets. Even though the management fraud and an employee fraud are different, both types of frauds may cause material misstatement in the financial statements. A material misstatement in the financial statement might affect the investors' decision. Arguably, a fraud risk assessment is critical and need be done concurrently with the financial statement auditing. However, performing a fraud risk assessment in concurrent with the financial statement auditing might affect the fraud risk assessment performance (Knapp & Knapp, 2001). Such scenario could not be avoided since time constraint and public pressure force the fraud risk assessment to perform concurrently with the financial

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statement auditing (Braun, 2000). Therefore, the auditors need to assess the fraud risk that exists in an organization while performing financial statement auditing.

The government auditors are from various backgrounds of education such as accounting, marketing, economic, banking and also from sciences discipline. The diversity of education backgrounds among the government auditors make brainstorming for a fraud risk assessment a necessity. The International Standards on Auditing (ISA) 240 and International Standards of Supreme Audit Institutions (ISSAI) 240 have encouraged auditors to hold discussions among the engagement team members on the potential for material misstatement due to fraud. Brainstorming refers to a group of individuals that attempt to seek solution to a problem or share information of specific issues by producing a list of ideas or information. In fraud risk assessment, brainstorming encourages the engagement team members to share client information, fraud indicator and fraud experience. Brainstorming can also be a tool for knowledge transfer between the team members on identification of fraud risks (Kerr, 2013). Due to the various education backgrounds of the government auditors, the level of knowledge about fraud is mainly based on the auditors' experience. However, lacking in experience in fraud detection may influences the auditors' judgment on the fraud risk assessment performance (Kozloski, 2011). The extent of the various education backgrounds under brainstorming process against a fraud risk assessment remains unclear. Thus, this study aims to examine the direct effects of brainstorming and education background on internal control review performance. This study also examines the interaction effects of these two variables on internal control review performance.

This study provides insight to the practitioners, especially government auditors on the importance of brainstorming as a tool for knowledge transfer between auditors. The findings in this study would be useful in enhancing the guidelines by emphasizing brainstorming in audit planning, especially in a fraud risk assessment. The remainder of this paper is structured as follows. The next section discusses the literature review. This is followed by section 3 that provides the research methodology. Section 4 presents the results. A summary and conclusion are provided in the last section.

## **2. LITERATURE REVIEW**

### **2.1 Internal Control and Assessing Fraud Opportunity**

Opportunity in fraud triangle has always been associated with the internal control and is a mandatory element to commit fraud (Schuchter & Levi, 2015). Fraud can happen when one of these three elements namely opportunity, pressure and rationalization exist together or separately in an individual or a group of individuals. Therefore, government auditors must be able to assess the opportunity elements in a fraud triangle. The standards have also mentioned the use of fraud indicator in a fraud risk assessment. A study by Omar & Mohamad-Din (2010) show that the government auditors perceive an opportunity 'red flags' as an important fraud indicator. Smith, Omar, Sayd Idris, & Baharuddin (2005) have also suggested that opportunity is an important element in assessing fraud risk. Opportunity is a manipulation of internal controls by an individual who wanted to commit fraud, concealing fraud and avoid being punished. An opportunity influences criminal behavior. For example: if an employee is facing financial pressure but has no opportunity to commit fraud due to a good internal control, then the fraud risk would be low. However, if the internal control is weak, then the fraud risk would be high. The employees can create an opportunity to commit fraud by colluding with another employee (LaSalle, 2007). Therefore, understanding the opportunity in the fraud triangle is necessary since prior studies have shown opportunity as a mandatory element for fraudsters to commit fraud.

An organization develops internal control as an effort to minimize fraud risk. Internal control is a process designed to provide reasonable assurance against financial reporting reliability and compliance, according to the laws and regulations. The use of technology in an internal control process prevents human interferences. However, the opportunity is a mandatory element for fraudsters to commit fraud. Thus, the government auditors need to assess the internal control effectiveness due to fraudsters also assessing opportunity to commit fraud (Dellaportas, 2013). To assess the internal control effectiveness in the technology environment, there is a need for the government auditors to rely on an audit technology in assessing internal control. Continuous auditing is among the audit technologies available to assess internal control (Alles, Kogan, & Vasarhelyi, 2008). By relying on an audit technology, performance in assessing an internal control could be improved. Thus, the government auditors should increase reliance on an audit technology coupled with opportunity 'red flag' to assess internal control. Although the government auditors have use the internal control framework for reviewing the internal control, they still use the fraud triangle elements in reviewing internal control (Mohd-Sanusi, Mohamed, Omar, & Mohd-Nassir, 2015). Thus, internal control is the first phase in preventing and deterring fraud risk and the government auditors should be able to review the internal control effectively.

## **2.2 Brainstorming in Internal Control Review Task**

Most studies have agreed that brainstorming process leads to better performance (Alon & Dwyer, 2010; Carpenter, 2007; O'Donnell, Arnold, & Sutton, 2000). Standards and guidelines have also encouraged the implementation of brainstorming during fraud risk assessment. Due to time and resources constraint, sometimes brainstorming is not done appropriately by the government auditors. Without proper brainstorming process, task performance might be jeopardized, and the auditors might not be able to identify fraud risk during an internal control review. Alon & Dwyer (2010) performed an experiment in their study and found brainstorming group with decision aids provide better performance in fraud risk assessment compared to a group without the decision aids and individuals with decision aids. O'Donnell et al. (2000) found brainstorming improves the internal control assessment for an information systems environment. A group interaction during the brainstorming process made the group to produce more quality ideas and information compared to individuals (Carpenter, 2007). With the availability of the technology, the auditors can use the technology and perform the internal control review individually. Even though the auditors can use the technology, the quality of ideas may not still be the same when the brainstorming group performs the internal control review using the technology (Alon & Dwyer, 2010). Therefore, brainstorming process is an additional benefit to a fraud risk assessment and an internal control review.

The brainstorming process is to ensure that the information, idea and experience among the engagement team members are shared. During the brainstorming process, information such as fraud triangle, anti-fraud measures and the elements of fraud are discussed (Trompeter, Carpenter, Desai, Jones, & Riley Jr., 2013). However, the psychology literature reported that mixed findings of brainstorming. For example: Dennis & Valacich (1993) found brainstorming does not generate more ideas due to process losses. The auditors might not participate to the discussion due several reasons such as a junior auditor not contributing since the senior auditor or manager is involved in the brainstorming session. Furthermore, it is common that in a brainstorming session, only one auditor can talk at one time while other members listen to the ideas given by the auditor who provides the talking. While waiting for their turn to speak, the idea may be lost due to the same idea or they perceive the idea to be inappropriate to the discussion known as block production. Other than production blocking, social loafing or free riding may also happen in the brainstorming session (Diehl & Stroebe, 1987). Sharing of information, ideas and experiences on fraud risk may not happen because of the production blocking and social loaf.

However, Carpenter (2007) found that although the quantity of ideas during brainstorming process may have reduced, but the ideas that have been posted are quality ones. A brainstorming is necessary for the government auditors to share quality ideas and most importantly, to make the knowledge transfer among the engagement team members (Kerr, 2013; Kozloski, 2011). Even though brainstorming reduces the quantity of ideas, vice versa it may also improves the quality of the ideas and hence improves the audit efficiency (Carpenter, 2007). Brainstorming leads the government auditors to focus on a given task such as an internal control review or fraud risk assessment. The auditors might modify the standard procedures according to the ideas from the brainstorming session (Hoffman & Zimbelman, 2009). Furthermore, prior studies in brainstorming have mostly used a fraud risk assessment (Alon & Dwyer, 2010; Carpenter, 2007). O'Donnell et al. (2000) found that brainstorming improves an internal control assessment for an information system. However, in the context of public sector, brainstorming has not been extensively examined and has not been documented during a fraud risk assessment or internal control review. The lack of evidence of brainstorming in the public sector has led this study to examine the process of brainstorming using the government auditors as the participants in this study. Therefore, the first hypothesis is developed:

H1: The government auditors in brainstorming groups perform better than individual auditors in performing internal control review tasks.

## **2.3 Education Background in Internal Control Review Task**

Knowledge emphasis depends on the educational background, and it determines strategic reasons (Tabak & Barr, 1999). Individual skills, knowledge and cognitive base reflect the individual education background. In the public sector, government auditors have various education backgrounds because government auditors do not only audit financial statement. National Audit Department provides training related to auditing, internal controls and fraud risk assessment to government auditors but different knowledge gained due to different education backgrounds still exist. For example: an auditor with an accounting education background are trained to assess the internal control using the internal control framework and will use them in the audit judgment task (LaSalle, 2007). On the other hand, an auditor without an accounting education background does not receive training related the internal control framework, and in worst case scenario, he or she may not have any accounting-

related knowledge. Furthermore, an auditor with an accounting education background is already exposed to the conservative principles and this make a professional skepticism much better. While the placement of a government auditor without an accounting education background might perform less effectively on the fraud risk assessments and internal control reviews. Therefore, an internal control review performance is likely to be affected by the diversity of the government auditors' education backgrounds. Therefore, the second hypothesis is developed:

H2: The government auditors with an accounting education background perform better than without an accounting education background to conduct an internal control review task.

## **2.4 Interaction between Brainstorming and Education Background**

The public sector auditors have diversity of education backgrounds. The brainstorming session can improve the performance of internal control review by the government auditors even without an accounting education background. The government auditors with an accounting education background understands the internal control framework while government auditors without an accounting education background only received a brief training when they first joined the services. Therefore, brainstorming and education background may affect the auditors' performance in the internal control review. In a brainstorming session, government auditors can share information, ideas and fraud experiences related to fraud risk. Brainstorming can become a platform for knowledge transfer from government auditors with an accounting education background to the government auditors without accounting education background (Kerr, 2013; Kozloski, 2011). Although the psychology literature has shown mixed findings, there have been suggestion that production blocking and social loaf may arise during the brainstorming process. Carpenter (2007) found that in the auditing domain, an auditor in a brainstorming group provides more quality ideas compared to an individual. However, no further explanation on the education background of the auditor is given. Therefore, this study aims to provide understanding on the effects of brainstorming and education background against the performance of internal control reviews. This study anticipates that there would be an interaction between the brainstorming and education background. Therefore, the third hypotheses is developed:

H3: Brainstorming and an education background have interaction effects against an internal control review performance, in such a way that auditors with accounting education background would perform better under the brainstorming session.

## **3. RESEARCH METHODOLOGY**

Two independent variables are chosen in this study. The two variables are brainstorming and education background. The objective of this study is to examine the direct and interaction effects of an independent variable against an internal control review. Brainstorming variable is being manipulated into two levels namely, a group or an individual in performing an internal control review. Education background is also being manipulated to two levels namely, a government auditor with a degree or diploma in accounting or otherwise. Therefore, a factorial design experiment 2 X 2 is used in this study with two independent variables being manipulated at two levels. While the dependent variable that is an internal control review is measured using scores of percentage of correct responses. The scores are calculated based on the number of correct responses divided by the total scores. The number of correct responses represents a transaction that has a same signatory as an authenticator and approver of payment voucher. This study chose 151 government auditors from various grades to be participants in the experiment. One hundred and ten government auditors function as external auditors whilst another 41 government auditors function as internal auditors. Even though the function and line of reporting between the external and internal auditors are different, they still received the same amount of training. Furthermore, studies have shown that there is no difference in terms of performance between external and internal auditors (Moyes & Hasan, 1996).

## **4. RESULT AND FINDINGS**

### **4.1 Demography of Participants**

The demographic profile of the participants in this study consists of 151 government auditors. Out of the 151 government auditors, 47 (31.1%) of the government auditors are male and 104 (68.9%) of the government auditors are female. The average age of participants is 35.36 years old and has an average 9.86 years experience in the public sector. For academic qualification, 8 (5.3%) participants hold the post graduate qualification, 61 (40.4%) participants have bachelor degrees, 10 (6.6%) participants have a professional qualification, 68 (45.0%)

hold diplomas qualification and 4 (2.6%) participants have certificate. Majority of the government auditors participate in this study do not have any membership. Only 28 (18.5%) of the participants are holding MIA, IIA or ACCA memberships. The government auditor scheme involved with the fieldwork consists of two groups namely, the professional and management group (Grade 41-54) and execution group (Grade 27-36). The difference between these two groups is execution group executes the program plan by the professional and management group. On the other hand, the professional and management group plan and monitor the execution of the plan. Fifty-four (35.8%) participants are from the professional and management and 97 (64.2%) of the participants are from support group.

#### 4.2 Descriptive Statistics

The overall mean score value of the internal control review performance is 65.50. The descriptive analysis for each group is shown in Table 1. From the descriptive analysis, the government auditors in the brainstorming group have a better performance compared to the individual group. The government auditors with accounting education background also have better performance compared to the government auditors without accounting education background.

Table 1: Descriptive Statistics

Internal Control Review	Education Background		Overall ( <i>n</i> )
	Accounting ( <i>n</i> )	Non-Accounting ( <i>n</i> )	
Brainstorming ( <i>n</i> )	78.38 (37)	67.33 (45)	72.32 (82)
Individual ( <i>n</i> )	70.24 (42)	37.41 (27)	57.39 (69)
Overall ( <i>n</i> )	74.05 (79)	56.11 (72)	65.50 (151)

#### 4.3 Brainstorming and Internal Control Review Performance

An independent samples t-test was conducted to compare the internal control review performance between the brainstorming group and individual. The results show significant difference at 5% in the internal control review scores between brainstorming group ( $M = 72.32$ ,  $SD = 28.687$ ) and individual ( $M = 57.39$ ,  $SD = 35.960$ ;  $t(129.22) = -2.782$ ,  $p = .005$ , two-tailed). The magnitude of the differences in the mean score (mean difference = -14.926, 95% CI: -25.539 to -4.312) is very small (eta squared = 0.05). Therefore, the results indicate that the government auditors in the brainstorming groups have better performance in an internal control review task compared to government auditors assigned as individuals. Therefore, hypothesis one is supported.

#### 4.4 Education Background and Internal Control Review Performance

An independent samples t-test was also conducted to compare the internal control review performance between the government auditors with accounting education background and government auditors without accounting education background. The results show that there is a significant difference at 5% in the internal control review scores between government auditors with an accounting education background ( $M = 74.05$ ,  $SD = 33.570$ ) and government auditors without an accounting education background ( $M = 56.11$ ,  $SD = 29.767$ ;  $t(149) = 3.461$ ,  $p = .001$ , two-tailed). The magnitude of the differences in the mean score (mean difference = 17.940, 95% CI: 7.697 to 28.183) is moderate (eta squared = 0.07). Therefore, the government auditors with an accounting education background have better performance in an internal control review task compared to the government auditors without accounting education background. Therefore, hypothesis two is supported.

#### 4.5 Interaction between Brainstorming, Education Background and Internal Control Review Performance

A two-way between-group analysis of variance was conducted to explore the interaction effects between brainstorming and education background against an internal control review performance. The results show that brainstorming and educational background have significant interaction effects on 5% ( $F = 4.715$ ,  $p = 0.032$ ). Therefore, hypothesis three is supported. Figure 1 shows that brainstorming group (mean score = 72.32) have a better performance compared to the individuals (mean score = 57.39) in an internal control review task. Individual government auditors without accounting education background (mean score = 37.41) have a lower performance on the internal control review task compared to individual government auditors with accounting education background. However, in the brainstorming group, government auditors without accounting education background (mean score = 67.33) have better performance. The details of the result are shown in Table 2.

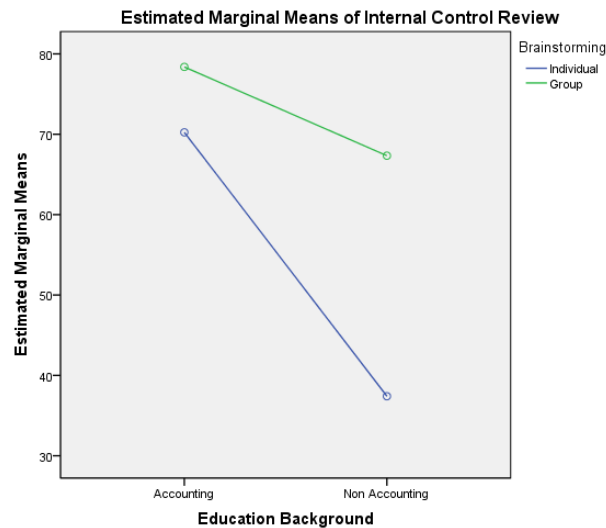


Figure 1: Interaction effects between Brainstorming and Education Background

Table 2: Interaction effect between Brainstorming and Education Background  
Tests of Between-Subjects Effects

Dependent Variable: Internal Control Review						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	28538.908 <sup>a</sup>	3	9512.969	10.405	.000	.175
Intercept	583036.521	1	583036.521	637.702	.000	.813
EduBackgrd	17485.497	1	17485.497	19.125	.000	.115
Ind.Group	13161.593	1	13161.593	14.396	.000	.089
EduBackgrd * Ind.Group	4310.920	1	4310.920	4.715	.032	.031
Error	134398.840	147	914.278			
Total	810700.000	151				
Corrected Total	162937.748	150				

a. R Squared = .175 (Adjusted R Squared = .158)

## 5. DISCUSSION AND LIMITATIONS

This study examines the effect of brainstorming and education background on an internal control review performance. The results indicate that government auditors that have no accounting education background may improve their performance when brainstorming process is provided. The results show that there is a significant interaction between educational background and brainstorming. In other words, brainstorming improves internal control review performance without taking into account the education background of the government auditors. The findings in this study are consistent with the previous studies related to brainstorming in the audit context (Alon & Dwyer, 2010; Carpenter, 2007; O'Donnell et al., 2000). Even though the psychology literature found brainstorming may cause production block and social loaf (Diehl & Stroebe, 1987), the results in this study shown otherwise. This study shows that in the context of audit, the internal control review performance are improved in the brainstorming group. In addition, a government auditor with accounting education background has a better performance compared to a government auditor without accounting education background. Furthermore, brainstorming group also performed better than an individual. However, government auditors without accounting education background performed review internal controls individually obtained lower scores. Therefore, a brainstorming needs to be emphasized to the practitioners especially the government auditors. This study implicates that an audit judgment made by a government auditor in brainstorming indirectly improve audit quality. As a conclusion, brainstorming needs to be intensified in the audit planning process.

However, the findings in this study need to be enhanced by creating mixed group between government auditors with accounting education background and government auditors without accounting education background. The absence of mixed group is a limitation in this study. Therefore, future research needs to use a factorial design experiment 3 X 2. Where there is a mixture in a group consisting of government auditors with accounting education background and government auditors without accounting education background are added. The results might be able to explain how production block and social loaf could be reduced during the brainstorming process caused by the diversity of education background.

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