DEVELOPING AUDITOR COMPETENCE IN GEOMETRIC THINKING TO MITIGATE AUDIT RISKS

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Abstract: Companies are vulnerable to audit risks related to fraud and financial statement manipulation. This study aims to measure the level of geometric thinking among external auditors and to demonstrate its impact on risk reduction. Accounting and auditing professionals face a significant challenge in Iraq and worldwide. Its secondary objective is to quantify the degree to which geometric thinking helps to mitigate audit risks. Accounting scholars, practitioners, and relevant professional organizations must address the long list of problems that have plagued auditors and their work to strengthen the credibility of the auditing profession, protect the investments of stakeholders, and keep the economy from collapsing.

The development of a questionnaire accomplished this objective. There were two axes to it. The first one focused on testing the external auditor's technical acumen. A total of 23 questions covering four areas (geometric skill self-evaluation, geometric mindset, geometric thought process, and individual growth) made up the axis. Audit risk was measured along the second axis. It was 20 questions long and covered four areas: lowering risks associated with detection, internal controls, analytical techniques, and inherent hazards. The study population consisted of audit businesses and public sector auditors in Iraq. A total of 121 participants were chosen at random, with three questionnaires being discarded because they were deemed unfit for research. For this analysis, 119 surveys were considered legitimate. To test hypotheses and draw conclusions, SPSS Version 27.01 was used for statistical analysis, including descriptive and factor statistics, basic linear regression, correlation, and other methods. Audit risk reduction and auditors' geometric thinking were shown to be 86.6% correlated. Additionally, all the auditors who participated in the survey felt the need to hone their abilities in creating testing models for internal control systems. Additionally, most respondents believed that improving geometric thinking abilities requires creativity as an integral component of problem-solving in the workplace.

Keywords: External Auditor, Geometric thinking, fraud, Audit Risks

1. INTRODUCTION

Knowledge contributes to the acquisition of skills that allow the learner to detect and correct errors. The computational mechanisms that implement these two functions are implemented in a simulation model that represents the learner's prior knowledge (Ohlsson, 1993). The brain's representation of concepts is referred to as knowledge, and the connections between these concepts are referred to as understanding. Neurons are the construction blocks of the brain and are responsible for learning and memory. When we encounter novel stimuli, our neurons activate in a predetermined manner; subsequently, this pattern is stabilized by reinforcement. (Furs, 2021). The field of education, like other areas of life, has witnessed innovations applied in the content, methods, techniques, and forms of educational activity (Nesteruk, 2023). Geometric thinking, or the geometric mindset, is a combination of artistic, technical, economic, constructive, and research thinking. It combines logic, creativity, theoretical and practical orientation, as well as artistic and humanistic components. Its dimensions are transformational orientation, consistency, scientific and theoretical foundation, critical thinking, constructivism, creativity, and adaptability. (Putilova & Shutaleva, 2022). We believe that the challenges facing the auditing profession worldwide, resulting from fraud and illegal actions, have led to distorted financial statements and, consequently, scandals and financial crises. This requires studying solutions and mechanisms to address this challenge by developing the skills of auditors and their teams to identify the risks facing the auditing process.

Therefore, it was essential to expand on the concept of this study to help address real-world challenges that auditors face and ultimately benefit stakeholders.

2. LITERATURE REVIEW

2.1 A Foundational Overview of Geometric Thought

There are 10 distinct kinds of solution criteria that engineers have used in their pursuit of ideal solutions. Finding the optimal middle ground does not have a systematic procedure. However, engineers use their judgment and explanations to support their decisions, and the logic that leads to an ideal solution is based on measurements and deduction. Thus, geometric education does include geometric thinking (Robinson, 1998). To address these evolving needs, we require new educational curricula.

Additionally, a more holistic strategy is required to ensure that students grasp fundamental geometric concepts and can subsequently acquire more specialized information as needed (Beder, 1999). Playing with blocks as a child was the earliest form of investigation into geometric thinking. Children aged 2 to 5 from a daycare center that is open all year round were the subjects of the study. A developmentally, culturally, and individually appropriate curriculum can be negotiated through play, which is a normal developmental process. There may be corresponding actions in geometric thought at each of these stages, and complex geometric jobs often employ a combination of these. To better integrate geometric thinking with learning theory, it is helpful to examine geometric thinking from a more holistic perspective (Brophy & Evangelou, 2007).

A key takeaway from university education is the importance of geometric thinking in preparing students for careers in industry and easing their transition from the academic to the professional world (Waks et al., 2011). Consequently, students often misunderstand geometric thinking concepts because they fail to grasp the material they are studying or their prior knowledge (Trotskovsky et al., 2013). Scientists say that in times of crisis, top-level leaders should have contingency plans that involve geometric principles. This is a novel idea that emphasizes an organization's capacity to adapt and be flexible. Preliminary safety standards established during project planning serve as the basis for final standards (Guarnieri & Travadel, 2014). In a separate study, researchers followed 18 kids (ranging in age from three to five) for four months to see if they may show signs of innovative geometric thinking. Based on the video data analysis, the kids demonstrated that they could think creatively, solve problems, and achieve their goals by combining different designs and repeating patterns (Bagiati & Evangelou, 2016).

When they play with things, preschoolers show that they are thinking geometrically. When adults receive instruction on geometric concepts and then ask children questions, they are better equipped to help children think geometrically. According to Lippard et al. (2017), children's geometric thinking has the potential to improve their social and emotional development in addition to their early arithmetic abilities. Theoretical frameworks in geometry are consistent with those in neurology, cognition, and epistemology (Yasar et al., 2017). According to Skurikhina et al. (2018), the ability to think geometrically facilitates the development of study skills in all types of educational settings. Even at a young age, students might absorb concepts that their teachers deemed too complicated. Early experiences with creative design, geometry, puzzle solving, and inquiry may help children's brains develop (Purzer & Douglas, 2018). Teaching kids to think creatively and solve problems they find interesting is the best approach to get them thinking about geometric concepts early on. According to Lippard et al. (2019), one of the most in-demand skills in today's digital society is the ability to think theoretically and experimentally about geometric. With the help of 3D technologies, this competency can be shaped, and future professionals will be better ready to meet the demands of this industry (Bushmeleva et al., 2020). Approximately 300 Kazan Federal University alums were able to demonstrate mastery of all material covered in over 20 sessions in recent research. According to Anisimova et al. (2021), the initiative was successful in fostering digital skills and geometric thinking in the study model. In addition, geometric as a mindset enables the incorporation of information from various domains, including the arts, which helps students understand how to apply theory in practice and appreciate the aesthetic value of geometric solutions (Titova, 2023). Furthermore, in STEM (science, technology, geometric, and mathematics) curricula, it is a necessary ingredient for students to hone their critical thinking abilities (Zhan et al., 2023)

2.2 The Potential for Fraud and Audit Risk

Auditor fraud risk assessments might be more accurate if they consider auditors' unique characteristics, including their digital technological abilities and personality types. According to Mat et al. (2022), auditors need digital technology capabilities to analyze fraud risk effectively. Auditors' capacity to identify fraudulent activity is enhanced by whistleblowing and by time and financial constraints (Rizkiana et al., 2022). Improving auditors' capacity for original thought is crucial in combating fraud (Ameen & Wahhab, 2023). According to Ginanjar et al. (2023), external auditors' capacity to identify audit fraud is positively and significantly affected by their level of professional skepticism. Some organizations' rules, implemented to safeguard private interests, make it difficult for external auditors to identify fraud in practice, which is why they fail to do so. Kassam specified the year 2023.

Most nations throughout the world have seen a rise in corporate fraud cases, which has altered the role of auditors and underscored the need to reassess the knowledge, skills, and behaviors required of auditors in today's businesses (Siriwardane et al., 2014). According to research, auditor competence should be defined more broadly to include not only technical knowledge but also interpersonal and behavioral abilities (Rumasukun, 2024). Auditors can improve their professional judgement and decrease audit risk by adopting a new way of thinking (Bucaro, 2019). Improved information familiarity and understanding are direct results of auditors increased geometric thinking and visual-spatial awareness. Additionally, auditors can utilize the mental processes required for geometric at a faster rate, which enhances their performance.

Additionally, it helps auditors, who are already creative and adaptable, reach new heights of geometric thinking, which will serve them well as they face the difficulties of auditing in different and complex corporate settings (Powell et al., 2020). The efficacy and quality of fraud detection procedures are also guaranteed. Moreover, how to stop it. Fostering an ethical company culture and gaining public trust are two more benefits. According to Papaya (2025), a decrease in fraud is anticipated when independent audits are combined with the auditor's technical knowledge.
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3. Method

3.1 The study's significance

To improve the performance of external auditors worldwide, including in Iraq, this study is critical because it utilizes metrics from the field of psychology to demonstrate how various areas of study can help auditors sharpen their skills and mitigate the risks that audit operations face. It also provides researchers in this area with a platform to learn from the findings and apply them to their own countries.

3.2 The study's aims

Companies are vulnerable to audit risks related to fraud and financial statement manipulation. This study aims to quantify the extent to which external auditors think like engineers and demonstrate how this mindset helps mitigate these risks. Accounting and auditing professionals face a formidable obstacle in Iraq and worldwide because of this. Its secondary objective is to quantify the degree to which geometric thinking helps to mitigate audit risks.

3.3 The study Proble

With the restricted capabilities of some auditors, the auditing profession in the digital age faces substantial hurdles owing to fraud and manipulation of financial accounts.

    A. Will developing the external auditor's geometric thinking reduce detection risk?
    B. Will developing the external auditor's geometric thinking reduce control risk?
    C. Will developing the external auditor's geometric thinking reduce the risk of analytical procedure errors?
    D. Will developing the external auditor's geometric thinking reduce inherent risk?
    E. Will developing the external auditor's geometric thinking reduce audit risks (Detection risks, Internal

control risks, Analytical procedures risks and Inherent risks)?

3.4 Hypothesis of the study

The study is based on the subsequent main hypotheses:

    A. Hypothesis 1: Reducing detection risks is significantly correlated with the external auditor's use of geometric thinking.
    B. Hypothesis 2: The external auditor's ability to reduce internal control risks is strongly correlated with their geometric mindset.
    C. Hypothesis 3: The external auditor's ability to reduce the risks associated with analytical procedures is strongly correlated with their geometric mindset.
    D. Hypothesis 4: A decrease in inherent risks is significantly correlated with the external auditor's use of geometric thinking.
    E. Hypothesis 5: There is a significant relationship between geometric thinking and the reduction of audit risk (detection risks, internal control risks, analytical procedures risks, and inherent risks.

3.5 Methods

To conduct the study's objectives and manage the issue, auditors from audit companies and external auditors in the public sector were selected as the study population across all governorates in Iraq. Out of the eighteen governorates of Iraq, a random selection of external auditors was made. Literature on the article's topic factors served as the basis for developing the questionnaire. Between May 1, 2025, and May 28, 2025, a total of 121 surveys were sent out. A total of 119 questionnaires were deemed valid for examination. Based on the relevant research, the 43-question survey was organized into two axes. A measure of auditors' ability to think like engineers was plotted on the first axis. There were four parts to it: assessment and analysis, geometric skill self-evaluation, geometric mindset, and geometric thought processes and individual growth. There was a total of 23 questions related to the first axis, with 20 questions comprising the second axis, which represented the dependent variable (reducing audit risks). Statistical analysis was completed utilizing SPSS V. 27.0.1 to test the study hypotheses, and the results were then presented. The validity and reliability of the questionnaire were confirmed by descriptive data analysis and conventional statistical techniques, including simple linear regression, multiple linear regression, correlation testing, and linear regression. The following statistical equations were utilized to test the hypotheses of the study:

- $DER = B_0 + B_1(ENTH) + e_{it} \ldots \ldots \ldots \ldots \ldots \ldots (1)$
- $ICR = B_0 + B_1(ENTH) + e_{it} \ldots \ldots \ldots \ldots \ldots \ldots (2)$
- $APR = B_0 + B_1(ENTH) + e_{it} \ldots \ldots \ldots \ldots \ldots \ldots (3)$
- $IHR = B_0 + B_1(ENTH) + e_{it} \ldots \ldots \ldots \ldots \ldots \ldots (4)$
- $AUDR = B_0 + B_1(ENTH) + e_{it} \ldots \ldots \ldots \ldots \ldots \ldots (5)$

DER = the dependent variable (reducing the detection risks).
ICR = The dependent variable (reducing internal control risks).
APR = The dependent variable (reducing analytical procedures risks).
IHR = The dependent variable (reducing inherent risks).
$AUDR$ = The dependent variable (reducing audit risks).

B_0 = The regression equation's constant represents the reduction in the detection risk when the geometric thinking equals zero.
$B_1(ENTH)$ = The slope of the regression function, which measures the effect of the independent variable (geometric Thinking) on the dependent variable (reducing the detection risks, reducing internal control risks, reducing analytical procedures risks or reducing inherent risk).

e_{it} = Estimation errors or so-called statistical residuals.

4. Results and discussion

Analysis of the results shows that the arithmetic mean for the independent variable (auditor's geometric thinking) was 3.75, which is within the statistically acceptable mean of 3, with a standard deviation of 0.971. This indicates a high degree of agreement among respondents on this axis. As for the dependent variables, the variable (reducing detection risks) achieved an arithmetic mean of 3.005 with a standard deviation of 0.954. The second dependent variable (reducing internal control risks) had an arithmetic mean of 2.789, which is lower than the statistically acceptable mean and with a low standard deviation of 0.995. The third dependent variable (reducing analytical procedures risks) had an arithmetic mean of 4.205, which is much higher than the statistically acceptable mean, with a standard deviation of 0.908. The fourth dependent variable (reducing inherent risks) had an arithmetic mean of 3.398 with a standard deviation of 1.019. The last variable, which included the four dimensions above (reducing audit risks), achieved an arithmetic mean of 3.585 with a standard deviation of 0.974. Using SPSS, we analyzed the data to determine the correlation and influence between the variables, employing both simple linear regression approaches to test the study hypotheses. The results were as follows:

4.2 Study Variables

The study variables and descriptive data are displayed in the following table.

Table 1. Descriptive statistics study variables

variables	Abbreviation	Mean	Std. Deviation	N
Geometric Thinking	ENTH	3.75	0.971	119
Reducing Detection Risks	DER	3.005	0.954	119
Reducing Internal Control Risks	ICR	2.789	0.995	119
Reducing Analytical Procedures Risks	APR	4.205	0.908	119
Reducing Inherent Risks	IHR	3.398	1.019	119
Reducing Audit Risks	AUDR	3.585	0.974	119

The table above shows the weighted arithmetic mean and Std—deviation of the independent and dependent variables. The third dimension of the dependent variable (reducing the risks of analytical procedures) achieved the lowest standard deviation of 0.908 and a weighted arithmetic mean of 4.205. The independent variable (developing the auditor's geometric thinking) achieved a standard deviation of 0.971 and a weighted mean of 3.75. All other variables are within the statistically acceptable limits, indicating the convergence of the answers to these variables and their suitability for analysis.

4.3 Results of testing the study hypothesis

Hypothesis 1: Reducing detection risks is significantly correlated with the external auditor's use of geometric thinking.

Table 2. Correlation matrix between geometric thinking and detection risks

		Geometric Thinking	Reducing Detection Risk
Pearson Correlation	Geometric Thinking	1	.956**
	Reducing Detection Risk		.000
Sig. (1-tailed)	Geometric Thinking	119	119
	Reducing Detection Risk	.956**	1
N	Geometric Thinking	.000	
	Reducing Detection Risk	119	119
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 2 above shows the variables of the regression matrix. The correlation coefficient reached a value of 95.6%, with a significance level of less than 0.01, indicating a statistically significant correlation. The relationship between geometric thinking and detection risk is statistically significant, with a value of 0.00 for both independent and

dependent variables.

Table 3. **Regression between geometric thinking and reducing detection risks**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.580	.515		-5.006	.000
	Geometric Thinking	.204	.006	.956	35.280	.000
a. Dependent Variable: Reducing Detection Risk						

The table above displays the standard and non-standard regression function coefficients, the standard error, and the T-test value, along with the probability value of the tests (statistical function). The table showed that the value of the regression equation constant reached -2.570, and the value of the slope of the regression equation reached 20.04%, indicating the effect of the independent variable (geometric thinking) on the dependent variable (reducing the risk of detection) through the coefficient B. The negative value of the coefficient indicates an inverse relationship between the two variables, the independent and the dependent. In other words, a one-degree decrease in the independent variable (geometric thinking) leads to a 20.4% decrease in the dependent variable (reducing the risk of detection), assuming all other independent variables remain constant. It is also noted from the table above that the significance level of the independent variable reached 0.00, which is less than the acceptable error in the social sciences, which is pre-determined by 0.05. This means that the sample data provided evidence. To accept the alternative hypothesis of a statistically proven effect, the result significantly affects the auditor's geometric thinking in reducing the risk of detection. The equation of the regression line can be derived from the data presented in the table above in the following manner:

$$DER = 18.97 + 45 + 1 = \cdots \ldots \ldots (6)$$

Below are the figures that show the normal distribution of the dependent variable (reducing detection risks):
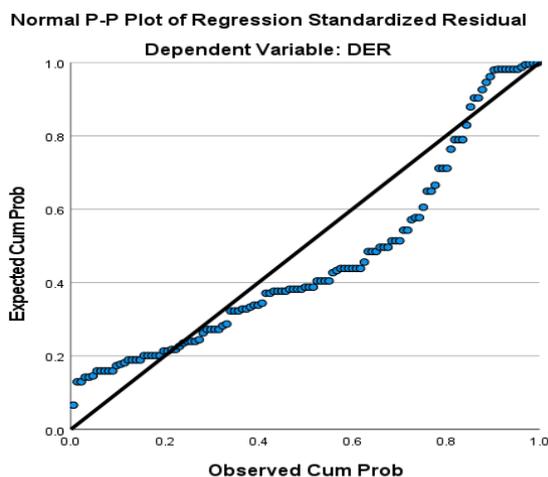

Figure 1. Reducing detection risks

The figure above shows the distribution of points as a straight line or one close to a line, indicating that the residuals are distributed according to the normal distribution of the data. This means that one of the conditions for regression analysis has been met.

Hypothesis 2: The external auditor's ability to reduce internal control risks is strongly correlated with their geometric thinking

Table 4. Correlation matrix between geometric thinking and reducing internal control risks

		Geometric Thinking	Geometric Thinking
Pearson Correlation	Geometric Thinking	1.000	.970
	Reducing Internal Control	.970	1.000
Sig. (1-tailed)	Reducing Internal Control	.	.000
	Geometric Thinking	.000	.
N	Reducing Internal Control	119	119
	Geometric Thinking	119	119

The table above shows the variables of the regression matrix. The correlation coefficient reached a value of 97%, with a significant level of less than 0.01, indicating a statistically significant correlation. The relationship between geometric thinking and internal control risks is statistically significant, with a value of 0.00 for both independent and dependent variables.

Table 5. Regression between geometric thinking and reducing internal control risks

Model		Unstandardized Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-4.698	.446		-10.542	.000
	Geometric Thinking	.216	.005	.970	43.217	.000
a. Dependent Variable: Reducing Internal Control Risks						

The table above displays the standard and non-standard regression function coefficients, the standard error, and the T-test value, along with the probability value of the tests (statistical function), and shows that the value of the regression equation constant reached -4.698. The value of the slope of the regression equation reached 21.6%, indicating the effect of the independent variable (geometric thinking) on the dependent variable (reducing internal control risks) through the coefficient B. The positive value of the coefficient indicates a direct relationship between the two variables, the independent and the dependent. In other words, a one-degree increase in the independent variable (geometric thinking) leads to a 21.6% increase in the dependent variable (reducing internal control risks), assuming all other independent variables remain constant. It is also noted from the table above that the significance level of the independent variable reached 0.00, which is less than the acceptable error in the social sciences, which is pre-determined by 0.05. This means that the sample data provided evidence. To accept the alternative hypothesis of a statistically proven effect, the result significantly affects geometric thinking in the auditor's role in reducing internal control risks. The equation of the regression line can be derived from the data presented in the table above in the following manner:

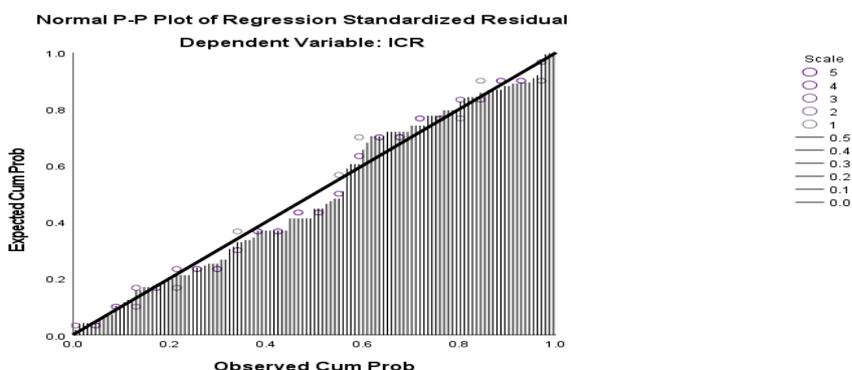$$ICR = -4.698 + 21.6 + 1 \ldots\ldots\ldots. (7)$$

Figure 2. Reducing internal control risks

The figure above shows the distribution of points as a straight line or one close to a line, indicating that the residuals are distributed according to the normal distribution of the data. This means that one of the conditions for regression analysis has been met.

Hypothesis 3: **The external auditor's ability to reduce the risks associated with analytical procedures is strongly correlated with their geometric mindset.**

Table 6. Regression between geometric thinking and reducing analytical procedures risks

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.005	.405		9.878	.000
	Geometric Thinking	.197	.005	.970	43.354	.000
a. Dependent Variable: Reduction of analytical procedures risks						

Table 6 shows that the value of the regression equation constant reached 4.005, and the value of the slope of the regression equation reached 19.7%, indicating the effect of the independent variable (geometric thinking risks) on the dependent variable (reducing analytical procedures risks) through coefficient B. The positive value of the coefficient indicates a direct relationship between the two variables, the independent and the dependent. In other words, a one-degree increase in the independent variable (auditor's risk management) leads to a 19.07% increase in the dependent variable (reducing analytical procedures risks), assuming all other independent variables remain constant. It is also noted from the table above that the significance level of the independent variable reached 0.00. This means that the sample data provided acceptable evidence for accepting the alternative hypothesis, thereby statistically confirming the effect. The result: "Geometric thinking affects reducing the risks of analytical procedures."

The equation of the regression line can be derived from the data presented in the table above in the following manner:
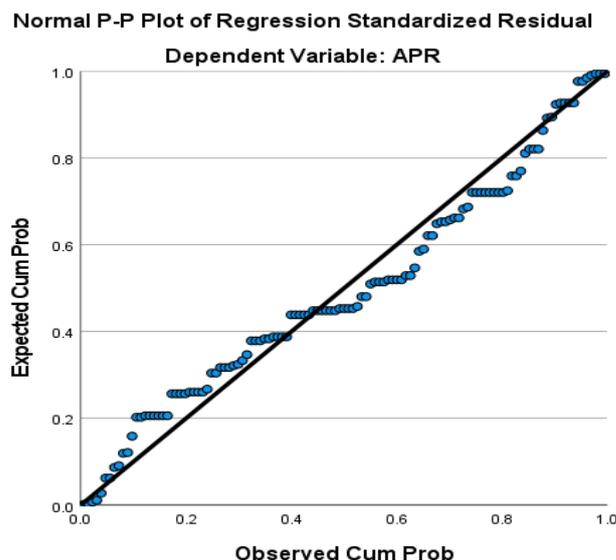
$$APR = 4.005 + 19.7 + 1 \dots\dots\dots. (8)$$

Figure 3. Reducing the risks of analytical procedures risks

The figure above shows the distribution of points as a straight line or one close to a line, indicating that the residuals are distributed according to the normal distribution of the data. This means that one of the conditions for regression analysis has been met.

Hypothesis 4: A decrease in inherent risks is significantly correlated with the external auditor's use of geometric thinking.

Table 7. Regression between geometric thinking and reducing inherent risks

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-2.061	.469		-4.397	.000
	Geometric Thinking	.221	.005	.968	41.977	.000
a. Dependent Variable: Reducing inherent risks						

As shown in Table 7, the constant value of the regression equation was 22.1, and the slope value was -2.061. This suggests that geometric thinking can help reduce the inherent risk with coefficient B. A negative coefficient value indicates an inverse relationship between geometric thinking and reduced intrinsic risk. Assuming all other independent variables remain constant, a one-point increase in auditor geometric thinking (the independent variable) results in a 22.1% decrease in inherent risk reduction (the dependent variable).

Furthermore, as shown in the table above, the significance level of the independent variable was 0.00, which is lower than the generally accepted error of 5%. This implies that the statistical proof of the influence was conducted by rejecting the null hypothesis and accepting the alternative hypothesis based on the sample data. The summary: "The auditor's geometric thinking in the audit process reduces inherent risk."

The equation of the regression line can be derived from the data presented in the table above in the following manner:

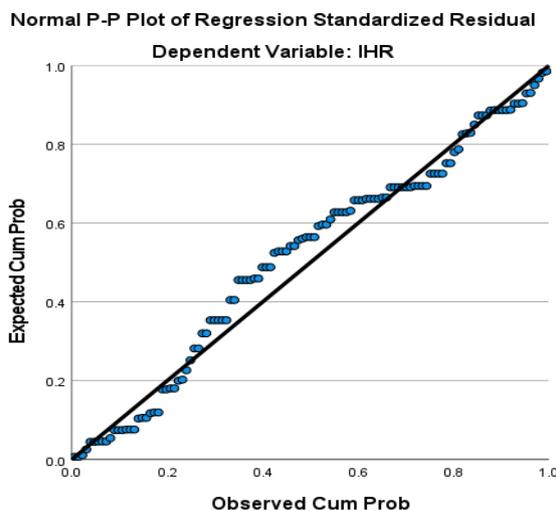$$INR = -2.061 + 22.1 + 1 \ldots \ldots \ldots (9)$$

Figure 4. Reducing inherent risk

The figure above shows the distribution of points as a straight line or one close to a line, indicating that the residuals are distributed according to the normal distribution of the data. This means that one of the conditions for regression analysis has been met.

Hypothesis 5: There is a significant relationship between geometric thinking and the reduction of audit risk (detection risks, internal control risks, analytical procedures risks, and inherent risks.

Table 8. Correlation matrix between geometric thinking and reducing audit risks

	Variable	Geometric Thinking	Reducing Audit Risk
Pearson Correlation	Geometric Thinking	1.000	.992
	Reducing Audit Risk	.992	1.000
Sig. (1-tailed)	Geometric Thinking	.	.000
	Reducing Audit Risk	.000	.
N	Geometric Thinking	119	119
	Reducing Audit Risk	119	119
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 8 above shows the variables of the regression matrix. The correlation coefficients reached a value of 99.2.6%, with a significance level of less than 0.01, indicating a statistically significant correlation. The relationship between geometric thinking and audit risk is statistically significant, with a value of 0.00 for both independent and dependent variables

Table 9. Regression between geometric thinking and reducing audit risks

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-2.997	.883		-3.394	.001
	Geometric Thinking	.866	.010	.992	87.364	.000
a. Dependent Variable: Reducing Audit Risks.						

Table 9 above shows that the value of the regression equation constant was -2.997, and the value of the slope of the regression equation was 0.866, which illustrates the effect of the independent variable (geometric thinking) on the dependent variable (reducing audit risks), as indicated by coefficient B. The negative coefficient suggests that a one-unit decrease in geometric thinking leads to an 86.6% decrease in A (reducing audit risks), assuming all other independent variables remain constant. It is also noted that the significance level of the independent variable was 0.00, indicating that the sample data provided sufficient evidence to reject the null hypothesis and sustain the alternative hypothesis: "There is a significant effect of geometric thinking on auditors to reduce audit risks".

The equation of the regression line can be derived from the data presented in the table above in the following manner:

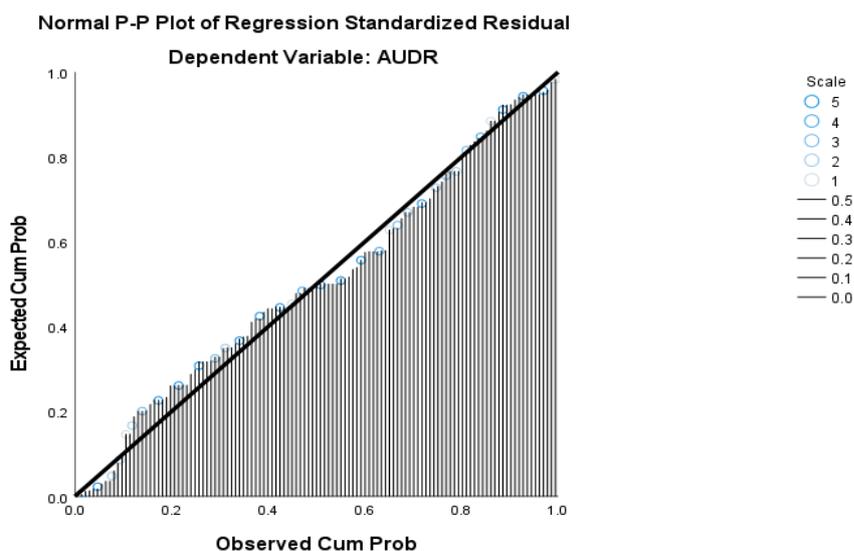$$AUDR = -2.997 + 86.6 + 1 \ldots \ldots \ldots (10)$$

Figure 5. Reducing audit risks

The figure above shows the distribution of points as a straight line or one close to a line, indicating that the residuals are distributed according to the normal distribution of the data. This means that one of the conditions for regression analysis has been met.

5. Conclusions

Accounting competence and cognitive interaction are both aided by learning, and the converse is also true: ability improves learning. There is a lack of understanding on how knowledge interacts with one's capacity to learn or digest data. As a result, audit professionals will be able to build better knowledge structures and do a better job. Ability seems to be rather constant in adults and only fluctuates over long periods of time, according to the expertise model. Based on this notion, teams that are just starting out with auditing have the greatest knowledge needs. This assumption has just lately come under scrutiny among accounting theorists. This is because challenging this assumption calls for new theoretical work as well as empirical investigations into the consequences of auditors' knowledge-experience interactions. An in-depth familiarity with the workplace is essential for auditors in order to comply with codes of behaviour. It is suggested in the psychological literature that decision-makers frequently encounter substantial challenges when attempting to comprehend intricate work settings. Improvements in memory efficiency are associated with gains in creativity and the capacity to model and comprehend novel information, both of which have an effect on people's preexisting knowledge systems. Improved data processing capacity is anticipated as a result of the auditor's knowledge structure being better built for the audit task. Identifying and reducing the inherent risks, as well as those associated with detection, internal controls, analytical techniques, and the audit risks generally acknowledged by practitioners, requires an understanding of the nature of auditing.

Dutch mathematician Pierre Van Hiele and his wife Dina van Hiele-Geldof of Utrecht University's Faculty of geometric came up with the novel idea of geometric thinking (Vojkuvkova, 2012). Science has taken up the hypothesis and is testing it with students in elementary, middle, and high school, as well as college freshmen, across the globe. Although researchers have used several mathematical and geometrical measurement approaches, their use by auditors and accountants is still in its early stages. There was a need for substantial research to establish its measurement methodologies, and a current research deficit existed on a global scale; thus, the study addressed this gap. Thus, to quantify the effect of geometric thinking on audit risks (detection risks, intrinsic risks, analytical procedures risks, and internal control risks), the study employed a survey list that encompasses the theory's fundamental features. Investigating the influence of auditors' geometric thinking abilities on audit risks, this study aimed to quantify the extent to which auditors in the sample demonstrated these abilities during audit processes. According to the findings, there was a high correlation and significant influence between the two. On the other hand, they proved that auditor geometric thinking made internal control and intrinsic risk reduction worse. On the other hand, there was a favorable correlation between auditor geometric thinking and reducing risks associated with analytical procedures and detection.

Public sector and private sector auditors in Iraq often exhibit a commendable degree of geometric thought. Because it affects auditors' efficiency and performance, which shows up in the audit report and overall quality, this grade requires ongoing improvement. Auditors can improve their credibility and output by keeping an acceptable level of risk in their work. Auditing and the auditor's role within it will be elevated as a result. As the level of risk decreases, stakeholders gain more faith in the auditor's report, which in turn leads to more prudent investment choices.

The study suggests that to fully comprehend the effects of auditor geometric thinking theory on audit processes, audit reports, and audit planning in line with global auditing standards, further research into its practical applications is needed.

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