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Sudoku Induced Cognitive Skills And Decision Making Of Small Scale Businesses In Uyo Local Government Area Of Akwa Ibom State

Abstract

The purpose of this study was to determine the extent of influence of sudoku induced cognitive skills on decision making of small scale businesses in Uyo Local Government Area of Akwa Ibom state. In order to achieve this, two (2) specific objectives were set, two(2) research questions where asked and two(2) null hypotheses were raised at 0.05 level of significance to guide the study. The ex post facto survey design was used for the study. The population for this study consisted all 7373 registered small scale businesses in Uyo metropolis. A sample size of 583 small scale business owners was used for this study. The researcher structured questionnaire titled "Sudoku Induced Cognitive Skills and Decision Making Questionnaire (SICSDMQ)" was used to collect data for the study. Richard Kuderson 21 was used to determine the reliability and internal consistency with a high r value of .88. Mean and standard deviation were used to answer the research questions while the t test was used to analyze the null hypotheses. It was discovered that there is a significant influence of working memory on decision making of small scale businesses in Uyo local government area of Akwa Ibom state. It was recommended among others that owners of small scale businesses should engage in sudoku trainings to help improve their businesses.

Keywords: Sudoku, Cognitive, Skills, Decision Making, Small Scale businesses

Abasienie Sampson Bassey(PhD)
Department of Business Education
University of Uyo
08162428134

Corresponding Author's Email:
abasieniesbassey@uniuyo.edu.ng

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Introduction

Background to the Study

Small-scale businesses (SSBs), including microenterprises and small and medium-sized enterprises (SMEs), represent a significant share of global economic activity. These firms operate with limited human, financial, and informational resources, yet confront frequent, consequential decisions: pricing, inventory, scheduling, hiring, supplier selection, and customer relationship management. Improving decision quality in these environments can yield outsized benefits (Ade, 2021). Finding a global acceptable definition for SSBs has often proved very problematic due to the varying sizes and depth of individual country economies which have resulted in varying SSB definitions by different institutions and countries. As Bassey & Akpan (2026) noted, defining SSBs depends on the local banking context and economy size while international organizations like the World Bank tend to set high sales, assets and staff employment thresholds for SSBs in developed countries, definitions vary

by country according to the size of the economies and structure of the corporate sector. Thresholds set by local institutions (banks and government agencies) in developing economies like Nigeria tend to be lower. The Central Bank of Nigeria (CBN) has through its various circulars and intervention funded programmes generally defined Small Scale Businesses (SSBs) as entities with asset base of N5 million and not more than N500 million excluding land and buildings with employees between 11 and 200. However, the Central Bank of Nigeria has not formally stipulated this definition of SSBs for reporting purposes so commercial banks mostly use account debit turnover to determine categories but even such turnover parameter varies widely from bank to bank (Greg,2024).

The Nigerian commercial banks' survey in 2024 observed that there exist variations in the definitions of SSB in Nigerian which mostly use the account turnover, employees size and ownership criteria noting that "for small enterprises, the median maximum turnover is N60 million, the first quartile is N38 million and the third quartile is N322 million, over five times the median." For medium enterprises, the median turnover is N480million, first quartile threshold is N200million while the third quartile threshold is N2,500 million(Anthony, 2025). The third quartile thresholds for both small and medium enterprises lean more towards the World Bank's SME definition. According to the World bank (2026), The small-scale enterprise (Small Enterprise) is a formal business with up to 50 employees, total assets and annual sales of up to $3 million(Henry,2022).

According to Ido & Bassey (2015a), small scale businesses can be defined as any business concern with less than ten (10) staff strength with a capital of fifty(50) million naira. According to the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN, 2025) a small scale business is defined by both personnel and capital base. It is a business with a staff count ranging from 10 to 49 employees and an asset base (excluding land and buildings) valued between ₦5 million and ₦50 million. Bassey, *et al.* (2024a) defined SSBs as a business which is owned, led by one or a few persons, with direct owner(s) influence in decision making, and having a relatively small share of the market and relatively low capital requirement. The earliest manifestations of SSBs in advanced countries were cottage industries that later transformed into industrial complexes and tech factories. SSBs today account for the bulk of output in most countries today. It is also a proven job creator: the share of SSBs in global productivity is over 30% higher in some countries, but generally growing. In China, SSBs employ over 50% of the workforce while in the United States (US), SSBs account for over 50% of Gross Domestic Product (Ido & Bassey, 2015b). In Nigeria, SSBs employ over 60% of the labour force both formal and informal sectors. The need to have a regulatory body to control the activities of SMEs in the country led to the formation of Small and Medium Enterprises Development

Agency of Nigeria (SMEDEN) in 2004 by an act of parliament towards the realization of the goals and objectives of SMEs.

Sudoku game to Bassey, *et al.* (2024b) can also be called the number game, which is defined as a logic based combinatorial number placement puzzle. The objective is to fill a 9 x 9 grids with digits so that each column, each row and each of the nine 3 x 3 subgrids that compose the grid contain all of the digits for 1 to 9. According to Bassey, *et al.* (2024a), Sudoku is a puzzle in which missing numbers are to be filled into a 9 by 9 grid of squares which are subdivided into 3 by 3 boxes so that every row, every column and every box contain the numbers 1 to 9. Ido & Bassey (2016a) also remarked that Sudoku is a logic based combination puzzle which is popular among people of different ages and classes.

In the same vein, Cognitive activities to strengthen specific mental skills—has been shown to enhance performance in various domains (Bassey, 2024). Sudoku, a widely practiced logic puzzle based on constraint satisfaction and deduction, engages several cognitive faculties: working memory, pattern recognition, iterative hypothesis testing, and error correction. Although Sudoku is recreational, the cognitive processes it cultivates closely parallel those required for many business decisions. This paper develops the theoretical and practical case for using Sudoku-based training as a low-cost intervention to improve decision-making among SSB managers and staff (Ekpo,2021).

Working memory (WM) refers to the cognitive system responsible for temporarily storing and manipulating information required for complex tasks such as learning, reasoning, problem-solving, and decision-making(AllIt allows individuals to hold and process relevant information, enabling them to focus on a task, update their knowledge in real-time, and use that information to make decisions. Research has consistently highlighted the importance of WM in both problem-solving and decision-making. Studies convincingly demonstrate that WM, especially the central executive of WM, plays an important role in solving insight problems and other creative tasks (Chuderski & Jastrzębski, 2018: Smirnitskaya & Vladimirov, 2017). A number of studies have also shown that modal-specific WM storages are primarily important for solving insight problems, in particular the visuo-spatial sketchpad for visual insight problems and the phonological loop for verbal insight problems (Chen, 2015). This evidence is most often cited in support of the non-specific approach, which postulates that insight does not entail any special processes that would distinguish it from the solution process of non-insight problems. In other words, the solution of insight and non-insight problems relies on the same analytic processes of heuristic search. At the same time, executive control and WM have been shown to be either less important or even detrimental for insight problem solving (Xing *et al.*, 2019; Khan, 2020). This idea relies on the concept of insight as overcoming an

impasse through representational change. In this case, executive control and over-concentration might inhibit representational change. Therefore, loading WM or redirecting attention or control may facilitate the solution of an insight problem. Recent studies revealed the low reproducibility of experiment results which had supported a positive correlation between WM loading or executive control distraction and insight solutions (Drąży *et al*., 2020; Russo, 2022). Modern research in psychology of thinking tends to move away from analyzing the process of insight problem solving towards analyzing insight itself (Moroshkina *et al*., 2020).

Constraint-based reasoning is an important area of automated reasoning in artificial intelligence, with many applications (Benson, 2019). These include configuration and design problems, planning and scheduling, temporal and spatial reasoning, defeasible and causal reasoning, machine vision and language understanding, qualitative and diagnostic reasoning, and expert systems. Constraint-Based Reasoning presents current work in the field at several levels: theory, algorithms, languages, applications, and hardware. According to Ukpa (2021), constraint-based reasoning has connections to a wide variety of fields, including formal logic, graph theory, relational databases, combinatorial algorithms, operations research, neural networks, truth maintenance, and logic programming. The ideal of describing a problem domain in natural, declarative terms and then letting general deductive mechanisms synthesize individual solutions has to some extent been realized, and even embodied, in programming languages(Sampson,2024).

Statement of the Problem

Small scale businesses are the nerve of employment generation in Uyo Local Government Area of Akwa Ibom state. Majority of school leavers earn their living either through engaging in or are employed by small scale businesses. This has a multiplier effect of boosting the economy and also ensuring employees' lead productive and comfortable lifestyle. It is quite disheartening to note that most small scale businesses do not live beyond their first year anniversary due to poor decision making by the owners. Most small scale businesses do not make use of reliable data in decision making (Ukana,2026). Most of the poor decisions made by the owners of these businesses could be also as a result of poor cognitive processes (Bassey, 2024), due to applying poor techniques and the seeming lack of cognitive wherewithal to tackle the rigorous processes and solve immediate problems that may affect them. Most decisions taken by owners of small scale businesses lack logical dexterity and has resulted to low turnover, customers' dissatisfaction, low net profit and at times huge losses resulting to the death of these firms. Moreover, searches on journals, online search engines, and libraries have shown that there exist limited

literature on the subject matter of sudoku induced cognitive functions and decision making. In small scale businesses. It was against these backdrops that this research was conducted to fill in the perceived gaps.

Objectives of the Study

The main purpose of this study is to examine the influence of sudoku induced cognitive skills on the decision making of small scale businesses in Uyo Local Government Area. Specifically, the study determined the level of influence of:

i. Working memory skills on decision making of small scale businesses
ii. Constrained based reasoning skills on decision making of small scale businesses

Research Question

The following research questions was asked by the researcher to guide the study.

i. To what extent does working memory skills influence decision making of small scale businesses?
ii. To what extent does constraint reasoning skills influence decision making of small scale businesses?

Research Hypotheses

The following null hypotheses are raised at 0.05 level of significance:

i. There is no significant influence of working memory skills on decision making of small scale businesses
ii. There is no significant influence of constrained based reasoning on decision making of small scale businesses.

Literature Review

Concept of Sudoku

Sudoku which means a single number is a widely known logic based number placement puzzle. It was invented by an American architect, Howard Carns, in 1979 with original names "Number in places". It was popular since 1986 when the name "Sudoku" was given by the Japanese puzzle company Nikoli and became an international trend since 2005 (Ido & Bassey, 2015). A Sudoku is a logic-based and not a math-based puzzle. It is possible to make and solve a Sudoku puzzle with letters or even some symbols. According to Ido &Bassey (2016a), Sudoku is a grid of 9x9 cells in which each row, column and 3x3 box can only accommodate digits from 1 to 9 exactly once. Sudoku (originally called Number place) according to Berthier (2024) is a logic-based combinatorial number-placement puzzle. The objective is to fill a 9x9 grid with digits so that each column, each row, and each of the nine 3x3subgrids that compose the grid (also called "boxes", "blocks", or "regions") contain all of the digits from 1 to 9. The puzzle setter provides a partially completed grid, which for

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a well-posed puzzle has a single solution. Sudoku puzzles are solved by logic and no math is required. As seen on the right, it consists of a grid which is usually made up of nine rows, nine columns, and nine boxes that are separated by thicker, darker lines. Some of these boxes will contain numerals from 1 to 9. To solve the puzzle, a person must fill in all the empty squares without using the same numeral twice in each column, row, or box, and without changing the numerals that are already in the grid.

These puzzles were created to be done using pencil and paper, and there are many books that contain collections of these puzzles with tips and strategies for completing them. They also appear in newspaper and magazines: typically, a different puzzle appears every day and the solution is printed somewhere else or in the next issue. Later, small handheld machines were created that generate Sudoku puzzles for the user to solve. More recently though, the game can be played on the internet or on mobile apps.

According to Ido & Bassey (2016b), Sudoku is an easy to learn logic-based number placement puzzle. The word Sudoku is short for Su-jiwadokushinnikagiru which means "the numbers must be single". The name "Sudoku" is abbreviated from the Japanese suujiwadokushinnikagiru, which means "the numbers (or digits) must remain single." According to Fish (2021), Sudoku puzzle is defined as a logic-based, number-placement puzzle. The objective is to fill a 9x9 grid with digits in such a way that each column, each row, and each of the nine 3 x 3 grids that make up the larger 9x9 grid contains all of the digits from 1 to 9. Each Sudoku puzzle begins with some cells filled in. The player uses these seed numbers as a launching point toward finding the unique solution. It is important to stress the fact that no number from 1 to 9 can be repeated in any row or column (although, the can be repeated along the diagonals).

The puzzle was introduced in Japan by Nikoli in the paper Monthly Nikolist in April 1984 as Suji wa dokushn ni kagiru, which also can be transferred as "the digits must be single" or "the digits are limited to one occurrence" (In Japanese, dokushin means an "unmarried person"). At a later date, the name was abbreviated to Sudoku by Maki Kaji (Kaji Maki), taking only the first kanji of compound words to form a shorter version, "Sudoku" is a registered trademark in Japan and the puzzle is generally referred to as Number place (Nanbapuresu) or, more informally, a portmanteau of the two words, Num(ber) Pla(ce) (Nanpure). In 1986, Nikoli introduced two innovations: the number of givens was restricted to no more than 32, and puzzles became "Symmetrical" (meaning the givens were distributed in rotationally symmetric cells). It is

now published in mainstream Japanese periodicals, such as the Asahi Shimbun (Kelvin, 2022).

The cognitive scientist, Grabbe (2020) found that Sudoku involved an area of cognition called working memory. A subsequent experiment by Grabbe showed that routine Sudoku playing could improve working memory in order people. According to Grabbed (2022), in

1997, Hong Kong Judge Wayne Gould saw a partly completed puzzle in a Japanese bookshop.

Over six years, he developed a computer program to produce unique puzzles rapidly (Smith; 2005). Knowing that British newspaper have a long history of publishing crosswords and other puzzles, he promoted Sudoku to the Times in Britain, which launched it on November 12, 2004 (calling it Su Doku). The first letter to the Times regarding Sudoku was published the following day on November 13 from Ian Payn of Brentford, complaining that the puzzle had caused him to miss his stop on the tube. Sudoku puzzles rapidly spread to other newspapers as a regular feature. (Kelvin, 2022).

The roots of the Sudoku puzzle are in the Switzerland. Leonhard Euler created "carrelatin" in the 18th century which is similar to a Sudoku puzzle but without the additional constraint on the contents of individual regions. The first real Sudoku was published in 1979 and was invented by Howard Garns, an American architect. The real world wide popularity started in Japan in 1986 after it was published and given the name Sudoku by Nikoli.

Concept of Small Scale Businesses

The importance of SMEs in contributing to economic development in different countries has been recognized. However, there is no single definition of what constitute small and medium enterprises, which is accepted by all countries (Ido & Bassey, 2016). In USA, the Small Business Act states that a small business is the one which is independently owned and operated and which is not dominant in its field of operation. But also the Law states that in determining what constitutes a small business, the definition will vary from industry to industry to reflect industry differences accurately. For example, in manufacturing and mining industries, small business is the one with 500 employees and $6.5 million in average annual receipts.

The European Commission has also defined micro and small and medium sized enterprises (SMEs) as following: A micro enterprise is referred as business with employees up to 10, a small one up to 50 employees and a medium enterprise is a business with less than or equal 250 employees.

In Canada, the Industry Canada uses the term SME to refer to businesses with fewer than 500 employees, while classifying firms with 500 or more employees as "large" businesses. Breaking down the SME definition, the industry defines a small business as one

that has fewer than 100 employees (if the business is a goods-producing business) or fewer than 50 employees (if the business is a service-based business). A firm that has more employees than these cut-offs but fewer than 500 employees is classified as a medium-sized business.

In Vietnam, by the size of registered capital, 90 percent of the firms have a registered capital less than VND 5 billion (about USD 330,000). Most types of SMEs fall well into the range of VND 1-5 billion. By the averaged size of regular labor force, SMEs are small in size, too. In 2005, the labor force averaged to 32 laborers per enterprise. This is a very slight increase because in 2000, it was only 30 laborers per enterprise. During the same period, the average capital of SMEs increased from VND 3 billion to 7 billion. Therefore, we can see that SMEs have been defined by using different criteria; and different countries have adopted slightly different definitions based on the local context.

Small-Scale Business Decision Context

SSBs typically exhibit constrained resources, informal processes, and high role multiplicity. Decision-making is often decentralized to single owners or small management teams with limited specialized training. Common decision-making challenges include bounded rationality (Simon, 2021), overreliance on heuristics (Johnson, 2017), and susceptibility to cognitive biases. Interventions aimed at improving cognitive processes can therefore yield improvements in planning, resource allocation, and problem solving.

Cognitive Skills Relevant to Business Decisions

Key cognitive skills implicated in effective business decision-making include:

- **Working memory:** This involves holding and manipulating multiple pieces of information simultaneously (James, 2020).
- **Pattern recognition:** This involves identifying regularities and anomalies in data.
- **Constraint-based reasoning:** This is the process of solving problems within fixed rules and limited resources (Bassey & Ebieme, 2026).
- **Hypothesis testing and iterative refinement:** This involves generating, testing, and updating solutions.
- **Error detection and correction:** This is the process of recognizing mistakes and implementing corrections.
- **Metacognition and reflective practice:** This involves monitoring and regulating one's decision processes (Ebieme & Bassey,2026).

Research Methods

This study was conducted in Uyo local government area of Akwa Ibom state. The study adopted a ex post facto survey design. The population of this study consisted of 3737 registered small

scale businesses in Uyo local government area (Akwa Ibom state ministry of commerce and Trade,2026). A sample size of 583 owners of small scale businesses were selected through a simple random sampling technique. The sample size was selected through the Taro Yameni formular. The researcher structured questionnaire titled "Sudoku Induced Cognitive Skills and Decision Making Questionnaire (SICSDMQ)" for owners of small scale businesses in Uyo local government area. The questionnaire was divided into two sections, A and B. Section A dealt with the bio data of the respondents while section B covers statements on the core variables and has response option of Very High Extent(VHE), High Extent(HE), Low Extent(LE), Very Low Extent(VLE) in a four (4) point Likert scale. The instrument (SICSDMQ)) was face validated by three (3) researchers in the department of Business Education in University of Uyo, Akwa Ibom state, Nigeria. The Richard Kuderson 21 was used to determine reliability of the instrument with a high r score of .88. The Richard Kuderson 21 was used in order to test the internal consistency of the research items and due to its simplicity. The instrument was administered by the researchers and an assistant who was explicitly briefed by the researchers. Mean and standard deviation were used to answer the research questions while t test was used to analyze the null hypotheses. In answering the research questions, a cut off point of 2.5 was utilized, which means scores of 2.50 and above were seem to have a high or very high extent of influence while scores below 2.50 are seen to be very low or low extent of influence. The researchers sought the consent of the respondents where they were assured anonymity of their responses through keeping their identities hidden. The study also referenced the authors whose works formed the fulcrum of the study in the reference section.

Data Analyses

Answering of Research Questions

Research Question 1: To what extent does working memory skills influence decision making of small scale businesses?

Table 1: Mean and Standard Deviation (SD) Rating of Responses to the Influence of Working Memory Decision Making No. 57

S/N	Statement	$\bar{X}$	SD	Remarks
1	I remember paying my staff promptly	311	1.89	HE
2	I do not miss weekly stock taking	2.58	0.69	HE
3	I do not forget to re-stock goods weekly	2.69	0.69	HE
4	I keep proper financial records of transaction	3.01	0.73	HE
5	I keep journals for reminding me on task to be executed in the business on simultaneously track multiple order	3.09	1.1	HE
	Grand mean.	3.62		

Source: Field study (2026)

Data analysis on Table 1 had shown that all the items surpassed the cut off point of 2.50. With a grand mean of

3.62 which also is higher than the mean score of 2.50. It therefore shows that working memory has influence decision making of small scale businesses to a high extent.

Research Question 2: To what extent does constraint reasoning skills influence decision making of small scale businesses?

Table 2: Mean (X) and Standard Deviation (SD) Rating of Responses to the extent influence of constraint based reasoning on Decision Making of small scale businesses

S/N	Statement	X	SD	Remarks
1	Supplies are justified by purchase day book	3.5	1.12	HE
2	Employee boosting man power and it human resource which are guided	2.6	0.17	HE
3	Staff promotion is timely	3.0	0.18	HE
4	Job description are usually scheduled	2.96	1.61	HE
5	Appraisals are tied to job performance	2.69	1.09	HE
	Grand mean	3.69		

Source: Field study (2026)

Data analysis on Table 2 has shown that all the items surpassed the mean cut off 2.50. Moreover, the grand mean score of 3.69 is higher than the mean cut off point of 2.50. This therefore implies that constrained reasoning skills influences decision making of small scale businesses to a high extent.

Analyses of Null Hypotheses

Null Hypotheses 1: There is no significant influence of working memory skills on decision making of small scale businesses

Table 3: T-test Analysis of the influence of working memory on decision making of small scale business No. 57

Variable	Score	X	SD	Df	t-crit	t-cal	Decision
Working memory	168	3.21	1.09				
				55	1.54	1.78	5*
Decision making	178	2.55	1.11				

Source: Field study (2026)

Data analysis on Table 3 had shown that the t-cal value of was higher than the t-crit value of 1.96, degree of freedom of at 0.05 level of significance. This shows that there exist a significant influence of working memory on decision making of small scale businesses in Uyo local government area of Akwa Ibom state, Nigeria.

Null Hypothesis 2: There is no significant influence of constrained based logic on decision making of small scale businesses.

Table 4: T-test Analysis of the influence of constraint reasoning on decision making of small scale business No. 57

Variable	Score	X	SD	df	t-crit	t-cal	Decision
Reasoning	211	2.61	1.69				
				55	1.54	2.8	5*
Decision	178	2.55	1.11				

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Source: Field study (2026)

Data analysis on Table 4 had shown that the t-cal value of was higher than the t-crit value of 1.96, degrees of freedom of and at 0.05 level of significance. This shows that there exist a significant influence of constrained logic on decision making of small scale businesses in Uyo local government area of Akwa Ibom State.

Discussion of Findings

The findings are discussed under the following subheadings:

Working Memory and Decision Making of Small Scale Businesses

Data analyses on Tables 1 and 3 had shown that there exist a significant influence of working memory on decision making of small scale businesses in Uyo local government area of Akwa Ibom State. This finding indicates that effective working memory can help businesses owners to remember factors and utilize these factors that will aid their business decision making. This finding is in consonance with the finding of Utuk (2022) who opined that effective memory is a requirement for solving complex business problems. The finding also align with the finding of Bassey (2024) who opined that sudoku skills can make entrepreneurs make concrete decisions that otherwise would be very difficult.

Constrained Based Reasoning and Decision Making of Small Scale Businesses

Data analyses on Tables 2 and 4 had shown that there exist a significant influence of constrained based reasoning on decision making of small scale businesses in Uyo local government area of Akwa Ibom State. This finding indicates that small scale business owners who engage in critical reasoning that are constrained to the businesses do well when taking critical decisions that would make or mar their businesses. This finding is supported by the works of Iche (2021) who opined that critical reasoning that are logical inclined usually help eliminate chances of making wrong decisions.

Conclusion

The paper highlighted the fact that sudoku can help small scale businesses to take decisions that would help businesses to grow. The core skills from sudoku that can help grow small scale businesses through effective decision making processes. The paper shows there exist a significant influence of working memory on the decision making of small scale businesses in Uyo local government area of Akwa Ibom State. The paper also showed a significant influence of constrained based reasoning on decision making of small scale businesses in Uyo local government area of Akwa Ibom State.

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Recommendations

Based on the conclusion reached, the following are suggested to help small scale businesses grow through sudoku skills:

1. Small-scale business owners should as a matter of urgency enroll in Sudoku trainings, symposium and seminars to help improve their businesses. This can be acquired through social media platforms and social networking by the business owners.
2. The federal ministry of education should include sudoku as a topic in Business Mathematics for business education programmes at all levels.
3. The federal ministry of education should review business education curriculum and lay emphasis on acquiring soft skills that would help graduates of the programme to be self reliant.
4. Finally, the federal government should improve the fundings of education in the country to help develop innovative technologies that would help in dissemination of learning contents, which would be beneficial to the generality of all Nigerians.

References

Barry, A. (2024). *Economics.* Holder's publishers.

Bassey, A. S. (2024). *Sudoku skills and students' academic performance in spreadsheet applications in federal Universities, South-South, Nigeria*. A PhD dissertation at the Michael Okpara University of Agriculture, Umudike

Bassey, A. S., & Akpan, K. E. (2026). Office Technologies and Workflow Outcomes of Junior Employees in UyoLocal Government Area. *UniUyo Journal of Business Education and Entrepreneurship*, *3*(1), 63-72.

Bassey, A. S., Udo, D. D., & Obayi, A. U. (2024). Assessment of Soduku Skills Acquired By Business Education Students' in Federal Universities in South-South, Nigeria. *Aau Journal of Business Educators*, *4*(1), 359-366.

Bassey, A. S., Obayi, A. U., & Agbaegbu, C. N. (2024). An Assessment of Sudoku Proficiencies for Spreadsheets Applications among Business Education Students in Federal Universities in South-South Nigeria. *AAUJournal of Business Educators*, *4*(2), 182-188.

Bassey, A, S., & Ebieme, E. E. (2026). Integration of Artificial Intelligence into the Business Education Programmes: A Panacea for Building a Technological Driven Workforce. *Studies in Education, 24*(1), 95-102.

Chen, Z. (2015). *Businesses in growing economy.* Xului

Chudersli, K. & Jastrzebski,S. (2018). Sudoku in a university environment for decisions.*Knowledge Upgrade. 4(3).* 35-38.

Drazy, M., James, L., Minie, Z.,& Sky, H. (2020). *Logical reasoning for decisions.* Allen.

Citation: Bassey, Abasienie Sampson. "Sudoku Induced Cognitive Skills And Decision Making Of Small Scale Businesses In Uyo Local Government Area Of Akwa Ibom State". *Journal of People and Worldviews (JPW),* 2026: pp99-111.

Ebieme, E, E., & Bassey, A.S. (2026). Evaluating the role of emotional intelligence in employees' job performance in First Bank, Akwa Ibom North-East, Nigeria. *African Journal of Management and Business Research,* 22 (1): 365-383.

Ekpo, A. (2021). Understanding logic in business settings. *Empirical analysis journals. 2(1)*123-131

Fish, A. (2022). *Sudoku games in a simplified version*. Arrhenius

Fish, M. (2021). *Principles of business education*. Apex publishers.

Grabbe, J. (2020). Public *finance.* Dreams.

Henry, F.(2022). *Principles of Philosophy.* Damson press.

Ido, C. F., & Bassey, A. S. (2015). Challenges of business education in achieving employment efficiency. *Journal of Qualitative Education*, *2*(1), 56-61.

Ido, C. F., & Bassey, A. S. (2015). Research in Business Education; A panacea for Employment Generation through Entrepreneurship. *Journal for Sustainable Education*, *6*(1), 160-166.

Ido, C. F., & Bassey, A. S. (2016). Improving business education contents; a prerequisite for achieving economic recovery in Nigeria's post oil era. *Knowledge Review*, *34*(1), 256-24.

Ido, C. F., & Bassey, A. S. (2016). Tvet Partnership and Profitability of Small Scale Business in Akwa IbomState; A Panacea for Economic Growth. *Journal of Association of Vocational and Technical Educators of Nigeria*, *21*(2), 47-55.

James, S. (2020). *Principles of small scale businesses.* Bright shining.

Kelvin, C. (2022). *Business education in Nigeria.* Fountain publishers.

Moroshkina, M.,Den,V., Agboyi,B., &Skrint, V. (2021). A text on business applications. Tyler

Russi, J. (2022). *Business operations in climates.* Adorning publication

Sampson, G. (2024). *Business decision Analysis.* Goodness publishers

Ukana, A. A. (2026). *Principles of computer programming.* McMillan

Ukpa, X. (2021). *Business and leaders.* McGraw Hill.

Citation: Bassey, Abasienie Sampson. "Sudoku Induced Cognitive Skills And Decision Making Of Small Scale Businesses In Uyo Local Government Area Of Akwa Ibom State". *Journal of People and Worldviews (JPW),* 2026: pp99-111.