



E-Accounting and Digital Framework for Diplomates in Nigeria

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Article Information

Suggested Citation:

Nwakeze, E.O. & Onwuliri, O. (2023). E-Accounting and Digital Framework for Diplomates in Nigeria. *European Journal of Theoretical and Applied Sciences*, 1(3), 203-214.

DOI: [10.59324/ejtas.2023.1\(3\).23](https://doi.org/10.59324/ejtas.2023.1(3).23)

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Abstract:

Owing to speedy advancement in technology, Accountants (Diplomates) now face a dreary future – where robots and Artificial Intelligence could entirely replace them on their accounting roles and functions. This explains the main objective of this study; to highlight the need for Diplomates to upskill and reskill, particularly on advanced, emerging, and disruptive career-related digital skills. Survey design is the research design deployed; with respondents drawn from four selected polytechnics in the south-east of Nigeria. Hypothesis was tested with ANOVA statistical tool. The study found, and concludes that, Diplomates in Nigeria possess significantly insufficient and inadequate digital disruptive skills requisite for e-accounting practice. Among others, the study recommends that advanced digital skills training be integrated into

accounting courses in polytechnics, by reviewing existing curricula, standards, and guidelines for polytechnics' accounting education in Nigeria, to adapt them to the emerging disruptive digital technologies.

Keywords: *E-accounting, digital skills framework, artificial intelligence, robotic process automation, blockchain technology, cloud-based software, big data analysis.*

Introduction

Imagine a world where humans are reduced to mere spectators in a game, while robots and artificial intelligence (AI) entirely takeover as virtuous players in the field. That is the dreary future ahead of the teaming workforce. 21st century has heralded intense advancement in digitization, automation, and Information Communication Technologies (ICT). Work functions, roles, operations, and their reporting in organizations now increasingly demand for a drift from the routine and mundane order of manual operations, to a newer order of modern and advanced digital operations – that yield

better and smarter value-added outputs. That is the import of *Electronic (E) - Accounting*. As such, employers now require workforce with a robust and requisite digital and technical skills. But the paucity of these skills among the greater number of workforce could also explain why recruitment practices are presently affected significantly, where AI inventions and tools are increasingly and speedily taking the positions of human in organization. This is creating a heightened and palpable scare for human resources in the world today, as technology gets more sophisticated. A study by Frey and Osborne – cited in an article in 2014 in *The Economics* - opine that 47% of human job categories are susceptible to



replacement by digitalization and automation within two decades (Nagarajah, 2016). And accountants and auditors are found to be the second practitioners to suffer such peril more after the tele-marketers (Nagarajah, 2016).

Therefore, accounting profession is one of the professions that have significantly been impacted by these digital disruptions. But unfortunately, and according to Zhyvets (2018), as cited in Zhu, Mayer & Chien (2022), 69% of new accountants consider themselves to be dispossessed of requisite and advanced digital skills and technology-based analytics competencies. This position is also corroborated by Nielsen (2018), who acknowledged that practicing accountants are behind in data mining, business intelligence, and data management skills. This is presently creating a real question of continual relevance for accountants in the present time. E-Accounting functions demand for Robotic Process Automation (RPA) skills, Big Data Analysis (BDA) skills, AI application skills, Cloud-Based Software (CBS) skills, Block-Chain Technology (BT)/Crypto-Accounting (CA) skills, and Digital Communication skills. These skills are capable of adapting accountants for utilizing technologies and techniques in driving efficiency and value-addition in today's world.

In Nigeria, the preparedness for embracing this E-Accounting by polytechnics' accounting students and their products (hereafter referred to as *Diplomates*) could even be more doubtful, either because, or the combination, of the following: the reluctance of Diplomates to realize the future risk of becoming irrelevance for them, by remaining fixated on the traditional, mundane manual dogma; and/or that their academic institutions and their curricula have over time failed them, by not providing the requisite and adequate curricula, directions, guidelines, and equipments for their advanced digital training. Additionally, and the most worrisome, is the failure of accounting professional bodies and other relevant regulators to create a comprehensive and globally recognizable digital skills framework for Diplomates and populace. Thus, these pose a real problem particularly for Diplomates, for any

quest to up-skill, and reinvent themselves. This research submits that this problem be taken seriously, otherwise Diplomates' roles and tasks in industries and organizations would either be taking over by AI, or digital experts – who may not be accountants by profession. This explains why this study is aimed at contributing coherently to the body of knowledge by developing a couple of emerging and/or advanced career-related digital skill competencies for accountants that, among others, aided this research in the measurement of the level of proficiencies of Diplomates in Nigeria, to that regard.

Review of Literature

E-Accounting

E-Accounting is the acronym for Electronic Accounting. According to Nicolau (2000), as cited in Alfartonsi & Jusoh (2021), E-Accounting is the computerized system that enhances control, and encourages teamwork in business. It has also been defined as the use of ICT, computer software and hardware to execute financial report preparation, and other accounting function in organizations (Ghaffar, Othman, Ismail & Mokhtar 2019; Thottoli & Ahmed, 2022). Sometimes, E-Accounting is referred to as Online or Digital Accounting, because it utilizes internet and online technologies in performing accounting functions in business (Teru, Idoko & Bello, 2019; Vakilifard & Khorramin, 2015). The application of E-Accounting in business is summarily for its' advantage of time and cost savings, and enhancement of effectiveness in executing traditional accounting duties.

However, in recent times, the concept and application of E-Accounting is speedily advancing and evolving; it is advancing from the application of older accounting software (e.g, Peachtree, Quickbook, Xero, *et cetera*), and older digital technologies (e.g, Enterprise Resource Planning, ERP, and spreadsheet), to the application of more advanced and disruptive technologies (e.g, AI, RPA, BDA, CBS, and BT) in the performance of accounting tasks and

functions. This is the fast emerging future of accounting practices. Thus, Diplomates are called to *upskill* or *reskill* to remain relevant in the future ahead.

Digital Framework

The advancement experienced in technologies that have evolved the field of accounting (see fig.

1), has not changed in entirety the underlying and fundamental principles on which accounting profession is built, and as first laid down by the Italian Monk, Lucas Pacioli. Accounting still remains the art and science that measures business performance (Deshmukh, 2006).

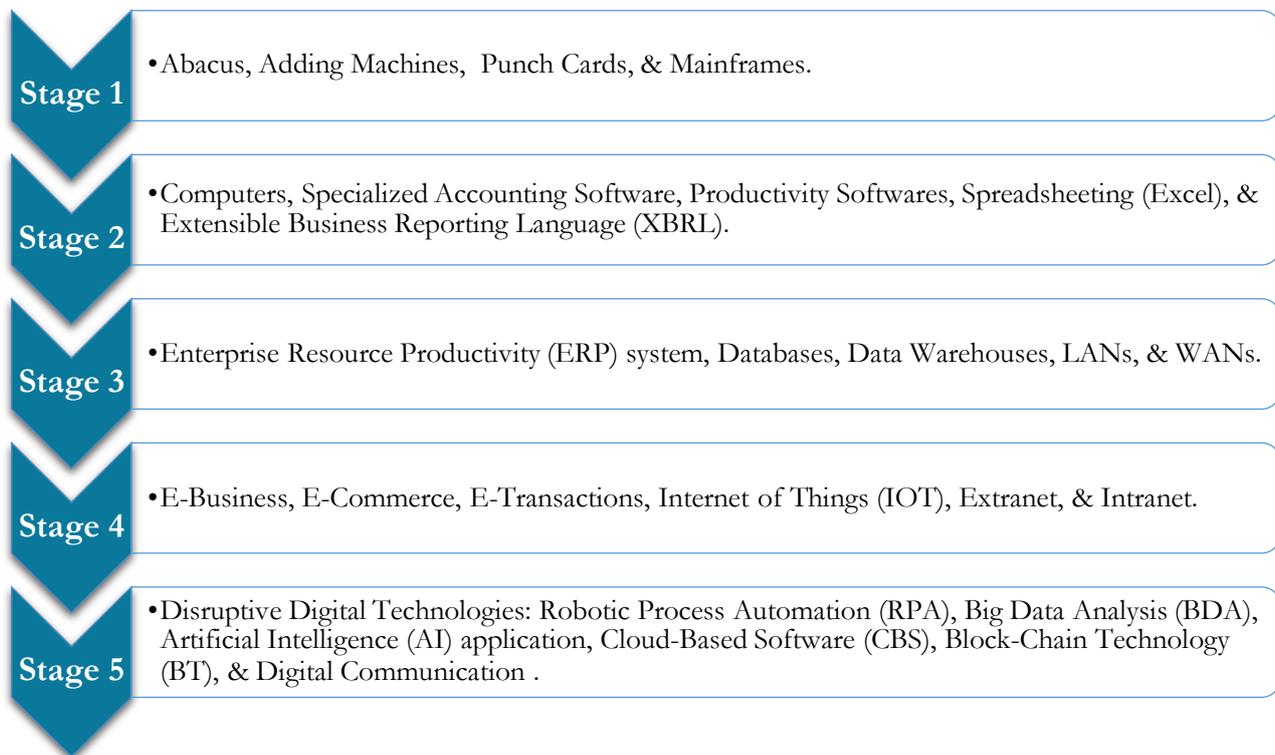


Figure 1. Stages of Digitalization That Has Evolved Accounting

Source: Authors' Compilation

Stage 5 is still nascent, and has been predicted also by previous studies to be one that would further shape the future accounting theory and practices. Thus, Diplomates are called to embrace its' requisite skill, so as to stay afloat in the field, and in the future.

The pivotal place of digital skills in different professions, and in the present modern world has propelled the development of a couple of comprehensive digital frameworks by some developed, OECD, Asian, and Latin American countries of the world, that is aiding the specification of pertinent competencies and proficiency level, and in the measurement of

digital skills acquired among their respective populations. For instance, countries under European Union (EU) developed *DigComp 2.0* (later updated to *DigComp 2.1*), that is widely used as a general digital framework, with 5 areas (information and data literacy; communication and collaboration; digital content creation; safety; and problem solving), and 21 competencies (Carretero, Vuorikari & Punie, 2017; World Bank 2020). EU further developed *E-Competences Framework 3.0*, that is also providing pertinent reference, and covers 41 competencies needed for skill level (World Bank 2020). In United States of America, similar framework was developed – *Framework for the*

Information Age (SFIA) (World Bank 2020). Japan is not left out; its' ICT dictionary has been widely adopted for use by professionals as reference framework for digital skills (World Bank 2020). These frameworks could also support or foster the development of formal and informal digital education and training in countries. Regrettably, Nigeria and many other African countries are yet to come-up with a comprehensive, and globally recognizable digital framework (World Bank 2020).

Emerging Digital Skills for Diplomates

The world may not be new to technologies, but the speed at which they evolve is immense. Thus, Diplomates are equally called to speed up in securing their work future by equipping themselves with the following emerging digital skills:

Robotic Process Automation (RPA) Skills

The use of RPA is increasing in popularity of late. The origin and usage of the term can be traced to the early 2000 (Fernandez & Aman, 2018). RPA is referred to as software apparatus that partially or wholly automate work force's functions that were hitherto rule-based, manual and repeated (Kokina & Blanchette, 2019, cited in Zhu *et al.*, 2022). Chukwuani & Egiyi (2020) see RPA as a solution that is technologically driven to automate and standardized rule-based activities using scripts. Bataller, Jacquot & Torres (2017), as cited in Fernandez *et al.* (2018), also defined RPA as system, procedure, and device (including computer programming) deployed for automating traditional processes. RPA entails a techno-solution that enables end-users to configure software on robots that can perform the functions of human (transaction performance, data manipulation, communication, and reporting) in a better cost and time saving fashion using applications.

Thus, the application of RPA in accounting could be seen in the accuracy, time and cost savings it brings. Additionally, RPA comes with the added advantage of its ability to be quickly adopted to comply with the frequent changes in the accounting regulations and standard (for instance, as experienced in tax laws)

(Introduction to robotic, 2015 cited in Jędrzejka, 2019). More also, RPA promises a better outsourcing alternative. Traditional outsourcing of accounting functions and processes by organizations is majorly for the purpose of labour cost savings. But outsourcing robs managers of control over data, and requires greater supervision of what are outsourced. RPA therefore, abridges these challenges; requires lesser supervision, and saves time and labour-cost more, when compared to the traditional outsourcing (Jędrzejka, 2019).

The acquisition of this RPA skills by Diplomates become highly imperative in this 21st century, because accounting and financial processes have been found to be among those most probably supported or replaced by software robots (Peccarelli, 2016 as cited in Jędrzejka, 2019). On the other hand, Zhu *et al.* (2022), didn't see RPA has been so disruptive as to replace existing accounting and financial processes and applications; instead they only assisted in their automation. Accordingly, Coper *et al.* (2019), as cited in Zhu *et al.* (2022), posited that the required skills for Diplomates to effectively use RPA include basic RPA awareness, data analysis skills, accounting and auditing skills, and computer programming and technology experience in Enterprise Resources Planning (EPR).

Artificial Intelligence (AI) Application Skills

AI is a term that is first coined and used by McCarthy John (Yadav, Gupta, Sahu & Shrimal, 2017 - cited in Chukwuani *et al.*, 2020). According Elaine (2000), and as cited in Chukwuani *et al.* (2020), AI is a discipline that emphasizes the application of technical know-how in configuring computers and their software to exhibit intelligent behaviours, and capable of executing human functions and processes in a more accurate and smarter manner. Chukwuani *et al.* 2020 qualified AI as programmable device capable of performing activities expected of the human brain – e.g, acquiring knowledge, ability to make judgment, producing original thoughts, and understanding relationships. Also, Pavone (2020) cited Smith (2018) as defining AI as a collection of programs

or individual program that is capable of replicating, in some situations, certain human attributes and engagement.

Many businesses have already begun leveraging on the promises of AI. AI promises more accuracy, speed and security while programmed to perform accounting functions and process: operating budget and forecast revenue, strategic management and budgeting processes, and forecast on probable frauds (Stancheva-Todorova, 2018 - as cited in Pavone, 2020).

Cloud-Based Software (CBS) Skills

CBS skills are sometime referred to as Cloud Computing Skills. CBS is defined as the utilization of software, and network of remote servers – hosted on the internet – to manage, store and process accounting data, as against using a computer or local servers (Dunbar, 2017 - cited in Birt, Wells, Kavanagh, Robb & Bir, 2018). Pavone (2020) also defined CBS as the online service that promised the permanent store of data that can easily and readily be accessed by customers for their financial analysis. CBS assures for a better alternative to using manual or individuals' hardware and software; and opens door for the accessibility of cloud provider's software and services (Rajaraman, 2014 - cited in Törnqvist & Forss, 2018).

Over the years, the adoption and utilization of CBS in businesses and by accounting firms has grown dramatically. According to a study in 2017, on American and Canadian companies, the usage of CBS has reached 51% chiefly because of its' promise of enabling real-time accounting data storage and flow (Robert Half International, 2017 - cited in Törnqvist *et al.* 2018).

CBS has indeed lowered cost and added flexibility to access of data by businesses and accounting. But security of these data (against cyber-attacks, and possible bankruptcy of Cloud companies – that could lead to lose of data and applications) have remained its' greatest risk and challenge.

Block-Chain Technology (BT) Skills

BT application looks more as a new model in business. According to Tiron-Tudor, Deliu,

Farcane & Dontu (2021), BT was originally used for recording crypto-currency transactions, but has of recent found usage also in banking and accounting. Morgan (2019), as cited in Panove (2019), argued that BT is a technology that produces unalterable records of transactions. It is a 'digitalized ledger' harboring a bank of transactions where no financial intermediaries or external parties are needed (Törnqvist *et al.* 2018). BT offers a more secured path for transactions, because of its' decentralized system - where all participants (nodes) are involved in the verification of transactions and payments. Zhao (2021) qualifies BT as a decentralized and distributed bookkeeping that is capable of modifying the way conventional accounting works. It has a unique digital fingerprint (timestamp) function that can also minimize the risk of financial fraud and records misstatement in businesses (Zhao, 2021)

The application of BT in accounting field would entail every accounting and business transaction be entered in organization's related ledger, and subsequently updated autonomously in another ledger in block-chain (Tiron-Tudor *et al.*, 2021). When these records are updated in blockchain, they get stored across different peer-to-peer network linked computers, that utilize algorithm functions to verify transactions (Dai and Vasarhelyi, 2017; Coyne and McMickle, 2017; Kokina & Davenport., 2017 - as cited in Tiron-Tudor *et al.*, 2021). Thus, BT promises greater transparency, accuracy, efficiency, credibility and real-time supervision and verification to both accounting and audit fields. BT, according to ACCA (2016), and as cited in Birt *et al.* (2018), has the force to upend industries; and accounting profession and practice are not exceptions. This could be more reason for Diplomates to get themselves girded with BT application skills.

Big Data Analytics (BDA) Skills

Big Data is an avalanche of fast-paced information (Kache & Seuring, 2017 - as cited in Zhu *et al.*, 2022). It is defined as data that are of high magnitude (volume), velocity, and variety, to the point that it becomes uneasy to analyze them manually, or with conventional accounting

software (Törnqvist et al. 2018; Rezaee, Sharbatoghlie, Elam & McMickle, 2002). Thus, the analysis of 'Big Data' requires staunch data analytical skills in statistics, econometrics, mathematics, simulations, *et cetera*. The results of this analysis assist managements of business/corporate organizations in generating better insights, and in decision making. According to Richardson, Chang & Smith (2021), as cited in Zhu *et al.* (2022), BDA skills expected of Diplomates would include: acquisition or erasing of data, setting-up data models or structures, and analysis or mining of data skills.

Research Methodology

Research Design

The research design deployed for this study is survey design. The respondents constitute the prospective Diplomates (accountancy students in the final year of their programmes). The purposive cases are the four (4) polytechnics in the south-east of Nigeria; and are spread between federal, state, and privately owned polytechnics, to ensure that the opinions of every divide are represented and sampled:

POLY 1: Grundvig Polytechnic, Oba, Anambra State (Private);

POLY 2: Federal Polytechnic, Oko, Anambra State (Federal);

POLY 3: Institute of Management and Technology (IMT), Enugu (State); and

POLY 4: Federal Polytechnic, Nekede, Imo State (Federal).

Data Presentation and Analysis

The purposive sample size of the study is 80. Equal numbers of questionnaires (20 each) were administered randomly to the respondents of the four (4) polytechnics using the combinations of direct and proxy medium. At the end, 93.75% aggregate retrieval rate was recorded in the following numbers: 20, 18, 19, and 18, for POLY 1, 2, 3, and 4 respectively. This study developed its' own 5 bench advanced career-related digital competencies/skills. And each respondent's digital proficiencies were measured based on these competencies/skills.

The data obtained are as presented (in percentage) in the table below, after been measured on a 3-point scale (Very Strong, VS – 3point, Fairly, F – 2, and Poorly, P - 1):

Table 1. Data (In Percentage) of Responses, After Been Measured on a 3-Point Scale (Very Strong, VS – 3 point, Fairly, F – 2, d3and Poorly, P - 1).

CODES		Advanced Digital Competencies/Skills				
		DDS1	DDS2	DDS3	DDS4	DDS5
		Awareness of Robotic Process Automation (RPA), and the ability to configure any software robot to perform any accounting task.	Ability to work with AI general tool (e.g, Skymind, IBM Watson, Accenture myWizard, etc.), and programme its device to perform accounting functions and processes.	Ability to utilize software and network of remote servers to store (permanently), manage, process, and analyze accounting data, via the internet.	Ability to update organizations' ledger transactions automatically in blockchain – that would not require external parties or intermediaries for verification of transactions.	Ability to analyze accounting 'Big Data' using any advanced analytical tools of, e.g statistics, optimization, econometrics, mathematics, simulations, etc.
POLY 1	VS	11.11 %	0.00 %	23.10 %	0.00 %	0.00 %
	F	37.04 %	9.52 %	15.38 %	18.18 %	40.00 %
	P	51.85%	90.48 %	61.54 %	81.82 %	60.00 %
POLY 2	VS	0.00 %	0.00 %	12.50 %	0.00 %	0.00 %
	F	28.57 %	28.57 %	33.33 %	20.00 %	50.00 %

	P	71.43%	71.43 %	54.17 %	80.00 %	50.00 %
POLY 3	VS	11.11 %	12.50 %	32.14 %	0.00 %	44.44 %
	F	44.44 %	25.00 %	21.43 %	0.00 %	0.00 %
	P	44.44 %	62.50 %	46.40%	100.00 %	55.56 %
POLY 4	VS	0.00 %	0.00 %	26.09 %	0.00 %	46.15 %
	F	43.48 %	28.57 %	8.70 %	10.53 %	0.00 %
	P	56.52 %	71.43 %	53.57 %	89.47 %	53.85 %

***DDS: Disruptive Digital Skills**

Source: Field Survey and Authors' Compilations (2023).

Hypotheses Testing

The formulated hypothesis for this research is:

HO₁: *Accounting Diplomates possess insufficient and inadequate digital disruptive skills requisite for e-accounting practice in Nigeria.*

One-Way ANOVA statistics was deployed for the test of the hypothesis, using the Statistical Package for Social Science, SPSS, ver. 25. This choice emanated from the research's desire to ascertain if there is a significant difference in the mean of responses of other sampled POLYs from POLY_1.

Table 2. Descriptive Statistics

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
POLY_2	.00	3	.0000	.00000	.00000	.0000	.0000	.00	.00
	9.52	1	28.5700	.	.	.	.	28.57	28.57
	11.11	1	.0000	.	.	.	.	.00	.00
	15.38	1	33.3300	.	.	.	.	33.33	33.33
	18.18	1	20.0000	.	.	.	.	20.00	20.00
	23.10	1	12.5000	.	.	.	.	12.50	12.50
	37.04	1	28.5700	.	.	.	.	28.57	28.57
	40.00	1	50.0000	.	.	.	.	50.00	50.00
	51.85	1	71.4300	.	.	.	.	71.43	71.43
	60.00	1	50.0000	.	.	.	.	50.00	50.00
	61.54	1	54.1700	.	.	.	.	54.17	54.17
	81.82	1	80.0000	.	.	.	.	80.00	80.00
	90.48	1	71.4300	.	.	.	.	71.43	71.43
Total	15	33.3333	28.24869	7.29378	17.6897	48.9769	.00	80.00	
POLY_3	.00	3	18.9800	22.91770	13.23154	-37.9507	75.9107	.00	44.44
	9.52	1	25.0000	.	.	.	.	25.00	25.00
	11.11	1	11.1100	.	.	.	.	11.11	11.11
	15.38	1	21.4300	.	.	.	.	21.43	21.43
	18.18	1	.0000	.	.	.	.	.00	.00
	23.10	1	32.1400	.	.	.	.	32.14	32.14
	37.04	1	44.4400	.	.	.	.	44.44	44.44
	40.00	1	.0000	.	.	.	.	.00	.00
	51.85	1	44.4400	.	.	.	.	44.44	44.44
	60.00	1	55.5600	.	.	.	.	55.56	55.56
	61.54	1	46.4000	.	.	.	.	46.40	46.40

	81.82	1	100.0000	.	.	.	.	100.00	100.00
	90.48	1	62.5000	.	.	.	.	62.50	62.50
	Total	15	33.3307	27.77945	7.17262	17.9469	48.7144	.00	100.00
POLY_4	.00	3	15.3833	26.64471	15.38333	-	81.5725	.00	46.15
	9.52	1	28.5700	.	.	.	.	28.57	28.57
	11.11	1	.0000	.	.	.	.	.00	.00
	15.38	1	8.7000	.	.	.	.	8.70	8.70
	18.18	1	10.5300	.	.	.	.	10.53	10.53
	23.10	1	26.0900	.	.	.	.	26.09	26.09
	37.04	1	43.4800	.	.	.	.	43.48	43.48
	40.00	1	.0000	.	.	.	.	.00	.00
	51.85	1	56.5200	.	.	.	.	56.52	56.52
	60.00	1	53.8500	.	.	.	.	53.85	53.85
	61.54	1	53.5700	.	.	.	.	53.57	53.57
	81.82	1	89.4700	.	.	.	.	89.47	89.47
	90.48	1	71.4300	.	.	.	.	71.43	71.43
	Total	15	32.5573	29.12454	7.51992	16.4287	48.6860	.00	89.47

Source: SPSS (ver. 25)

Table 2 provides pertinent descriptive statistics – that can be utilized in describing the data; displaying the mean, standard deviation, and confidence intervals (95%) for POLY_2, 3, and 4 variables for each separate question item responses, as well as their accumulation. The evaluation of the above output indeed revealed that, difference in the mean of our three variables (i.e., responses from POLY_2, 3 & 4)

exist. But we may not outrightly tell of the significance in this difference. Levene's test of equality of error variances (Test of Homogeneity of Variances) would have proved valuable in telling the level of significance of the difference, but it is unfortunately not computed because of the less than two nonempty groups entered in the package. Nevertheless, the subsequent table could give us an insight.

Table 3. ANOVA Analysis

		Sum of Squares	df	Mean Square	F	Sig.
POLY_2	Between Groups	11171.841	12	930.987	.	.
	Within Groups	.000	2	.000		
	Total	11171.841	14			
POLY_3	Between Groups	9753.328	12	812.777	1.547	.459
	Within Groups	1050.442	2	525.221		
	Total	10803.771	14			
POLY_4	Between Groups	10455.459	12	871.288	1.227	.534
	Within Groups	1419.882	2	709.941		
	Total	11875.341	14			

Source: SPSS (ver. 25)

significant difference between the mean of respondents' responses for each POLY. From the table, the significance value is given as $p = .459$ and $.534$, which are each greater than $.05$. That reveals that there is no statistically significant difference between the mean of

responses from POLY_1 with that of other three sampled POLYs'. Figure 2, 3 and 4 below visually support this conclusion, as their curves virtually shows no significant difference in bends.

Decision

From table 3, it is glaringly evident that $p (.459 \text{ \& } .534) > .05$. Thus, and in consonance with the general rule of thumb, we reject the alternative

hypothesis, and accept the null hypothesis that states: “*Accounting Diplomates posse insufficient and inadequate digital disruptive skills requisite for e-accounting practice in Nigeria.*”

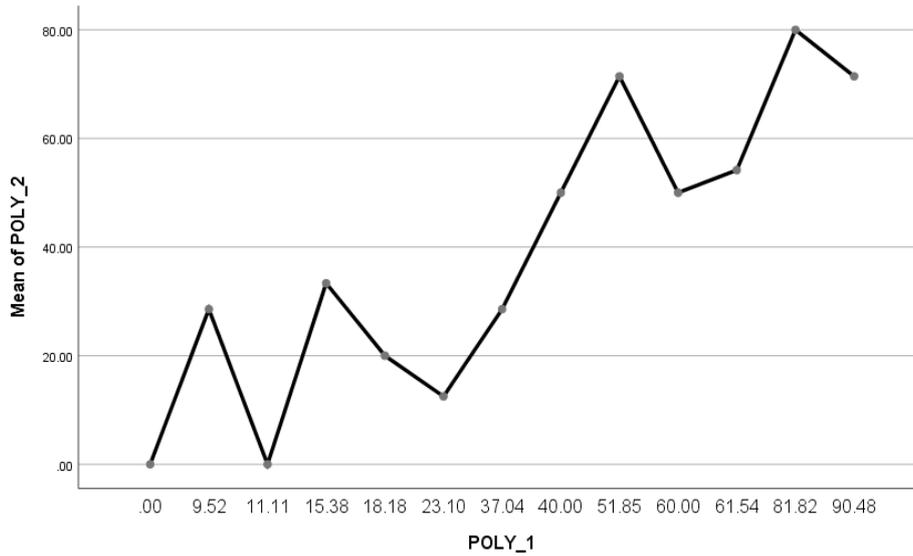


Figure 2. Mean Plot of POLY_1 Against POLY_2
Source: SPSS (ver. 25)

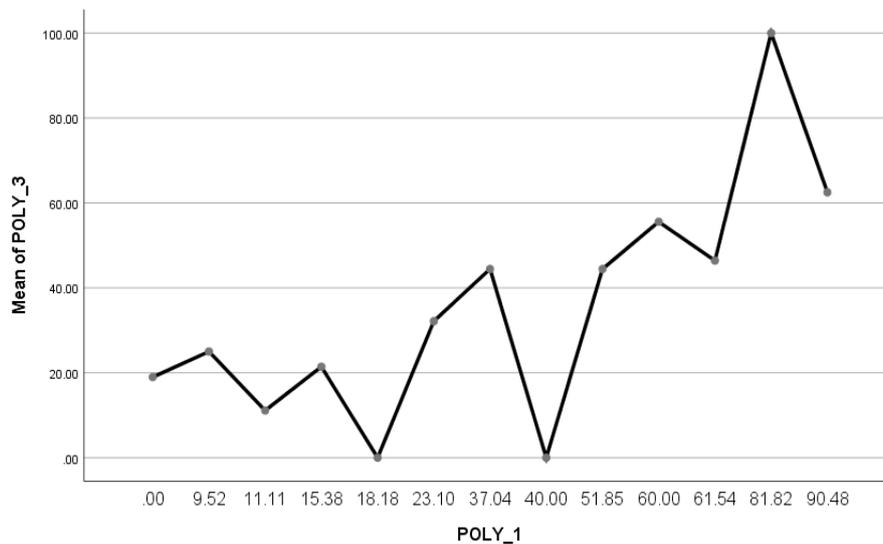


Figure 3. Mean Plot of POLY_1 Against POLY_3
Source: SPSS (ver. 25).

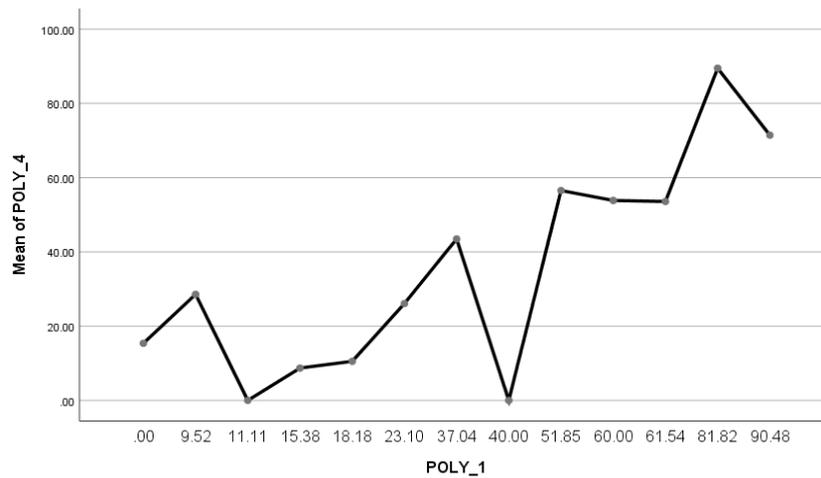


Figure 4. Mean Plot of POLY_1 Against POLY_4

Source: SPSS (ver. 25).

Conclusion

The respective total mean for the sampled polytechnics (POLY 2 - 4) ranging from 32.5573% - 33.3333%, and being below 50%, corroborates the output from hypothesis testing – where each sig. (p) value (.459 & .534) > .05. These statistical evidence and results give this research the premise on which to conclude that accounting Diplomates posse insufficient and inadequate digital disruptive skills requisite for e-accounting practice in Nigeria. The main limitation of the study could be on the minimal sampled polytechnics, whose respondents' responses may not fairly be generalized to the actual views of the entire polytechnics in Nigeria. Therefore, further researches could raise the number of sampled polytechnics, or chose better-fit respondents for the study (such as, the Diplomates already practicing in accounting firms, or in industries.

The findings and conclusion of this study have necessitated the following recommendations directed at Diplomates, polytechnic institutions, relevant regulatory bodies, and other policy makers:

i. Advanced digital skills training should be incorporated or integrated into accounting courses in polytechnics. And this can be achieved by the review of existing curriculum, standards, and guidelines for polytechnics'

accounting education in Nigeria, to adapt them to these emerging disruptive digital technologies. This would help in securing students' and Diplomates' digital future.

ii. Polytechnics institution should adequately equip their accounting laboratory with modern, state-of-the-art, and advanced digital facilities; and technological apparatus needed for formal training and retraining of students for embracing the emerging type of E-Accounting.

iii. Diplomates should also, and independently avail themselves of such advanced digital skills training and retraining via training institutions, and other informal system, e.g on-the-job formal training, peer-to-peer learning, online and blended learning.

iv. Accounting professionally bodies, educational regulators, and other policy makers in Nigeria should work synergistically at developing a comprehensive and globally recognizable digital framework to aid digital skills specification, and measurement of their proficiencies among its populace. In lieu of its benefit, World Bank (2020) also posit that Nigeria, and other African countries need to urgently develop digital framework.

Declaration of Competing Interest

No known competing interests are found to have influenced the findings and report of this research.

Acknowledgement

Our sincere acknowledgements are reserved to the Executive Secretary of NBTE - Prof. Idris Muhammad Bugaje (COREN, FNSChE, FSESN, FMSN) - for the appreciated privilege he, and his Board, offered to publish in this prestigious national journal without Article-Processing-Charge (APC); and Chairman/Executive-Director, Grundtvig Movement of Nigeria, Dr. Kachi A. Ozumba, for the kind support, counsel, and motivation that fostered the timely accomplishment of this study.

References

Alfartoosi, A. & Jusoh, M.A. (2021). A Conceptual Model of E- Accounting: Mediating Effect of Internal Control System On the Relationship Between E-Accounting and the Performance in The Small and Medium Enterprises. *International Journal of Economics and Management Systems*, 6(1), 228-252.

Birt, J., Wells, P., Kavanagh, M., Robb, A. & Bir, P. (2018). *ICT Skills Development: The Digital Age and Opportunities for Accountants*. IAESB Accounting Education Insights. Retrieved from: https://www.ifac.org/system/files/publication_s/files/IAESB-Accounting-Education-Insights-ICT-Skills-Issues-for-Accounting-Profession.pdf

Carretero, S., Vuorikari, R. & Punie, Y. (2017). *Digcomp 2.1: The Digital Competence Framework for Citizens with Eight Proficiency Levels and Examples of Use*. EUR 28558 EN. Retrieved from [http://Publications.Jrc.Ec.Europa.Eu/Repository/Bitstream/Jrc106281/Webdigcomp2.1pdf\(Online\).Pdf](http://Publications.Jrc.Ec.Europa.Eu/Repository/Bitstream/Jrc106281/Webdigcomp2.1pdf(Online).Pdf) (accessed 15 March 2023).

Chukwuani, V. N. & Egiyi, M. A. (2020). Automation of Accounting Processes: Impact of

Artificial Intelligence. *International Journal of Research and Innovation in Social Science (IJRISS)* 4(8), 444-449.

Deshmukh, A. (2006). A Framework for Digital Accounting. Retrieved from: <https://www.igi-global.com/chapter/framework-digital-accounting/8314>

Fernandez, D. & Aman, A. (2018). Impacts of Robotic Process Automation on Global Accounting Services. *Asian Journal of Accounting and Governance*, 9(1), 123–131. <http://dx.doi.org/10.17576/ajag-2018-09-11>

Ghaffar, A.M., Mokhtar, M.Z., Ismail, W.N.S. W. & Othman, M.R. (2019). Determinant of E-Accounting (EA) Adoption among Malaysian Maritime SMEs. *International Journal of Engineering and Technology*, 8(18), 102-105.

Jędrzejka, D. (2019). Robotic Process Automation and its Impact on Accounting. *Zeszyty Teoretyczne Rachunkowości*, 105 (161), 137–166. <https://doi.org/10.5604/01.3001.0013.6061>

Nagarajah, E. (2016) Hi Robot. What Does Automation Mean for the Accounting Profession? *Accountants Today*, 34-37. Retrieved from: <https://www.pwc.com/my/en/assets/press/1608-accountants-today-automation-impact-on-accounting-profession.pdf>

Nielsen, S. (2018). Reflections on the Applicability of Business Analytics for Management Accounting – and Future Perspectives for the Accountant. *Journal of Accounting and Organizational Change*, 14(2), 167-187. <https://doi.org/10.1187/jaoc-11-2014-0056>

Pavone, L. (2020). Digitalization of the Accountancy Profession and Accountancy Practices: An Outlook on Progress in North East of Italy. *Università Ca'foscari Venezia*. Retrieved from <http://dspace.unive.it/handle/10579/19038>

Rezaee, Z., Sharbatoghlie, A., Elam, R. & McMickle, P.L. (2002). Continuous Auditing: Building Automated Auditing Capacity. *Auditing: Journal of Practice & Theory*, 21(1), 147-

<https://doi.org/10.2308/Aud.2002.21.1.147>

Teru, S. P., Idoko, I. F. & Bello, L. (2019). The Impact of E-Accounting in Modern Businesses. *International Journal of Accounting and Finance Review*, 4(2), 1-4.

Thottoli, M. M. & Ahmed, E. R. (2022). Information Technology and E-Accounting: Some Determinants among SMEs. *Journal of Money and Business*, 2(1), 1-15. <https://doi.org/10.1108/jmb-05-2021-0018>

Tiron-Tudor, A., Deliu, D., Farcane, N. & Dontu, A. (2021). Managing Change With and through Blockchain in Accountancy Organizations: A Systematic Literature Review. *Journal of Organizational Change Management*. <https://doi.org/10.1108/jocm-10-2020-0302>

Tornqvist, E. and Forss, L. (2018). *Automated Accounting in Accounting Firms: A Qualitative Study on Impacts and Attitudes*. Master's Thesis, Department of Business Administration, Umea University, Sweden. Retrieved from:

<https://pdfs.semanticscholar.org/9c26/dfea081fd035a6070e382f1b5f0727faa37a.pdf>

Vakilifard, H. R. & Khorramin, M. (2015). A Review of E-Accounting. *Indian Journal of Fundamental and Applied Life Sciences*, 5(1), 1824-1829.

World Bank (2020). Digital Skills: Frameworks and Programs. Retrieved from: <https://openknowledge.worldbank.org/server/api/core/bitstreams/7d01c8ae-dca0-55cf-ad21-b2df0a03d207/content>

Zhao, Y. (2021). Research On Digital Skills that Accountants Should Possess in the Intelligent Era. *Modern Economics & Management Forum*, 2(4), 145-148.

Zhu, L. P., Mayer, R. & Chien, W. (2022). Strategies to Improve Digital Skills for Accountants. *Journal of Finance and Accountancy*, 32(1), 1-23.