Impact of Focused-Trainings and Educational Qualifications: TVET Educators' Capacity to use Emerging Technology towards Edupreneurship

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Abstract
Edupreneurship promotes application of entrepreneurship principles to enhance functional educational sector with financial profits. However, transferring physical business in education to online educational business practices is challenging because many academics need competency training on digital skills to engage in edupreneurship. Irrespective of educational qualifications, focused-trainings could provide competency capacity to practice edupreneurship. So, this study investigated the impact of focused-training and educational qualifications on development of TVET educators' capacity to use emerging technology towards entrepreneurship. Data were collected through online questionnaire. Validated, online, 4-Likert scale questionnaire (0.79 reliability coefficient) was used to collect data. The data were analysed using frequency count, Chart and Chi-square. Results revealed no significant differences in the capacity development to use emerging technology due to educational qualifications. Therefore, it was recommended that trainings should be specific and practically situated on real life experiences intended to achieve, and that it should be inclusive irrespective of academic cadres.

Keywords: Focused-training, Educational qualifications, Educators' capacity, Emerging digital-tools, Edupreneurship

Introduction

Actually, most educators were not trained to be entrepreneurs and those who were trained or gifted to be entrepreneurs were not prepared for reality of the edupreneurship activities in digital

age. These and some other important factors are pertinent regarding matters of edupreneurship. The word "edupreneurship" is a new construct that is coined from two words “education” and “entrepreneurship” with conscious purpose of creating motivation for citizens to imbibe business mindset in providing educational services and products, for profits making by meeting the digital needs of the learners and users of educational resources, whose population predominantly consists of the digital native and sizeable number of digital immigrants.

Though Jamal (2023) observed that education sector is reluctant to integration of innovative technology, "edupreneurship” embraces the emerging digital technology. However, transferring physical business in education to online educational business practices is challenging because many academics still need competency training on digital skills for online education business. Observably, many academics are hindered in their tasks due to lack of necessary computer software, non-existence of appropriate policies, and non-commensurate rewards. Altogether, these challenges could suppress requisite capacity of academics regarding using emerging digital tools to engage in edupreneurship. Basically, edupreneurship revolves around creating innovative educational products, services, business models and risk-taking, with approaches that should be collaborative, inclusive and technology driven. However, often, technology trainings are focused on acquiring knowledge about how computer application or software works, which may not guarantee best practices of integrating the technology tools in the classroom (see Voogt & McKenney, 2017; Tondeur, Scherer, Siddiq & Baran, 2020; Colón, Rus, Moreno & Montoro, 2023; Weidlich & Kalz, 2023), or not tailored towards making profits elsewhere as needs arise.

Importantly, the stakeholders should understand how to get ultimate benefits of focused technology trainings as part of continued professional development programme. The concept of edupreneurship requires the possession or acquisition of digital skills pertaining to entrepreneurship. This would empower an educator or someone who is passionate about education to create viable business activities around teaching and learning engagements. To do this, the skills on business model and business plan will help greatly to be a good edupreneur.

The business model is all about "what" and "how" of the business. The model is concerned about the overall business framework or structure - covering revenue streams, cost structure, value

preposition, customer segments, channels of business communication or marketing, and partnerships. Meanwhile, the business plan refers to "when" and "where" of the business by stating actual steps to be taken in order to implement the business. The business plan is important to edupreneurs in a bid to convert academic ideas into business. Business plan involves market analysis, competitive analysis, marketing strategy and sales strategies, financial projections, operational plan, management team and organizational structure.

Ideally, other necessary skills include how to create innovative and valuable instructional resources products and services; how to create or adapt existing business models and business plans for educational products or services; strategic planning; marketing; finance; financial management; collaboration and partnerships; calculated risk taking; customer focus; market research; branding and budgeting; as well attributes of adaptability and resilience to smartly achieve set goals and objectives. Furthermore, the would-be edupreneur needs to understand how to identify students' needs (coupled with diverse preferences); learning styles; gaps in educational programmes; trends in technology; how to set metric milestones and success indicators. The main goal of edupreneurship should encompass enhancing learning experiences to provide desirable satisfactory experiences to the customers (that is, the direct users as well indirect users), who are mutually beneficial partners for their educational or instructional products and services.

Edupreneurship according to Eko (2022) has a combined meaning of education and entrepreneurship that portrays a unity that cannot be separated from its meaning. Further explaining, Eko (2022) stated that education and entrepreneurship formed a single unit because the process reflects the concept of entrepreneurship education, which means educating someone to do and produce something of sale value, as well the owner could make use of it. Nevertheless, it is important that an educator should imbibe a mindset of creating sustainable business and this call for efficient continuous improvement on every aspect of edupreneurship activities. In order to ascertain sustainable edupreneurship, serious attention is needed to know its possible social impact, economic viability, cultural sensitivity, readiness for partnership or collaboration, learner-centred approach, flexibility resilience, data driven decision making, scalability, ethical issues, as well as compliance with legal and regulatory provisions. By keeping to all these requirements among others, edupreneurs could be successful if visionary leadership is their prominent hallmark.

Nevertheless, the participants in this study were trained on AI tools namely - Education-copilot, Openread.academy, Paperbrain, Scite, Coursebox, as well as Researchrabbit tools because appropriate emerging tools are required to practice efficient edupreneurship. Some other useful digital technologies are LMS platforms (e g. Moodles, Blackboard coursite, Canvas); course creation tools like Udemy, Teachable; Augmented reality software (for immersive learning experience), video conferencing platforms (like Zoom, Googlemeet); assessment tools (like Quizlet, Kahoot, Gradescope), gamification and game-based learning platforms (e.g. Classcraft, ClassDojo, Minecraft), learning analytics tools, as well online payment and billing systems tools. Necessary to mention is that edupreneurs could thrive in the aspects of - creating personalised learning, providing virtual and augmented reality field trips, providing online mentorship or guidance counselling programme, creating gamified learning platforms, organising virtual conferences or workshops, hosting webinars and managing online communities of practice (virtual forum for educators, edupreneurs and learners) to share best practices and innovative ideas.

Further, the edupreneurs could explore opportunities in monetization of course application creation via creating blogs, websites to prepare candidates for standard examination, tutorials on subjects in demand, designing your own course with optional in-built assessments (for certificate issuance), designing for other colleagues, schools, colleges, training schools, organizations, designing customised assessment tools, and collection of analytics for data science.

All the possible categories of edupreneurship activities highlighted above within utilization of emerging technology, point to TVET educators' capacity development. Those skills training are necessary because the world of AI is fast-pacing making it impossible for anybody to assume absolute authority whether on AI innovation or AI utilization. Mbambo and Du Plessis (2024) opines that the evolvement of technology, AI in particular, calls for developmental transformation in teacher training, and that teacher training should be dynamic with all the modern digital technologies in the 21st century. So, a well-focused training with appropriate hands-on practices will input quality and authentic competence in the TVET educators' skills. When talking about focusing the training it is also pertinent to consider peer group mentoring opportunity to be among other elements of training focus. This is because it would encourage co-operative learning, collaborative learning, personalized learning and self-actualization within the system. Invariably, this would translate to the peers separately and collectively working as a team to achieve both

individual and common goals; and this would stimulate and sustain continual raising of benchmark for the TVET educators' skills capacity as related to AI tools integration for edupreneurship commitments.

The advents of focused training and capacity development for the TVET educators are centered-around meaningful training-content, productive learning experiences (that are acceptable as relevant), and access to requisite AI software in order to put whatever skills acquired into impactful practice. With developing and developed capacities of the TVET educators, the concerned institutions could be positioned to create additional source of internally generated revenue (IGR). Depending on how they are able to formulate policies that would actually benefit the TVET educators, to motivate them as partners in progress regarding what they could gain financially while exploring the edupreneurship activities of the institution, the workforce would greatly improve the financial status for the employees and the host institutions. However, considering variance in educational qualifications of the TVET educators, other needs that may arise bother on appropriateness in selecting participants in terms of what aspect of skills to cover in the focused training and what exact purposes would be indicated for monitoring and evaluation in the training. Therefore, this study investigated the impact of focused training and educational qualifications as related to TVET educators' capacity to use emerging technology towards edupreneurship.

Theoretical Framework

This study is rooted in the TPACK theory. The fundamentals of the theory have not changed, which predominantly stated that technological pedagogical and content Knowledge are essential teacher knowledge, supported by OECD (2018) and EU (2018). However, some other scholars have added various suggestions (See Bagheri, 2020), to extend the scope of the theory; and such modification was to study more variables. The application of this theory in this study portends that the pedagogy of TVET educators would not be professionally complete without being technologically savvy. Meaning that the category of teachers who have digital phobia or those who see utilisation of digital tools as burden, may lack any of the four 21st century skills, vis-a-vis - Critical thinking skills, Collaboration skills, Communication skills, and Creativity skills (4C's) - that are unequivocally important for overwhelming success in edupreneurship. Meanwhile, the teachers who would not fit in the category of the 21st century teachers would be considered as

having insufficient knowledge; due to lacking in requisite technological skills to provide learning experiences to the digital learners of the technology savvy students. In addition to the technological pedagogy, it is pertinent for the educators to be able to select most appropriate technology to mediate learning experiences, in order to attain the specific objectives of the learning activities. So, whether for personal development or for knowledge content delivery to the learners, academics with the mastery of the content knowledge, who is professionally trained in pedagogy and with adequate knowledge of digital technology integration to facilitate learning, further need to be dynamic with emerging technology for edupreneurship, which is the focus of this study.

Significance of the study

Pertaining to AI utilization in our society that is digitally dynamic, this study is significant because it will be a reliable source of empirical data to initiate informed decision on factors that could be considered or not when putting together a focused training programme for TVET educators, to enable them acquire useful skills on aspects of AI tools. Moreover, the study would reveal if the educational qualifications of TVET educators is really relevant or not before they could embrace emerging digital technology that are potent to support edupreneurship. Again, knowing that edupreneurship has enormous potentials to boost both personal and national economy developments makes this study to be of great significance.

Purpose of the Study

The purposes of the study were:

1. To investigate if focused training will impact the TVET educators to be able to develop capacity to use emerging digital tools for the 21st century edupreneurship.
2. To investigate what extent will TVET educators be able to develop capacity to use emerging digital tools for the 21st century edupreneurship.
3. To investigate how educational qualifications of TVET educators would affect their capacity development to use emerging digital tools for the 24th century edupreneurship.
4. To investigate the impact that educational qualifications of TVET educators have on their capacity development to use emerging digital tools towards 21st century edupreneurship.

Research Questions

The study was guided by the following research questions:

1. What effect did focused training have on the TVET educators' level of capacity development to use AI and emerging digital tools towards 21st century edupreneurship?
2. To what extent were TVET educators able to develop capacity to use emerging digital tools for the 21st century premiership?
3. How did educational qualifications of TVET educators affect their capacity development to use emerging digital tools for the 24th century?
4. What impact does educational qualifications of TVET educators have on their capacity development to use emerging digital tools towards 21st century edupreneurship?

Hypotheses

The four hypotheses raised in the study were:

1. There is no significant difference in the TVET educators' level of capacity development, before and after the focused training to use AI and emerging digital tools towards 21st century edupreneuship.
2. There is no significant difference between HND certificate/Bachelor degree holders and Master's degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship.
3. There is no significant difference between HND certificate/Bachelor degree holders and PhD degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship.
4. There is no significant difference between Master's degree holders and PhD degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship.

Methodology

This study was designed as one sample group, pre-test, post-test, quasi experimental research. The population in the study was TVET educators in tertiary institutions in Lagos state and purposive sampling method was used to select participants from a Polytechnic and a University. The selected participants voluntarily participated in the study (93 of them completed the training activities). The focused-training was conducted virtually. Data on capacity development levels of the participants were collected through the questionnaires administered online, before and after the treatment

(focused-training covering how to use some selected Artificial Intelligence software - that could be used for research, design of online instructional resources, development and delivery of instructional content). The instrument was on 4-Likert scale, it was appropriately validated and the questionnaire reliability co-efficient was 0.79 (parallel form reliability) in the study. The data were analyzed using frequency count, Chart, t-test and Chi-square.

Results

Research question 1 - What effect did focused-training have on the TVET educators' level of capacity development to use AI and emerging digital tools towards 21st century edupreneurship?

To answer the research question 1 as shown below in Fig. 1, the focused-training has a positive effect on most of the 93 participants because 80 (86.02%) of them had low level capacity development while only 13 (13.98%) participants had medium (8 participants = 8.60%) or high (5 participants = 5.38%) levels capacity development before the training was conducted; compared to their levels of capacity development to use emerging digital tools after the focused-training where just 10 (10.75%) participants had low level capacity, 32 participants (34.41%) had medium level capacity and 51 participants had high level capacity (54.84 %) - So, both medium and high were 83 participants which is 89.25% participants) regarding the effect of focused training to use the emerging digital tools. These results revealed that the treatment, i.e. the focused-training received by the participants was responsible for the improvement on their levels of skills and capacity development.

Research question 2 - To what extent were TVET educators able to develop capacity to use emerging digital tools for the 21st century premiership?

To answer research question 2 as revealed in Fig. 1 below, most of the participants recorded high level (54.84%) capacity development on the skills to use emerging digital tools. Meaning that after the treatment, 10 participants (10.75%), 32 participants (34.41%) and 51 participants (54.84%) were at the low, medium and high levels respectively regarding capacity to use emerging digital tools.

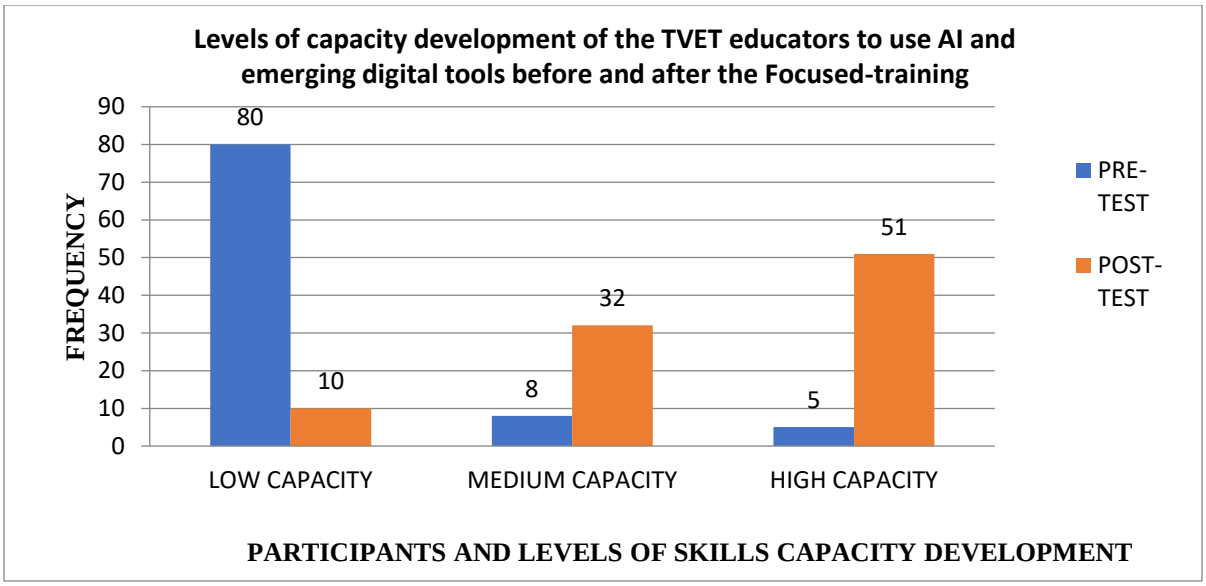

Figure 1

Research question 3: How did educational qualifications of TVET educators affect their capacity development to use emerging digital tools for the 24th century?

Also, to answer research question 3, Fig. 2 shows that the educational qualifications of TVET educators affected them in acquiring skills in the focused-training. Showing that in the low skills level, 1 participant (10%) with HND-B.Sc, 8 participants (80%) with Master's degree and 1 participant (10%) with Ph.D are in the low level of skills capacity development; compared to 3 participants (9.38%) with HND-B.Sc, 23 participants (71.88%) with Master's degree and 6 participants (18.78%) with Master's degree who are in the medium level of skills capacity development; while 5 participants (9.80%) with HND-B.Sc, 34 participants (66.67%) with Master's degree and 12 participants (23.53%) with Ph.D are in the high level of skills capacity development after the treatment on how to use AI and emerging digital tools. However, within the HND-B.Sc who were of 9 participants, 1 participant (11.11%) was in low skills capacity development, 3 participants (33.33%) was in medium skills capacity development and 5 participants (55.56%) was in high skills capacity development, For the Master's degree who were 65 participants, 8 participants (12.31%) was in low skills capacity development, 23 participants (35.39%) was in medium skills capacity development and 34 participants (52.31%) was in high skills capacity development; Whereas, for the Ph.D degree who were 19 participants, 1 participant (5.26%) was in low skills capacity development, 6 participants (31.58%) was in medium skills capacity development and 12 participants (63.16%) was in high skills capacity development. These

results distinctively show that educational qualifications of TVET educators affected their acquisition of skills at diverse levels during the focused-training, on capacity development to use AI and emerging digital tools.

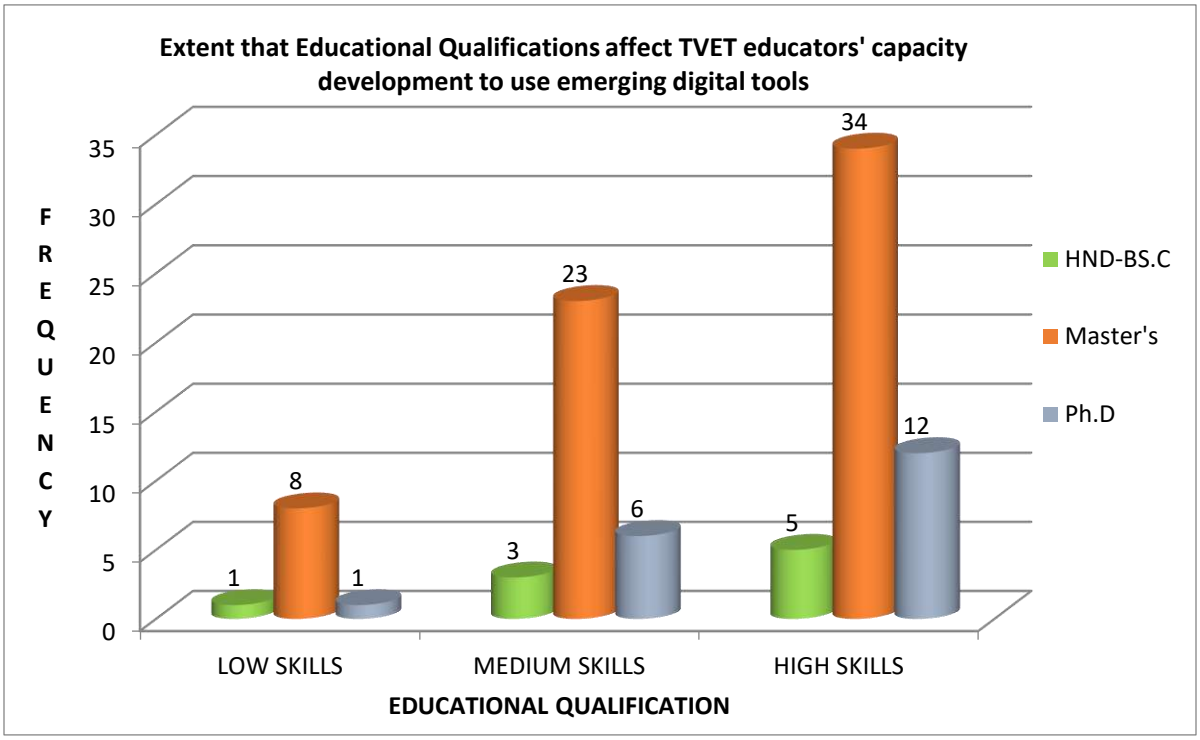

Figure 2

Research question 4: What impact does educational qualifications of TVET educators have on their capacity development to use emerging digital tools towards 21st century edupreneurship?

The following hypotheses were used to provide answers to the research question 4.

Hypothesis 1: There is no significant difference in the TVET educators' level of capacity development, before and after the focused training to use AI and emerging digital tools towards 21st century edupreneuship.

Table 1: Descriptive Statistics

SKILLS TEST	Mean	N	Std. Deviation	Std. Error Mean
Pre-test	15.81	93	16.49	1.61
Post-test	53.23	93	20.49	2.13

Table 2: Paired t-test Analysis of Pre-test and Post-test: TVET Educators' Capacity development during Focused-Training to use AI and emerging digital tools

		Mean Difference	Std. Deviation	t	df	p
Pre-test AI Skills Capacity Post-test AI Skills Capacity	Equal variances not assumed	-37.42	21.51	16.77	92	.000*

* denotes Significant at p > .05

As shown in t-test analysis in Table 2 above, there is significant difference in the TVET educators' level of capacity development, before and after the focused training to use AI and emerging digital tools towards 21st century edupreneuship (0.000 > 0.05); hence, the hypothesis 1 is rejected.

Hypothesis 2: There is no significant difference between HND certificate/Bachelor degree holders and Master's degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship.

Table 3: Chi-Square Analysis of B.Sc-HND Vs Master's Degrees - Skills Capacity Development to use AI Tools

ACADEMIC QUALIFICATION	Level of Skills Capacity Acquired to use AI Tools				df	P-Value	Sig.
		Low	Medium	High			
BS.C-HND	Count	1	3	5	2	.192[F]	1.000[ns]
	% within BS.C-HND	11.1%	33.3%	55.6%			
MASTER'S	Count	8	23	34			
	% within MASTER'S	12.3%	35.4%	52.3%			
Total	Count	9	26	39			
	% within ACADEMICS	12.2%	35.1%	52.7%			

ns = Not Significant at P > .05

In the Chi-square analysis Table 3 above, there is no significant difference between HND certificate/Bachelor degree holders and Master's degree holders TVET educators in their capacity

development to use emerging digital tools towards 21st century edupreneurship. (0.000 > 0.05); hence, the hypothesis 2 is not rejected.

Hypothesis 3: There is no significant difference between HND certificate/Bachelor degree holders and PhD degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship.

Table 4: Chi-Square Analysis of B.Sc.-HND Vs Ph.D. Degrees - Skills Capacity Development to use AI Tools

ACADEMIC QUALIFICATION	Level of Skills Capacity Acquired to use AI Tools				df	P-Value	Sig.
		Low	Medium	High			
BS.C-HND	Count	1	3	5			
	% within BS.C-HND	11.1%	33.3%	55.6%			
					2	.766[F]	1.000[ns]
Ph.D	Count	1	6	12			
	% within Ph.D	5.3%	31.6%	63.2%			
Total	Count	2	9	17			
	% within ACADEMICS	7.1%	32.1%	60.7%			

ns = Not Significant at P > .05

In the Chi-square analysis Table 4 above, there is no significant difference between HND certificate/Bachelor degree holders and PhD degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship. (0.000 > 0.05); hence, the hypothesis 3 is not rejected.

Hypothesis 4: There is no significant difference between Master's degree holders and PhD degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship.

Table 5: Chi-Square Analysis of Master's Vs Ph.D. Degrees - Skills Capacity Development to use AI Tools

ACADEMIC QUALIFICATION	Level of Skills Capacity Acquired to use AI Tools				df	P-Value	Sig.
		Low	Medium	High			
MASTER'S	Count	8	23	34			
	% within MASTER'S	12.3%	35.4%	52.3%			

					2	.825[F]	1.000[ns]
Ph.D	Count	1	6	12			
	% within Ph.D	5.3%	31.6%	63.2%			
Total	Count	9	29	46			
	% within ACADEMICS	10.7%	34.5%	54.8%			

ns = Not Significant at P > .05

Also in the Chi-square analysis Table 5 above, there is significant difference between Master's degree holders and PhD degree holders TVET educators in their capacity development to use emerging digital tools towards 21st century edupreneurship (0.000 > 0.05); therfore, the hypothesis 3 is not rejected

Discussion and Conclusion

From the analysis of the result, it was established that focused training was effective and this confirmed the assertion of Kim (2023) about integration of AI in teacher training, that it will equip the teachers with enhanced teaching skills and problem-solving skills. The training improved the AI capability development of the TVET educators because they were really better than their entry point skills before the training on the AI and emerging digital tools (that could be used for edupreneurship activities). This reflected in the excellent extent of the achievements recorded after the focused training. This finding corroborates Ding, Shi, Yang and Choi (2024) report that intentional focus on designing and providing meaningful training, content-specific professional development, that situate complex learning tasks in authentic scenarios, would enhance teachers' fundamental understanding of AI literacy and AI integration practices, because the teachers would apply their knowledge and skills to real-world situations. This implies that when skills acquisition training is conducted with the trainees having instant access to hands-on practice, coupled with well designed and appropriately focused training programme, there is great tendency of huge success. This finding corroborates Helfat and Raubitschek (2018) that digital platforms do not automatically generate positive knowledge exchange without purposeful action by platform leaders. Also, it is observable from the study that there were very clear differences in how the TVET educators' educational qualifications affected their capacities development during the focused training, to digitally empower them towards edupreneurship. Though none of them is with outright dominance, the findings in this study reported that the differences were not significant

between and among B.Sc./HND degree holders, Master's degree holders and PhD degree holders; in their capacities to use AI and emerging digital tools towards edupreneurship engagements. The implication of this is that the focus of training programme should emphatically be on the content and hands-on opportunity, focus should equally embrace considerations that would not give undue advantages to any participating trainees with disparity in educational qualifications; that is, necessary provisions should be done to ensure that educational qualification is not to advantage of any participants. This as well affirming the assertion of Helfat and Raubitschek (2018) that digital platforms do not automatically generate positive knowledge exchange without purposeful action by platform leaders.

Irrespective of educational qualifications, focused-trainings could provide competency capacity to practice edupreneurship, for financial profits as addition to salary being received. Importantly, the stakeholders in TVET education and tertiary institutions should understand how to get ultimate benefits of focused-trainings on emerging technology as part of strategic continued professional development programme.

Recommendations

Based on the findings from this study, the followings are recommended:

1. Whenever skills acquisition training programme is being organised, emphasis should resonate on how the participants would have open access to make use of the relevant software. This would grant them privilege to personalise their learning activities, as well would accord them opportunities to prepare to actively engage in co-operative learning.
2. Trainings should be specific and practically situated on real life experiences; it should prevent discrimination by educational qualifications if not relevant as prerequisite.
3. Moreover, in order to ascertain quality assurance, training programmes should be subjected to data-driven critique to assist in making informed decision so that necessary provisions should be done to ensure that educational qualification is not to advantage of any participants.

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