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Perceived Graduates' Employability in the 4IR Era: Assessing Predictors' Impacts

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This paper assesses the impacts of perceived proactive career behaviors (PCB), Work-integrated learning effectiveness (WILE), and abilities (AB) on perceived graduates' employability (PGE) within Nigeria's businesses in the 4IR era. The sample used in this study came from First City Monument Bank Plc, Isoglass Industries Nigeria Ltd, Honeywell Flour Mills Plc, CohoTek IT Solutions, and Freezeland Nigeria Limited. These are the five examined businesses. They belong to the manufacturing, sales, information technology, and finance sectors. The cross-sectional questionnaire approach was used in this study, and surveys were distributed at random. Nonetheless, 486 of the 500 distributed surveys were located, deemed suitable for use, and subjected to Statistical Packages for Social Sciences analysis (SPSS version 28). This study indicated a considerable individual and collective impact of perceived proactive career behaviors, work-integrated learning effectiveness, and abilities on perceived graduates' employability within Nigeria's businesses in the 4IR era. Businesses and higher education management are urged to investigate and model the most suitable proactive career practices in the current 4IR period. They should also consistently include and encourage work-integrated learning and support due to the sensitive nature of students' understanding of the workplace and requirements inspired by the fourth industrial revolution. Further, managers and leaders in higher education and the workplace should promote and motivate performance abilities appropriate for the current industrial revolution.

Keywords: *vocation, learning, skills, employability, businesses, education, Nigeria*

JEL Classification: *D83, I23, J64, L20, O33*

1. Introduction

The idea of employability skills emerged from the desire to equip people with the information and abilities necessary for obtaining, maintaining, and advancing their jobs (Zaharim et al., 2009). These abilities fall into three categories: general abilities, fundamental competencies, and character traits (Learning and Teaching Council, 2011). Higher education institutions' ability to match the needs and expectations of the labor market in the face of the 4IR is a worry for the education sector. It is clear from this that obtaining an undergraduate degree results in acquiring general skills, essential abilities usable in various contexts and beyond the discipline's core knowledge (McArthur et al., 2017). It is well recognized that graduate

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employability skills are a hot topic in fields where technology reshapes our social, cultural, economic, and personal lives. Additionally, more research is being done to evaluate the programs that higher education should offer to address this difficulty while considering employers' opinions (Winterton and Turner, 2019). In more detail, perceived employability is defined as the person's perception of their chances of landing a new job (Chughtai, 2019).

As we enter the Fourth Industrial Revolution, technological innovation is spawning new industries, upending existing ones, and altering how goods are produced. The introduction of cyber-physical systems, the Internet of Things (IoT), and online technologies has resulted in profound changes in how we live, work, and interact with one another, referred to as the Fourth Industrial Revolution (Hatimtai and Hassan, 2018). As a result, businesses that do not offer quick and efficient services and skills will be left behind and unable to achieve their objectives in a swift and non-geographic environment. The Fourth Industrial Revolution (4IR) is taking place as we speak, and it appears to be increasing social disparity between First and Third World nations. For this reason, upskilling and reskilling of individuals must take precedence if the economy is to survive (Jerome and Ajakaiye, 2019). It has never been more crucial to determine which employability skills are responsive to 4IR. This is a universal requirement (Loy and Novak, 2021).

Furthermore, concerns about the evolving graduate labor market are persistent. Higher education (HE) graduates in developed economies must increasingly compete with a broader pool of candidates for entry-level positions due to the expansion in student enrollment (Li et al., 2018). They are more likely to land jobs that do not require their formal qualifications (Jackson, 2019). Although there is a sizable pool of graduate recruits, questions remain about how prepared they are for the profession (Deloitte, 2017). Universities have been urged to adapt and adopt work-based training initiatives, such as degree programs developed in partnership with businesses, to better prepare students for the workforce of the future (Deegan and Martin, 2017). Proactive career behaviors are those that people use to manage their careers, such as career planning, networking, getting guidance, and skill acquisition (Smale et al., 2019). In a recent study, numerous proactive career behaviors are essential for effective career management (Taber and Blankemeyer, 2015). Three proactive career behaviors are the subject of the current study: career planning, skill development, and networking (Strauss et al., 2012; Chughtai, 2019).

The employability of recent graduates is attracting the attention of numerous important stakeholders (i.e., industry, institutions, and students). Therefore, work-integrated learning (WIL) is thought to increase graduates' employability and broaden their career options (Schonell and Macklin, 2019). WIL is called practicums, fieldwork, cooperative education, and associated activities in higher education. By preparing graduates for future employability, WIL strives to make the transition from a student learner to a professional easier (Ng et al., 2021). WIL enhances the traditional university paradigm by ensuring graduates are more employable and job-ready (Boahin and Hofman, 2013). Studies suggest incorporating WIL into the curricula to enhance experiential and authentic learning for students because discipline-based knowledge in higher education falls short of achieving all employers' objectives (Helyer and Lee, 2014; Jackson, 2015). Including WIL in young graduates' overall employability skills development boosts employability (Winteron and Turner, 2019). The most sought-after graduates should have expertise in IT, teamwork, communication, analytical and critical thinking, and teamwork, according to Paadi (2014). Ambepitiya (2016) observed that the growth of academic knowledge, soft skills, practical skills, and technical talents are the essential elements that prepare graduates for employment. These results also demonstrated that academic achievement is an important but not the only factor in graduates' employability (Jayasingha and Suraweera, 2020). Thus, the following abilities are taken into account in this study: technical skills (TS), communication skills (CS), and teamwork and problem-solving skills (TPSS).

Higher education institutions in Nigeria produce more than 300,000 graduates each year, which should typically be enough to meet the nation's needs regarding human capital, which is one of their main concerns. Nonetheless, firms are increasingly willing to pay well to attract competent people as they struggle to fill job openings (Edinyang et al., 2015). According to Akanmu (2011), Nigerian university graduates have been tested several times to see if they qualify for the few open white-collar jobs. However, the existing educational system does not produce graduates with fundamental and standardized abilities, as evidenced by the ongoing rise in youth unemployment (Phillips Consulting, 2014). Although the effects of some factors have been examined in earlier studies, proactive career behaviors, work-integrated learning, academic performance, and abilities on perceived graduates' employability in the 4IR have not been thoroughly investigated in Nigeria. By examining the effects of proactive career behaviors, work-integrated learning, and abilities on perceived graduates' employability within Nigeria's firms in the 4IR era, this research seeks to add to the body of

literature. It aims to derive an applied model from motivating, enhancing, and sustaining graduates' employability. The literature review and hypotheses statements, the techniques advocated, the research results, and the discussion of findings are the four sections that follow the introduction of this study. Furthermore, discussed are the study's limitations, implications, and conclusions.

2. Literature Review

The literature review for this topic discusses proactive career behaviors, work-integrated learning effectiveness, abilities, and perceived graduates' employability.

2.1 Proactive Career Behaviors and Perceived Graduates' Employability

Existing research has shown that proactive career behavior (PCB), which is the idea that people will proactively consider options, set goals, create networks, and improve their skills and abilities to ensure the competitiveness of their career future, plays a crucial role in enabling people to build their careers proactively and contributes to favorable individual career outcomes, such as employment and career success (Zacher, 2014a; Jackson, 2019). Hence, the higher education (HE) sector aims to increase graduates' employability. Research demonstrates the importance of proactive career behaviors for students' employment status and other job-related outcomes, including proactive skill development, personal growth, a willingness to explore professional possibilities, and career planning (John et al., 2021). According to a study, proactive career behaviors like career planning, skill improvement, and networking were linked favorably to perceived employability (Chughtai, 2019). Results showed that PCBs are positively related to employability, future work self, career adaption, career success, and job and life satisfaction in particular (Taber and Blankemeyer, 2015; Kowsikka and James, 2019; Cheah et al., 2020). Furthermore, according to Kinash et al. (2016) and Gardiner (2015), students who approach their career development learning with greater initiative will be better equipped to deal with the job market's challenges. Yet, there is limited proof of the behavioral factors contributing to some university students' superior employability development compared to others (Clements and Kamau, 2018). Few studies have examined how proactive career behaviors affect employability (Chughtai, 2019).

2.2 Work-Integrated Learning Effectiveness and Perceived Graduates' Employability

The purported advantages of work-integrated learning (WIL) include enhanced non-technical abilities and a greater understanding of expectations, requirements, and features of a student's planned career (Smith et al., 2014; Jackson and Collings, 2018). According to Namutuwa (2020), WIL is a reaction to employability problems. Students can apply their academic theory to the industry by building work-integrated learning opportunities in their courses. This improves young graduates' employability and educational outcomes. It strengthens the connection between employers, institutions, and students for the growth of employability (Ng et al., 2021). Moreover, Fenta et al. (2019) found a strong correlation between graduates' employability and academic work-integrated learning. In addition, Zehr and Korte (2020) suggested that graduates' employability is impacted by their exposure to work-integrated learning because they will learn about the requisite credentials and abilities in a preferred field of work. Additionally, it has been shown that work-integrated learning or placements significantly improve employability abilities like teamwork, self-confidence, or leadership (Messer, 2018; Ebner et al., 2021).

2.3 Abilities and Perceived Graduates' Employability

Technical skill (TS) is the term used to describe the knowledge and skills required to examine and utilize various tools and processes, such as software, computers, and informational technology. Such skills are essential in the current cutthroat 4IR environment because of the rapid changes in the adoption of information technology and the Internet (Hosain et al., 2021). According to El Mansour and Dean (2016), employers seek out graduates with both technical and soft skills. In addition, Jayasingha and Suraweera (2020) opined that technical skills could affect the employability of organizational graduates. Hossain et al. (2020) further indicated that employability strongly correlates with technical and soft skills. Also, CS often refers to the capacity to interact with people through delivering and receiving clear and concise messages. Hence, efficient communication decreases perceptual bias, time, and effort to boost efficiency further (Hosain et al., 2021).

Hosain et al. (2021) found that employers highly value communication, problem-solving, teamwork, and personal attributes. Besides, the employability of graduates is increased by communication, interpersonal, and problem-solving skills, according to a recent investigation by Succi and Canovi (2020). Teamwork refers to the interpersonal ability of a person who can work well with others and fulfill their responsibilities as a team member. Conversely, problem-solving ability means solving a real-world or simulated problem effectively and quickly (Hosain et al., 2021). The two essential talents that make a job candidate competent in every circumstance are teamwork and problem-solving abilities (TPSS). Such findings were reinforced by Nazron et al. (2017), who discovered that TPSS could improve students' job status. Moreover, Nusrat and Sultana (2019) indicated that TPSS could help people find a job and keep it longer.

3. Research Premise

This study suggested the following through reflections on the proactive career behaviors, the efficacy of work-integrated learning, abilities, and perceived employability of graduates:

- *H1*. Proactive career behaviors significantly impact the perceived employability of graduates within Nigeria's businesses in the 4IR era.
- *H2*. Perceived work-integrated learning effectiveness significantly influences the perceived employability of graduates within Nigeria's businesses in the 4IR era.
- *H3*. Abilities significantly predict the perceived employability of graduates within Nigeria's firms in the 4IR era.
- *H4*. Proactive career behaviors, the perceived work-integrated learning effectiveness, and abilities jointly influence the perceived employability of graduates within Nigeria's businesses in the 4IR era.

4. Research Methodology

A cross-sectional questionnaire method was used in this investigation. Participants were given surveys to complete to learn more about their perceptions of graduates' employability, the efficacy of work-integrated learning, and proactive career behaviors. Five hundred (500) employees from five workplaces across five industries in the Nigerian states of Lagos and Oyo received surveys at random. First City Monument Bank Plc, Isoglass Industries Nigeria Ltd, Honeywell Flour Mills Plc, CohoTek IT Solutions, and Freezeland Nigeria Limited are the five (5) businesses. They belong to the manufacturing, sales, information technology, and finance sectors. The respondents' voluntary participation in this study encouraged respect for ethical considerations. The questionnaires were collected, and four hundred eighty-six (486) were chosen for use. The data was recovered, and Statistical Packages for Social Sciences (SPSS version 28) was used to clean and analyze it. Nonetheless, a factor and reliability analyses were involved in this investigation to develop an ideal instrument and establish the survey's local consistency. The units on the questionnaire for this study are:

Section A: Participants' Demographics

The respondents' demographics are covered in this section.

Section B: PCB

Proactive professional behaviors were measured using the career planning, proactive skill development, and network building sub-scales of the proactive career behavior scale developed by Strauss et al. (2012). Each subscale contained three components. Examples include the following: *"Several present-day graduates engage in career path planning"* (career planning); *"Several present-day graduates develop knowledge and skill in tasks critical to their future work life"* (proactive skill development); and *"Several present-day graduates are building a network of colleagues to call on for support"* (network building). A five-point scale with the values 1 (strongly disagree) and 5 (strongly agree) was used to score each item. The values of Cronbach's alpha for the subscales evaluating proactive skill development, career planning, and network building were 0.89, 0.76, and 0.92, respectively, according to Clements and Kamau (2018). Cronbach's alpha values for the three sub-scales in the current study were 0.79, 0.74, and 0.89, respectively.

Section C: WE

A six-item measure utilized in the study by Ng et al. (2021) was adapted to assess perceptions of the effectiveness of work-integrated learning. A sample item includes: *"WIL enhances present-day graduates' problem-solving skills."* The three items were evaluated by respondents on a scale of 1 (strongly disagree) to

5 (strongly agree) on a five-point scale. According to Ng et al. (2021), the scale's Cronbach's alpha score was 0.87. In the current study, Cronbach's alpha revealed that the scale's dependability was 0.82.

Section D: AB

The TS, CS, and TPSS of the abilities scale created by Hosain et al. (2021) were used to measure abilities. The subscales each had three elements. Sample items include: *"Technical skills are one of the mandatory competencies for employability in my organization"* (technical skills); *"Candidates must have sound communication skills along with other requirements"* (communication skills); and *"We strongly seek candidates with better teamwork capabilities*" (teamwork and problem-solving skills). Each item was scored using a five-point scale with the values 1 (strongly disagree) and 5 (strongly agree). Cronbach's alpha values for the subscales evaluating technical skills, communication skills, and teamwork and problem-solving skills were 0.86, 0.74, and 0.92, respectively, according to Hosain et al., 2021. Cronbach's alpha values for the three sub-scales in the current study were 0.89, 0.79, and 0.93, respectively.

Section E: PGE

De Vos and Soens (2008) created a three-item scale to measure perceived graduate employability. A sample item includes: *"I believe present-day graduates could easily obtain a comparable job with employers."* The three items were assessed by respondents on a scale of 1 (strongly disagree) to 5 (strongly agree) on a five-point scale. Due to their analysis, De Vos and Soens (2008) found that the scale's Cronbach's alpha value was 0.91. The current study's Cronbach's alpha indicated that the scale was 0.89 reliable.

5. Analysis and Findings

Pilot research was conducted in this study to identify potential issues and validate the usefulness of the measuring tool. Multiple linear regression was used to examine hypotheses 1, 2, 3, and 4. The following are the findings from this study's analysis of the data: To test hypotheses, linear regression analyses were used in this study and the results are presented in this section.

Table 1: The multiple regression analysis indicates the combined impact of perceived proactive career behaviors, work-integrated learning effectiveness, and abilities on perceived graduates' employability within Nigeria's work organizations in the 4IR era.

Model	R	R-squared	Adjusted R-squared	F	Sig
1	.899[a]	.895	.895	31617.023	.000

Note: a. Dependent Variable: Perceived Graduates' Employability; b. Predictors: (Constant), perceived proactive career behaviors, work-integrated learning effectiveness, abilities. Source: Author's results

Table 2: Measurements of the predictors of perceived graduates' employability

Influencers	B	β	t	Sig	95.0% Confidence Interval for B		R	R^2	F (3, 482)	P
					Lower Bound	Upper Bound				
(Constant)	-15.976		318.826	000	-16.075	-15.878	.899[a]	.895	31617.023	<0.01
Perceived Proactive Career Behaviors	.227	.590	383.409	000	.225	.228				
Perceived Work-integrated Learning Effectiveness	.822	.386	289.806	000	.816	.827				
Perceived Abilities	.250	.559	312.034	000	.248	.251				

Note: a. Dependent Variable: Perceived Graduates' Employability. Source: Author's results

Table 2 provides evidence that proactive career behaviors significantly favorably impact perceptions of graduates' employability inside Nigeria's firms in the 4IR era, supporting hypotheses 1 to 3 to be tested ($\beta = 0.590$; $p<.001$). Proactive career behaviors increase graduates' employability within Nigeria's businesses in the 4IR period. Thus, the stated premise is established: proactive career behaviors significantly impact the

perceived employability of graduates within Nigeria's businesses in the 4IR era. The results also suggest that graduates' employability is considerably and favorably affected by their perception of the effectiveness of work-integrated learning ($\beta = 0.386$; $p<.001$). This indicates that students' employability after graduation in Nigeria was boosted via work-integrated learning. Hence, the stated premise is established: perceived work-integrated learning effectiveness significantly influences the perceived employability of graduates within Nigeria's firms in the 4IR era. Also, the findings imply that graduates' employment is considerably and favorably influenced by assessed abilities ($\beta = 0.559$; $p<.001$). This conclusion suggests that graduates' employability levels are increased by their skills. Therefore, the proposition is established: abilities significantly predict the perceived employability of graduates within Nigeria's firms in the 4IR era.

In testing hypothesis 4, **Table 1** shows that perceived proactive career behaviors, perceived work-integrated learning effectiveness, and perceived abilities significantly and jointly impact the perceived employability of graduates within Nigeria's businesses in the 4IR era ($R = .899$, $R2 = .895$, $F = 31617.023$, $p < .01$). Hence, the p-value is sufficient. These results show that perceptions of proactive career behaviors, the effectiveness of work-integrated learning, and perceived abilities significantly, jointly, and positively influenced an 89.9% shift in graduates' perceptions of their employability. Thus, the postulation has established that Proactive career behaviors, the perceived work-integrated learning effectiveness, and abilities jointly influence the perceived employability of graduates within Nigeria's businesses in the 4IR era.

6. Discussion and Conclusion

The results of this study showed that perceptions of proactive career behaviors have a significant, favorable impact on how employable graduates are thought to be by Nigerian employers in the 4IR era. This discovery is predicated on the idea that proactive career behaviors, those adopted by individuals to manage their careers, such as career planning, networking, seeking advice, and skill development, increase graduates' chances of finding employment in Nigerian companies during the 4IR era. This finding supports the evidence that proactive career behaviors significantly impact graduates' employability (John et al., 2021). It also supports Chughtai's (2019) opinion that proactive career behaviors like career planning, skill improvement, and networking were linked favorably to perceived employability. The present finding further corroborates the position of (Kowsikka and James 2019; Cheah et al., 2020) that PCBs are positively related to employability, future work self, career adaption, career success, and job and life satisfaction in particular.

The perceived effectiveness of work-integrated learning has been shown in this study to significantly improve graduates' perceptions of their employability in Nigerian businesses throughout the fourth industrial revolution. The findings suggest that students who engage in work-integrated learning within Nigerian enterprises are more likely to find employment after graduation. These findings support the claims made by some researchers (e.g., Fenta et al., 2019; Ng et al., 2021) that work-integrated learning improves the relationships between institutions, employers, and students to increase employability. Hence, they found a strong correlation between graduates' employability and academic work-integrated learning. This outcome is consistent with empirical data from Zehr and Korte (2020). They asserted that exposure to work-integrated learning affects graduates' employability since they will learn the necessary skills and credentials in a desired field. The findings of Messer (2018) and Ebner et al. (2021) are also supported by this research. They demonstrated that work-integrated learning or placements considerably enhance employability skills like teamwork, self-confidence, or leadership.

Moreover, this paper established that perceived abilities notably and positively impact the perceived graduates' employability within Nigeria's firms in the 4IR era. This implies that, to the extent that students possess and demonstrate their abilities, there will be a greater possibility of finding a job following graduation. These results, therefore, support Jayasingha and Suraweera's (2020) assertion that technical skills may influence an organizational graduate's employability. These results also support the assertion made by Hossain et al. (2020), who claimed that technical and soft skills directly impact employability. The conclusions of Succi and Canovi (2020) are further supported by the current findings (2020). They noted that communication, interpersonal, and problem-solving abilities improve graduates' employment. These also support Nusrat and Sultana's (2019) findings, which suggested that TPSS could aid job search and employment retention.

Also, this article has demonstrated how perceptions of proactive career behaviors, the effectiveness of work-integrated learning, and abilities significantly, jointly, and favorably affect perceptions of graduates' employability in Nigerian businesses in the 4IR era. These findings demonstrate that perceptions of proactive

career behaviors, the effectiveness of work-integrated learning, and perceived abilities significantly, jointly, and favorably influenced a change of 89.9% in the perception of graduates' employability. Other factors not considered in this study were responsible for the remaining 10.1% difference in graduates' perceived employability.

In light of the current findings, this study seeks to conclude a realistic strategy that may be used to promote, enhance, and maintain graduates' employability within Nigerian businesses in the 4IR era. Hence, the model in figure 1:

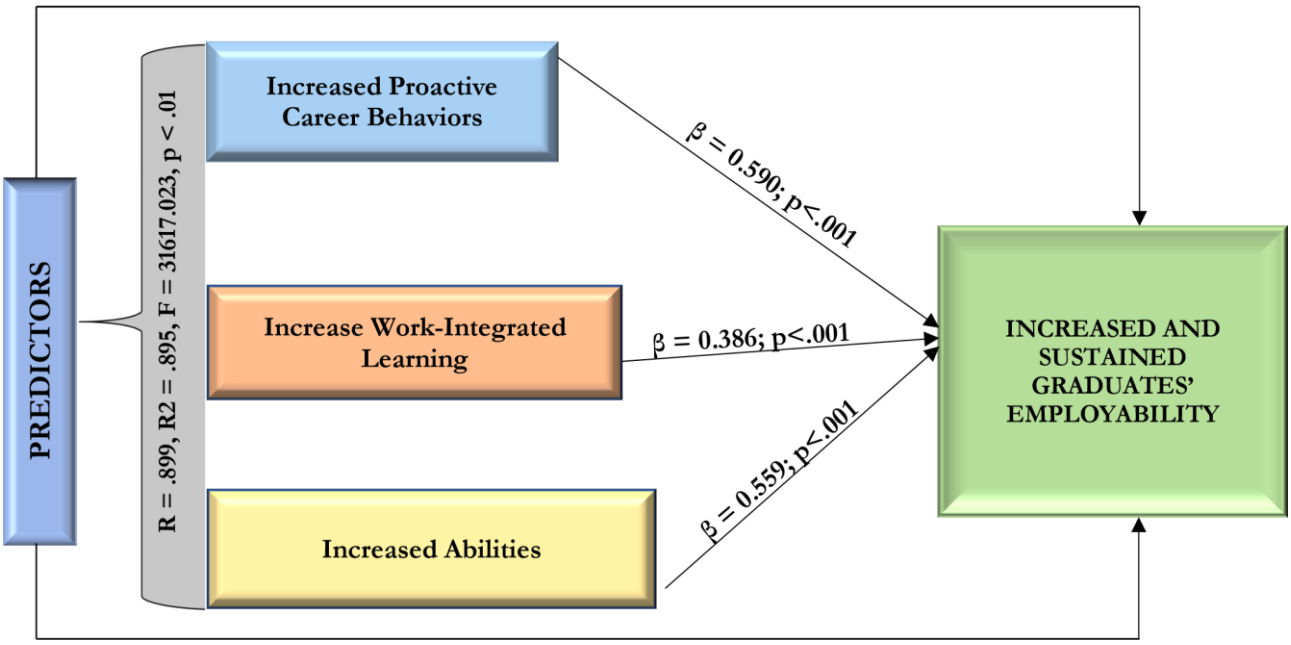

Figure 1: Combined and individual impact of perceived proactive career behaviors, perceived work-integrated learning effectiveness, and abilities on perceived graduates' employability within the work organizations in the 4IR era.
Source: Paper's findings

This study concludes that proactive career behaviors, work-integrated learning effectiveness, and abilities significantly and individually increase graduates' employability within Nigerian businesses in the 4IR period. Furthermore, it is established that proactive career behaviors, work-integrated learning effectiveness, and abilities considerably and jointly impact graduates' employability. As a result, in the 4IR period, these criteria substantially affect perceived graduates' employability within Nigerian organizations.

6.1. Contribution

The fourth industrial revolution, human resources management, employment relations management, employability, performance abilities, career habits, and apprenticeship are all topics that this study expands upon in the literature. Additionally, it shows how businesses and the higher education sector can motivate, accomplish, and improve graduates' employability in the 4IR era.

6.2. Managerial Inferences or Policy Inferences

The study's findings provide managerial, HR, and higher education experts with tips on how to better prepare students for the achievement and sustainability of graduates' employability in the 4IR era, specifically by encouraging more proactive career behaviors, students' involvement in work-integrated learning, and strategies to improve their performance abilities. Graduates will be more employable in the current fourth industrial age by attracting this. The opinions and knowledge presented in this paper may also advance business and higher education management strategies relating to motivating proactive career behaviors, work-integrated learning, and performance capabilities suitable for employment in the current 4IR era.

6.3. Limitations of Research / Future Directions of Study

This study only used a quantitative approach. As a result, it could not offer a practical exploration into the variables influencing graduates' employment in the 4IR era. Also, this study analyzed its date with the Statistical Packages for Social Sciences (SPSS version 28). This could not allow a more robust qualitative analysis (e.g., Thematic analysis), as this study's approach was quantitative.

Notwithstanding the paper's findings, the following suggestions are helpful:

- In the current 4IR period, this study urges business and higher education management to investigate and model the most suitable proactive career practices.
- Employers and higher education officials should always include and encourage work-integrated learning and support due to the sensitive nature of students' understanding of the workplace and requirements inspired by the fourth industrial revolution. This improves graduates' employability in business environments.
- Also, managers and leaders in higher education and the workplace should promote and motivate performance abilities appropriate for the current industrial revolution.

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