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Aligning Employability Skills and Career Opportunities Among Employees in the Electronics Industry: A Proposed Upskilling of the Digital Talent Development Strategy in Guangdong Province, China

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Abstract: The research paper investigated the skills gap in the electronics industry, emphasizing the necessity for employees to continuously update their competencies due to rapid technological advancements and the emergence of Industry 4.0. It identified key employability skills, including problem-solving, teamwork, communication, and technology. The study proposed an upskilling strategy to align education and training with industry demands, ensuring employees possessed both technical and soft skills. A descriptive-correlational design and convenience sampling method were used to collect data from 410 respondents across 10 major electronics companies in Dongguan City, Guangdong, China. A Self-administered survey assessed respondents' employability competency levels and the contribution levels in influencers on career opportunities, and further analyzed the significant alignment between employability skills and career opportunities. Based on the results of the findings, the study proposed a digital talent development upskilling strategy aimed at addressing the skills gap and enhancing employability within the sector.

Keywords: Employability skills, Career opportunities, Digital talent development, Electronics industry, Guangdong province.

1. Introduction

The electronics sector is critical to today's society because it drives innovation, connectivity and economic growth. The demand for qualified professionals in the electronics business has skyrocketed in the contemporary digital era, as technology advances at an unprecedented rate. Employers predict that problem-solving, critical thinking and analysis, as well as self-management skills such as resilience, adaptability, stress tolerance and active learning will be in high demand in the years leading up to 2025. Businesses expect 40% of workers to require retraining within six months on average and 94% of CEOs want employees to learn new skills on the job up from 65% in 2018 (World Economic Forum, 2020).

Jobs that previously required a high level of hard skills are becoming less so as technology advances. As automation and artificial intelligence grow, more soft skills will be necessary to keep up with cutting-edge technology. Furthermore, technical improvements occur quickly, rendering technology-oriented skills obsolete in less than two years. The most valuable skills are those that may be transferred to various functions within a firm, such as teamwork and communication (WEF, 2020).

However, a persistent issue remains: a mismatch between the workforce's skill set and the changing expectations of the organization (Deloitte, 2021). Closing this gap entails not just recruiting more people to fill positions, but also preserving industrial competitiveness and stimulating innovation in an ever-changing environment. However, the growing discrepancy between workforce skill levels and changing industry expectations is a recurring issue caused by the rapid pace of technological development.

New technologies have caused skill transitions in the workplace since at least the Industrial Revolution; however, the implementation of automation and artificial intelligence (AI) will speed these transformations in comparison to the most recent past. While the demand for physical and manual abilities decreases, certain talents, such as technological, social and emotional skills will become more in demand. To react to these changes, workers everywhere will need to extend or learn new skills. Businesses will also need to reassess how their internal work arrangements are organized.

According to the World Economic Forum (2020), the rise of Industry 4.0 has increased the need for a highly qualified workforce capable of navigating complex digital ecosystems. Industry 4.0 is described by the combination of cyber-physical systems, cloud computing and the Internet of Things (IoT). However, research indicated that many schools struggle to keep up with these advancements, resulting in a shortage of competent people who can meet business expectations (Acemoglu & Restrepo, 2019).

Furthermore, the rapid automation of repetitive employment necessitates a shift toward higher-order skills such as problem solving, critical thinking, and flexibility (World Bank, 2020). Companies express concern that their staff lack sufficient capabilities (Fajaryati et al, 2020). In developing countries, there are around 75 million unemployed youth; in the majority of these countries, the unemployment rate for adolescents is two to four times that of adults. Education providers must also educate students with workplace-relevant hard and soft skills in order for them to be employable and productive. Employers respect people who can communicate, work well with others, solve problems and think critically, in addition to being technically proficient. Over half of stakeholders were unable to find individuals with the necessary capabilities for the positions they advertised, resulting in over 80% of job seekers not being hired (World Bank, 2020, as cited in Rajarata et al., 2020).

In their systematic evaluation of research, Fajaryati et al.

(2020) state that in order to participate in the global economy and the workforce of the future, people must update their marketable skills. Employers believe that employees must be able to solve problems, work in groups, communicate effectively and use technology. Then, there are three major kinds of essential workplace skills that will be widely used during the disruptive time and in the future: cognitive abilities, basic skills, and cross-functional skills. However, soft skills and technology skills will make up the vast bulk of expected future skill sets. Because of the importance of employability skills, the education system must include them into all aspects of the learning process.

In response to these challenges, organizations within the electronics industry have increasingly turned to talent development strategies to cultivate a skilled workforce capable of driving innovation and sustaining competitive advantage. However, the effectiveness of these initiatives is contingent upon the alignment between the skills imparted through training programs and the actual requirements of the industry.

To address this misalignment, a comprehensive understanding of the employability skills sought by employers and the career pathways available to individuals within the electronics industry is essential. By identifying key areas of convergence and divergence between skill supply and demand, organizations can tailor their talent development strategies to better meet the needs of both employers and employees. Considering this, there is a pressing need to upskill the digital talent development strategy within the electronics industry.

2. Literature Review

The electronics industry, driven by technological advancements and innovation, demands diverse employability skills. Rapid developments in AI, robotics, and related technologies are reshaping job markets, rendering traditional roles obsolete while creating new opportunities in fields like engineering and computer science (World Economic Forum, 2020). Both technical skills, such as programming and circuit design (Zhao et al., 2020), and soft skills, including communication, adaptability, and problem-solving (Sony & Mekoth, 2022; Chuang, 2024), are essential. Bridging the skill gap requires collaboration between industries and educational institutions (Norul, 2021), supported by government policies through subsidies and specialized training (Mavroeidi, 2019; Li et al., 2019). Employees must also possess decision-making and analytical skills to address challenges like supply chain disruptions and cybersecurity threats (Yang et al., 2020; Lou, 2022). Teamwork and clear communication foster creativity and adaptability (Carmeli et al., 2021; Yang et al., 2020). To stay competitive, continuous learning and skill enhancement are crucial, enabling employees to leverage emerging technologies and giving firms a competitive edge (Li, 2022).

Career opportunities in the electronics industry are shaped by factors like market demand, technological advancements, and organizational strategies. Emerging areas such as Artificial Intelligence (AI), the Internet of Things (IoT), and Big Data analytics are creating new roles requiring skills in electrical engineering, programming, and artificial intelligence (Mark et al., 2021; Bahroun et al., 2023). Market demand drives the need for skilled workers in manufacturing, R&D, and supply chain management, aligning with consumer preferences and technological progress (Li et al., 2020). Advancements in fields like AI, robotics, and renewable energy further expand opportunities, emphasizing the importance of continuous skill development and adaptability. Skills in cutting-edge technologies, such as IoT and 5G, are critical for roles in research, innovation, and product development (Liu et al., 2020). High-quality education and vocational training are essential for equipping individuals with industry-relevant expertise, with government-led STEM and lifelong learning programs playing a key role (Chen, 2019). Additionally, organizational strategies, including talent management, employee development, and fostering innovation, significantly influence career growth by attracting and retaining top talent.

To enhance employability and organizational competitiveness, aligning employability skills with career opportunities is essential. Education programs must address industry needs, equipping students with the technical skills, soft skills, and adaptability required in the dynamic electronics sector (Zapata-Cantu, 2022). Continuous learning is vital for practitioners to adapt to evolving roles and technologies, improving performance and career prospects. Both technical and non-technical skills, including problem-solving, teamwork, and communication, are highly valued in this collaborative and fast-paced industry (Gajdzik & Wolniak, 2022). In Guangdong's electronics sector, job opportunities span R&D, production, and sales, with success hinging on acquiring relevant skills and certifications (Liu et al., 2022). Additionally, flexibility and strong interpersonal skills are increasingly sought by employers to foster innovation and adaptability in a rapidly changing landscape (Kim Wa-Jeong, 2023).

The Digital Talent Development Upskilling Program aims to build a skilled workforce by aligning education with industry needs, fostering collaboration between academia and industry, and focusing on emerging technologies like AI and cybersecurity (Mudau, 2023; Wang et al., 2023; Haleem et al., 2022). Soft skills such as communication and teamwork are emphasized to improve workplace efficiency (Hsieh, 2019). Lifelong learning, supported by certifications and workshops, ensures competitiveness (Burns, 2020). Government policies and funding are essential to strengthen partnerships and drive innovation in Guangdong's electronics sector (Guangdong Provincial Government, 2020; Chan, 2022; Zhou et al., 2023).

3. Research Questions

The study aimed to discover the significant misalignment between the employability skills possessed by individuals and the career opportunities available within the industry. It also attempted to upskill the digital talent development strategy to align with industry needs.

Specifically, the study attempted to answer the following sub-problems:

What is the level of competencies the respondents in the electronic industry possess in employability skills in terms of problem-solving and decision-making, teamwork and collaboration, communication, and technology?

What is the level of contribution of the influencers on the career opportunities of the respondents in the electronic industry in terms of industry demand, technological advancement, access to education and training, and organizational strategies?

Is there a significant alignment between the level of competencies in the employability skills and the degree of contribution of the influencers on the career opportunities of

respondents in the electronic industry?

Based on the results of this study what digital talent development upskilling could be proposed as a strategy for the electronic industry?

4. Methods

This study employed convenience sampling to collect data through self-administered questionnaires from employees in various departments of the electronics industry in Dongguan, Guangdong Province, China. The questionnaire was divided into two sections: the first section involved 12 questions regarding employability skills variables, while the second section also contained 12 questions regarding influencer on career opportunities in the electronics industry.

The aim was to identify the competency levels of employment skills among employees in Guangdong's electronics industry, as well as the contribution levels of four main influencers on career opportunities. A total of 410 valid responses were collected.

Data collection for this study took place from August to September 2024. The employability skills and influencers on career opportunities surveyed are as follows:

ES: Employability Skills

PSDM: Problem Solving and Decision-Making

PSDM1: Solve technical challenges

PSDM2: Use data for decision-making

PSDM3: Find issue root causes and manage risks

TC: Teamwork and Collaboration

TC1: Share technical knowledge in a comprehensible way with clients, stakeholders, and teams

TC2: Collaborate to innovate and solve team challenges

TC3: Adapt to changing team dynamics, project needs, and technological advancements

C: Communication

C1: Clear write technical documents

C2: Communicate with diverse audiences effectively

C3: Listen and respond appropriately

T: Technology

T1: Diagnose and resolve hardware issues in electronics

T2: Integrate software with hardware

T3: Adapt to new tools and technologies

IOCO: Influencers On the Career Opportunities

ID: Industry Demand

ID1: Assess career steady employment and growth in the industry

ID2: Explore diverse employment options

ID3: Evaluate global work experience, diverse teams, and cultural exposure

TA: Technological Advancement

TA1: Identify opportunities to specialize in career pathways like AI and IoT

TA2: Assess flexibility for global work and remote opportunities

TA3: Use online courses to stay updated with evolving technology

AET: Access to Education and Training

AET1: Enhance career through continued education

AET2: Network for job opportunities and guidance

AET3: Develop technical and soft skills

OS: Organizational Strategies

OS1: Pursue professional growth through leadership and skills training

OS2: Identify career paths and progression opportunities via career pathing frameworks and succession planning

OS3: Support diverse backgrounds through goals and recognition

The questionnaire utilized a four-point Likert scale, where respondents were required to score based on their level of opinion, with a score of 4 indicating high competency / contribution and a score of 1 indicating no competency / contribution at all.

In the data analysis process, the researcher conducted a Cronbach's Alpha test, and the results showed that the Cronbach's Alpha values for both the employability skills and influencers on career opportunities sections were 0.901 and 0.840, respectively, both exceeding the 0.70 standard, indicating good internal consistency. Thus, the study's questionnaire or scale was considered reliable and suitable for assessing these specific factors related to career development.

Finally, the researcher used mean values and Spearman rho p-value statistical methods to evaluate and interpret the data.

5. Results

5.1. Level of Competencies in Employability Skills

Table 1. Levels of Competencies in Employability Skills Among Employees in the Electronics Industry

Indicator Code	Mean	Interpretation
PSDM1	2.53	Moderate Competency
PSDM2	2.33	Slight Competency
PSDM3	2.14	Slight Competency
PSDM	2.33	Slight Competency
TC1	2.55	Moderate Competency
TC2	2.30	Slight Competency
TC3	2.14	Slight Competency
TC	2.33	Slight Competency
C1	2.35	Slight Competency
C2	2.39	Slight Competency
C3	2.42	Slight Competency
C	2.39	Slight Competency
T1	2.48	Slight Competency
T2	2.39	Slight Competency
T3	2.11	Slight Competency
T	2.33	Slight Competency

Three metrics were used to assess decision-making and problem-solving abilities. With a mean score of 2.53, which was considered Moderate Competency, the ability to identify, evaluate, and resolve technical challenges within electronic components and systems was the highest-ranked indicator. Although workers showed a respectable ability to handle technical problems, they might use additional skill development to become more proficient. The following two indicators were classified as Slight Competencies: collecting and analyzing data for decision-making (mean = 2.33) and looking into the underlying reasons to reduce risks (mean = 2.14). The first finding was that, in spite of the workers' success in everyday issue management, employees had a little bit of a problem with the complex activities like risk management and in-depth analysis. This, however, suggests the potential for improvement in more challenging problem cases.

Teamwork is an essential skill where members of different teams often come together and collaborate to eliminate difficulties and enhance knowledge. A major talent in this

discipline is being able to convey technical data to customers, stakeholders, and team players as efficiently as possible; the participants had an average score of 2.55 and were classified Moderate Competency. It means that the employees were quite proficient at communication among the team, which was a guarantee of achieving goals and ensuring that everyone knew clearly where they were going as well as what was expected from them. The other two indicators, which were team members helping to broaden creativity (mean = 2.30) and adapting to team dynamics and project requirements (mean = 2.14), were considered less competent. This indicated that members of the group may have a weak point when it comes to building up collaborative skills and being able to get along as soon as the situation is different. Such variability in abilities may negatively influence the overall performance of teams in a dynamic environment where being agile and innovative team-building is a crucial factor in staying competitive.

For the technology domain, a systematic explanation of complex knowledge can be best presented with an effective communication tool. The results have shown that respect for cultural norms was top-ranked in situations where mean performance was 2.42 (Slight Competency) during listening and response. Employees expressed a degree of ability to engage in meaningful dialogue, but more training ought to be conducted in the area of active listening and intercultural communication to a great degree. The other two indicators have been graded at "slight competency", i.e. communicating with various groups of individuals (mean score = 2.39) and presenting complex technical data in writing formats (mean score = 2.35). Thus, there was still the problem of effectively communicating complex concepts all the more so when messages need to be adapted to suit the audience.

Being able to work with both hardware and software systems is essential for success and innovation in an industry that is driven by technology improvements. The capacity to identify and fix hardware-related problems was the highest-ranked indicator in this category, with a mean score of 2.48, which was still merely Slight Competency. Although staff members possessed a basic understanding of hardware diagnostics, they might have profited from more in-depth knowledge. The remaining two indicators, combining software with hardware (mean = 2.39) and adjusting to new tools and technologies (mean = 2.11), also fell into the Slight Competency range, emphasizing the difficulties in keeping up with quickly changing technologies like semiconductors and Internet of Things devices.

Only a small number of indicators reach Moderate Competency across all four domains, with Slight Competency being the most common level. There was a majority of workers with slight competency, which means that they received very low training in some of the basic skills, such as communication, teamwork, and technological skills, but were significantly less likely to have the skills to accomplish increasingly difficult, complex, and demanding jobs. Guangdong Province's electronic sector could profit from focused training and development initiatives to improve these vital skills, thus, making sure that workers can live up to the demands of the industry, which is constantly changing and moving forward.

According to the study, people demonstrated a good level of competency in resolving technical problems but the one in risk management and data analysis was lower. Bhatia and Kumar (2020) emphasized the fact that only technical knowledge is not enough but situations analysis and decision-making skills should be equally mastered to be successful. Yang et al. (2020) raised the issue that employees in the electronics industry have to be good at quality control procedures and supply chain operations which are very data-driven and one needs a lot of decision-making in those two areas. Consequently, the study backs up these conclusions by demonstrating the lack of good analytical skills among such employees which are needed for dealing with the complex electronics sector.

The study's results on cooperation, especially the lower grades in collaboration and flexibility, which distracted from previous research highlighting these skills were the main skills to be innovative. Along the same line, Zajac et al. (2021) analyzed some of the collaboration barriers, such as issues of communication and cultural differences, while Carmeli et al. (2021) stated that working in diverse environments enhances the flexibility and problem-solving power to the members. The research highlighted that in this area, there was a need for improvement, which was consistent with the literature's spotlight on collaboration success stories in the electronics industry.

The study showed that the ability to communicate was at a low level, especially when it comes to the aspect of reaching a wide range of audiences and communicating technical information. Similarly, Yang et al. (2020) emphasized that unveiling concrete and concise discussions is the cornerstone of electronic correspondence, particularly in the transmission of technical knowledge and the address of conflicts. Furthermore, Majid et al. (2019) asserted that firms in this domain are now making communication a higher precedence. The results of the study, therefore, confirmed earlier findings that there was a severe need for communication skills development, especially in communicating with various stakeholders and in explaining technical concepts.

According to the report, respondents found it difficult to adjust to new tools and technologies, especially in domains like semiconductor technology and the Internet of Things. The results of Li (2022), who highlighted the value of ongoing education and skill development to be competitive in the electronics sector, were in line with this. According to this earlier study, workers must keep up with technology improvements as a result of the growing digitization of goods and services (Lou, 2022). The study's discovery of this gap supported the necessity for companies to make investments in staff development by highlighting the necessity of continual training in new technology tools, as noted by Trenerry et al. (2022) and Sony & Mekoth (2022).

The study's conclusions were by and large parallel to several previous studies on human resource management in the company electronics sector. The challenges illustrated were those mentioned in the research too thus the problems in the decision-making, teamwork, communication, and technological competence areas were the same. Realizing technical and soft skills is a must for workers to be relevant even when jobs and roles evolve. As exposed in the findings of Li (2022), targeted skill developments mean more folks would be productive and in the end, they would be the wheels for everything in the workplace that is being created in the future.

5.2. Level of Contribution of Influencers on Career Opportunities

Table 2. Levels of Contribution in Influencers on the Career Opportunities Among Employees in the Electronics Industry

Indicator Code	Mean	Interpretation
ID1	3.75	High Contribution
ID2	3.50	High Contribution
ID3	3.56	High Contribution
ID	3.60	High Contribution
TA1	3.84	High Contribution
TA2	3.43	High Contribution
TA3	3.45	High Contribution
TA	3.57	High Contribution
AET1	3.84	High Contribution
AET2	3.62	High Contribution
AET3	3.71	High Contribution
AET	3.72	High Contribution
OS1	3.73	High Contribution
OS2	3.69	High Contribution
OS3	3.49	High Contribution
OS	3.64	High Contribution

Industry demand is a major factor influencing career opportunities in the electronics sector. Graduates and career changers typically benefit from the industry by ensuring secured, stable, and growing positions for its employees (mean = 3.75). Apart from that, these phenomena indicated that people think they have good jobs and also personal developments in the field which driven continuous growth in the world of electronics and relevant products. Through a rated mean score of 3.56 and contributing substantially, the indication of the possibilities of not only being around different markets and cultures but also having international job experience became second. Along with this, employees would be able to engage in foreign market relations and indeed, they would get the advantage of diverse cross-cultural interactions that would allow the electronics sector to broaden worldwide. With a mean score of 3.50, the third-placed factor, was the broad industry career options avalable besides positions in technical areas. The factor highlighted the industry's wide diversity of career paths, including those in management, marketing, and research, thus increasing the person's opportunity.

Career advancement is majorly influenced by technological changes, especially in a field that is competitive and fast-paced as electronics. Obtaining an average score of 3.84, the possibility to specialize in newer areas like AI, ML, IoT, and renewable energy was the top-ranked factor in this category. Innovation is no longer an option but a reality, and technology has made that possible by bringing new career opportunities to people who are already in the field. The 2nd place indication of online courses and certificates with a mean score of 3.45 showed that employees had the know-how of upskilling and constant learning of the latest techniques to become one of the remaining ones in their field as technology is always improving. According to the third indicator, the ability to communicate with other people and research the opening of the offices abroad (mean = 3.43) was the main reason why technology had become a common term that describes flexibility at work, in particular at the global level.

Career opportunities are also heavily affected by the accessibility of education and training. With a mean of 3.84, it meant a significant contribution. The growth of employability and the possibility of the advancement of career options through continuous education and training was the first ranking indicator in this field. In the electronics industry, workers see education and continual skill development as essential tools for career growth. The mean score of 3.71 drove the development of both hard and soft skills to become the second highest, which showed more abstraction, thus signifying the depth of skill development that went beyond the acquisition of technical skills to include communication, cooperation, and leadership. The exchange of pointers that professional networks and mentorship possess in controlling the flow of career development and creating jobs was the third indicator, networking with mentors and professionals (mean = 3.62) interpreted this point effectively.

Organizational strategies also played a crucial role in shaping career opportunities. The highest-rated indicator in this category was professional growth through leadership training, skills seminars, and mentoring programs, with a mean score of 3.73, which demonstrated a high contribution. This suggested that employees benefited from organizational initiatives aimed at enhancing leadership and other professional skills, supporting their career advancement in a competitive environment. The indicator identifying career paths and progression opportunities through career pathing frameworks and succession planning was ranked second, with a mean of 3.69, indicating that employees found structured career planning within organizations to be instrumental in their professional growth. This structured approach helped individuals understand their potential trajectories and the steps required to achieve their career goals. The third-ranked factor, supporting diverse backgrounds for professional advancement (mean = 3.49), showed that organizations increasingly focused on diversity and inclusion as part of their career development strategies, providing opportunities for employees from various backgrounds to succeed.

The results showed that all four factors - technological advancement, industry demand, education, training access, and organizational strategies - were favorable to employment prospects in Guangdong Province, China's electronics sector. Workers in an industry characterized by stable demand, ongoing technological improvements, educational availability, and strategic support to the organization could enjoy higher levels of job satisfaction. Nevertheless, according to the researchers, it would be necessary for workers to opt for networking, develop skills, and continual learning to compete well in the era of a globalized world, for them to make the best out of these opportunities. Finally, the organizational sector should take extra steps to support employees not only with structured professional development programs but also with career diversity and specialization in the use of cutting-edge technology.

As stated by the report, secure employment and occupational promotion were very valued. It was from the study of Li et al. (2020), which emphasized the requirement for competent workers due to the market dynamics and technological innovations that the electronics sector brings. As from Collins et al. (2021), new jobs such as AI, IoT, and big data analytics emphasize the fact that people need to be adaptable to the market and to remain up-to-date in case there are changes that might render them less relevant in a very fast-paced environment. In connection with Bahroun et al. (2023), who argued that the expansion of international trade and cross-functional positions create the need for professionals

who possess versatile skills that enable them to deal with different cultural and business situations, the study highlights the importance of global work exposure and varied job options.

The results of the research indicated that individuals think very hard and in a very technological environment to have a hope for the future. In addition, Liu et al. (2020) covered the effects of AI, IoT, and 5G vis-a-vis the electronics sector and emphasized the transformative capacities of these technologies vis-a-vis future job trajectories. These factors, in turn, were the reasons for the increasing interest of employees in the programs. The research favored creative men's minds by continuing education and transformation programs, which provided a theoretical framework for the effective adjustment of skills to changing work tasks and, thus, furthering practical skill enhancement along diverse directions.

The study underlined the importance of both employment and education through networking and education, which, as shown by the previous research, was the case. The results of the study were parallel with the research of Chen (2019) and the governmental projects which promoted STEM education, clearly pointing out that intense educational programs may have significantly increased the skills of the employees. Additionally, the study was concentrated on the development of both technical and soft skills which was in line with Wang and Zhang's (2019) findings of the necessity for the electronics industry to adopt a combination of hard and soft skills such as leadership, teamwork, and communication circling the wheel of usable cooperation and innovation.

The findings of the research correspond to the development of career paths, succession planning, and leadership development as crucial elements for advancing professionally. This was very similar to the earlier research, which showed that companies in the electronics sector (Faizi & Umar, 2021) dedicated themselves to supervising the processes of promotion and employee development so as to get and retain high-performing talent. Pertaining to the importance of inclusive practices in career development, the study was in line with Bahroun et al. (2023) as well, who mention corporate diversity and inclusion as vital factors that invigorate employee morale and cause innovation.

People can better navigate career opportunities and meet industry requirements, thus, by these skills in electronics along with employability skills, the work will be competent. The correlation of learning between academic reactor and historical practice was the basis of the research and its cited literature (Singh et al., 2023; Almulla & Al-Rahmi, 2023). The employees and the organizations may succeed in the high-drive electronics industry by establishing a setting of enduring growth and adaptation.

5.3. Significant Alignment between the Level of Competencies in Employability Skills and the Degree of Contribution of Influencers on Career Opportunities

The results of the survey of participants in the electronics sector of Guangdong Province showed that different problem-solving and decision-making abilities had different effects on employment prospects. Identifying, assessing, and resolving technical challenges were strongly correlated with diversified employment possibilities ($p = 0.000$) and international work experience ($p = 0.003$), but not significantly correlated with stable employment ($p = 0.176$). Data collection and analysis was associated with positions that were more general than technical domains ($p = 0.004$), but not substantially associated with stable employment ($p = 0.380$) or international work experience ($p = 0.124$). Root cause analysis and risk management were strongly correlated with stable employment ($p = 0.000$), but they were not significantly correlated with diverse positions or international possibilities. Problem-solving and decision-making abilities were generally more closely linked to foreign exposure and career diversity than to landing steady technical jobs, underscoring the dynamic character of the electronics sector and the significance of flexibility in career planning.

Furthermore, the findings indicated that decision-making and problem-solving abilities influence job prospects associated with technology innovations to differing degrees. There was a high correlation between overcoming technical issues and worldwide prospects and remote work flexibility ($p = 0.006$), but not with career specialty ($p = 0.549$) or access to educational resources ($p = 0.464$). Likewise, collecting and evaluating data was much more in line with global prospects than with specialization ($p = 0.001$). While access to online training was still negligible, examining the underlying causes revealed strong alignment with both global flexibility ($p = 0.047$) and specialized career pathways ($p = 0.000$). According to the data, these abilities were generally more important in generating flexible and global employment alternatives than in encouraging specialization or facilitating access to training materials.

The results also showed that decision-making and problem-solving abilities had conflicting effects on career development access to education and training. Finding and fixing technical challenges was not significantly related to improving networking or employability, but it was significantly related to developing soft skills like communication and leadership ($p = 0.025$). Data collection and analysis was significantly associated with improving employability ($p = 0.003$), but not with skill development or networking. Examining the underlying reasons was significantly associated with improving employability ($p = 0.000$), however it was not significantly associated with networking or soft skill development. Overall, the evidence points to these skills having a greater influence on skill development and employability than networking opportunities.

Lastly, the results showed that organizational methods for professional growth and problem-solving and decision-making abilities were not always in agreement. Technical difficulty recognition and resolution were significantly correlated with career path and advancement prospects ($p = 0.023$), but not with initiatives for professional growth or diversity support. While gathering and evaluating data was in line with promoting development for people from different backgrounds ($p = 0.043$), it was not substantially in line with career pathing or professional growth. Examining the underlying reasons was substantially consistent with recognizing career advancement ($p = 0.047$) and professional growth prospects ($p = 0.000$). According to these findings, some talents help people identify their career paths and develop professionally, but were not consisted in assisting to more comprehensive organizational strategies for efforts promoting diversity in advancement.

Table 3. Significant Alignment-Employability Skills (Problem Solving and Decision-Making) and Influencers on Career Opportunities Among Employees of the Electronics Industry

ES	IOCO	Spearman rho p-value	p-Value Interpretation	Null Hypothesis Decision
PSDM1	ID1	0.176	No significant alignment	Accept
	ID2	0.000	Significant alignment	Reject
	ID3	0.003	Significant alignment	Reject
PSDM2	ID1	0.380	No significant alignment	Accept
	ID2	0.004	Significant alignment	Reject
	ID3	0.124	No significant alignment	Accept
PSDM3	ID1	0.000	Significant alignment	Reject
	ID2	0.179	No significant alignment	Accept
	ID3	0.140	No significant alignment	Accept
PSDM	ID	No Significant Alignment		Accept
PSDM1	TA1	0.549	No significant alignment	Accept
	TA2	0.006	Significant alignment	Reject
	TA3	0.464	No significant alignment	Accept
PSDM2	TA1	0.137	No significant alignment	Accept
	TA2	0.001	Significant alignment	Reject
	TA3	0.926	No significant alignment	Accept
PSDM3	TA1	0.000	Significant alignment	Reject
	TA2	0.047	Significant alignment	Reject
	TA3	0.256	No significant alignment	Accept
PSDM	TA	No Significant Alignment		Accept
PSDM1	AET1	0.057	No significant alignment	Accept
	AET2	0.077	No significant alignment	Accept
	AET3	0.025	Significant alignment	Reject
PSDM2	AET1	0.003	Significant alignment	Reject
	AET2	0.167	No significant alignment	Accept
	AET3	0.724	No significant alignment	Accept
PSDM3	AET1	0.000	Significant alignment	Reject
	AET2	0.562	No significant alignment	Accept
	AET3	0.373	No significant alignment	Accept
PSDM	AET	No Significant Alignment		Accept
PSDM1	OS1	0.352	No significant alignment	Accept
	OS2	0.023	Significant alignment	Reject
	OS3	0.087	No significant alignment	Accept
PSDM2	OS1	0.117	No significant alignment	Accept
	OS2	0.560	No significant alignment	Accept
	OS3	0.043	Significant alignment	Reject
PSDM3	OS1	0.000	Significant alignment	Reject
	OS2	0.047	Significant alignment	Reject
	OS3	0.196	No significant alignment	Accept
PSDM	OS	No Significant Alignment		Accept

The overall results showed that in Guangdong's electronics industry, the ability to solve problems and make decisions was more in line with global chances and career versatility than in technical roles. In particular, abilities like identifying the underlying causes of problems greatly aided in career advancement and professional development, whereas data analysis improved employability but had no effect on wider networking. Although these abilities made it easier to access a variety of professional routes and international flexibility, they don't always support organizational strategies for programs aimed at promoting diverse growth.

Though there were some clear discrepancies, the research generally supported the findings about how employability skills (such as problem-solving and decision-making) align with job opportunities in the electronics industry.

According to Zapata-Cantú (2022), the findings that problem-solving and decision-making abilities were more compatible with career diversity and international work experience than with stable technical jobs are supported by the significance of ongoing learning and upskilling to adapt to technological developments. The findings that addressing technical problems and analyzing data were connected to more extensive career possibilities and global prospects are also supported by Masato & Kim (2023), who emphasized that people with a combination of technical and soft abilities were well-positioned for a variety of professional routes.

The findings about stable employment marginally deviated from the literature. Although both technical and non-technical skills are important for employability in the electronics industry, there is no discernible correlation between these abilities (such as addressing technical problems) and stable employment (Gajdzik & Wolniak, 2022). This implied that although the business appreciates these skills, they might not ensure steady work in technical positions; instead, they provide flexibility and more expansive career options.

Contrary to Liu et al. (2022), who pointed out that people must have particular credentials in order to take advantage of chances in the electronics industry, the results implied that

problem-solving and decision-making abilities were not related to job specialty. However, the results demonstrated that these abilities were highly compatible with remote work and global flexibility, which was consistent with the literature's focus on adaptation in a sector that is changing quickly.

The results showed that these talents had a mixed effect on career development and access to training materials; they significantly aligned with the development of leadership and communication skills but not with networking. This was in line with Zapata-Cantú (2022), who emphasized that workers must always improve their skills in order to perform better, even though the literature does not emphasize how important networking is for employability.

Since problem-solving abilities were connected to determining career routes and professional development, the results supported Masato & Kim's (2023) assertion that technical and soft skills are crucial for career advancement. There might be a discrepancy between organizational goals and the skill sets being created, nevertheless, given the absence of notable alignment with organizational policies for promoting various backgrounds.

In conclusion, the literature acknowledged the value of problem-solving and decision-making abilities in fostering professional development, career diversity, and global opportunities. Moreover, it identified the areas in which these abilities are less significant, like obtaining stable employment or encouraging specialization.

Table 4. Significant Alignment-Employability Skills (Teamwork and Collaboration) and Influencers on Career Opportunities Among Employees of the Electronics Industry

ES	IOCO	Spearman rho p-value	p-Value Interpretation	Null Hypothesis Decision
TC1	ID1	0.396	No significant alignment	Accept
	ID2	0.001	Significant alignment	Reject
	ID3	0.005	Significant alignment	Reject
TC2	ID1	0.040	Significant alignment	Reject
	ID2	0.062	No significant alignment	Accept
	ID3	0.089	No significant alignment	Accept
TC3	ID1	0.001	Significant alignment	Reject
	ID2	0.033	Significant alignment	Reject
	ID3	0.017	Significant alignment	Reject
TC	ID	Significant Alignment		Reject
TC1	TA1	0.142	No significant alignment	Accept
	TA2	0.011	Significant alignment	Reject
	TA3	0.644	No significant alignment	Accept
TC2	TA1	0.240	No significant alignment	Accept
	TA2	0.001	Significant alignment	Reject
	TA3	0.841	No significant alignment	Accept
TC3	TA1	0.000	Significant alignment	Reject
	TA2	0.249	No significant alignment	Accept
	TA3	0.179	No significant alignment	Accept
TC	TA	No Significant Alignment		Accept
TC1	AET1	0.139	No significant alignment	Accept
	AET2	0.160	No significant alignment	Accept
	AET3	0.562	No significant alignment	Accept
TC2	AET1	0.017	Significant alignment	Reject
	AET2	0.535	No significant alignment	Accept
	AET3	0.553	No significant alignment	Accept
TC3	AET1	0.000	Significant alignment	Reject
	AET2	0.149	No significant alignment	Accept
	AET3	0.002	Significant alignment	Reject
TC	AET	No Significant Alignment		Accept
TC1	OS1	0.006	Significant alignment	Reject
	OS2	0.336	No significant alignment	Accept
	OS3	0.037	Significant alignment	Reject
TC2	OS1	0.094	No significant alignment	Accept
	OS2	0.293	No significant alignment	Accept
	OS3	0.039	Significant alignment	Reject
TC3	OS1	0.017	Significant alignment	Reject
	OS2	0.000	Significant alignment	Reject
	OS3	0.076	No significant alignment	Accept
TC	OS	Significant Alignment		Reject

The study of respondents from Guangdong Province's electronics industry highlighted the changing impact of teamwork and collaboration on career opportunities. Communicating technical knowledge showed no significant alignment with steady employment ($p = 0.396$), but it was significantly aligned with diverse roles ($p = 0.001$) and global work experience ($p = 0.005$). This suggested that while technical communication was essential for navigating various

job functions, it may have not directly contributed to job stability. Effective collaboration significantly aligned with steady employment ($p = 0.040$), but not with career diversity ($p = 0.062$) or global opportunities ($p = 0.089$). This indicated that teamwork was crucial for securing stable positions, although it may have not necessarily led to a broader range of career options. Adapting to team dynamics strongly correlated with steady employment ($p = 0.001$), diverse roles ($p = 0.033$), and global experience ($p = 0.017$). Overall, teamwork and adaptability played a crucial role in career growth and international exposure, while technical communication supported career diversity.

Moreover, the findings also revealed mixed impacts of teamwork and collaboration on technological advancement. Communicating technical knowledge did not significantly align with career specialization in fields like AI and IoT ($p = 0.142$), but it significantly supported global work flexibility ($p = 0.011$), though it showed no connection with access to online training ($p = 0.644$). Effective collaboration also showed no significant alignment with career specialization ($p = 0.240$) but was highly aligned with global flexibility ($p = 0.001$), while online training access remained insignificant ($p = 0.841$). Adapting to team dynamics strongly aligns with career specialization ($p = 0.000$), but not with global professional opportunities ($p = 0.249$) or access to training resources ($p = 0.179$). Overall, collaboration and adaptability were key to technological specialization and remote work flexibility, while access to training showed limited alignment.

Likewise, the results of the study indicated diverse impacts of teamwork and collaboration on access to education and training. Communicating technical knowledge did not significantly enhance employability ($p = 0.139$), networking ($p = 0.160$), or skill development ($p = 0.562$). However, effective collaboration significantly enhanced employability ($p = 0.017$) but did not show significant alignment with networking ($p = 0.535$) or skill development ($p = 0.553$). Adapting to team dynamics and technological changes significantly improved employability ($p = 0.000$) and skill development ($p = 0.002$) but had no significant effect on networking opportunities ($p = 0.149$). Overall, adaptability and collaboration were key to improving employability and skill development, while networking opportunities remained less influenced.

Lastly, the results stressed how teamwork and collaboration influence organizational strategies for professional development. Communicating technical knowledge significantly aligned with professional growth opportunities through leadership training and mentoring ($p = 0.006$) and supporting diverse backgrounds for advancement ($p = 0.037$), but it did not significantly align with career pathing ($p = 0.336$). Effective collaboration did not significantly enhance career progression frameworks ($p = 0.293$) or professional growth initiatives ($p = 0.094$), though it significantly supported diversity in professional advancement ($p = 0.039$). The team dynamic played an essential role in development, hence both professional skills ($p=0.017$) and career pathing ($p=0.000$), even if the background alignment of diverse employees was a minor ($p=0.076$) issue. Furthermore, team cooperation and adaptability were two crucial cornerstones for career development, the creation of career development plans, and diversity management in this industry.

Overall, the study generally showed that teamwork and cooperation were vital for career development and flexibility in the electronics sector in Guangdong Province, thus, significantly, improving employability and supporting the diverse backgrounds. Even though dynamic collaboration brought professional development and versatility in specialty, thus career growth, none of the two had a high correspondence to networking possibilities or career pathing techniques. The evidence pointed at teamwork and adaptability as the means for international exposure and diverse roles but they were not part of the consistent structured improvement frameworks.

The research on respondents from Guangdong Province's electronics industry brought subtle insights pertaining to the impacts of teamwork, collaboration, and technical communication on the achievement of career opportunities and professional development. The results were consistent with the majority of the literature and thus, supported the belief that these skills were the basis of a job search in a competitive market. Zapata-Cantú (2022) articulated the need for the ongoing learning and in turn, skill acquisition, in the industries such as electronics that are developing at a fast pace. The study also underscored the idea that the employees who could adapt to the team dynamics were the ones who maintained their jobs steadily, diversify their careers and secure international opportunities. This correlation implied that employees who were able to successfully navigate team interactions were more likely to have stable jobs and be able to explore a variety of career paths. Nevertheless, the failure to establish a close connection between technical communication and employment stability, as opposed to the overall emphasis on communication as a key employability skill, suggested the requirement for additional training in communication to help increase job stability.

Gajdzik and Wolniak (2022) pointed out that the technical and soft skills are both important which was aligned with the study's findings of perceptive teamwork and adaptability as the two factors that contribute to professional development and diversity. The research indicated that an efficient and steady way to work with others was a strong predictor of regular employment; however, this was not true to career diversity, which revealed the difference in teamwork's place in an organization in terms of job continuity and presence in other roles. In other terms, it represented the fact that teamwork could guarantee job security which was the main thought, but on the other hand, it was not enough to be able to find alternative career opportunities. Masato & Kim (2023) thought that those who are most comfortable with the shift to multiple career tracks would likely be the ones taking advantage of this varied job range, which the study exemplified by showing the strong influence of flexibility in career specialization.

On the other hand, although access to education and training in professional development is often highlighted as the most valuable part of the literature, the study showed conflicting results. Aside from adjusting to team dynamics which are employability and skill improvement, the functional role of teambased techniques in terms of the network had been identified to be one of the reasons to believe that professional connections sometimes are largely nonexisting.

In conclusion, the results were generally in line with the previous literature where teamwork, collaboration and adaptability are vital to the career development of experienced customs agents in the electronics industry. Nevertheless, some sectors such as the effect of technical communication on workers' careers and opportunities to

engage in social networking, were the issues of the gap that ought to be closed, thus necessitating further better harmony between skills and industry needs is achieved.

Table 5. Significant Alignment-Employability Skills (Communication) and Influencers on Career Opportunities Among Employees of the Electronics Industry

ES	IOCO	Spearman rho p-value	p-Value Interpretation	Null Hypothesis Decision
C1	ID1	0.000	Significant alignment	Reject
	ID2	0.295	No significant alignment	Accept
	ID3	0.131	No significant alignment	Accept
C2	ID1	0.954	No significant alignment	Accept
	ID2	0.002	Significant alignment	Reject
	ID3	0.131	No significant alignment	Accept
C3	ID1	0.001	Significant alignment	Reject
	ID2	0.033	Significant alignment	Reject
	ID3	0.017	Significant alignment	Reject
C	ID	Significant Alignment		Reject
C1	TA1	0.000	Significant alignment	Reject
	TA2	0.072	No significant alignment	Accept
	TA3	0.131	No significant alignment	Accept
C2	TA1	0.032	Significant alignment	Reject
	TA2	0.002	Significant alignment	Reject
	TA3	0.548	No significant alignment	Accept
C3	TA1	0.511	No significant alignment	Accept
	TA2	0.002	Significant alignment	Reject
	TA3	0.883	No significant alignment	Accept
C	TA	No Significant Alignment		Accept
C1	AET1	0.009	Significant alignment	Reject
	AET2	0.454	No significant alignment	Accept
	AET3	0.556	No significant alignment	Accept
C2	AET1	0.054	No significant alignment	Accept
	AET2	0.084	No significant alignment	Accept
	AET3	0.886	No significant alignment	Accept
C3	AET1	0.430	No significant alignment	Accept
	AET2	0.005	Significant alignment	Reject
	AET3	0.021	Significant alignment	Reject
C	AET	No Significant Alignment		Accept
C1	OS1	0.053	No significant alignment	Accept
	OS2	0.008	Significant alignment	Reject
	OS3	0.879	No significant alignment	Accept
C2	OS1	0.042	Significant alignment	Reject
	OS2	0.803	No significant alignment	Accept
	OS3	0.008	Significant alignment	Reject
C3	OS1	0.301	No significant alignment	Accept
	OS2	0.100	No significant alignment	Accept
	OS3	0.001	Significant alignment	Reject
C	OS	No Significant Alignment		Accept

The feedback received from the respondents working in the electronics sector in Guangdong Province provided the crucial information that communication is a very important part of people's careers. However, a brief report on the sharing of technical facts is associated with employment (p=0.000), which suggests that this technique contributes to employment security and progress, even though it is not related to variation in employment measures (p = 0.295) or moving abroad for a job (p = 0.131). In contrast, the strong correlation of clear communication with diverse audience suggestions of adaptability in communication allowed an individual to secure the jobs even beyond technical roles (p = 0.002). Additionally, listening and responding appropriately demonstrated strong alignment with both steady employment (p = 0.001), diverse career paths (p = 0.033), and global work experience (p = 0.017). Overall, these results highlighted that while technical communication is crucial for job stability, broader communication competencies are key to navigating diverse career opportunities in the electronics sector.

Further, the study's findings highlighted a relationship, albeit a complicated one, between communication skills and technological advancement among respondents in the electronics industry of the Guangdong province. Communicating complex tech-related content was closely correlated with the possibility to major in areas like AI, and IoT, which are newborn fields, p = 0.000. Moreover, being successful in exchanging ideas with different audiences was also strongly associated with chances to specialize (p = 0.032). True, the capability to perform jobs globally was connected to good communication skills (p = 0.002), but not the case with speech or listening abilities in technical settings. listening and responding appropriately had statistically

significant alignment with the ability to work globally ($p = 0.002$). Overall, these results emphasize that while strong communication abilities supported specialization in technology, access to training resources remained less impacted by communication skills alone.

Moreover, the results disclosed that effective communication played a crucial role in enhancing education and training within the electronics industry of Guangdong Province. Specifically, the ability to convey complex technical information clearly was significantly aligned with advancing career opportunities ($p = 0.009$). Conversely, networking and skill development did not show significant alignment with communication skills. Effective communication with diverse audiences was not linked to career advancement, networking, and technical and soft skills development. Additionally, listening and responding appropriately was associated significantly with networking ($p = 0.005$), and developing technical and soft skills ($p = 0.021$). Overall, these results underscored the necessity of strong communication skills in navigating career advancement, networking, and holistic skill development.

Finally, the findings indicated different levels of alignment between the communication skills and the organizational strategies in the electronics industry of Guangdong Province. Notably, the information spanning complex technical fields was on a par with career path and progression opportunities identification ($p = 0.008$). Moreover, effective communication with different audiences showed a considerable correlation of the initiatives for professional growth ($p = 0.042$) and the broader population for professional development ($p = 0.008$). Listening and responding appropriately was related to the support of diverse backgrounds for the advancement ($p = 0.001$), however, in general, career progression strategies were little or no communication skill-oriented.

In summary, the data showed that good communication skills were vitally important to land steady jobs and to drive career progression in Guangdong's electronics industry. The transmission of complex technical information serves as a driving force for job security and furthermore, promotes specialization in forthcoming fields and career routes. Broad communication skills, like interface with varied audiences, are very much essential for entering various roles and helping one's career to take off. In addition, the study revealed that although communication is instrumental in career development, its effect on networking and organizational advancement strategies is still minimal, thus indicating that organizations need to upgrade their systems of support.

The data from the electronics industry research showed that communication to a great extent shaped job prospects, thus giving new perspectives and resembling the findings of previous projects of this kind. In particular, the strong correlation of effective communication of technical complex information with steady employment is witnessed in the workplace and shows the importance of that skill for job security and promotion Zapata-Cantú's idea of lifelong learning highlighted as a result of the fast-shifting electronics industry. While this corpus of data, which is very important for job security, as mentioned, has little to do with global work experiences or job variabilities ($p = 0.295$), thus it is clear that it is necessary but not enough for a general career path. These were also the findings of Gajdzik & Wolniak (2022) concerning the importance of soft skills.

Masato & Kim's (2023) assertion that communication flexibility is empowering even beyond technical professions is true. Conversely, the mastery of successful communication with different audiences is a factor that is highly in line with the opportunities for the corresponding variety of employment sectors. Further to this, the results indicate that listening to and responding correctly to a problem is a fundamental skill required in all kinds of jobs, whether you are working locally or internationally. This means that successful graduates have to exhibit the required interpersonal skills in every type of project, which was well-defined by the study of Liu et al. (2022), wherein the industry was depicted as a field where different roles need communication skills.

The study also demonstrated the intricate connection between technological growth and communication skills. The literature indicating that technical communication improves job opportunities in tech-driven sectors was consistent with the noteworthy alignment of communicating technical information with specialization in domains such as AI and IoT (Chuang, 2024). According to Piorkowski (2021), having strong communication and listening abilities were associated with flexibility in international work chances. Although there was no discernible relationship between online resource access and communication, it did suggest that characteristics other than communication abilities affect access to training materials.

Furthermore, the findings showed that improving education and training in the electronics sector requires effective communication. Its significance in professional development was highlighted by the close connection between communicating complicated knowledge and expanding career prospects. This was consistent with the larger educational necessity to match curricula with industry demands to close the skills gap. The fact that networking and skill development do not significantly align, however, indicates that although communication is important, other factors also play a role in these routes.

Lastly, the necessity for firms to improve employee support is highlighted by the differing degrees of alignment between organizational strategies and communication abilities. The strong link that exists between employee training programs and communication skills means that organizations should place a greater emphasis on communication training as a way of encouraging employee development, on the one hand, while the strong link between career path identification and the transfer of technical information points to the significance of IT for professional communication. At the end of the day, these results would underline how valuable communication skills are in finding a job and adapting to the ever-changing electronics industry.

Table 6. Significant Alignment-Employability Skills (Technology) and Influencers on Career Opportunities Among Employees of the Electronics Industry

ES	IOCO	Spearman rho p-value	p-Value Interpretation	Null Hypothesis Decision
T1	ID1	0.036	significant alignment	Reject
	ID2	0.101	No Significant alignment	Accept
	ID3	0.000	Significant alignment	Reject
T2	ID1	0.033	significant alignment	Reject
	ID2	0.084	No Significant alignment	Accept
	ID3	0.004	Significant alignment	Reject
T3	ID1	0.000	Significant alignment	Reject
	ID2	0.014	Significant alignment	Reject
	ID3	0.093	No significant alignment	Accept
T	ID	Significant Alignment		Reject
T1	TA1	0.631	No significant alignment	Accept
	TA2	0.026	Significant alignment	Reject
	TA3	0.185	No significant alignment	Accept
T2	TA1	0.930	No significant alignment	Accept
	TA2	0.000	Significant alignment	Reject
	TA3	0.084	No significant alignment	Accept
T3	TA1	0.000	Significant alignment	Reject
	TA2	0.798	No significant alignment	Accept
	TA3	0.009	Significant alignment	Reject
T	TA	No Significant Alignment		Accept
T1	AET1	0.182	No significant alignment	Accept
	AET2	0.407	No significant alignment	Accept
	AET3	0.039	Significant alignment	Reject
T2	AET1	0.128	No significant alignment	Accept
	AET2	0.897	No significant alignment	Accept
	AET3	0.003	Significant alignment	Reject
T3	AET1	0.000	Significant alignment	Reject
	AET2	0.002	Significant alignment	Reject
	AET3	0.006	Significant alignment	Reject
T	AET	Significant Alignment		Reject
T1	OS1	0.046	Significant alignment	Reject
	OS2	0.123	No significant alignment	Accept
	OS3	0.084	No significant alignment	Accept
T2	OS1	0.174	No significant alignment	Accept
	OS2	0.019	Significant alignment	Reject
	OS3	0.013	Significant alignment	Reject
T3	OS1	0.000	Significant alignment	Reject
	OS2	0.000	Significant alignment	Reject
	OS3	0.019	Significant alignment	Reject
T	OS	Significant Alignment		Reject

The findings from the respondents in Guangdong Province's electronics industry revealed a strong alignment between technical skills and career opportunities in the sector. Diagnosing and resolving hardware-related issues showed significant alignment with steady employment and career growth ($p = 0.036$) and global work experience ($p = 0.000$), emphasizing the critical role of technical expertise in enhancing employability and adapting to the demands of a rapidly evolving job market. However, this skill did not significantly align with diverse employment options ($p = 0.101$), indicating that technical proficiency alone may have not opened its doors to non-technical roles such as management and marketing. The ability to integrate and operate physical components with software systems also aligned with steady employment ($p = 0.033$) and global work experience ($p = 0.004$), reinforcing the importance of system architecture knowledge for job stability. Moreover, adapting to new tools and technologies, such as semiconductor advancements, shows strong alignment with both career growth ($p = 0.000$) and diverse employment options ($p = 0.014$), suggesting that those who keep pace with technological changes are better positioned for a variety of roles, including global work opportunities. Overall, the aforementioned results showed that both technical skills and flexibility were needed for improvement in the career of the electronics industry.

Further, the results pointed out the varying association of technological skills on technological advancement. Diagnosing and resolving hardware-related issues showed no significant alignment with specializing in advanced fields like AI and IoT ($p = 0.631$), though there was a significant relationship with global professional opportunities ($p = 0.026$), suggesting that problem-solving skills in hardware could facilitate remote and international work. Integrating and operating physical components with software systems demonstrated a strong alignment with flexibility to explore global opportunities ($p = 0.000$), but showed no significant link to specialization in emerging fields ($p = 0.930$). On the

other hand, adapting to new tools and technologies, such as IoT and semiconductor advancements, was significantly aligned with opportunities to specialize in emerging areas ($p = 0.000$) and access to online certifications ($p = 0.009$), indicating that staying updated with technological trends was key to career growth. In a nutshell, the findings highlighted that the technical knowledge developed in the technological sector creates the pathway to work globally but individual learning and technical adaptation are driven essential for career mastery and development.

Furthermore, the practical findings of this study also led to obtaining some crucial insights into the role of education and training in career advancement. Troubleshooting and resolving hardware-related issues is not in a significant way related to employability and networking opportunities, although it is highly correlated to the development of both technical and soft skills ($p = 0.039$), thus, it can be said that hands-on experience is a significant factor in professional well-rounded growth. In contrast, the latter, the integration of physical components with software systems, is in no way linked with employability or networking but on the contrary with the development of the crucial skills like leadership and communication ($p = 0.003$). Adapting to new tools and technologies demonstrates a significant alignment with employability and career advancement ($p = 0.000$), networking opportunities ($p = 0.002$), and skill development ($p = 0.006$), underscoring the importance of staying updated with technological advancements. Overall, the results highlight that while employability may not always directly correlate with training, continuous learning, and skill development are crucial for professional growth in the electronics industry.

In summary, the information also demonstrated a strong correlation between organizational strategies and certain elements of career development. The usefulness of organized growth activities in the industry was demonstrated by the significant correlation ($p = 0.046$) between diagnosing hardware-related issues and professional development through leadership training and mentorship programs. Supporting different origins and identifying career paths, however, did not significantly align. However, integrating software and hardware was in line with diversity support programs ($p = 0.013$) and career pathing frameworks ($p = 0.019$), suggesting a strong connection between inclusive organizational assistance and strategic career planning. Accepting technological change is essential for career success in this field, as seen by the strong alignment of adapting to new tools and technologies across all elements, especially in leadership development and career promotion.

The results obtained convincingly showed the significance of recognizing hardware issues and successfully mixing software systems for a long-lasting job and career enhancement, thus, there was a clear connection between technical skills and job opportunities that could be made in the e-industry in Guangdong Province. Adaptability to new technologies greatly improved the possibilities of specialization, international employment, and career advancement, nevertheless, even though technical proficiency might have not resulted in various roles. Organizational skills set that supports inclusion and leadership were also necessary for professional development by focusing on the interaction of institutional programs and human abilities in the establishment of successful career paths.

Aligning with past studies, the data collected from the respondents of Guangdong Province's electronics industry revealed that there was a strong link between the possession of technical skills and employment opportunities. According to Gajdzik & Wolniak (2022), for example, employability skills involve both technical knowledge and non-technics; therefore, the conclusion that diagnosing hardware issues was linked with career growth but not with some job options ($p = 0.101$) stayed intact. This was noted by Masato and Kim (2023) who emphasized the significance of soft and transferable skills for a variety of careers suggesting that even though technical competence is the basis of job security, it may have not necessarily mean wider job options. Moreover, Liu et al. (2022) highlighted a wide range of skills needed in different roles in the sector, which was the reason why sustained employment required the integration of physical components with software systems ($p = 0.033$).

According to Zapata-Cantú (2022), education and ongoing development constitute a compelling basis for the survival of the electronics industry through the innovative sector by presenting the connection between the career upliftment and the adoption of IoT and the ability to acclimate the new tools and technologies. ($p = 0.000$). The importance of lifelong learning was thereby pointed out since the workers who were tech-savvy enough to stay abreast of technology trends, thus, could do better in grabbing the provided career advancement opportunities, which agreed with the company's policy of perpetual technology adaptation.

The report also reaffirmed how important organizational strategies were to career advancement. The usefulness of organized development initiatives in the sector was demonstrated by the considerable alignment between leadership training and mentoring programs and diagnosing hardware-related issues ($p = 0.046$), which was in line with the study of Liu et al. (2022). Limited alignment with diversity programs and career path identification, however, suggested some areas where employers could need to improve support for inclusion and career advancement.

Overall, the results supported the literature by highlighting the value of technical proficiency, flexibility, and lifelong learning for professional advancement in the electronics sector. The connection between professional development and organizational strategy emphasized the need of organized efforts in promoting career progression.

5.4. Digital Talent Development Upskilling Strategy

Based on the study findings, the researcher proposes a digital talent development upskilling strategy in the electronics industry from the perspectives of government agencies, educational institutions, electronics industry associations, electronics companies, individual employees, as well as investors and stakeholders. The details of this strategy are shown in Figure 1.

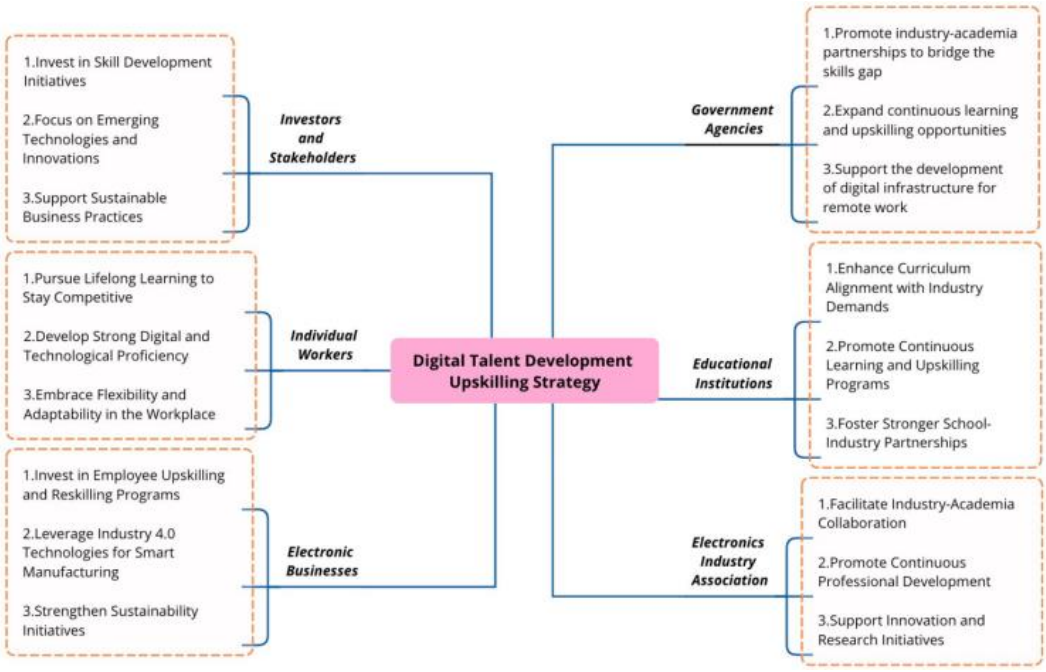

Figure 1. Digital Talent Development Upskilling Strategy

6. Conclusions and Recommendations

6.1. Conclusions

The workers in the electronics sector of Guangdong had a basic level of technical problem-solving, but they were significantly lacking in soft skills (communication, cooperation) as well as advanced technical skills (risk management, data analysis, etc.). Such discrepancies, as illustrated by previous studies, showed that to remain competitive, the sectors that were constantly improving their technical fields required henceforth, the capacity to develop for both technical and cross-functional skills (Chen, 2020; Li & Zhang, 2021). Similarly, the study highligted the necessity of such training programs which were based on earlier findings that were based in this report. The conclusions also emphasized the necessity of targeted skill development, which would have been essential for workers to adapt to the evolving requirements of the sector (Wang & Sun, 2019).

The same statistics which accounted for industry demand, technological developments, and access to education and training all towered up or towered down the employment opportunities in electronics fabrication. These results concured with another study that underscored the fact that the relevance of skills and changes of tech were pivotal in career mobility in the IT sector (Sony & Mekoth, 2022). Similarly, Li's (2022) investigation stated that workers valued the security of their jobs, promotions, and especially the mastery of the developing technology fields but were disappointed due to the physical and technical limitations of the infrastructures when it came to remote work. These findings, which looked at the importance of technological advancement and industry demand were in line with the findings from a larger body of literature (Lee, 2019), which emphasized that the career influencers were vital in supervising human development at work and highlighted the necessity of organizational support and skill development training.

The skills of Decision-making and Problem-solving that were initially acquired by the employee pinned employability and skill development. Nevertheless, these diverse effects were recorded alongside organizational practices, career options, and jobs security. According to the research, by Yang et al. (2020), technical troubleshooting capabilities enabled individuals to follow many career paths, although they did not provide job security. The study recognizes the importance of problem-solving skills but they may not have been enough to encompass the complex influence on job stability. Earlier research reported that the study might have considered emphasizing these differences more clearly (Chen, 2019).

In various aspects of technology, communication, teamwork, and adaptability helped workers remain in stable jobs, although they did not have so much of a broader effect on global opportunities or many career paths. This concurred with the research results of Lee (2019), which emphasized the importance of flexibility in skill development and employability but noted no effect on wider networking opportunities. While the study underlined the need for collaboration and flexibility as critical skills for the industry, it corroborated the fact that such skills were drivers of professional development but came with the caveat of limited career mobility (Chuang, 2024).

Technical information that was effectively communicated not only increased one's, career diversification, and employment security but also played a role in worldwide roles interpersonal skills, which had also been reported as the most critical aspect of job success by earlier studies (Chen et al., 2019), remained an essential component for the same purpose. Yet, communication skills per se were less determining in terms of reaching resources to develop skills and global mobility. The results related to the importance of interpersonal as well as technical communication for ensuring both job security and career diversification were highly supportive of these conclusions about the role of communication for professional growth and were harmonious with Chen's (2020) views.

Even though the primary technical skills were foundational for career stability, they did not necessarily mean the availability of technical-oriented jobs alone. This finding agreeed with Xu (2019), who underscored that social networking and employability also meant lifelong education in the growing fields of knowledge, in addition to technical skills as the foundation. The technical skills and continuous

learning for employability that were the focus of the study were consistent with previous research showing their necessity for career adaptability and success (Wang & Liu, 2020).

The researcher proposed a digital talent development upskilling strategy for the electronics industry, which aimed to deal with gaps in technical and soft skills. Government agencies should promote industry-academia partnerships to bridge the skills gap, expand continuous learning and upskilling opportunities (Zhao et al., 2020), and support the development of digital infrastructure for remote work. Educational institutions should enhance curriculum alignment with industry demands (Mudau, 2023), promote continuous learning and upskilling programs, and foster stronger school-industry partnerships.

Electronics industry associations should facilitate industry-academia collaboration, promote continuous professional development programs, and support innovation and research initiatives (World Bank, 2020). Electronics businesses should invest in employee upskilling and reskilling programs, leverage Industry 4.0 technologies for smart manufacturing, and strengthen sustainability initiatives (Singh et al., 2023). Individual workers should pursue lifelong learning to stay competitive, develop strong digital and technological proficiency, and embrace flexibility and adaptability in the workplace. Investors and stakeholders should invest in skill development initiatives, focus on emerging technologies and innovations, and support sustainable business practices.

6.2. Recommendations

Guangdong government agencies should be partners in the realization of industry training programs by giving the necessary policies backing to the development of soft skills and advanced technical skills programs, thus the competitiveness of industry would be enhanced. Guangdong educational institutions should intensify their curricula, by emphasizing the acquisition of interpersonal skills (such as communication, teamwork) and advanced technical skills (such as data analysis, risk management). The Guangdong Electronics Industry Association ought to invigorate academia, business, and research institutions' collaboration to promote the development of training programs for both soft skills and advanced technical abilities. Guangdong electronics companies ought to commit more dollars to employee training and retraining programs that are aimed at boosting the areas of the employee's skills in the risk management and data analysis sections of the advanced technical areas through the redeployment and skills development programs.

Moreover, Guangdong government bodies should back lifelong learning policies, thus encouraging the continual updating of skills among the industry talent to meet the fast-evolving technology and industry requirements. Besides, Guangdong universities and colleges can progrown the lifelong learning programs by the practice of teaching and learning that includes not only cross-functional skills like teamwork, leadership but also advanced technical skills such as data analysis, and project management. The Guangdong Electronics Industry Association can introduce the facilitator industry-academia-research cooperation which can enhance partnership among academic institutions, companies, and research institutes to the end that a workforce training program is strongly aligned with industry needs. Guangdong electronics companies should optimize their employee training systems based on the trends in industry technology development, particularly in the training of cross-functional skills and advanced technical skills. Guangdong electronics industry employees should actively participate in lifelong learning and skill development programs to enhance their soft skills and advanced technical abilities, thereby improving their career competitiveness. Investors and stakeholders should focus on emerging technologies and innovations, investing in skill development programs to support the industry's transformation toward smarter and more flexible directions.

Likewise, Guangdong government agencies should design policies to support the development of cross-functional skills, particularly in project management, communication, and teamwork, to enhance employees' flexibility and career diversity. Guangdong educational institutions should incorporate more training in decision-making, problem-solving, and cross-functional skills (such as teamwork, flexibility) in their curricula to meet the evolving demands of the technology industry. The Guangdong Electronics Industry Association should promote cross-industry collaboration projects, particularly those focused on cross-functional abilities (such as project management, problem-solving) and their importance in career development. Guangdong electronics companies should invest in the enhancement of cross-functional skills, especially in project management, communication, and teamwork, to promote employees' career flexibility. Employees in the Guangdong electronics sector should improve their cross-functional skills, particularly in case management, problem-solving, and teamwork, in order to expand their career development opportunities.

Stakeholders in Guangdong’s electronics industry should create a human capital plan that includes upskilling of talents through targeting skills gaps that are not so readily employable. The development and execution of the plan must start with the main goal of learning how to tackle complex problems confidently, make smart decisions based on data analytics, and manage risks, as well as develop the skills of project management and resource allocation. Besides, it should be the premier area to be focused on by intentionally strengthening collaboration and teamwork, giving the road to communication mastery, and training employees in such fields as AI, IoT, machine learning energy sources that renew. Monitoring continual sit-rate at online accreditation projects that stimulate technological growth. Hence, workers update their credentials with new knowledge. Besides, these skills are to be developed, along with time management and organizational abilities, and must be the main focus of one's life according to the employees. Finally, the strategy should be providing leadership and career development training as well as helping employees to discover their own growth and alignment with organizational goals. Hence, laying down the firm deal for a long-term career.

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