

# Mismatch in Academia and Industry: An Exploration of Perceived Graduate Competencies and Industry Expectations in Information Technology

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## Abstract

The present research constitutes an initial phase of a more extensive ongoing investigation aimed at gaining deeper insights into the graduate competencies and industry expectations in the field of Information Technology (IT) and related domains. This paper examines the disparities in perceptions between IT managers and IT professionals when considering the competencies of graduates. To achieve this objective, a survey explores the perceived skills gap between recent IT graduates' competencies and industry expectations. There are 214 respondents reviewed for this paper. Drawing upon the criteria outlined by the Accreditation Board for Engineering and Technology (ABET), the survey questionnaire comprised a Likert scale measuring participants' perceptions of various IT-related abilities and skills. Using the ABET attributes as a measure, perceptions of IT managers and IT professionals in Oceania and the Asian Rim were assessed via the survey. Findings suggest notable variations in perception between IT professionals and IT managers, shedding light on the nuanced understanding of recent graduates' abilities in the IT domain. These findings have implications for educational institutions, employers, and policymakers in Oceania and the Asian Rim, providing insights into the alignment between educational curricula and the needs of the industry. This research contributes to the ongoing exploration of employer expectations in IT and serves as a foundation for further investigation. Future studies could delve deeper into the specific factors contributing to the observed disparities and explore potential strategies to bridge the gaps identified in this comparative analysis.

**Keywords:** IT professionals, IT managers, Perceptions, Comparative study, Oceania, Asian Rim

## 1. INTRODUCTION

The rapid advancement of technology has necessitated a parallel evolution in the competencies required by IT professionals. The importance of aligning academic programs with

industry expectations to facilitate graduate preparedness cannot be overstated (Leonard, Jones, & Lang, 2019; Wang & Bromall, 2018). The accreditation criteria developed by the Accreditation Board for Engineering and Technology (ABET) provide a framework of

desired attributes for graduates in technical fields. This study investigates the perception gap between IT managers and IT professionals against these ABET attributes.

The overarching question underpinning this research is whether academic programs sufficiently equip students with the competencies employers desire. This question is particularly relevant given the perceived mismatch between academic offerings and industry expectations (Leonard, Jones, & Lang, 2019; Wang & Bromall, 2018). This mismatch spans technical aptitude and extends to soft skills, such as communication and teamwork (Hodgman, 2018; Lisá, Hannelová, & Newman, 2019). Interestingly, there is a reported variation in the perception of this skills gap, with IT managers highlighting insufficiencies in recent graduates' skills more than the IT professionals in the field (Hodgman, 2018).

Considering these disparities, this study utilized the ABET student outcome attributes, condensed to Solutions for Business Problems, Communication, Laws and Ethics, Work in Teams, Troubleshooting, Automation, Cybersecurity, Information Systems, Information Technology, and Data Science, as a yardstick to assess recent IT graduates' skills (Table 1). Through the survey conducted among IT

managers and IT professionals in Oceania and the Asian Rim, the study sought to ascertain their perspectives on the preparedness of recent graduates in the ten ABET attributes.

This research paper aims to contribute to the existing body of knowledge by examining the perceptions and viewpoints of IT professionals and IT managers in Oceania and Asian Rim. By exploring the discrepancies between these two distinct groups, we seek to gain insights into their differing perspectives on the abilities of recent graduates in IT or related fields. These insights can inform educational institutions, employers, and policymakers in aligning educational curricula with industry demands. As we deepen the understanding of the perceived skills gap, the goal of this paper is to help guide curricular adjustments to curriculum and methods to address industry expectations better. It also seeks to encourage a dialogue between academia and industry to foster greater alignment of expectations and outcomes. Understanding the varying perceptions of the skills gap is a crucial first step in developing strategies to bridge this divide, thus enhancing the career prospects of IT graduates and contributing to the growth of the IT industry.

Survey Item Taken from CAC Student Outcomes	Shortened / Outcomes Area
The ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions	Troubleshooting (General Criteria)
Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements	Solutions for Business Problems (General Criteria)
Communicate effectively in a variety of IT professional contexts	Communication (General Criteria)
Recognize IT professional responsibilities and make informed judgments in computing practice based on legal and ethical principles	Laws and Ethics (General Criteria)
Function effectively as a member or leader of a team engaged in information technology or related activities	Work in Teams (General Criteria)
Apply computer science theory and software development fundamentals to produce computing-based solutions	Automation (Computer Science)
Apply security principles and practices to maintain operations in the presence of risks and threats	Cybersecurity (Cybersecurity)
Support the delivery, use, and management of information systems within an information systems environment	Information Systems (Information Systems)
Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals	Information Technology (Information Technology)
Apply theory, techniques, and tools throughout the data analysis lifecycle and employ the resulting knowledge to satisfy stakeholders' needs	Data Science (Data Science)

**Table 1: ABET to Shortened Reporting Descriptions**

## 2. LITERATURE REVIEW

In the rapidly evolving field of information technology, a disconnect between the skills delivered by academic programs and those desired by employers is well-documented (Leonard et al., 2019; Wang & Bromall, 2018). This discord is often magnified by the swift technological advancements that outpace academic adaptations (Wang & Bromall, 2018).

The perception of this skills gap is non-uniform among stakeholders, with a notable divergence between IT managers and field IT professionals. Disparity manifests in the perception of skill preparedness between recent graduates and the employers recruiting them. Employers often find new graduates lacking necessary skills, ranging from technical proficiency to soft skills, including communication and leadership (Hodgman, 2018; Lisá et al., 2019). Conversely, a significant factor contributing to this divergence could be an inherent tendency to overestimate individual contributions and competencies (Larkin, I., Pierce, L., & Gino, F., 2012; Lisá et al., 2019).

Ethics and decision-making represent one area of differing perspectives. Many students perceive themselves as ready for the ethical challenges of the workplace, but a far smaller percentage of employers agree with this viewpoint (Hodgman, 2018). In technology, employers do not believe most recent graduates are adequately equipped for the industry's demands (Hodgman, 2018).

Employers often voice concerns over graduates' preparedness in the technology sector, associating the gap with inadequate computer and systems integration skills training in higher education institutions (Hodgman, 2018). Disparities also stem from the academic emphasis on theoretical knowledge in contrast to the industry's need for practical skills (Bilgihan, Berezina, Cobanoglu, & Okumus, 2014; Quek, 2005). Further divergence exists in the relative importance of discipline-specific skills versus generic employability skills. Employers frequently prioritize generic employability skills, such as punctuality and communication, over specific technical skills (Lisá et al., 2019).

The discrepancy between IT managers and IT professionals in their perceptions and evaluations of recent graduates' skills may be influenced by their distinct roles and orientations within the industry and their career path. IT managers lean towards a business-centric view, in contrast to the profound technical insight held by IT professionals (D'Arcy, Hovav, & Galleta,

2009; Lowry, Gaskin, Twyman, Hammer, Robert, Moody, & Vance, 2013).

Specific vital skills such as security often receive insufficient attention in academic curricula, leading to a gap in skills crucial to the industry (Wang & Bromall, 2018; National Centers of Academic Excellence in Cybersecurity, n.d.; Challenges of Recruiting and Retaining a Cybersecurity Work Force, 2017; Clair & Girard, 2020; Suffers, 2014). In order to verify domain knowledge and overcome the cybersecurity skills gap, industry certifications continue to be emphasized in IT (Draus, Mishra, Slonka, & Bromall, 2022; Lee, 2017).

Addressing these challenges involves reevaluating the pace and content of education. By incorporating an agile approach and seeking industry feedback, academic institutions can better align their programs with the industry's evolving needs (Wang & Bromall, 2018). The quality of work life and psychological factors also play a significant role in performance and productivity (Alves, Pereira, & Gonçalves, 2019).

Incorporating perspectives from various stakeholders, including IT professionals, leads to a more accurate measure of performance (Owadat, Aal, & Lotfy, 2019). Often early-career IT professionals can provide accurate and valuable perspectives that drive improvements in education and training programs (Mahaney & Fisher, 2019). Collaboration and knowledge sharing among different levels of an organization, including IT managers and IT professionals, enhance performance (Arsawan, Wirga, Rajiani, & Suryantini, 2020). Perspectives from both managers and non-managers are crucial for a comprehensive understanding of performance.

Acknowledging a skills gap between IT curricula and industry needs is widely accepted (Ellahe, Khan, & Shah, 2019; Naim, Ali, Hussain, & Qureshi, 2019). However, its perception differs among IT managers and IT professionals. To bridge this gap, improved communication and mutual understanding between all stakeholders about the abilities of new graduates are crucial. Addressing these discrepancies involves tackling the pace and content of education. Academia may benefit from an adaptive, agile approach, facilitating regular industry feedback and collaboration to align educational programs with the industry's needs (Wang & Bromall, 2018). The focus on specific gaps, such as cybersecurity, has led to initiatives like the National Centers for Academic Excellence in

Cybersecurity to establish standards that improve student competency and solve issues facing higher education institutions (National Centers for Academic Excellence in Cybersecurity, n.d.).

### 3. METHODOLOGY

This study employs a cross-sectional survey design to investigate the perception gaps in Information Technology (IT) skill attributes among IT managers and IT professionals within Oceania and the Asian Rim. The research constitutes an initial phase of a broader ongoing investigation to understand employers' expectations in IT and related fields.

Data was collected through an online survey incorporating ABET standards, mainly referring to the "CAC Criteria" document (ABET, 2020). This research focuses on the ABET criteria as it is internationally recognized for its comprehensive and rigorous approach to evaluating higher educational institutions helping them better prepare graduates to enter the workforce. Because this study is IT-focused, the verbiage is slightly modified to be more IT friendly.

The study participants include students, novices, and experts in the IT industry, along with IT managers and executives. The participants' roles are self-selected. The classification based on the role allowed us to conduct a comparative analysis between IT managers (including managers and executives from the survey) and IT professionals (containing students, novices, and experts from the survey), thereby uncovering any disparity in perception regarding the skill attributes of recent graduates. We had 109 Managers and 105 Professionals respond to the survey. The total of managers and professionals are 214 respondents that answered question eleven and partially answered question five from the online survey. Attributes that were not answered are not part of the calculation. There were very few of these. Of the 214 respondents, five partially answered question number five. Those 5 answers were considered for the attributes they answered, and were not considered for the attributes they did not answer.

The critical question for this paper that participants responded to was: "Considering recently graduated students in Information Technology or related fields, how well do their abilities align with the following attributes in your country?" The attributes were listed and

rated on a 5-point Likert scale from Extremely bad to Extremely good. Relevant parts of the survey are included in Appendix-A.

The attributes of the Likert scale being rated are related to the student outcomes for the different programs in the CAC document (ABET, 2020).

Data collection for this study started for the English version of the survey in January 2022, then added Japanese in October, Vietnamese in November, Chinese (Traditional and Simplified) in December, And Samoan in December. Data collection is ongoing as of the writing of this paper. However, the data utilized in this paper is accurate up until 22 May 2023. As a cross-sectional study, the findings present a snapshot of the perceptions at the time of the survey, serving as a valuable stepping-stone for future longitudinal research in this area.

This research methodology ensures a robust and comprehensive understanding of the perceptions regarding the skill attributes of recent IT graduates, as seen from the viewpoints of IT managers and IT professionals within the industry.

### 4. RESULTS

Following the outlined methodology, the research used an online survey to gather data on perceptions of recent IT graduates' abilities from two distinct groups - IT managers and IT professionals. Each group assessed the graduates' abilities based on ten attributes derived from the ABET standards. The survey utilized a 5-point Likert scale to facilitate this assessment.

With this being an ordinal scale, the results were analyzed using the Mann-Whitney U tests, providing valuable insights into the perceptions of the two groups. Mann-Whitney U tests were conducted to identify the differences in the perception of recent IT graduates' competencies across ten distinct attributes, as observed by IT managers and IT professionals.

The Mann-Whitney U test results are presented in Table 2, with each row representing the statistics for each attribute.

A significant disparity was found in the perceptions of all attributes with p-values less than .010. The IT managers' mean ranks were consistently lower than those of the IT professionals, implying that IT managers consistently assessed the abilities of recent

Attribute	Mann-Whitney U	Standard Error	Stand. Test Statistic	Asymptotic Sig. (2-sided)	IT Managers Mean Rank	IT Professional Mean Rank
Solution for Business Problems	3021	437.092	-6.056	<.001	81.55	131.28
Communication	3804	437.861	-4.262	<.001	89.23	124.28
Laws and Ethics	4478	440.232	-2.827	.005	95.65	118.92
Work in Teams	3475	438.783	-5.002	<.001	86.10	127.32
Troubleshooting	4565	438.363	-2.642	.008	96.47	118.12
Automation	3216	436.484	-5.618	<.001	83.42	129.50
Cybersecurity	3652	435.354	-4.512	<.001	87.61	124.69
Information Systems	4515	437.269	-2.763	.006	96.00	118.58
Information Technology	3600	435.77	-4.627	<.001	87.11	125.17
Data Science	3265	438.304	-5.482	<.001	83.89	129.05

**Table 2: Survey Results**

graduates less favorably across all considered attributes. The most substantial differences in perception were noted for 'Solution for Business Problems,' 'Work in teams,' 'Automation,' and 'Data Science,' as indicated by the standardized test statistics of -6.056, -5.002, -5.618, and -5.482, respectively. These findings suggest that assessing recent IT graduates' competencies significantly varies between IT managers and IT professionals. IT managers generally express a lower perception of graduates' abilities across diverse skill attributes. We will dive deeper into a few of these attributes.

**Cybersecurity**

The results of the item "Apply security principles and practices to maintain operations in the presence of risks and threats" are presented in Figure 1, differentiating between the responses provided by IT managers and IT professionals. As this was not a required question, only 212 of our 214 participants answered the question. We can see that only five IT managers thought that recent graduates were good at Cybersecurity compared to 13 IT professionals. On the other side, 32 IT managers thought that 32 recent graduates were extremely bad, compared to 10 IT professionals.

The data showcases the distribution of responses across the Likert scale, representing the perceived ability of recent graduates to apply security principles and practices in the face of risks and threats.

For IT managers and IT professionals, the most frequent response falls within the "Somewhat Bad" to "Neither Good Nor Bad" range. This suggests that a considerable portion of

respondents do not perceive recent graduates' abilities in this particular domain as strong or highly proficient.



**Figure 1: Cybersecurity**

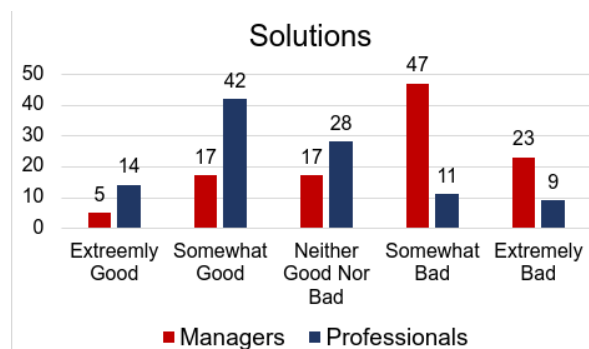
Comparing the responses between IT managers and IT professionals, it is noteworthy that IT professionals tend to have a more positive outlook overall. They provide higher ratings in the "Extremely Good" and "Somewhat Good" categories than IT managers. On the other hand, IT managers exhibit a more significant proportion of responses in the "Somewhat Bad" and "Extremely Bad" categories.

These findings indicate a discrepancy in perception between IT managers and IT professionals regarding recent graduates' application of security principles and practices. While IT professionals generally hold a more positive view, IT managers are more likely to express concerns or dissatisfaction with graduates' proficiency in this area. The observed variations in perception between IT managers and IT professionals suggest the need to understand this gap better.

It is important to note that these results indicate the perceptions of the surveyed participants and should be interpreted within that context. Further research and analysis may be required to gain a more comprehensive understanding of the factors influencing these perceptions and to inform targeted strategies for bridging the perceived skills gap in applying security principles and practices.

**Solutions to Business Problems**

The data about the item "The ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions" is summarized in Figure 2.



**Figure 2: Complex Computing Solutions**

The data presented above represents the distribution of responses across the Likert scale, indicating the perceived ability of recent graduates to analyze complex computing problems and apply principles of computing and other relevant disciplines to identify solutions.

Most respondents, IT managers, and IT professionals, selected responses falling within the "Somewhat Good" and "Neither Good Nor Bad" categories. This suggests that many participants view recent graduates' abilities in this domain as moderately proficient or neutral.

When comparing the responses between IT managers and IT professionals, it is noteworthy that IT professionals provide higher ratings overall. They have more responses in the "Extremely Good" and "Somewhat Good" categories than IT managers. Conversely, IT managers exhibit a higher proportion of responses in the "Somewhat Bad" and "Extremely Bad" categories.

These findings indicate a disparity in perception between IT managers and IT professionals concerning recent graduates' ability to analyze complex computing problems and apply relevant

principles to identify solutions. While IT professionals generally have a more positive outlook, IT managers are more likely to express concerns or perceive graduates' abilities in this area as inadequate.

The observed variations in perception between IT managers and IT professionals highlight the importance of further investigation and potential interventions to address the perceived gaps in problem-solving and analytical skills among recent graduates. Such interventions may involve incorporating practical problem-solving exercises, promoting interdisciplinary collaboration, or enhancing critical thinking components within educational programs.

It is crucial to note that these findings are based on the perceptions of the surveyed participants and should be interpreted accordingly. Additional research and analysis are necessary to gain deeper insights into the underlying factors influencing these perceptions and to inform targeted strategies to bridge the perceived skills gap in analyzing complex computing problems and applying principles to identify solutions.

**5. DISCUSSION**

Differing perspectives between IT managers and professionals on recent IT graduates' competencies reveal a challenge in aligning education with industry needs. Addressing disparities in "Business Solutions" and "Automation" calls for collaboration. These perceptions highlight the gap between academic training and real-world demands, underscoring the need to involve various stakeholders. This extends to the perceived skills gap in technical, soft, ethical, and decision-making skills. Differences might arise from distinct industry roles. To bridge these gaps, academia should adopt an agile approach, integrating industry feedback to align education with practical skills and industry dynamics.

**Interpretation of Findings**

The discrepancy in perceptions between IT managers and IT professionals concerning recent IT graduates' competencies uncovers a pivotal challenge in IT education. The varied perceptions from different stakeholders, specifically IT managers and professionals, are not merely nuances; they represent a broader dialogue about aligning education with real-world demands.

These varying viewpoints provide an essential lens to understand and respond to the

misalignment between academic training and industry needs, a theme well-supported by existing literature (Leonard et al., 2019; Wang & Bromall, 2018). Our research argues that an inclusive approach, embracing different stakeholders' perspectives, is not just advisable but necessary for aligning curricula with industry expectations and needs.

The pronounced disparities in areas like "Solutions for Business Problems" and "Automation" further underline the importance of collaborative engagement. By focusing on these domains, academic institutions can resonate more closely with industry requirements.

The insights drawn from these varied perspectives build upon previous research that highlights the gap between academic abilities and practical IT industry demands (Leonard et al., 2019; Wang & Bromall, 2018). It is not only about identifying the gap but actively working with different industry stakeholders to bridge it.

These findings present a compelling case for academia to recognize and prioritize the insights of different stakeholders in shaping IT education. Future research may look deeper into the dynamics of such collaboration, laying the groundwork for effective academia-industry alignment. Longitudinal studies can further validate these insights, consistent with recommendations by Leonard et al. (2019).

### **Contrasting Perspectives**

There exists a clear discrepancy in how prepared recent graduates are perceived to be by employers. Our findings resonate with prior research suggesting employers find new graduates under-equipped in job performance skills (Hodgman, 2018; Lisá et al. 2019). Our research finds this sentiment cuts across various skill categories, from technical proficiency to soft skills such as communication, leadership, and decision-making.

The readiness of graduates to face workplace ethical challenges is another point of contention. Although many students believe they are prepared, employers tend to disagree (Hodgman, 2018). Recent graduates' perceptions may be influenced by their academic training and exposure to ethical principles and dilemmas within their educational programs. They may lack real-world experiences and observations to understand what they lack. IT professionals may not have insight into the organization's ethical dilemmas and may also

lack the real-world experiences and observations to understand what recent graduates lack.

Skepticism persists among employers about graduates' ability to meet IT industry standards (Hodgman, 2018). This discrepancy may be associated with the perceived lack of computer and systems integration skills training within higher education institutions. It may be compounded by the organization's desire for more, while not having enough qualified individuals to fill the positions. The desire for more falls on the IT professionals they have and the skills those IT professionals bring with them.

Perceptions of individual contributions within group work also differ. Individuals may inflate the value and impact of their contributions when evaluating group work (Larkin et al., 2012). Thus, the perceived value of individual contributions within a team can vary significantly, further intensifying the skills gap issue. IT managers may better understand individual contributions as they focus on outcomes and progress more than the individual.

IT managers and professionals perceive graduates differently, potentially rooted in their unique industry roles and career trajectories. Research suggests that IT managers often have a more business-focused perspective, while IT professionals possess a deeper technical understanding (D'Arcy, Hovav, & Galleta, 2009; Lowry, Gaskin, Twyman, Hammer, Robert, Moody, & Vance, 2013). As business-oriented decision-makers, IT managers are responsible for aligning IT strategies with organizational goals and ensuring the efficient operation of IT systems to support business objectives (D'Arcy et al., 2009; Allen, Armstrong, Reid, & Riemenschneider, 2009). Their primary focus is IT management's strategic planning, budgeting, and governance aspects. Consequently, their evaluation of recent graduates' skills may lack a more solid technical understanding with a strong emphasis on soft skills (Robles, 2012).

The evident, multifaceted perception gap between employers and graduates covers hard and soft skills and individual contributions in team settings. This result underlines the need for enhanced dialogue between academia and industry to align expectations and effectively prepare students for their workplace transition.

The disconnect between IT academic training and industry requisites is well-acknowledged (Ellaoui et al., 2019; Naim et al., 2019).

However, the perception of this gap varies between IT managers and IT professionals, possibly due to their differing roles, expectations, and interactions with new graduates. Bridging this gap will require not just an alignment of curricula with industry needs but also enhanced communication and understanding among stakeholders regarding the capabilities and potential of new graduates.

### **Academics versus Industry Needs**

There remains an ongoing debate surrounding the actual versus perceived skills of recent graduates (Lisá et al 2019). The differential weight academia and industry assign to distinct skills lead to this disconnect. For instance, employers might prioritize practical abilities and generic employability skills more than academia, leading to a perceived skills gap (Lisá et al. 2019). IT professionals, when reflecting on this gap, often advocate for a richer integration of real-world experiences in academic settings. (Crumpler & Lewis, 2019).

While the IT domain continually evolves, academic adjustments often seem reactionary, leading to inevitable mismatches in skills. The IT industry, characterized by frequent technology changes, necessitates a dynamic, adaptive skill set. Academia, however, operates at a slower pace and struggles to keep abreast with these changes (Wang & Bromall, 2018). This creates a time lag where academic curricula may offer training in technologies that have already been superseded in the industry.

The skill focus of academic institutions also diverges from the industry's expectations. Academic rigor often gravitates toward theory, potentially at the expense of applied, industry-relevant proficiencies. However, industry tasks may require more practical, applied skills (Bilgihan et al., 2014; Quek, 2005; Crumpler & Lewis, 2019). Hands-on, real-life, experiential learning is lacking in many educational settings. This does not give the recent graduates exposure to the experience they need to be more successful.

This divergence in prioritizing between academic curricula and employer needs could be rooted in varied objectives for both domains. Employers consider generic employability skills, including punctuality, time management, responsibility, and communication, more important than specific technical skills (Lisá et al. 2019). The prioritization gap may affect the skills gap as the focus may be incorrectly aligned.

Another gap is apparent in covering specific vital skills in academic courses. While the IT industry rings alarm bells on security, academia appears to offer a more muted response, potentially jeopardizing future security paradigms. (Wang & Bromall, 2018; Intelligence and National Security Alliance, 2015). A focus on this gap has led to National Centers of Academic Excellence in Cybersecurity in the United States to help establish standards to help faculty improve student competency and solve issues facing higher education institutions. (National Centers of Academic Excellence in Cybersecurity, n.d.).

Addressing these discrepancies involves tackling the pace and content of education. Academia may benefit from an adaptive, agile approach, facilitating regular industry feedback and collaboration to align educational programs with the industry's needs (Wang & Bromall, 2018). It is hard to teach IT and other computer-related subjects well without moving at the pace of IT itself.

## **6. CONCLUSION**

The study sought to assess perceptions about the preparedness of recent Information Technology graduates, specifically in the context of the ABET attributes Solutions for Business Problems, Communication, Laws and Ethics, Work in Teams, Troubleshooting, Automation, Cybersecurity, Information Systems, Information Technology, and Data Science. The perceptions of IT managers and IT professionals were compared, and the results unveiled a significant discrepancy. IT managers consistently reported lower levels of graduate readiness across all attributes, aligning with existing literature that indicates a mismatch between academic competencies and those required by the IT industry (Leonard et al., 2019; Wang & Bromall, 2018).

Two primary areas of concern emerged, "Solutions for Business Problems" and "Automation," where the perception gap was most pronounced, coupled with attributes like "Communication," "Teamwork," and "Cybersecurity." This points towards the pressing need for educational institutions to ensure alignment with industry needs in these critical IT competencies (Leonard et al., 2019) and broaden their curricula scope. The focus should be on bolstering discipline-specific skills and generic employability skills, as employers often prioritize the latter (Lisá et al. 2019).

The study also underscores the imperative for academia to enhance its alignment with industry



expectations actively. A more significant interaction between academia and industry, with industry feedback playing a role in curriculum design, could better prepare graduates for the IT industry's demands (Wang & Bromall, 2018).

The divergence in perception between IT managers and IT professionals emphasizes the gap between the theoretical knowledge imparted in academia and the practical skills required in the industry. This reflection highlights the challenge of maintaining an equilibrium between transmitting theoretical knowledge and applying it in real-world contexts (Bilgihan et al., 2014; Quek, 2005).

This research serves as a steppingstone for further investigation into the sources of these perception gaps, their implications on the IT sector, and viable strategies to improve academia-industry alignment. Addressing these issues will contribute significantly towards preparing future IT professionals for the evolving demands of the IT industry.

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## Appendix A Survey

### Consent to Participate

N/A

### Survey

**Q2** - In what country do you spend most of your time? If you are currently in college please choose the country you lived in before going to college. For the remainder of this survey this country will be referenced as your country.

**Q5** - Considering recently graduated students in Information Technology or related fields. How well do their abilities fit the following in your country?

	Extremely bad	Somewhat bad	Neither good nor bad	Somewhat good	Extremely good
The ability to analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions					
Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements					
Communicate effectively in a variety of professional contexts					
Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles					
Function effectively as a member or leader of a team engaged in information technology or related activities					
Apply computer science theory and software development fundamentals to produce computing-based solutions					
Apply security principles and practices to maintain operations in the presence of risks and threats					
Support the delivery, use, and management of information systems within an information systems environment					
Use systemic approaches to select, develop, apply, integrate, and administer secure computing technologies to accomplish user goals					
Apply theory, techniques, and tools throughout the data analysis lifecycle and employ the resulting knowledge to satisfy stakeholders' needs					

### Demographics

**Q11** - Which best describes your role in IT

- Student - Current student, or recent graduate (within one year)
- Novice IT Worker - Worked in IT for less than five years
- Expert IT Worker - Have worked in IT for five or more years
- IT Business Manager - Manager/Director
- IT Business Executive - CIO, CISO, etc