



Skill Gap Analysis of Human Resources Between Higher Education and the Workforce in Bangka Belitung Province

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Abstract

This research examines the ongoing skills gap between higher education and the labor market in the Bangka Belitung Islands Province, Indonesia. The study aims to uncover the root causes of the mismatch between graduates' competencies and industry needs while analyzing psychological and institutional factors that influence employability. Employing a qualitative case study approach, data were collected through interviews, focus group discussions, and document analysis involving universities, industries, and local government agencies. Findings indicate that the skills gap is primarily driven by three factors: misaligned curricula, limited academia–industry collaboration, and low career self-efficacy among graduates. Furthermore, the lack of exposure to practical and experiential learning environments reduces students' confidence, adaptability, and work readiness. To address these challenges, the study recommends an integrated approach that combines experiential learning, curriculum co-creation, and strong cross-sectoral collaboration supported by local policies. Theoretically, it integrates the Skills Gap Theory, Human Capital Theory, and Link and Match Theory within an educational psychology perspective to explain how structural and psychosocial factors jointly influence human capital development. Ultimately, this study provides actionable insights for enhancing higher education's role in regional workforce competitiveness and equipping graduates to succeed in a rapidly evolving, technology-driven labor market.

Keywords: *Skills Gap, Employability, Higher Education*

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Introduction

The increasingly competitive and dynamic development of the global economy demands the availability of human resources (HR) that are adaptive to technological change and the evolving dynamics of the labor market. The transformation toward a digital economy and the implementation of the Fourth Industrial Revolution (Industry 4.0) have accelerated the shift in job structures, which now require 21st-century skills such as critical thinking, effective communication, collaboration, and digital literacy (Ali et al., 2020). In the context of developing countries, including Indonesia, the main challenge in human resource development is not only related to increasing access to higher education but also to the effectiveness of the education system in producing graduates who are competent and relevant to industry needs (Ismail et al., 2023).

Data from the Central Statistics Agency (BPS) shows that college graduates (Diploma–S3) still contribute a significant proportion of national unemployment, namely around 13.89% of total unemployment in February 2025, with the open unemployment rate for university graduates in the range of $\pm 5\%$ (BPS, 2025). This condition is reinforced by the results of a Populix & KitaLulus survey which found that more than 50% of companies assessed that college graduates do not have the technical and soft skills that match industry needs, thus indicating a skills mismatch between academic competencies and job market demands (Populix & KitaLulus, 2024).

This phenomenon illustrates the existence of a skills gap—the disparity between the skills possessed by the workforce and those demanded by industry. This issue has become a global strategic concern as it directly affects labor productivity and the economic competitiveness of a region (Suarta et al., 2020). Several studies have argued that the skills gap emerges from weak coordination between educational institutions and industry, as well as the slow adaptation of curricula to changing labor market demands (Deloitte & Touche, 2021). In Indonesia, this problem is increasingly complex in regions with specific economic structures, such as the Bangka Belitung Islands Province. Despite its significant potential in the mining, fisheries, and tourism sectors, the region continues to face a shortage of skilled human resources aligned with these sectors' needs (Fauzi & Abdullah, 2022). The limited collaboration between universities and industries results in low graduate relevance to local labor market requirements, thereby widening the regional competency gap (Wijaya et al., 2021).

Theoretically, the phenomenon of the skills gap can be explained through three main frameworks: the Skills Gap Theory, the Human Capital Theory, and the Link and Match Theory. The Skills Gap Theory highlights the imbalance between the supply and demand of skills caused by technological change and the lack of responsiveness in the education system. The Human Capital Theory emphasizes that education and training are forms of investment that play a critical role in enhancing labor productivity and fostering economic growth (Becker & Murphy, 2020). The combined use of these theories is supported by empirical studies showing that skills mismatch is a multidimensional problem shaped by structural labor market changes, the quality of human capital investment, and weak institutional alignment between higher education and industry (McGuinness et al., 2018; Hanushek et al., 2017; Tilak, 2015). Meanwhile, the Link and Match Theory underscores the importance of synergy between educational institutions and industry to produce graduates with practical and contextual skills relevant to market needs (Sari et al., 2021). The integration of these three theories provides a conceptual foundation for understanding the dynamics of the skills gap and for guiding policy direction in aligning education with industry demands.

Nevertheless, there remains a significant research gap in studies examining the skills gap in Indonesia, particularly within regional contexts. Most previous studies have focused on macro-level analyses at the national or metropolitan scale, employing quantitative approaches that emphasize statistical indicators such as unemployment rates and work-readiness indices (Suarta et al., 2020; Rahman et al., 2023). These studies have not fully captured the social, economic, and institutional dynamics of regions with distinctive economic characteristics, such as Bangka

Belitung, which relies heavily on the primary and tourism sectors. Furthermore, the dominance of quantitative approaches often overlooks qualitative dimensions such as perceptions, experiences, and interactions among education and industry stakeholders. Therefore, qualitative research focusing on regional contexts is essential to provide a more comprehensive and contextual understanding of the factors contributing to the skills gap, as well as the collaborative efforts to address it (Yuliani & Prasetyo, 2022).

Based on this background, this study seeks to critically examine the structural and institutional dimensions of the skills gap between higher education and the labor market in the Bangka Belitung Islands Province. Specifically, it aims to identify the key factors driving competency mismatch, including curriculum relevance, industry engagement, and graduate skill formation. This study adopts a qualitative case study approach, utilizing in-depth interviews and field observations involving key stakeholders local government, higher education institutions, industry representatives, and alumni to capture diverse perspectives on the mismatch phenomenon. Data credibility is ensured through methodological and source triangulation, enabling a nuanced and context-specific understanding of how and why the skills gap persists at the regional level.

Theoretically, this study is expected to enrich the literature on the relationship between Human Capital Theory and Link and Match Theory in the context of regional human resource development. Practically, the results of this research are expected to provide policy recommendations that support the strengthening of strategic collaboration between educational institutions and local industries to create an adaptive, relevant, and competitive higher education system. Thus, this study contributes to human resource development efforts that respond effectively to the challenges of the digital economy and support sustainable regional economic growth (Nasution et al., 2023; Ardiyansyah & Kusuma, 2022).

Method

This study employs a qualitative approach using a case study strategy to analyze the phenomenon of the skills gap between higher education graduates and labor market demands in the Bangka Belitung Islands Province. The main variables in this research encompass three key aspects: (1) the competencies of higher education graduates, (2) the skill requirements of industries, and (3) the effectiveness of regional education and employment policies. These variables were identified through the exploration of the relationships among educational institutions, industry actors, and local governments in shaping the alignment of workforce competencies.

Research subjects were determined using a purposive sampling technique, considering the relevance and involvement of informants in the issue under study. The subjects included representatives from higher education institutions (program administrators and lecturers), local industry practitioners, university alumni, and regional government agencies responsible for education and labor affairs. Inclusion criteria were established to ensure that informants had direct experience in recruitment processes, training programs, or labor policy formulation. Data collection procedures involved in-depth interviews and field observations, supported by document analysis such as regional employment reports and education policy documents.

The research instrument consisted of a semi-structured interview guide, developed based on the theoretical dimensions of the skills gap and the Link and Match framework between education and industry. The collected data were analyzed using thematic analysis to identify patterns, categories, and emerging themes derived from interviews and observations. The analytical process included data reduction, data presentation, and the drawing and verification of conclusions. To maintain data validity, triangulation of sources and methods was applied. In addition, simple descriptive analysis was used to interpret the frequency and tendency of findings in a more systematic manner. These procedures were designed to ensure that the study could be replicated and verified by other researchers within similar contexts.

Result and Discussion

Result

This study reveals that the skills gap between higher education and the workforce in the Bangka Belitung Islands Province is not only structural and institutional but also has a significant psychological dimension. Based on thematic analysis of interviews and observations, it was identified that the mismatch between academic curricula and labor market demands directly affects the development of graduates' psychological competencies, particularly in terms of self-efficacy, career readiness, and learning orientation. Most alumni reported that university learning remains focused on theoretical cognitive domains, without providing sufficient practical experiences to build confidence in meeting workplace demands. One informant stated, "I understand the concept, but when I have to apply it at work, I feel less confident because I have never actually done it." This illustrates a gap between declarative knowledge (knowing) and procedural knowledge (doing), which is closely related to the formation of professional self-confidence.

From the perspective of soft skills, the findings indicate weaknesses in the affective and social domains of graduates. Limited communication, collaboration, and self-regulation skills reflect an underdeveloped emotional intelligence and interpersonal competence key components in industrial and organizational psychology. Industry representatives expressed concern that many graduates struggle to manage their emotions when facing work pressure or team dynamics, which negatively affects work effectiveness. Higher education institutions acknowledged that such skills are difficult to teach directly in classrooms, as they require experiential learning and intensive social interaction. Alumni also emphasized that campus environments provide limited opportunities to develop a sense of agency the ability to take initiative and assume responsibility for professional decisions. This situation indicates that affective and social development has not yet become a central focus in learning systems, even though these aspects are critical predictors of career adaptability in the digital economy era.

Another aspect identified is the low level of intrinsic motivation and professional identity among graduates, stemming from weak linkages between the education system and industry. Collaborative programs such as internships or *Merdeka Belajar Kampus Merdeka* have not yet fully succeeded in fostering students' sense of belonging to the professional world. Industry respondents observed that these programs tend to be formalities and lack sufficient psychological feedback to cultivate long-term career orientation. From the perspective of motivational psychology, this situation reflects the unfulfilled three basic needs described in Self-Determination Theory autonomy, competence, and relatedness which are essential for developing professional commitment. Higher education institutions recognized that bureaucratic barriers, limited supervision, and short internship durations have hindered students from internalizing professional work values. Consequently, many graduates experience work anxiety and uncertainty about their career identity after graduation.

In addition, the structural barriers identified in this study also have psychological consequences for adaptive workforce behavior. The differing orientations between academia which emphasizes cognitive achievement and industry which demands practical productivity create role dissonance among recent graduates. They often encounter difficulties adjusting to organizational cultures due to the lack of effective coping strategies. Industry participants highlighted the need for project-based learning, mentoring, and continuous training as means to foster work resilience and lifelong learning skills. Overall, the findings demonstrate that the skills gap does not solely stem from curricular misalignment but also from graduates' psychological unpreparedness to adapt, communicate, and internalize their professional roles in the workplace.

Table 1. Summary of Psychological Findings in the Skills Gap

Psychological Aspect	Field Findings	Implications for the Workforce
Self-efficacy and Career Readiness	Graduates express doubt about their practical abilities	Experiential and project-based learning is required
Emotional and Interpersonal Intelligence	Weaknesses in communication and teamwork	Soft skills training and collaborative simulations are needed
Intrinsic Motivation and Professional Identity	Internship programs fail to foster career orientation	Career mentoring and psychological feedback need to be strengthened
Role Dissonance and Work Resilience	Graduates struggle to adapt to workplace culture	Adaptation training and coping strategy development are needed in professional environments

Psychologically, this study affirms that human resource development cannot rely solely on enhancing technical skills; it must also involve strengthening individuals' psychological and social capacities. The development of soft skills, self-efficacy, and career adaptability serves as key factors in bridging the gap between the educational system and the labor market. Collaborative efforts among universities, industries, and local governments should therefore be directed not only toward curriculum reform but also toward cultivating the mindset and psychological readiness of the future workforce, enabling them to respond to labor market changes with resilience and productivity.

To deepen the understanding of field findings, a thematic categorization process was conducted to summarize the main patterns emerging from interviews and observations. This analysis not only highlights structural and institutional aspects but also emphasizes the psychological dimensions underlying the dynamics among universities, industries, local governments, and alumni. Through processes of coding and theme abstraction, four major themes were identified as representations of the gap between the higher education system and labor market demands. These themes reflect both external conditions (such as policy and system factors) and internal conditions (such as attitudes, motivation, and the psychological readiness of educational actors and the workforce).

Table 2. Summary of Themes and Analytical Interpretation

Main Theme	Dominant Data Source	Key Findings	Implications
Curriculum–Workforce Mismatch	Alumni, Industry	Curriculum remains theoretical; weak digital competence	Curriculum revision based on local labor market needs is required
Low Soft Skills Among Graduates	Industry, Alumni	Poor communication and teamwork skills	Integration of project-based and practical learning is necessary
Suboptimal Education–Industry Collaboration	Universities, Government	Internships are ceremonial; weak coordination	A sustainable partnership system and incentive mechanisms are needed
Structural Barriers	Policy Local Government	Lack of integration among government departments	Cross-sectoral synergy should be strengthened through regional policies

The four themes presented in the table above indicate that the skills gap is not merely technical in nature but also reflects psychological processes that have not yet been optimally developed. The curriculum workforce mismatch highlights students' low career self-efficacy in assessing the relevance of their academic knowledge to real-world job demands. The lack of soft skills demonstrates the weak internalization of social and emotional values within the educational process, resulting in limited interpersonal adaptability in professional environments. Meanwhile,

the suboptimal collaboration between educational institutions and industry reveals a trust gap among institutional actors, which may reduce collaborative motivation and shared commitment in building a practical learning ecosystem. On the other hand, structural policy barriers illustrate the limited systemic support for developing the psychological readiness of young workers. Therefore, these findings emphasize the need for an integrative approach that combines policy, institutional, and psychological dimensions in formulating strategies to enhance regional workforce competitiveness.

Discussion

The findings of this study indicate that the skills gap between higher education and the labor market in the Bangka Belitung Islands Province represents a systemic issue shaped by the interaction of educational, industrial, and regional policy factors. This phenomenon highlights the persistent divide between graduates' academic competencies and the dynamic demands of the labor market, particularly in terms of practical skills, digital literacy, and adaptive capacity toward technological change. From a psychological perspective, this condition also reflects a mismatch between graduates' mental readiness and the work environment's expectations for flexibility, efficiency, and innovation. Limited exposure to real-world situations during their studies has resulted in low self-efficacy and diminished confidence when facing the complexities of professional work.

The identified gap supports the Skills Gap Theory, which explains skills mismatch as a consequence of misalignment between educational orientation and labor market demands. Similar patterns are evident across Indonesia, where higher education emphasizes theoretical knowledge while industries increasingly require applied, digital, and problem-solving skills (McGuinness et al., 2018; Suryadi, 2014). Comparable challenges are also observed in Southeast Asia, driven by weak university–industry linkages and slow curricular adaptation to technological change (ADB, 2021; World Bank, 2020). Consistent technological acceleration exacerbates these gaps when education systems fail to respond, while limited practice-based learning further constrains graduates' problem-solving capacity, career adaptability, and professional self-concept key components of work readiness.

From the perspective of Human Capital Theory, the results suggest that educational investment has not yet translated effectively into increased workforce productivity. Becker and Murphy (2020) emphasize that education becomes a form of economic capital only when the acquired skills align with labor market needs. In Bangka Belitung, graduates face challenges in converting their knowledge capital into productive competencies, particularly in strategic sectors such as mining, fisheries, and tourism. From an industrial psychology standpoint, this indicates a low transfer of learning that is, the individual's ability to apply what has been learned in real work contexts. Thus, higher education has not yet optimized the return on education, both economically and psychologically, such as enhancing achievement motivation and career satisfaction.

In light of the Link and Match Theory, this study reveals that collaboration between higher education institutions and industry remains formalistic and has not yet been institutionalized. Internship programs, practitioner lectures, and curriculum partnerships are still implemented sporadically. Sari et al. (2021) demonstrate that challenges in implementing link and match in Indonesia generally stem from weak cross-sectoral communication and the absence of a shared evaluation mechanism. Psychologically, this weak partnership affects the formation of students' sense of belonging toward the world of work. Many students perceive internship experiences merely as administrative requirements rather than opportunities for building a professional identity. As a result, their transition to the workforce often involves heightened anxiety and low emotional readiness.

These findings are consistent with Ismail et al. (2023), who explain that the skills gap in Southeast Asia largely stems from inadequate integration between theory and practice in education. However, this study adds a new dimension by identifying limited infrastructure and technological

access as major barriers to strengthening digital competencies. In line with Lee et al. (2021), the integration of digital learning has the potential to strengthen the relationship between education and industry but requires both infrastructural support and human resource readiness. From a psychological perspective, low digital literacy also affects digital self-efficacy, defined as an individual's confidence in utilizing technology as a tool for work and innovation. The geographical nature of Bangka Belitung as an archipelagic region exacerbates this gap due to limited facilities and experiential learning opportunities.

This study also supports Rahman et al. (2023), who found that non-metropolitan regions face structural obstacles in aligning education with the labor market due to disparities in human resources and institutional coordination. In this context, Bangka Belitung exhibits a similar pattern: limited industrial participation in curriculum design and the scarcity of inter-agency coordination forums. Psychologically, this reflects the absence of a shared mental model among key stakeholders that is, a shared understanding, values, and goals concerning the meaning of ideal work competencies. The differing cognitive orientations between higher education institutions, industries, and local governments create discontinuities in communication and collaboration patterns.

From a theoretical standpoint, this study contributes by integrating three major conceptual frameworks Skills Gap Theory, Human Capital Theory, and Link and Match Theory into a single applied analytical model within the context of an archipelagic region. This integration demonstrates that the skills gap arises not only from curriculum mismatches but also from institutional disparities and psychological factors such as self-efficacy, motivation, and professional identity. These findings align with Tomlinson (2017), who asserts that employability is determined not only by academic achievement but also by graduate capital, which encompasses experience, social networks, and psychological confidence in navigating the world of work.

Practically, the results of this study provide strategic implications for strengthening cross-sectoral collaboration. Higher education institutions, industries, and local governments need to establish a co-designed curriculum system that enables participatory curriculum formulation, implementation, and evaluation. Furthermore, experiential learning approaches, as explained by Kolb (2015), should be integrated to enhance students' self-efficacy, social competence, and psychological resilience. Hidayat et al. (2023) emphasize that the success of the Merdeka Belajar–Kampus Merdeka policy depends on local institutions' capacity to contextualize national policies according to regional characteristics. Within the context of Bangka Belitung, this collaborative and contextualized approach is essential for developing a competent and adaptive workforce for the digital-based industrial landscape.

The limitations of this study lie in the relatively narrow scope of informants and regional coverage, making the findings context-specific and not yet generalizable. In addition, the qualitative interview process may be subject to social relationship bias, as respondents' answers can be influenced by institutional affiliations, power relations, or the desire to present socially acceptable narratives, particularly when discussing education–industry alignment and policy effectiveness. However, as emphasized by Creswell and Poth (2018), qualitative research prioritizes depth of contextual understanding over statistical generalization. Future research could integrate qualitative and quantitative approaches to further examine the relationships among self-efficacy, work readiness, and the effectiveness of education–industry collaboration. Local governments are also encouraged to strengthen cross-sectoral coordination mechanisms and develop data-driven monitoring systems to evaluate skills policy outcomes, as sustainable public–private partnerships are crucial for aligning education systems with labor market needs (Mourshed, Farrell, & Barton, 2013). Moreover, psychosocial interventions—such as career counseling, adaptability training, and industry mentoring—are essential to enhance students' resilience in navigating labor market uncertainty, suggesting that a combined approach of structural policy reform and psychological support is necessary to improve work readiness and human resource resilience in the digital era.

Conclusion

This study reaffirms that the skills gap between higher education and the labor market in the Bangka Belitung Islands Province is a systemic phenomenon encompassing structural, social, and psychological dimensions. The misalignment between academic curricula and industrial needs is not solely the result of institutional weaknesses, but also of graduates' low career self-efficacy, limited adaptability, and insufficient self-regulation in responding to labor market changes. This phenomenon illustrates that work readiness is determined not only by cognitive mastery, but also by the development of affective and social dimensions that shape individual motivation, self-confidence, and professional identity.

Theoretically, this study integrates the Skills Gap Theory, Human Capital Theory, and Link and Match Theory within the framework of educational and industrial psychology, thereby expanding the understanding of the relationship between education and the formation of workers' psychosocial competencies. The practical implications of these findings highlight the importance of experiential learning in fostering self-regulated learning and career confidence, alongside cross-sectoral collaboration among higher education institutions, industries, and local governments. By combining policy reform with a positive psychology approach, the skills gap can be transformed into an opportunity for developing human potential that is more adaptive, resilient, and competitive in the era of digital transformation.

Suggestion

Future efforts to reduce the skills gap between higher education and the labor market in the Bangka Belitung Islands Province should focus on strengthening collaborative frameworks among universities, industries, and local governments through continuous curriculum alignment, competency-based training, and applied learning programs. Higher education institutions need to integrate experiential learning and digital literacy enhancement into their teaching strategies to develop both technical expertise and psychological readiness among graduates. Meanwhile, local governments should facilitate policy synchronization and provide incentives for sustainable industry–university partnerships. Further research employing mixed methods is also recommended to measure the long-term impact of career self-efficacy, adaptability, and emotional intelligence on employability outcomes.

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