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Original Article

# Educated Unemployment in the Digital Age: Between Overqualification and Skills Mismatch in the Modern Job Market

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## Abstract

The development of the digital economy creates new job opportunities, but also increases educated unemployment due to the mismatch between graduate competencies and the needs of the workforce. The phenomena of overqualification and skill mismatch are major obstacles to labor absorption. This study aims to analyze the factors causing educated unemployment in the digital era and the relationship between overqualification and skill mismatch. The method used is a descriptive qualitative approach through literature studies from scientific journals, employment reports, and secondary data. The results show that approximately 35% of young workers in Indonesia experience a mismatch between education and work, with 22.36% classified as overeducated. Furthermore, the level of overqualification in certain groups can reach 50%, while skill mismatch is the dominant phenomenon. The main causes include rapid digital transformation, curriculum misalignment with industry needs, and low adaptive skills. Therefore, synergy is needed between universities, industry, and the government to make education more relevant to the job market.

**Keywords:** Digital Era, Educated Unemployment, Modern Job Market, Overqualification, Skill Mismatch.

## 1. Introduction

The development of digital technology has brought about significant changes in the structure of the modern labor market, particularly in recruitment patterns, competency requirements, and the types of jobs available. Digitalization has driven the emergence of various new technology-based professions, but at the same time, it has also posed a serious challenge in the form of increasing educated unemployment. This condition occurs when university graduates are unable to be optimally absorbed in the workforce due to a mismatch between their competencies and industry needs. According to Salim (2023), educated unemployment occurs when individuals with secondary or higher education have not found jobs that match their academic abilities, resulting in their education not yielding optimal economic results. This demonstrates that increasing educational attainment does not always translate directly into increased job opportunities.

This phenomenon is further complicated by the fact that many graduates experience overqualification, a situation where a person's education level is higher than the job they are applying for. Hasibuan and Handayani (2021) explain that overeducation or overqualification is a form of vertical mismatch that occurs when workers work in positions that require a lower level of education than their own. Their research shows that approximately 27.9% of the Indonesian workforce is overeducated, while the mismatch in field of study reaches 68.4%, indicating that this problem is structural and widespread.

Besides overqualification, another very dominant issue is skills mismatch. This condition illustrates the gap between graduates' skills and the actual needs of the workforce, particularly in the digital sector, which demands adaptive skills, technological literacy, problem-solving, and practical experience. Khoiruddin et al. (2024) explain that age, gender, education level, and regional characteristics significantly influence education-job mismatch among educated workers in Indonesia. These results demonstrate that mismatch is not only an individual issue but is also influenced by regional economic structure and the quality of the national education system.

To understand this issue more broadly, previous research has focused on the macro-determinants of educated unemployment, such as economic growth, wages, and education expenditure. Putri et al. (2025) found that education spending, higher education enrollment rates, and wages significantly influence the educated unemployment rate in OECD countries. However, this research focused more on macroeconomic aspects and did not specifically examine the relationship between overqualification and skills mismatch in the era of rapid digital transformation.

Another study by Paramitasari et al. (2024) examined job-education mismatch in the context of vocational education and economic agglomeration in Indonesia. Their results indicate that the match between education and employment is a crucial factor in driving inclusive growth and effective human capital investment. However, this study focused more on vocational education and did not fully examine university graduates in the digital economy, who face the phenomena of credential inflation and overqualification.

Based on various previous studies, there is still a research gap because most studies only discuss educated unemployment from a macroeconomic perspective or educational mismatch in general, while the relationship between overqualification and skill mismatch in the modern digital-based labor market has not been widely studied. Therefore, this study aims to analyze educated unemployment in the digital era comprehensively by highlighting the relationship between overqualification and skill mismatch. The novelty of this study lies in the integration of these two concepts as the main structural factors of educated unemployment by placing digital transformation as a variable that accelerates the occurrence of labor mismatch. Thus, it is expected to contribute to the development of labor economics studies and become the basis for the formulation of more adaptive and sustainable education and employment policies.

## 2. Literature Review

### 2.1. Educated Unemployment in the Digital Age

Educated unemployment is a crucial issue in the modern labor economy, particularly in the digital era, characterized by rapid changes in the labor market structure. Educated unemployment refers to the situation where individuals with secondary or tertiary education are unable to find employment that matches their academic abilities, skills, and competencies. According to Sawitri and Widarini (2025), high levels of educated unemployment indicate a mismatch between formal education outcomes and actual labor market needs. Consequently, the demographic dividend, which should be an opportunity, has the potential to become a burden on the national economy. This phenomenon is increasingly relevant as the workplace no longer solely values formal diplomas but places greater emphasis on practical abilities and adaptive skills aligned with developments in digital technology.

As a bridge to this issue, digital transformation has driven significant changes in the workforce recruitment system (Iseh, 2025). The industrial world now prioritizes skills-based

hiring over mere formal educational background. Pratiwi (2025) explained that the expansion of higher education in Indonesia has actually shown a paradox in the form of increasing unemployment among diploma and university graduates amidst improving macro employment indicators. This condition indicates a structural mismatch between higher education output and labor market needs. Therefore, an increase in the number of university graduates will not necessarily be in line with an increase in labor absorption if their competencies do not align with the needs of modern industry.

This phenomenon demonstrates that the problem of educated unemployment lies not only in the number of available jobs, but also in the quality of the match between the education received and the needs of the workforce. Therefore, educated unemployment is a crucial issue that requires further study in the context of digital economic transformation.

## 2.2. Overqualification as a Form of Educational Mismatch

One of the key concepts explaining this phenomenon is overqualification or overeducation. Overqualification occurs when a person's educational level is higher than their job qualifications. Hasibuan and Handayani (2021) explain that overeducation is a form of vertical mismatch that occurs when workers work in positions that actually require a lower level of education than their own. Their research shows that 27.9% of the workforce in Indonesia is overeducated, while the mismatch in field of study reaches 68.4%. These findings demonstrate that educated unemployment occurs not only due to a lack of jobs, but also because the quality of available jobs is not commensurate with the worker's level of education.

Overqualification also results in low job satisfaction, decreased work motivation, and suboptimal investment in education by individuals and the government. In the long term, this condition can lead to wasted human resources because highly educated graduates work in sectors that do not require high academic competency. Thus, overqualification is an important indicator of the failure of the labor market to effectively absorb an educated workforce. This shows that increasing access to higher education must be accompanied by the expansion of relevant employment opportunities so as not to create structural inequality in the labor market.

## 2.3. Skill Mismatch and Modern Job Market Needs

Besides overqualification, another crucial concept is skill mismatch. Skill mismatch describes the gap between the skills possessed by graduates and the skills required by employers. In the digital era, employers demand skills such as technological literacy, data proficiency, problem-solving, digital communication, and practical experience, which are often not fully provided in formal education (Putrapandowo & Meilani, 2025). Khoiruddin et al. (2024) explain that age, gender, education level, and regional characteristics significantly influence education-job mismatch among educated workers in Indonesia. This suggests that mismatch is influenced not only by individuals but also by the education system, regional conditions, and regional economic structure.

To strengthen this understanding, several previous studies have examined the determinants of educated unemployment from a macroeconomic perspective. Putri et al. (2025) found that government education spending, higher education enrollment rates, and wage levels significantly influenced educated unemployment in six OECD countries. These results suggest that increased investment in education will not necessarily reduce unemployment if it is not accompanied by job creation that matches the competencies of graduates. However, this research still focuses on macro indicators and does not deeply link the phenomenon of overqualification to skills mismatch in the context of digital transformation.

Another study by Harahap and Yusuf (2025) also shows that education level and job opportunities significantly influence educated unemployment, while economic growth negatively impacts such unemployment. This research confirms that increasing the number of higher education graduates is not always a solution if the labor market is unable to optimally absorb the workforce. In a broader social context, this phenomenon is also widely discussed in community experiences. One comment in a public discussion forum noted that companies often "seek experience" and are reluctant to provide training to new workers, making it difficult for new graduates to enter the job market even with higher education. This perspective suggests that the problem of skills mismatch is also related to companies' increasingly selective recruitment practices regarding work experience.

Based on these various studies, it can be concluded that educated unemployment in the digital era is not only caused by the high number of job seekers, but also by overqualification and an increasingly complex skills mismatch. Most previous research still focuses on education level, unemployment rate, and macroeconomic factors, while studies specifically linking overqualification with skills mismatch based on the needs of the digital industry, especially at the local level such as villages and districts, are still relatively limited. Therefore, this study is novel in its attempt to integrate these two concepts as the main structural causes of educated unemployment in the modern labor market. This approach is important because it provides a more comprehensive perspective in understanding the relevance of higher education to the real needs of the contemporary workforce.

# 3. Methods

## 3.1. Research Methodology

This study uses a descriptive qualitative approach using library research to analyze the phenomenon of educated unemployment in the digital era, particularly as it relates to overqualification and skill mismatch in the modern labor market. A qualitative approach was chosen because this research focuses on an in-depth understanding of the social and economic phenomena of labor, which can be explained not only through statistics but also through the interpretation of various previous research findings. According to Sugiyono (2022), qualitative research is a research method used to examine the natural conditions of objects, where the researcher plays a key role in understanding the meaning and context of a phenomenon. In the context of this research, this approach is used to explore the relationship between education level, the needs of the digital industry, and the mismatch between the competencies of university graduates and job market needs.

The data sources used in this study are secondary data obtained from various national and international scientific journals, previous research articles, reports from the Central Bureau of Statistics (BPS), reports from the International Labour Organization (ILO), and official documents related to educated unemployment and the dynamics of the digital labor market. The selected literature focused on publications from the last five years to ensure the data was relevant to current employment conditions. Data collection techniques included documentation and literature searches from Google Scholar, national journal portals such as SINTA and Garuda, and other scientific databases. Researchers selected articles based on their thematic relevance, source credibility, and direct relevance to the research variables: educated unemployment, overqualification, and skills mismatch. This study aims to identify the main factors causing the rise in educated unemployment in the digital era and analyze the relationship between overqualification and skills mismatch as structural causes in the modern

labor market. Thus, this research is expected to provide a more comprehensive academic understanding of contemporary employment issues.

### 3.2. Analysis Techniques

The data analysis technique used in this study was qualitative descriptive analysis using a content analysis model. This analysis was conducted by identifying, categorizing, comparing, and interpreting various pieces of information obtained from relevant literature sources. According to Miles et al. (2014), qualitative data analysis is conducted through three main stages: data reduction, data presentation, and conclusion drawing. In the data reduction stage, researchers selected information relevant to the research focus, namely educated unemployment, overqualification, and skill mismatch. Data not directly related to the research theme was removed to allow for a more focused and systematic analysis.

The next stage is data presentation, which involves compiling the findings from various sources into a systematic and structured narrative in accordance with the discussion focus. In this study, data is presented based on three main aspects: the phenomenon of educated unemployment in the digital age, overqualification as a form of educational mismatch, and skill mismatch in modern job market needs. The final stage is conclusion drawing, which is the process of interpreting the analysis results to identify relationships between variables and explain existing research gaps in previous research. The researchers then formulated a novel research approach by emphasizing the integration of overqualification and skill mismatch as the primary causes of educated unemployment in the digital era, particularly within the context of the local job market and the needs of the contemporary digital industry.

Through this analytical technique, the research not only describes the general condition of educated unemployment but also provides a deeper understanding of the structural causes influencing the low employment of college graduates in the modern job market.

## 4. Results and Discussion

### 4.1. The Phenomenon of Educated Unemployment in the Digital Era

Research shows that educated unemployment in the digital era is experiencing increasing complexity along with changes in the structure of the modern labor market. Companies no longer solely assess graduates based on formal diplomas, but rather place greater emphasis on practical competencies, work experience, and the ability to adapt to digital technology. This situation causes many college graduates to struggle to find jobs relevant to their fields of study, despite the increasing number of job openings, particularly in digital-based sectors.

According to Sawitri and Widarini (2025), educated unemployment arises from a mismatch between formal education outcomes and the actual needs of the labor market. Consequently, the demographic bonus, which should be an opportunity, has the potential to become a burden on the national economy. This research confirms that the increase in the number of college graduates does not always correspond to an increase in labor absorption if their competencies are not relevant to industry needs.

Data from the Central Statistics Agency (BPS) in 2024 shows that Indonesia's Open Unemployment Rate (TPT) in February 2024 was 4.82%, with a workforce of 149.38 million and an employed population of 142.18 million (see Figure 1 and Table 1). Although unemployment rates are declining nationally, diploma and bachelor's degree graduates are still a group vulnerable to structural unemployment due to job mismatch.

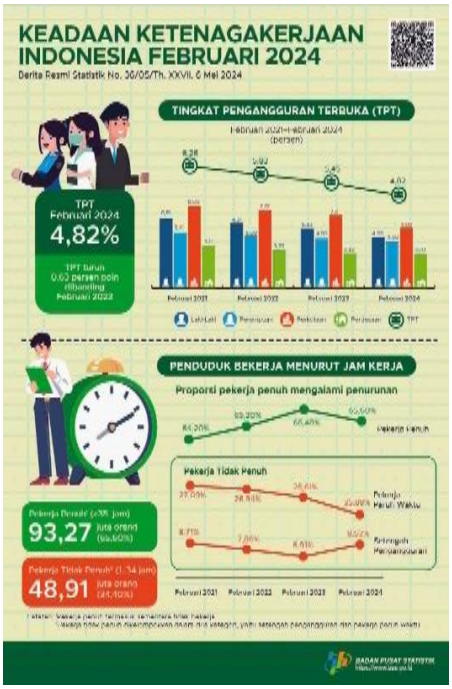


**Figure 1. Indonesian Employment Data for 2024**
Source: BPS, (2024)

**Table 1. Indonesian Employment Data for 2024**

| Indicator | Number |
|---|---|
| Labor force | 149.38 million people |
| Employed population | 142.18 million people |
| Open unemployment rate | 4.82% |
| Formal workers | 58.05 million people |
| Average monthly wage | IDR 3.04 million |

This phenomenon demonstrates that the primary problem is not simply a lack of jobs, but the low relevance of higher education to the needs of the digital labor market. This is reinforced by Pratiwi (2025), who explains that the expansion of higher education actually presents a paradox of increasing unemployment among diploma and university graduates amidst improving national employment indicators.

## 4.2. Overqualification as a Structural Cause of Educated Unemployment

One of the main findings of this study is the dominant phenomenon of overqualification or overeducation. This condition occurs when a person has a higher level of education than their job qualifications. As a result, workers cannot optimally utilize their academic capacity, resulting in low work productivity. Hasibuan and Handayani (2021) explain that overeducation is a form of vertical mismatch that causes workers to work in positions that actually require a lower level of education than their own. Their research shows that approximately 27.9% of the workforce in Indonesia is overeducated, while the mismatch in field of study reaches 68.4%.

**Table 2. Data on Overqualification of Indonesian Workers**

| Indicator | Presentation |
|---|---|
| Workforce is overeducated | 27.9% |
| Field mismatch | 68.4% |
| Qualification mismatch | 72.1% |

The data in Table 2 shows that educated unemployment occurs not only due to a lack of jobs, but also because available jobs do not match the graduates' educational level. This leads to low job satisfaction, increased psychological stress, and a high desire to change jobs. Permatasari and Nugroho (2024) found that young workers who experience overqualification tend to have low levels of job satisfaction and high turnover intentions. Thus, overqualification is an important indicator of the failure of the labor market to effectively absorb educated workers. This phenomenon suggests that investment higher education will not fully produce optimal economic output if the job market does not provide jobs that are relevant to the graduates' competencies.

## 4.3. SWOT Analysis

### 4.3.1. Strengths

Indonesia boasts a steadily increasing number of universities graduates each year, representing a significant asset in national economic development. If managed properly, an educated workforce can be a key driver of innovation and productivity in the digital era. Government programs such as the Pre-Employment Card, Independent Learning and Independent Campus (MBKM), and digital training are also strategic strengths in improving the quality of human resources. According to the Statistics Indonesia (BPS) (2024), the Indonesian workforce will reach 149.38 million people, demonstrating the enormous potential of a productive workforce. This presents a significant opportunity if the quality of graduates can be aligned with the needs of modern industry.

### 4.3.2. Weaknesses

The main weakness lies in the misalignment of higher education curricula with the needs of the workforce. Many graduates possess strong theoretical skills but lack practical skills such as technology utilization, professional communication, and real-world project experience. Hasibuan and Handayani (2021) showed that 27.9% of the workforce is overeducated and 68.4% experience a mismatch in their field of study. This data suggests that the problem of educated unemployment stems more from the quality of job matches than the number of available jobs.

### 4.3.3. Opportunities

The digital era has created vast new job opportunities, particularly in the technology, creative economy, digital marketing, data analysis, fintech, and startup sectors. Furthermore, remote work and freelance work systems open up global job opportunities without geographical boundaries. Universities have a significant opportunity to build strategic partnerships with industry through internship programs, professional certification, and project-based learning to better prepare graduates for the job market.

### 4.3.4. Threats

The greatest threat comes from increasing global labor competition and the rapid development of technologies such as Artificial Intelligence (AI). Many simple administrative and technical jobs are starting to be replaced by automation, making it increasingly difficult for graduates without adaptive skills to compete. Furthermore, companies currently prefer experienced workers over fresh graduates, resulting in significant barriers to recruitment. This situation is even more challenging for graduates from rural and district areas who have limited access to training and industry networks.

## 4.4. SWOT Matrix

Based on the previous SWOT analysis, strategies that can be implemented to address educated unemployment in the digital era are formulated using a SWOT matrix approach, namely SO (Strength-Opportunities), WO (Weakness-Opportunities), ST (Strength-Threats), and WT (Weakness-Threats) strategies. This strategy aims to maximize strengths and opportunities while minimizing existing weaknesses and threats, the SWOT Strategy is summarized in Table 3.

**Table 3. SWOT Strategy**

| Strategy | Description |
|---|---|
| SO (Strength-Opportunities) | Leveraging the large number of university graduates to meet workforce needs in the digital industry sector through competency-based training programs, professional certification, and strengthening digital literacy. Universities can collaborate with startups, digital MSMEs, and the creative industry to improve graduates' employability. |
| WO (Weakness-Opportunities) | Synchronizing higher education curricula with industry needs through internship programs, project-based learning, MBKM (Communication-Based Learning), and technology-based vocational training. This strategy aims to reduce skills mismatch and overqualification among new graduates. |
| ST (Strength-Threats) | Optimizing government support such as the Pre-Employment Card Program, digital training, and business incubation to increase graduates' competitiveness in facing global competition and job automation due to AI developments. Graduates are encouraged to develop adaptive skills and digital entrepreneurship. |
| WT (Weakness-Threats) | Expanding access to digital job training to the village and district levels through Job Training Centers (BLK), online training, and collaboration with local governments so that graduates from non-urban areas are not left behind in the competition of the modern job market. |

## 4.5. Explanation of SWOT Matrix Strategy

### 4.5.1. SO (Strength-Opportunities) Strategy

This strategy focuses on leveraging internal strengths to seize external opportunities. Indonesia has a large number of university graduates and the digital industry continues to grow. This situation can be exploited by strengthening competency certification programs, digital technology training, and developing digital-based entrepreneurship so that graduates become not only job seekers but also job creators.

### 4.5.2. WO (Weakness-Opportunities) Strategy

This strategy aims to address internal weaknesses by capitalizing on external opportunities. One major weakness is that higher education curricula are not fully aligned with industry needs. Therefore, educational reform is needed through curriculum synchronization, industry internship programs, and project-based learning so that graduates gain practical work experience before entering the workforce.

### 4.5.3. ST (Strength-Threats) Strategy

This strategy uses internal strengths to address external threats. Global labor competition and the development of Artificial Intelligence (AI) pose serious threats to new graduates. Government support through the Pre-Employment Card program, national digital training, and strengthening MSMEs can provide solutions to better prepare an educated workforce for changes in the modern job market.

### 4.5.4. WT (Weakness-Threats) Strategy

This strategy is a defensive effort to minimize weaknesses and avoid threats. The disparity in education quality between urban and rural areas has led to a growing skills mismatch. Thus, equitable access to digital job training is needed in local areas so that graduates from rural and district levels have equal opportunities to enter the modern job market.

## 5. Conclusion

Educated unemployment is a structural problem caused not only by limited job opportunities but also by a mismatch between education levels, graduate skills, and the needs of the modern workforce. Digital transformation has shifted workforce recruitment patterns from being oriented toward formal diplomas to being based on competencies, work experience, and the ability to adapt to technology. The phenomenon of overqualification shows that many college graduates are working in positions that do not match their level of education, thus underutilizing their academic potential. Meanwhile, skills mismatch demonstrates a gap between graduate skills and the needs of the digital industry, particularly in aspects of technological literacy, data analysis, problem-solving, digital communication, and practical work experience. These two factors are the main causes of the increase in educated unemployment in the modern era. The main problem is therefore not simply the high number of graduates, but the low relevance of higher education to industry needs, meaning that educated unemployment must be understood as a question of the quality of the match between education and jobs, rather than simply a question of labor quantity.

Academically, this research contributes to the development of labor economics studies by positioning overqualification and skills mismatch as the main structural causes of educated unemployment. While most previous research has focused on education level, economic growth, and unemployment, this study emphasizes the importance of a more comprehensive view of the relationship between graduate quality and the needs of the digital industry. The novelty of this research lies in the integration of these two key concepts in the context of digital economic transformation, particularly at the local level, such as villages and districts, where academic research is still scarce. This research shows that graduates from non-urban areas face greater challenges due to limited access to digital skills training and formal employment opportunities. Practically, the results of this research provide a basis for universities, the government, and industry to strengthen the alignment of educational curricula with labor market needs. Internship programs, professional certification, project-based learning, and industry-based digital training need to be expanded to better prepare graduates for modern workplace demands. The government also needs to increase equitable access to job training down to the village and district levels to prevent educated unemployment from becoming increasingly concentrated in certain areas.

Based on the research findings, a collaborative strategy between universities, the business world, and the government is needed to reduce educated unemployment in the digital era. Universities must reform their curricula to be more adaptive to industrial developments, particularly in the areas of digital technology, entrepreneurship, and practical work skills, producing graduates not only with theoretical knowledge but also with relevant and applicable work competencies. The government needs to strengthen employment policies through competency-based training programs, strengthening Vocational Training Centers, and expanding relevant national programs. Support for local industries, digital MSMEs, and the creative economy sector also needs to be increased to create new jobs that align with the competencies of university graduates. For further research, it is recommended to conduct field

research using quantitative or mixed methods approaches to more specifically measure the level of overqualification and skills mismatch in specific areas, such as villages, districts, or specific industrial sectors. Further research could also examine the impact of Artificial Intelligence, job automation, and the platform economy on the future rise in educated unemployment, ensuring that the resulting solutions will be more targeted and sustainable.

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