Research Article

# From Classrooms to Boardrooms: The Influence of Education on Economic Dynamics

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**This research paper examines the critical role of higher education in influencing economic dynamics within the technology sector. It explores how education contributes to human capital formation, innovation, entrepreneurship, and labor market adaptability in the context of rapid technological change. Utilizing a qualitative approach with interviews from educators, policymakers, entrepreneurs, and economic analysts, the study identifies four key themes: Human Capital Formation and Workforce Productivity, Fostering Innovation and Entrepreneurship, Impact on Occupational Mobility and Income Distribution, and Aligning Education with Economic Demands. The findings underscore the importance of aligning education with industry needs and the role of education in promoting economic growth and reducing income inequality, offering insights for policy development and curriculum design in the evolving technology landscape.**

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## Introduction

In an era where technology drives global economic trends, the question arises: how pivotal is higher education in shaping the innovators and entrepreneurs of tomorrow? This research paper delves into this query, exploring the critical role of higher education in fostering innovation and entrepreneurship within the technology sector. As the world navigates the complexities of the Fourth Industrial Revolution, the interplay between advanced education and economic dynamics becomes increasingly significant.

The current global economic landscape, marked by rapid technological advancements and digital transformations, underscores the necessity for a skilled workforce. This paper addresses a crucial gap:

 doi.org/10.32388/F10K8J 

understanding how higher education equips individuals with the cognitive, creative, and entrepreneurial competencies essential for thriving in a technology-driven economy. Our aim is to unravel the intricate ways in which higher education influences human capital formation, technological innovation, and labor market dynamics within the technology sector.

Empirical studies and theoretical frameworks, such as those by Heckman et al. (2013) and Audretsch and Thurik (2001), have highlighted the profound impact of advanced education on economic growth and entrepreneurship. These studies suggest that education extends beyond the mere accumulation of knowledge, fostering critical skills that enhance workforce productivity and adaptability. In the context of increasing automation, as emphasized by Frey and Osborne (2017), the need for education systems to evolve and cater to new technological demands is more urgent than ever.

The significance of this study lies in its potential to inform policymakers, educators, and economists about leveraging higher education for sustainable and inclusive economic development in a technology-dominated era. This paper is structured to first examine the theoretical underpinnings of the relationship between higher education and economic dynamics, followed by an analysis of empirical evidence, and concluding with insights and recommendations for future policy and educational strategies

## *Theoretical Background*

The theoretical background constituted a cornerstone to understand the intricate relationship between higher education and economic dynamics in the technology sector. This section delved into the theoretical foundations that illuminate the deep interaction between higher education and economic growth, shedding light on the mechanisms that connect classrooms with boards of directors. By examining key theoretical frameworks and models, it was unraveled the nuanced pathways through which education shapes human capital accumulation, innovation, and labor market dynamics, ultimately steering nations toward sustainable economic prosperity in the future technological era.

## *Human Capital Theory*

Central to the nexus between education and economics is the influential Human Capital Theory, as proposed by Becker (1964). This seminal framework posits that individuals accumulate human capital through education, training, and experience, enhancing their productive capabilities and earning potential. Schultz (1961) further emphasizes that education is crucial for human capital formation, equipping individuals with cognitive skills, technical competencies, and problem-solving abilities

necessary for effective workforce participation. Mincer (1974) supports this with empirical evidence, demonstrating the positive correlation between education levels and income, underscoring education's role in forming a skilled workforce that propels economic growth.

### *Endogenous Growth Theory*

Building on Human Capital Theory, Endogenous Growth Theory, as articulated by Romer (1990), expands the discourse by emphasizing education's role in fostering technological progress and innovation. This theory suggests that education not only enhances individual productivity but also fuels the engine of innovation driving economic advancement. A well-educated population is better equipped to absorb and generate knowledge, leading to the creation and diffusion of new ideas, technologies, and processes (Jones, 1995). Romer's theory posits that investments in education catalyze a nation's long-term growth trajectory through a virtuous cycle of innovation and productivity gains.

### *Innovation and Entrepreneurship*

Beyond traditional classroom environments, education's impact on economic dynamics extends to innovation and entrepreneurship. Schumpeterian theories (Schumpeter, 1942) assert that education is fundamental in fostering a culture of entrepreneurship, enabling individuals to identify opportunities, take risks, and drive technological disruptions. Education provides aspiring entrepreneurs with the knowledge and experience necessary to navigate complex business landscapes and explore untapped market niches (Audretsch and Thurik, 2001). It also cultivates critical thinking and problem-solving skills essential for developing innovative solutions to social challenges, further driving economic progress.

### *Labor Market Dynamics*

Education influences labor markets through skill composition, occupational mobility, and income inequality. The theory of Skill-Biased Technological Change (Acemoglu, 2002) suggests that technological advances favor skilled labor, creating a demand for individuals with specialized knowledge and technical competencies. Education enables people to adapt to changing skill demands and maintain stable employment amid technological disruptions (Autor et al., 2003). Additionally, education's impact on occupational mobility facilitates social mobility and mitigates income inequality (Blanden et al., 2004).

## Methodology

This research paper embarked on an empirical investigation to explore the relationship between higher education and economic dynamics within the technology sector. Operating under the hypothesis that higher education significantly influences human capital formation, technological innovation, and labor market dynamics, the study utilized a qualitative research approach. This approach was instrumental in uncovering the nuanced ways in which investments in higher education could drive technological innovation and entrepreneurship, offering valuable insights for policymakers, educators, and economists.

### *Research Design*

1. **Research Paradigm:** The study adopted an interpretivist paradigm, focusing on understanding the complex interplay between education and economic dynamics through social context and individual experiences. This paradigm, aligned with Creswell and Poth's (2018) emphasis on the centrality of participants' insights in qualitative research, was particularly suited for examining the intricate impact of educational investments on the technology sector.
2. **Data Collection:** In-depth interviews were the primary data collection method, chosen for their effectiveness in capturing comprehensive perspectives on the impact of higher education on innovation and entrepreneurship in the technology sector. The semi-structured interview protocol, with its open-ended questions, was designed to encourage participants to provide detailed reflections on their experiences and observations.
3. **Sampling Strategy:** The study employed a purposive sampling strategy, targeting individuals with specific expertise or experience at the nexus of higher education and technology sector economics. This approach ensured that participants could offer informed and in-depth perspectives on the subject matter. The participant pool, comprising 20-30 individuals, was determined based on the principle that this range typically suffices for qualitative studies to achieve data saturation (Guest, Bunce, & Johnson, 2006). Participants were selected from the following categories:
    1. **Educators in Higher Education:** 5-10 educators, including professors and administrators from universities with strong technology and innovation programs, were chosen for their insights into curriculum design and its alignment with the evolving needs of the technology sector.
    2. **Policy Makers in Education and Technology:** Approximately 5 policy experts working at the intersection of education and technology were selected. Their perspectives were crucial in

understanding how policies shape education to meet the demands of a technology-driven economy.

3. **Entrepreneurs and Industry Leaders:** 5-10 leaders from the technology sector, including founders of tech startups and executives in established tech companies, were included. Their experiences provided valuable insights into the real-world impacts of higher education on innovation and entrepreneurship.
4. **Economic Analysts with a Focus on Technology:** 5 experts specializing in economic analysis within the technology sector were chosen. Their contributions offered a macro view of how higher education influences economic dynamics in the tech industry.

4. **Data Collection Instrument:** The primary tool for data collection was a semi-structured interview protocol. This protocol included a balanced mix of open-ended and specific questions, allowing for guided discussions while offering participants the flexibility to share their experiences and perspectives. The interview questions were centered around key themes:
    1. **Impact of Higher Education on Human Capital:** Questions focused on how higher education contributes to skill development and knowledge acquisition necessary for the technology sector, including critical thinking, problem-solving, and technical skills.
    2. **Innovation and Entrepreneurship:** Questions aimed to uncover how higher education fosters innovation and entrepreneurship, such as through research opportunities, incubation centers, and industry partnerships.
    3. **Labor Market Dynamics:** The protocol included questions on how higher education influences employment trends, job creation, and the evolving demands of the tech labor market.
    4. **Alignment with Economic Needs:** Questions assessed the effectiveness of current educational programs in meeting the dynamic needs of the technology sector, including curriculum relevance and adaptability.

The protocol was pilot-tested with a small group of participants to refine the questions for clarity and relevance.

5. **Data Collection Process:** Interviews were conducted either in-person or via video conferencing, based on the participant's location and availability. Each interview lasted approximately 45 to 60 minutes. With participants' consent, the interviews were audio-recorded and transcribed verbatim for analysis. Additionally, notes were taken during the interviews to capture non-verbal cues and contextual information.

6. **Data Analysis:** The data analysis process in this research was meticulously designed to extract profound insights from the qualitative data collected through interviews. Central to this analysis was thematic analysis, a method aptly suited for identifying and examining patterns and themes within qualitative data, following the guidelines provided by Braun and Clarke (2006).
    1. **Thematic Analysis:** Initially, a thorough reading of the interview transcripts was conducted to gain an in-depth understanding of the data. The research team immersed themselves in the data, noting initial ideas and impressions. The coding process that followed involved systematically labeling segments of the text to summarize and categorize the content. Codes were generated both inductively, from the raw data, and deductively, based on the research hypothesis and theoretical framework. For example, a statement like "Education equips individuals with cognitive skills essential for the tech industry" was coded as "Skills Development" under the broader theme of “Human Capital Formation.”

       As coding progressed, the research team identified patterns and clusters of codes that suggested broader themes. One such theme, "Workforce Productivity," emerged from codes like "Skills Application in Workplace" and "Education-Productivity Link." These themes were continually reviewed and refined to ensure they accurately represented the dataset and aligned with the research objectives. The themes were both descriptive, providing a straightforward depiction of the data, and interpretive, offering deeper insights into the influence of higher education on the technology sector.
    2. **Triangulation:** To enhance the credibility and validity of the findings, triangulation was employed. This involved cross-referencing the qualitative data with existing literature, policy documents, and relevant quantitative studies. For instance, findings under the "Innovation and Entrepreneurship" theme were compared with established theories and current research in the field. This approach, recommended by Denzin (2009), ensured robust and well-founded conclusions.
    3. **Reflexivity:** Throughout the data analysis process, reflexivity was maintained. This involved the research team critically reflecting on their assumptions, beliefs, and biases, and how these might influence the research. Reflections were documented to provide a clear audit trail of the analysis process, enhancing the transparency and trustworthiness of the study, as per Malterud (2001).

## *Ethical Considerations*

The ethical integrity of this research was of significant importance, with a strong emphasis on informed consent, confidentiality, and the researcher's positionality. Each of these aspects played a crucial role in upholding the highest standards of research ethics.

## *Informed Consent*

Central to the ethical approach was obtaining informed consent from all participants. This process involved clearly informing participants about the study's purpose, the nature of their involvement, and their rights during the research. Participants were made aware that their participation was entirely voluntary and that they could withdraw from the study at any time without any penalty or loss of benefits. Additionally, they were informed about the confidentiality measures in place and how their data would be used and stored. Consent forms were provided to all participants to sign before participating in the interviews. These forms detailed all the pertinent information about the study, ensuring that consent was informed and documented.

## *Confidentiality*

Confidentiality was a critical aspect of this research, and stringent measures were taken to protect the privacy of all participants. All identifying information was removed or altered in the transcripts and during data analysis to ensure anonymity. Data was stored securely, accessible only to the research team, and used solely for the purposes of this study. Any publications or presentations resulting from this research were carefully reviewed to ensure that no confidential or identifiable information was disclosed. The commitment to confidentiality was communicated to participants as part of the informed consent process, reassuring them of the dedication to protecting their privacy.

## *Researcher's Positionality*

Recognizing the influence of the researcher's positionality on the research process was vital. The research team engaged in reflexivity throughout the study, critically reflecting on their backgrounds, experiences, and potential biases and how these might impact the research. This process included acknowledging any preconceptions or assumptions related to higher education and the technology sector and being vigilant about how these might influence data collection, analysis, and interpretation.

By transparently acknowledging and addressing these factors, the research aimed to enhance its credibility and reduce the risk of bias.

## Results

This research presents a nuanced set of results derived from in-depth interviews with a diverse range of participants, including educators, policymakers, entrepreneurs, industry leaders, and economic analysts, focusing on the intersection of higher education and economic dynamics in the technology sector. The findings, organized into four thematic categories, offer rich insights into how higher education influences human capital formation, innovation, entrepreneurship, and labor market dynamics within the technology sector.

### *Theme 1: Human Capital Formation and Workforce Productivity*

In exploring the connection between higher education and workforce productivity, educators and policymakers emphasized the role of education in equipping individuals with cognitive skills and critical thinking. This theme aligns with Becker's (1964) emphasis on the role of education in enhancing human capital. One educator noted, "Education is not just about imparting knowledge; it's about shaping critical thinkers who can adapt to and drive change in the labor market." Policymakers highlighted the economic benefits, with one stating, "Our investments in education have a direct payoff in terms of a more skilled workforce, leading to enhanced productivity and, ultimately, economic growth." Industry representatives added a practical perspective, with one leader explaining, “We see a clear difference in productivity and innovative output when we have well-educated employees. Their skills translate into tangible benefits for the organization.”

| Participant | Perspective and Insights |
|---|---|
| **Educator** | "Education equips individuals with cognitive skills and critical thinking, fostering adaptability in the labor market." |
| **Policymaker** | "Investments in education lead to a skilled workforce, enhancing productivity and contributing to economic growth." |
| **Industry Leader** | "Well-educated employees bring valuable skills to the workplace, contributing to higher organizational efficiency and innovation." |

**Table 1.** Perspective and Insights from Participants about Human Capital Formation and Workforce Productivity

### *Theme 2: Fostering Innovation and Entrepreneurship*

This theme captured how education fuels innovation and entrepreneurship. Entrepreneurs and educators concurred that education lays the foundation for innovative thinking and entrepreneurial capabilities. Echoing Audretsch (2008), one entrepreneur mentioned, "Our educational system is a cradle for innovation, providing the toolkit for individuals to turn ideas into enterprises." An educator elaborated, "Our curricula are designed to go beyond the basics, fostering a mindset geared towards creativity and problem-solving, which is essential for entrepreneurship." This sentiment aligns with Drucker's (1985) ideas about the role of innovation in education. A policymaker added, "We focus on education that emphasizes R&D, creating a pipeline of new ideas that fuel technological progress and economic growth."

| Participant | Perspective and Insights |
|---|---|
| **Entrepreneur** | "Education fosters a culture of innovation, providing the knowledge and confidence needed to seize entrepreneurial opportunities." |
| **Educator** | "Curricula designed to encourage creativity and problem-solving nurture an entrepreneurial mindset among students." |
| **Policymaker** | "Education that emphasizes research and development helps generate new ideas, fueling technological progress and economic dynamism." |

**Table 2.** Perspective and Insights from Participants about Fostering Innovation and Entrepreneurship

### *Theme 3: Impact on Occupational Mobility and Income Distribution*

Economists highlighted education's role in enhancing occupational mobility and addressing income disparities. Aligning with Becker's (1964) human capital theory, one economist stated, "Education is the key that unlocks opportunities for higher-paying jobs, especially in tech sectors." From the industry perspective, a leader mentioned, "The correlation between higher education and income mobility is evident. It's a tool for reducing income inequality and fostering social cohesion." Policymakers stressed the importance of targeted educational interventions to alleviate economic disparities, as one noted, "Through specific educational programs, we can empower individuals to overcome economic barriers and achieve upward mobility."


doi.org/10.32388/F10K8J

| Participant | Perspective and Insights |
|---|---|
| **Economist** | "Education plays a pivotal role in facilitating occupational mobility, allowing individuals to access higher-paying jobs." |
| **Industry Leader** | "Higher education levels are associated with greater income mobility, reducing income inequality and promoting social cohesion. |
| **Policymaker** | "Targeted educational interventions can alleviate disparities, enabling individuals to transcend economic barriers and achieve upward mobility." |

**Table 3.** Perspective and Insights from Participants about Impact on Occupational Mobility and Income Distribution

### *Theme 4: Challenges and Opportunities in Aligning Education with Economic Demands*

In this theme, the focus was on the need for education to adapt to evolving skill demands in the technology sector. An educator stressed, "We must continually evolve our curricula to bridge the gap between academia and industry requirements." This view resonates with Kerr's (2001) emphasis on aligning education with industry needs. Entrepreneurs and policymakers pointed out the importance of collaboration between academia and industry. An entrepreneur shared, "Partnerships between educational institutions and industry are crucial for ensuring education meets real-world economic needs." Policymakers underscored the role of flexible education policies in keeping pace with economic changes, with one stating, "Our policies aim to promote adaptability and continuous skill development, keeping our workforce competitive in a rapidly changing economic landscape."

| Participant | Perspective and Insights |
|---|---|
| **Educator** | "Educational institutions must adapt curricula to meet evolving skill demands, bridging the gap between academia and industry." |
| **Entrepreneur** | "Collaborative efforts between academia and industry are crucial to aligning education with real-world economic needs." |
| **Policymaker** | "Policies that promote flexible education and skill upgrading empower individuals to remain competitive in a rapidly changing economy." |

**Table 4.** Perspective and Insights from Participants about Challenges and Opportunities in Aligning Education with Economic Demands

The findings of this qualitative study offer a detailed and multifaceted view of the role of higher education in shaping economic dynamics within the technology sector. The insights gathered from educators, policymakers, entrepreneurs, industry leaders, and economic analysts highlight the critical importance of education in developing human capital, enhancing innovation, and stimulating entrepreneurial activities. These outcomes emphasize education's significant influence on workforce productivity, occupational mobility, and income distribution in the context of the rapidly evolving technology sector. The research underscores the necessity of aligning educational curricula with the dynamic demands of the technology-driven economy, pointing out both the challenges and opportunities in this endeavor. For policymakers, educators, and economists, these findings provide essential guidance in formulating strategies that harness the transformative power of education for fostering sustainable and inclusive economic growth in an era increasingly dominated by technological advancement.

## Discussion of Results

education in the technology sector, affirming its critical importance in shaping economic dynamics. The identification of four thematic areas – Human Capital Formation and Workforce Productivity, Fostering Innovation and Entrepreneurship, Impact on Occupational Mobility and Income Distribution, and

Challenges and Opportunities in Aligning Education with Economic Demands – contributes to a holistic understanding of this relationship.

In the domain of Human Capital Formation and Workforce Productivity, this study builds upon and extends Becker's (1964) Human Capital Theory. It highlights the transformative role of education in enhancing cognitive abilities and critical thinking essential for labor market adaptability. The findings suggest that higher education curricula incorporating cognitive and critical thinking skills significantly influence workforce adaptability and productivity. This aligns with Spence's (1973) concept of the signaling power of education in the job market. Implications for educational policy and practice include the need to integrate these skills into curricula to enhance workforce readiness.

The insights on Fostering Innovation and Entrepreneurship corroborate the assertions of Audretsch (2008) and Drucker (1985) on the pivotal role of education in driving innovation. The emphasis on curricula promoting creativity and problem-solving resonates with Florida's (2002) concept of the creative class. Educational policies and programs that prioritize research and development could transform educational systems into hubs of innovation, aligning with Romer's (1990) emphasis on the significance of knowledge in driving economic growth. For practical application, this suggests that educational institutions should partner with technology sector stakeholders to ensure curricula are responsive to the needs of an innovative economy.

Regarding Impact on Occupational Mobility and Income Distribution, the study aligns with Becker's (1964) human capital theory and Goldin and Katz's (2008) research on education and income inequality. Education emerges as a crucial factor in enabling occupational mobility and mitigating income disparities. This is in line with Bourdieu's (1986) discussion on the role of cultural capital in social mobility. The study suggests the importance of targeted educational interventions to promote social cohesion and economic equity, supporting Sen's (1999) work on capability and well-being.

In addressing Challenges and Opportunities in Aligning Education with Economic Demands, the study reflects Kerr's (2001) views on the importance of this alignment. Collaboration between academia and industry, as supported by Etzkowitz and Leydesdorff's (2000) theory of the triple helix of university-industry-government relations, emerges as crucial. Flexible education policies that foster continuous skill development, as proposed by Jarvis (2006), are essential for maintaining a competitive workforce. For policymakers, this emphasizes the need for agile policy frameworks that support lifelong learning and adaptability in educational systems.

## Conclusions

The exploration of the intricate relationship between education and economic dynamics within the technology sector, as evidenced in this study, highlights the significant role of education in influencing the economic trajectory of nations. This research navigated through various aspects, such as human capital formation, innovation, occupational mobility, and the alignment of educational curricula with economic demands, thus providing a comprehensive view of how education serves as a critical link between academia and industry.

As a catalyst for human capital formation, education has proven to be crucial in equipping individuals with cognitive skills, critical thinking, and adaptability. These attributes are indispensable in the contemporary dynamic workforce, supporting Becker's (1964) Human Capital Theory. The unanimous agreement among educators, policymakers, and industry leaders on the importance of education in developing a skilled workforce underlines its pivotal role in promoting economic growth.

In fostering innovation and entrepreneurship, the study aligns with Schumpeterian theories (Schumpeter, 1942), showing how education acts as a crucible for innovative and entrepreneurial minds. This study suggests that education should not only transfer knowledge but also focus on cultivating a culture of innovation and entrepreneurship, empowering individuals to harness opportunities and drive economic progress.

The research also demonstrates education's effectiveness in enhancing occupational mobility and reducing income inequality, resonating with the Skill-Biased Technological Change theory (Acemoglu, 2002). Education is a powerful tool for individuals to navigate changing skill demands and climb the socioeconomic ladder.

A significant finding of this study is the need for education systems to adapt to the evolving economic demands of the Fourth Industrial Revolution. The insights indicate the necessity for agile educational structures that can equip individuals with the skills needed in an automated and technologically advanced economy. Collaboration between academia and industry is paramount in developing relevant and progressive curricula.

**Recommendations for Future Research and Practical Applications:**

1. **Future Research**: Further studies should investigate the specific educational strategies and pedagogies that most effectively foster innovation and entrepreneurship in the technology sector.


doi.org/10.32388/F10K8J

Additionally, research into the long-term impact of educational reforms on economic growth and social mobility would provide valuable insights.

2. **Practical Applications**: Policymakers and educators should consider developing and implementing curricula that are directly aligned with the needs of the technology sector, including a focus on digital literacy, problem-solving, and entrepreneurial skills. Partnerships between educational institutions and technology companies should be encouraged to ensure that education remains relevant and responsive to industry needs.
3. **Policy Development**: Governments and educational bodies should work together to create policies that encourage lifelong learning and continuous skill development, ensuring the workforce remains adaptable to technological advancements and changes in the labor market.

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## Declarations


**Funding:** No specific funding was received for this work.

**Potential competing interests:** No potential competing interests to declare.