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Towards 2030: sustainable development goal 8: decent work and economic growth. A sociological perspective

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Towards 2030: sustainable development goal 8: decent work and economic growth. A sociological perspective

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Editorial: Towards 2030: sustainable development goal 8: decent work and economic growth. A sociological perspective

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KEYWORDS

SDG8, unemployment, labor-market issues, social insurance, working poor, precarity, remote work

Editorial on the Research Topic
Towards 2030: sustainable development goal 8: decent work and economic growth. A sociological perspective

Overview

This Research Topic explores Sustainable Development Goal (SDG) eight, which is to "promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all." It highlights the COVID-19 pandemic's severe impact and triggered global economic recession, worsened gender pay gaps, increased undeclared employment, and significantly raised unemployment (United Nations, 2024). From a sociology-specific perspective, this Research Topic examines the global and local implementation of SDG8, its adaptation to different geographical contexts, stakeholder involvement, and issues related to decent work conditions worldwide.

The Research Topic was edited in cooperation with two journals: "Frontiers in Sociology" and "Frontiers in Public Health." The Research Topic contains ten articles by 38 authors in: Bangladesh, China, Colombia, Germany, India, Indonesia, Peru, the Republic of Korea, South Africa, Switzerland, and the United States. Four types of articles are included: seven original research articles (Cho et al.; Islam and Hoque; König and Seifert; Naveen et al.; Quispe Mamani et al.; Ran and Zhao; Vélez-Rolón et al.), one review article (Chigbu and Nekhwevha), one perspective article (Broecher and Painter), and one opinion article (Setiawan et al.). This Research Topic deals with, among others, telework, digital skills, education, entrepreneurship, gig economy, intellectual capital, and work-life balance. The Research Topic of articles is organized according to three themes.

Theme I: transformations in the modern workforce

The papers start with Chigbu and Nekhwevha, who focus on promoting decent work and sustainable economic growth within SDG8. The authors argue that this goal requires addressing gender inequality, market economy consequences, informal sector roles, and environmental sustainability. The presented research critically reviews 108 papers, revealing persistent gender biases, income disparities, insecure working conditions, and insufficient support for informal workers, highlighting gaps in achieving inclusive and sustainable growth. The findings emphasize the importance of fair, safe, and secure employment opportunities to support economic growth and uphold workers' rights. In the following article, Cho et al., based on a South Korean case, introduce recent changes related to home-based telework that has changed rapidly due to the COVID-19 pandemic, necessitating adjustments in productivity, evaluations, and employment rules as per the Korean Labor Standards Act. This study underlines the need for societal and institutional shifts, including legal and organizational changes, to sustain post-pandemic remote work and optimize its dynamics for future advancements. König and Seifert continue discussing this subject by focusing on digital skills. Support for their development has become even more critical during the pandemic, especially for older employees working from home, although many still have lower digital proficiency. This research found that, among others, older workers expanded their computer skills during the pandemic. Ran and Zhao focus on another unexpected pandemic effect: the growing importance of occupational injury protection for gig workers in China. The authors show that the current measures are insufficient due to their exclusion from traditional employee benefits. This study contributes ideas for reforming work-related injury insurance to better protect gig workers, offering insights that may also benefit other countries.

Theme II: challenges of bridging gaps between education and employment

Islam and Hoque's study on the trade-off between schooling and labor for children in rural Bangladesh opens the next section. This research finds that subsistence needs, labor demand, and parental occupation influence decisions to prioritize work over education. Additionally, factors such as sexual division of labor, credit constraints, and cultural beliefs negatively impact parents' decisions regarding child schooling, suggesting that interventions must consider these socio-economic and cultural factors. The team of Vélez-Rolón et al., in their research, focused on another example of the relationship between education and employment. The authors argue that rapid technological advances and global challenges, including the COVID-19 pandemic, underscore the need for educational models that enhance employability and economic growth. The study conducted in Colombia shows that combining academic and company learning spaces helps close gaps and promote economic growth by developing intellectual capital, emphasizing decision-making, interorganizational coordination, and knowledge sharing. Quispe Mamani et al. show that education is crucial for financial inclusion in Peru. Financial inclusion is understood as access to quality financial services, essential for leveraging global opportunities for households and companies. The last paper in this section by Broecher and Painter underlines the potential for creating self-determined, healthy, and sustainable forms of working, learning, and living through a transformative community project initiated in Eastern Germany. The investigated initiative integrates components such as self-directed education and unconditional basic income, aiming to foster active civil society and improve conditions for children and young people, with potential for widespread application in rural and urban areas.

Theme III: empowering communities through entrepreneurship and stakeholder engagement

The final section focuses on two case studies of actions toward supporting specific communities. Naveen et al. concentrated their studies on empowering tribal women through entrepreneurship. The authors argue that particular programs can enhance their economic and social viability. The study suggests increasing government and organizational initiatives to improve women's education and financial capacity to start new enterprises, thereby boosting their decision-making power within their families. The team of Setiawan et al. provides another example based on the scaling up of social entrepreneurship. The authors claim that stakeholder engagement is crucial in Indonesia's state-driven programs to reduce poverty and combine business and social dimensions to improve economic welfare. The research shows that involving state and non-state actors enhances innovation, employment opportunities, and access to capital, ultimately leading to sustainable development and poverty alleviation.

Conclusion

The results in the Research Topic of articles enable the identification of five directions for further research, namely: (1) the effects of the lack of decent jobs and weak social insurance schemes (see Chen and Carré, 2020); (2) recent technological changes in the world of work related to automation and robotics (see Vos et al., 2023); (3) new forms and models of employment and education responding to megatrends including population aging, climate change, and dissemination of artificial intelligence (see Postepska, 2022); (4) transparent, flexible, and predictable legal employment frameworks development (see Gyulavári and Menegatti, 2022); and (5) development-oriented policies and employment services supporting decent job creation and entrepreneurship (see Shabbir, 2023).

Author contributions

AK: Conceptualization, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing. DD: Supervision, Validation, Writing –

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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ORIGINAL RESEARCH
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Digitally Savvy at the Home Office: Computer Skills of Older Workers During the COVID-19 Pandemic Across Europe

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Digital skills can be a valuable resource in work life, especially in such times as the current COVID-19 pandemic, during which working from home has become new reality. Although increasing numbers of older employees (aged 50 years and above) are using digital technologies to work remotely, many of these older adults still have generally lower digital skills. Whether the pandemic will be a push factor for the acquisition of computer skills in late working life remains unclear. This study investigated the explanatory factors of the computer skills gained by older workers who were working from home during the COVID-19 pandemic, using representative data for 28 countries from the Survey of Health, Aging and Retirement in Europe (SHARE). The analysis of the survey responses of 11,042 employed persons aged 50 years and older revealed that, 13% worked only at home due to the pandemic, while 15% said they worked at home and in their usual workplace. The descriptives indicate that full-time homeworking is more of an option among those with tertiary education and who already have some computer skills. Of the older employees who worked only at home, 36% reported an improvement in their computer skills, whereas of the older workers who worked at home and at their usual workplaces, only 29% reported such an improvement. Our results based on logistic regressions suggest that significantly more women, younger employees, respondents with tertiary educational qualifications, and those whose work was not affected by unemployment or even business closure acquired new computer skills, regardless of whether they were working permanently or only partly from home. The study underlines the importance of investigating the possible digital skills gained from the home office situation resulting from the pandemic.

Keywords: home office, corona, COVID-19, digital skills, Europe, older adults, SHARE

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INTRODUCTION

The digitalization of society yields opportunities to maintain daily life activities (e.g., online classes, shopping, medical consultation) and stay engaged with social ties, even in the midst of a pandemic. However, for individuals who are not adept at using technology or have difficulty adapting to technological innovations, living in a digitalized society may be problematic (Lupton, 2015). Further, many people in later adulthood do

not have direct or immediate access to such new technologies and, thus, have fewer opportunities to use these devices to garner additional benefits for their daily working lives (Francis et al., 2019; Niesel and Nili, 2021). Many older adults, who did not grow up with today's technologies (e.g., the internet and video conferencing), seldom use the latest information and communication technologies (ICTs), unlike younger age groups (Cotten, 2021). This perceived gap between people who have access to ICTs and those who do not or cannot access ICTs is referred to globally as the "digital divide" (Compaine, 2001).

On the basis of the life course paradigm, Sackmann and Winkler (2013) presented the following technical generations: (1) the mechanical generation (born before 1939), (2) the generation of the household revolution (born 1939–1948), (3) the generation of technology spread (born 1949–1963), (4) the computer generation (born 1964–1978), and (5) the internet generation (born after 1978). This concept of different cohort-specific relationships with technology illustrates the importance of ICT exposure as a function of historical timing and technology proliferation. This historical timing and life stage influence the types of ICTs used by different age cohorts. Furthermore, many individuals in these cohorts have not encountered ICTs in their workplaces. For example, historically, to conduct meetings, they may have relied extensively on face-to-face meetings rather than online video conferencing tools.

With the internet, social interactions over a long distance have become possible; for instance, video chatting via the internet can be useful for visual interactions when geographic distance or health limitations prevent in-person interactions. For older adults, the use of the internet allows them to find useful information, access health information, and connect with others via online communities and social media (Leist, 2013; Cotten, 2021). Although internet use has been increasing among older adults, a digital gap remains between age groups (Pew Research Center, 2021). For example, a representative survey conducted across European countries showed that only 49% of people aged 50 years and older used the internet; nevertheless, a divide exists between northwest European countries (e.g., 83% of Denmark's population uses the internet) and southeast European countries (e.g., only 27% of Croatia's population uses the internet) for this group of adults (König et al., 2018). In this study, internet use among older adults was influenced by personal factors, such as age, gender, education, and income. Participants aged 80 years and older reported spending less time online than those aged 65–79 years. Further, men and older adults with higher educational and economic profiles were more likely to use the internet. Health, prior experience with technology, social salience (i.e., internet use among members of one's social network), and the communication technology infrastructure of the country of residence were also predictors of internet use by older adults (König et al., 2018). Another study using recent data from 13 European countries showed that 53% of people aged 50 years and older use the internet; however, health limitations (e.g., subjective health and grip strength) were identified as important factors that affect older adults' ability to remain online (König and Seifert, 2020). Moreover, both studies highlight differences in ICT usage based on employment status, whereas compared to retirees, employees were significantly more likely to use the internet recently (König et al., 2018). Leaving the labor force and entering retirement also marks a change in individual internet use, since new pensioners were more likely to stop using the internet and thus become more often so-called "offliners" (König and Seifert, 2020).

With the digitalization of work advancing rapidly, daily work has been increasingly more dependent on employees' use of various types of digital technologies (Warhust and Hunt, 2019). Today, for workers, investing in computer skills has become more important. Theoretically, this can be framed with the concept of "digital capital" (Park, 2017; Ragnedda, 2018). In this vein, digital capital is a recent concept that advances the understanding of digital inequalities by conceptualizing the set of abilities, aptitudes, and external resources that enable individual digital engagement and its related gains (Ragnedda et al., 2020). Digital capital refers to the accumulation of digital competence and access throughout a person's life. While digital competence refers to one's acquired and owned abilities to operate digital technologies, digital access covers the external resources available to individuals for full electronic participation. These two components are fluid and susceptible to development (e.g., through training and enhanced availability of devices). Digital capital varies greatly among groups of individuals in terms of, for example, age, education, income, and place of residence (Ragnedda et al., 2020). As described earlier, workers aged 50 years and older in particular have less internet experience (König et al., 2018; Pew Research Center, 2021) and fewer digital skills (Anderson et al., 2019; Francis et al., 2019; Cotten, 2021) and were therefore more likely to be confronted with a digital capital gap when they needed to work remotely at a digitally dominated home office.

The current COVID-19 pandemic reminds us of the significance and persistence of the digital divide and fosters discussion of the positive and negative outcomes of using vs. not using technologies (e.g., the internet) during a time of physical distancing (Xie et al., 2020). When physical distancing mandates started being implemented at the start of the COVID-19 pandemic, older adults, one of the most at-risk groups for COVID-19, were prevented from physically interacting with their social ties in person and were told to refrain from going out to work (if possible) or from visiting stores, restaurants, and other establishments (Ayalon et al., 2020). However, older adults who had access to and the ability to use ICTs could still maintain contact with their social ties, purchase food and groceries, and stay engaged in working life via their home office. By contrast, older adults who did not use ICTs, in addition to having possible age-related health and/or mobility limitations, were likely to struggle with a double burden of social exclusion; that is, older adults with fewer digital skills were not only excluded from physical contact but were also unable to compensate for face-to-face social interactions with digital solutions, such as video chatting and online social media (Robinson et al., 2020; Seifert et al., 2021). This struggle with online participation influences older adults' access to online services and content, such as social events

and social networking, during a time when digital solutions can compensate for missing physical contacts (Marston et al., 2020).

Health authorities and governments worldwide have categorized older adults as a "risk group" for more serious and possibly fatal illnesses associated with the current coronavirus (COVID-19) infection (Brooke and Jackson, 2020). Consequently, measures requiring older adults to shelter in place and maintain physical distancing from others have been enacted in many countries during the pandemic. Older workers (aged 50 years and above) and employees with preexisting conditions were therefore encouraged to work from home, if possible (Engstler et al., 2020). Working from home, however, requires additional technical prerequisites in the home, such as the hardware (e.g., personal computer) and software (e.g., video conferencing application) needed to set up the home office and the digital skills needed for the digital solutions necessary for working at home (Milasi et al., 2021).

Reinforced by the COVID-19 pandemic, access to ICTs and skills in using them have become critical to participation in society, as well as in working life, when a home office is recommended by employers or mandated by the government. Contemporary work life is characterized by vast and rapid digitalization, that is, an increase in the use of digital technology by industry and companies for administration, service delivery, and production (Warhust and Hunt, 2019; OECD, 2020a) and, thus, by workers who have to face new technical challenges and learn computer skills even in their later professional careers (van Laar et al., 2020). This is manifested, for example, in many companies expanding their uptake of digital technologies, adopting new modes of production for existing or new products, moving or enlarging their businesses online, partially or completely converting to digital service delivery, and supporting their employees with new digital equipment for working on-site or outside company premises. The COVID-19 pandemic has forced an acceleration of such digital transformation of work, with companies mobilizing more resources for the digital shift and workers being exposed to more digital work (Nagel, 2020; Sostero et al., 2020). These new challenges for digitally supported work (at home) also affect the training of older people in the form of continuing education. In this context, education has been an important strategy for combating digital inequality and improving the labor market opportunities of older adults (Garcia et al., 2021).

RESEARCH QUESTIONS

Based on the partial fragility of the digital capital of older workers ($\geq$ 50 years of age), discussed above, and how this fragility has been exacerbated by the current COVID-19 pandemic, we investigated the intensity and the explanatory factors of the computer skills gained from home office work during the COVID-19 pandemic in a large representative dataset of older adults aged 50 years and older in Europe. Therefore, the study addresses the following research questions: (a) Did the computer skills of older workers change during pandemic-related homeworking? (b) If so, who among the older workers was able to acquire new computer skills?

DATA AND METHODS

Data

Our analyses are based on the Survey of Health, Aging, and Retirement (SHARE), which provides standardized information on respondents aged 50 years and older in various European countries. The main sample employed in this study was gathered from the first COVID-19 survey as part of the eighth (2020) SHARE wave, covering 28 European countries (including Israel) [for details on the data used, see Börsch-Supan (2022e)]. These specific data on 57,559 respondents were collected via computer-assisted telephone interviews (CATIs), mainly between May and September 2020, and covered a wide range of important life domains and changes caused by the global spread of COVID-19. The countries that participated in this wave were Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and Switzerland.

For the purpose of this study, the respondents were selected in a two-stage process. First, the initial sample covering the overall situation of employed Europeans included 11,944 respondents who were employed or self-employed (including those working in family businesses) when COVID-19 broke out ($n = 45{,}524$ not employed such as retired or unemployed, and $n = 90$ no information). Out of this number, we further excluded those whose daily work did not require them to use a computer ($n = 135$) or the internet ($n = 65$). Moreover, we had to exclude respondents below the target age of SHARE and, thus, those respondents who were younger than 50 years ($n = 184$), those living in nursing homes ($n = 24$), and those with a missing value in one of the explanatory variables (see below) used in our multivariate setting ($n = 494$). Considering these exclusions, the first sample included 11,042 valid interviews of employed and self-employed Europeans (see **Table 1** for a descriptive overview).

Based on the respondents' employment situations at the time of the survey, we were able to distinguish four distinct places of work among them: (1) their usual workplace only ($n = 5{,}913$); (2) their home and, alternately, their usual workplace ($n = 1{,}473$); (3) their home only ($n = 1{,}724$); and (4) neither their home nor their usual workplace ($n = 1{,}932$), as they lost their job or closed their businesses due to the outbreak. Since only employed respondents who worked partially or entirely at home due to the outbreak of COVID-19 were further asked, "Did you learn new computer skills?," we analyzed the growth of individual computer skills of older workers working from home due to the pandemic by restricting our multivariate sample to those 3,197 individuals.

Dependent Variable

The dependent variable was information on the respondents' acquired computer knowledge due to their home office-related work during the pandemic. The respondents who mentioned working at home partially or entirely during the pandemic were

TABLE 1 | Characteristics.

Parameters	Min	Max	Total	Worked at the usual workplace	Worked from home and the usual workplace	Worked at home only	None of these
Computer skills							
Excellent			0.08	0.06	0.10	0.17	0.04
Very good			0.15	0.11	0.32	0.22	0.09
Good			0.28	0.26	0.33	0.35	0.26
Fair			0.23	0.23	0.18	0.15	0.30
Poor/None			0.18	0.23	0.02	0.04	0.27
Missing			0.08	0.10	0.05	0.07	0.04
Female	0	1	0.46	0.44	0.46	0.53	0.46
Year of birth	1929	1969	1960	1961	1961	1960	1960
Tertiary education	0	1	0.31	0.21	0.57	0.62	0.17
Migrant	0	1	0.07	0.07	0.06	0.06	0.07
Living alone	0	1	0.19	0.17	0.20	0.20	0.21
Affected by unemployed, laid off or business closure	0	1	0.20	0.11	0.15	0.12	0.58
Total			1.00	0.54	0.15	0.12	0.19
N			11,042	5,913	1,473	1,724	1,932
Included in further analysis					✓	✓	

Data sources: Survey of Health, Aging and Retirement in Europe (SHARE), wave 8, COVID-19 Survey 1, release 8.0.0, weighted, own calculations.

asked, "Did you learn new computer skills?" They could choose to answer "No" (coded as "0") or "Yes" (coded as "1").

Independent Variables

Several variables covering the respondents' demographics, as well as their working and living conditions during the pandemic, were included in the empirical models to investigate the explanatory factors for computer skill gain.

As our sample focused on respondents who had to set up a home office as an economic consequence of the COVID-19 crisis, our analysis differentiated between those who worked entirely at home and those who worked both from home and in their usual workplace. Further, we included information on how many of the respondents experienced reduced working hours, increased working hours, or the same working hours since the outbreak of the pandemic. We further included information on whether respondents were affected by unemployment (such as being laid off), and even information on business closures resulting from the pandemic.

As the work of all the respondents required the use of ICT, they were further asked, "Was your internet connection adequate?" Again, their answer options were "Yes" or "No." Since we were investigating the question of whether working from home led to an improvement in computer skills, we fell back on the individual level from previous surveys. In detail, since the fifth wave of SHARE, all the respondents were able to rate their computer skills on a five-point Likert scale that ranged from "Excellent" to "Poor," with one response added for spontaneous answers like "I never used a computer," which we added to the category "Poor." If a respondent answered this question in more than one wave, we used the more recent information. As not all respondents who participated in the first SHARE COVID-19 survey were asked this question or did not answer in a previous wave, we added a category for those respondents that we labeled "Missing."

Since the use of modern ICT often requires corresponding cognitive skills, we also included respondents' cognitive skills using the last available value from the first trial of the so-called 'Ten words list learning test' from previous waves. In that test, the respondents were shown a list of 10 words. They were then asked to recall as many words as possible, resulting in a score ranging from 0 to 10. Moreover, as physical and psychological health plays an important role in the opportunities to acquire or deepen individual knowledge, especially during a pandemic, we considered the respondents' health conditions as well as their personal traits. Regarding their health condition, respondents were asked, "Before the outbreak of COVID-19, would you say your health was excellent, very good, good, fair, or poor?" Due to the comparatively low occurrence of "poor" health responses, we added "Fair" to the responses.

As the pandemic has had long-lasting effects on everyone's daily lives, including feelings of fear, insecurity, and powerlessness, we also considered psychological and personality-related questions that covered some possible accompanying symptoms and prospects. These questions first referred to situations in which the respondents recently felt "nervous, anxious, or on edge" and accounted for changes since the outbreak of COVID-19 by further asking those who answered "Yes" if such symptoms had "increased" since the outbreak of COVID-19. Especially during a pandemic, past and present situations can not only impact the psychological conditions of individuals but also their views and expectations of the future. Such changes can reflect their personality, which, in turn, can affect their current behavior and actions, as well as their motivation and willingness to deal with new technical

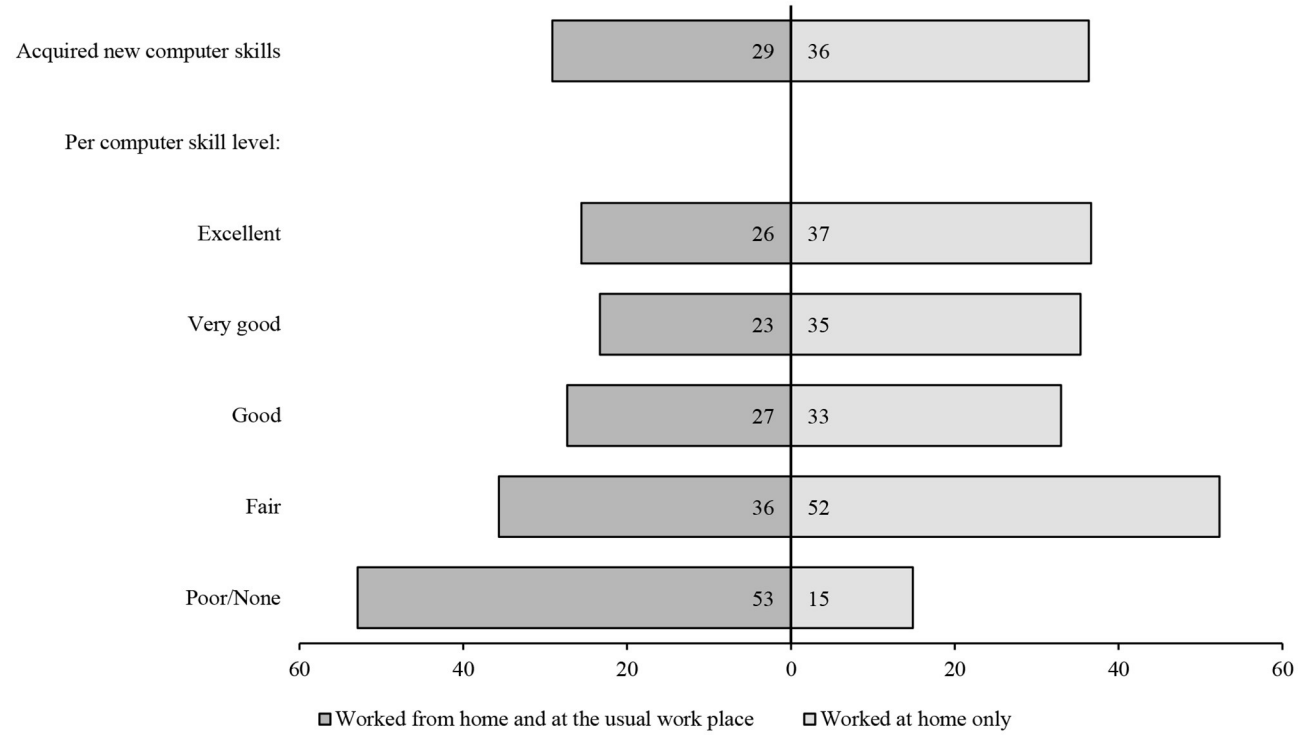

FIGURE 1 | New Computer Skills due to Home-Office in Times of Covid-19 (Proportion). Presented are proportions. Authors' own graph. Data source: Survey of Health, Aging and Retirement in Europe (SHARE), wave 8, COVID-19 Survey 1, release 8.0.0; *N* = 3,197 (respondents w/o information on skill level are not shown); weighted, own calculations.

requirements in a new working environment (their own homes). Therefore, we included two further questions to indicate the respondents' degree of positivity: "What was your most uplifting experience since the outbreak of COVID-19, or in other words, what experience did you have that made you hopeful or happy?" and "What are you looking forward to doing most once COVID-19 abates?" Both questions had three answer categories: some respondents did not name anything, others named something right away, and others hesitated before they named something.

Finally, we controlled for the following sociodemographic data of the respondents: their year of birth, sex (0 = male and 1 = female), and their highest educational attainment. Based on the respondents' level of education according to the International Standard Classification of Education (ISCED), we included information whether respondents held a tertiary educational qualification (ISCED 5 and higher) or not. Moreover, we considered the cultural and occupational differences caused by migration, in which case we qualified migrants as not born in their country of residence. In addition to individual characteristics, we controlled for the situation in which the respondent lived alone ("No" = 0 and "Yes" = 1).

To consider national differences regarding ICT infrastructure, we included the general distribution of broadband internet access in each of the 28 countries. Based on the national share of households with internet broadband access (in % of total households), we computed three distinctive categories of internet access across all our included countries. We labeled seven countries (Austria, Belgium, Czech Republic, Hungary, Italy, Slovenia, and Malta) whose household internet access was within one standard deviation (6.50) from the European average (86.5%) as countries with a "medium" broadband internet usage; 11 countries (Bulgaria, Croatia, Israel, France, Greece, Latvia, Lithuania, Poland, Portugal, Romania, and Slovak Republic) whose household internet access showed more than a half standard deviation (3.25) from the European average as countries with a "low" broadband internet usage; and 10 countries (Cyprus, Denmark, Estonia, Finland, Germany, Luxembourg, the Netherlands, Spain, Sweden, and Switzerland) whose household internet access was at least half a standard deviation (3.25) above the European average as countries with a "high" broadband internet usage. This information refers to 2019 (Israel: 2018)—the year preceding the interview in 2020—and was drawn from the OECD (OECD, 2020b) and Eurostat (Eurostat, 2021) databases.

Methods

After providing a general overview of the main characteristics of employees aged 50 years and older across Europe (see **Table 1**), we answered our main question on the improvement in their computer skills due to homeworking related to COVID-19 (see **Figure 1**). Moreover, based on stepwise logistic regressions, we analyzed the relationship between homeworking and improved computer skills under the consideration of other relevant

TABLE 2 | Determinants of improved computer skills.

	Gross			M1			M2			M3			M4			M5			M6			M7-1			M7-2		
	OR	**P**	**SE**	**OR**	**P**	**SE**	**OR**	**P**	**SE**	**OR**	**P**	**SE**	**OR**	**P**	**SE**	**OR**	**P**	**SE**	**OR**	**P**	**SE**	**OR**	**P**	**SE**	**OR**	**P**	**SE**
Worked at home only	**1.30**	0.000	0.10	**1.27**	0.001	0.09	**1.29**	0.001	0.10	**1.29**	0.001	0.10	**1.30**	0.001	0.10	**1.29**	0.001	0.10	**1.30**	0.001	0.10		**No**			**Yes**	
Workload																											
Unchanged (Ref.)																											
Reduced	1.05	0.550	0.09	1.15	0.124	0.11	1.16	0.114	0.11	1.15	0.136	0.11	1.14	0.161	0.11	**1.20**	0.065	0.12	**1.21**	0.050	0.12	1.11	0.480	0.17	**1.30**	0.046	0.17
Increased	**2.43**	0.000	0.24	**2.36**	0.000	0.24	**2.38**	0.000	0.24	**2.34**	0.000	0.24	**2.20**	0.000	0.22	**2.02**	0.000	0.21	**2.03**	0.000	0.21	**2.09**	0.000	0.33	**1.99**	0.000	0.28
Affected by unemployed, laid off or business closure	**0.60**	0.000	0.08	**0.62**	0.000	0.08	**0.62**	0.000	0.08	**0.62**	0.000	0.08	**0.58**	0.000	0.08	**0.60**	0.000	0.08	**0.61**	0.000	0.09	**0.60**	0.021	0.13	**0.61**	0.007	0.11
Internet connection	**0.77**	0.036	0.10	**0.81**	0.081	0.10	**0.81**	0.098	0.10	**0.80**	0.083	0.10	**0.80**	0.076	0.10	0.84	0.175	0.11	0.85	0.198	0.11	0.98	0.929	0.20	0.78	0.146	0.13
Computer skills																											
Excellent (Ref.)																											
Very good	**1.43**	0.004	0.18				**1.52**	0.001	0.19	**1.50**	0.001	0.19	**1.46**	0.003	0.19	**1.40**	0.010	0.18	**1.40**	0.011	0.18	1.28	0.224	0.26	**1.45**	0.033	0.26
Good	**1.55**	0.000	0.18				**1.63**	0.000	0.20	**1.62**	0.000	0.20	**1.57**	0.000	0.19	**1.56**	0.000	0.20	**1.55**	0.001	0.20	**1.38**	0.097	0.27	**1.65**	0.003	0.28
Fair	**1.47**	0.005	0.20				**1.57**	0.001	0.22	**1.55**	0.002	0.22	**1.54**	0.002	0.22	**1.65**	0.001	0.25	**1.64**	0.001	0.24	**1.48**	0.090	0.34	**1.75**	0.004	0.34
Poor/None	0.78	0.344	0.20				0.89	0.640	0.23	0.92	0.746	0.24	0.87	0.606	0.23	0.94	0.808	0.25	0.95	0.846	0.26	1.53	0.264	0.58	0.58	0.157	0.22
Missing (not asked yet)	**1.79**	0.000	0.28				**1.82**	0.000	0.29	**1.83**	0.000	0.29	**1.86**	0.000	0.30	**1.61**	0.005	0.27	**1.60**	0.006	0.27	**1.81**	0.020	0.46	1.39	0.155	0.32
Cognition score *(centered)*	**1.10**	0.000	0.03							**1.09**	0.001	0.03	**1.08**	0.005	0.03	1.01	0.802	0.03	1.01	0.823	0.03	0.99	0.862	0.04	1.01	0.697	0.04
Pre-covid health																											
Excellent (Ref.)																											
Very good	1.05	0.673	0.12							1.03	0.775	0.12	1.03	0.823	0.12	1.03	0.832	0.12	1.04	0.753	0.12	1.01	0.970	0.18	1.11	0.542	0.18
Good	1.11	0.325	0.12							1.09	0.423	0.12	1.07	0.550	0.12	1.12	0.311	0.13	1.13	0.280	0.13	1.27	0.161	0.22	1.05	0.764	0.17
Fair/Poor	1.13	0.392	0.16							1.07	0.643	0.15	1.03	0.857	0.15	1.10	0.518	0.16	1.10	0.524	0.17	1.09	0.720	0.25	1.15	0.495	0.23
Nervous																											
No (Ref.)																											
Yes	**1.49**	0.011	0.23										**1.39**	0.044	0.23	1.29	0.122	0.22	1.30	0.120	0.22	1.45	0.139	0.36	1.19	0.430	0.27
Yes & more since Covid	**1.52**	0.000	0.13										**1.44**	0.000	0.13	**1.28**	0.010	0.12	**1.28**	0.009	0.12	**1.46**	0.008	0.21	1.13	0.332	0.15
Felt uplifted																											
No (Ref.)																											
Yes, spontaneous	**1.64**	0.000	0.17										**1.57**	0.000	0.17	**1.50**	0.000	0.17	**1.50**	0.000	0.17	**1.44**	0.040	0.25	**1.55**	0.004	0.23
Yes, delayed	**1.36**	0.025	0.18										**1.28**	0.086	0.18	1.27	0.105	0.19	1.26	0.115	0.19	1.15	0.525	0.26	1.36	0.124	0.27
Looking forward																											
No (Ref.)																											
Yes, spontaneous	**1.82**	0.000	0.26										**1.51**	0.006	0.22	**1.56**	0.003	0.24	**1.57**	0.003	0.24	**1.78**	0.012	0.41	**1.40**	0.097	0.29
Yes, delayed	**1.88**	0.001	0.35										**1.67**	0.009	0.33	**1.74**	0.006	0.35	**1.76**	0.005	0.36	**2.10**	0.014	0.63	1.56	0.109	0.43
Female	**2.08**	0.000	0.16													**1.69**	0.000	0.14	**1.68**	0.000	0.14	**1.50**	0.001	0.18	**1.89**	0.000	0.22
Year of birth *(centered)*	**1.04**	0.000	0.01													**1.03**	0.000	0.01	**1.03**	0.000	0.01	**1.02**	0.084	0.01	**1.04**	0.000	0.01
Tertiary education	**2.17**	0.000	0.18													**2.05**	0.000	0.18	**2.03**	0.000	0.18	**2.03**	0.000	0.26	**2.05**	0.000	0.25
Migrant	**0.77**	0.066	0.11													0.82	0.181	0.13	0.81	0.156	0.12	0.99	0.949	0.23	**0.67**	0.056	0.14
Living alone	1.02	0.849	0.10													0.99	0.940	0.10	0.99	0.935	0.10	1.04	0.798	0.16	0.96	0.772	0.14
National broadband access																											
Medium (Ref.)																											
Low	**1.28**	0.014	0.13																1.10	0.372	0.12	1.08	0.640	0.18	1.14	0.378	0.17
High	**1.15**	0.100	0.10																1.15	0.136	0.11	**1.37**	0.029	0.20	1.02	0.903	0.13
N			3,197			3,197			3,197			3,197			3,197			3,197			3,197			1,473			1,724
Nagelkerke's R^2						0.034			0.042			0.046			0.061			0.103			0.104			0.091			0.120
Model c-statistic						0.599			0.612			0.618			0.638			0.686			0.687			0.678			0.700

Data sources: Survey of Health, Aging and Retirement in Europe (SHARE), wave 8, COVID-19 Survey 1, release 8.0.0, logistic regressions, odds ratios (OR), P value (P), robust standard errors (SE), references (Ref.), significant coefficients ($p \leq 0.100$) are displayed bold, own calculations.

individual and structural influences (see **Table 2**). Furthermore, our multivariate analysis examined whether and which type of homeworking (partial or entire) might promote computer skills in older people as well as different patterns between these two types. Lastly, we considered interactions between the type of home working, workload, sex, education and national internet distribution to account for the complex mechanisms regarding the improvement in computer skills in later working life (see **Table 3**). All statistical analyses were conducted using Stata 16.0 (StataCorp, 2019).

RESULTS

Working at Home During the Pandemic and New Computer Skills: A Descriptive Overview

A first glance (see **Table 1**) at the data from our 11,042 employed respondents aged 50 years and older revealed that 12% said they worked at home only due to the pandemic, while 15% alternately worked from home and at their usual workplace. However, more than one in two of the respondents (54%) continued to work at their usual workplace, while 19% said that such working arrangements did not apply to them. These 19% were those whose employment was directly affected by the pandemic, and most of whom could not continue their work either at their usual workplace or at home. Overall, 53% of all respondents who were faced with unemployment, being laid off, or business closures belonged to this group of employees.

Although the type of continued employment during the pandemic did not differ greatly according to sex, cohort, migration history, and living situation, there were clear variations with regard to educational background and preexisting computer skills. The descriptives point out that those with no tertiary educational attainment seemed to be doing more jobs that could not be done from home (see **Table 1**). Whereas, 21% of the respondents who continued to work in their usual working environment had tertiary educational credentials, this proportion was almost three times higher among people who were partially or entirely working from home (57 and 62%, respectively). A similar picture emerged for the respondents' individual computer skills. Around 40% of the part-time and full-time homeworkers rated their computer skills as "Excellent" or "Very good," whereas only 17% of those who kept working in their regular working environment claimed the same. Regarding the differences between those who worked at home full time and those who did so only part time, the descriptives indicate that full-time homeworking was more of an option or was more common among those with a higher educational attainment and who already had excellent computer skills.

The main aim of this study is to investigate whether and how the computer skills of full-time and part-time homeworkers changed during the pandemic with their new working environment. Overall, the majority of the homeworkers did not report that they had acquired new computer skills. However, the respondents who worked entirely from home reported a higher extent of newly learned computer skills than those who worked only part time from home (**Figure 1**). More precisely, 36% of the older employees who worked only at home reported an increase in their computer skills, whereas only 29% of the older workers who worked alternately at home and at their usual workplaces reported such an improvement. The older workers who were working entirely at home and who had rated their previous computer skills as "Fair" showed the highest gain (52%) in IT knowledge. Interestingly, the small proportion of older workers who were working part time at home and who had reported "Poor" or even no IT knowledge (2%) showed the highest gain (53%) in IT knowledge. In summary, the results highlight that a considerable proportion of the respondents were able to improve their computer skills regardless of their previous knowledge.

Determinants of Gaining New Computer Skills

The previous results indicate that working from home (entirely and partially) improves the computer skills of a substantial percentage of older employees. To test which type of homeworking (entire or partial) is likelier to improve computer skills in later working life, and to explain which other factors and circumstances lead to improved IT knowledge, we performed stepwise logistic regressions (**Table 2**). Prior to our multivariate modeling, we first measured the gross effect of each independent variable and further tested for multicollinearity, whereby the variance inflation factor (VIF) of all the individual variables did not exceed 10.0 (mean 2.57). Further, both non-dichotomous independent variables (cognition score and year of birth) were included as mean-centered items in our empirical setting.

In the first step (M1), we included work-relevant factors in the analysis. The findings show that the complete switch to the home office significantly improved the computer skills of older workers. These older workers were also precisely those respondents whose working hours increased on average in the wake of the pandemic and who were less affected by work interruptions, such as unemployment, layoffs, or even business closures. Interestingly, adequate internet speed at home was not necessary for improved computer literacy. This suggests that those with a high private internet speed already had better computer skills even before the pandemic. By including such previously acquired computer skills in our analysis (M2), the results showed that the home office led to a significant improvement in the computer skills of older people with fair, good, or very good IT knowledge. By contrast, those who previously rated their digital skills as "Excellent" or "Poor" (including those who indicated that they had no computer skills) did not learn new computer skills from working at home.

With regard to the link between pre-COVID-19 cognition and health and the improvement in computer skills (M3), workers with higher cognitive skills seemed to be more able to acquire new knowledge and thus were more likely to report improved computer skills. However, the state of health had no impact on this skill acquisition. Since COVID-19 has affected the lives of almost everyone and in various dimensions, we further tested the personal traits related to the pandemic and their influence on newly acquired computer skills (M4). The results showed two

TABLE 3 | Interactions between determinants of improved computer skills.

M8		OR	P	SE	M9		OR	P	SE
Worked at home only	**Workload**				**National broadband access**	**Workload**			
No (Ref.)	*Unchanged (Ref.)*				*Medium (Ref.)*	*Unchanged (Ref.)*			
No	Reduced	1.11	0.469	0.16	Medium	Reduced	**1.72**	0.001	0.29
No	Increased	**2.06**	0.000	0.32	Medium	Increased	**1.90**	0.001	0.38
Yes	Unchanged	**1.26**	0.026	0.13	Low	Unchanged	1.22	0.186	0.19
Yes	Reduced	**1.63**	0.000	0.21	Low	Reduced	1.14	0.493	0.22
Yes	Increased	**2.54**	0.000	0.36	Low	Increased	**3.51**	0.000	0.76
					High	Unchanged	**1.32**	0.029	0.17
					High	Reduced	**1.46**	0.020	0.24
					High	Increased	**2.35**	0.000	0.40
N				3,197	*N*				3,197
Nagelkerke's R^2				0.104	Nagelkerke's R^2				0.107
Model c-statistic				0.687	Model c-statistic				0.690
Worked at home only	**Sex**				**National broadband access**	**Sex**			
No (Ref.)	***Male (Ref.)***				***Medium (Ref.)***	***Male (Ref.)***			
No	Female	**1.48**	0.001	0.17	Medium	Female	**1.95**	0.000	0.30
Yes	Male	1.12	0.357	0.14	Low	Male	**1.45**	0.040	0.26
Yes	Female	**2.12**	0.000	0.23	Low	Female	**1.85**	0.000	0.29
					High	Male	1.22	0.176	0.18
					High	Female	**2.14**	0.000	0.30
N				3,197	N				3,197
Nagelkerke's R^2				0.104	Nagelkerke's R^2				0.105
Model c-statistic				0.687	Model c-statistic				0.688
Worked at home only	**Tertiary education**				**National broadband access**	**Tertiary education**			
No (Ref.)	*No (Ref.)*				Medium (Ref.)	No (Ref.)			
No	Yes	**2.02**	0.000	0.26	Medium	Yes	**1.30**	0.086	0.20
Yes	No	**1.28**	0.084	0.19	Low	No	0.84	0.377	0.17
Yes	Yes	**2.63**	0.000	0.33	Low	Yes	**1.69**	0.001	0.26
					High	No	**0.69**	0.021	0.11
					High	Yes	**1.92**	0.000	0.26
N				3,197	N				3,197
Nagelkerke's R^2				0.104	Nagelkerke's R^2				0.108
Model c-statistic				0.687	Model c-statistic				0.691
Worked at home only	**National broadband access**				**National broadband access**	**Worked at home only**			
No (Ref.)		***Medium (Ref.)***			**Medium (Ref.)**	**No (Ref.)**			
No	Low	1.11	0.532	0.19	Medium	Yes	**1.50**	0.008	0.23
No	High	**1.36**	0.033	0.19	Low	No	1.11	0.532	0.19
Yes	Medium	**1.50**	0.008	0.23	Low	Yes	**1.68**	0.001	0.27
Yes	Low	**1.68**	0.001	0.27	High	No	**1.36**	0.033	0.19
Yes	High	**1.51**	0.004	0.22	High	Yes	**1.51**	0.004	0.22
N				3,197	*N*				3,197
Nagelkerke's R^2				0.105	Nagelkerke's R^2				0.105
Model c-statistic				0.688	Model c-statistic				0.688

*Data sources: Survey of Health, Aging and Retirement in Europe (SHARE), wave 8, COVID-19 Survey 1, release 8.0.0, separate logistic regressions (models under control of all variables included in M6 of **Table 2**), odds ratios (OR), P value (P), robust standard errors (SE), references (Ref.), significant coefficients ($p \leq 0.100$) are displayed bold, own calculations.*

seemingly contradictory results. First, respondents who recently felt (increasingly) nervous, anxious, or on edge were likelier to gain new computer skills during this phase of the pandemic in comparison to those who had not such feelings. Second, we found the same pattern for a gain in computer skills for employees who had uplifting experiences during the outbreak that gave them inspiration or happiness, and those who said they were looking forward to the time when COVID-19 would abate in contrast to respondents who did not report such positive experiences or expectations.

Model 5 controlled for the respondents' demographics and living conditions. It showed that women in particular experienced improved computer skills from working from home. The younger among the older generation reported the same. Further, those with tertiary education degrees were also more likely to report improved computer skills during the pandemic. We found no influence of migration or the current living situation on changed computer skills. The respondents' years of birth and sex influenced their self-reported improvement in computer skills in two ways: with a loss and with a gain. In line with previous findings (see for example, Foverskov et al., 2018; Kamin and Lang, 2020), this can be attributed to the natural decline in cognitive abilities with age and to the fact that the women under investigation achieved—despite a similar age distribution—higher cognition scores than men (t-test significant at the $p = 0.001$ level). However, employees whose working hours were reduced due to the pandemic were now also more likely to report that they had acquired new computer skills. This pattern applies mainly to younger employees with tertiary qualifications.

Model 6 considered the country-specific distribution of broadband internet access. Whereas, the gross effect indicated improved computer skills for respondents living in countries with national broadband access below and above the European average, the analysis that covered all relevant indicators underlined that the direction of this pattern remained true but simultaneously lost its significance.

Based on these findings and to investigate different mechanisms depending on the type of homeworking experienced, we tested the model specified under M6 separately for employees who worked partially (M7-1) or entirely (M7-2) at home. Overall, the results confirmed the previously found mechanisms and pointed out that women, younger employees, those who are highly educated, and those whose work was not affected by unemployment, layoffs, or even business closures acquired new computer skills significantly more often, regardless of whether they worked entirely or partly from home.

However, we simultaneously found differences depending on the type and extent of homeworking. Partial homeworking respondents who increased their working time as a result of the pandemic as well as those, who showed increased feelings of nervousness or anxiety were likelier to have learned new computer skills since the outbreak. The same outcome was observed with respondents, who worked partially at home and who resided in one of the ten countries with a generally higher internet distribution such as Cyprus, Denmark, Estonia, Finland, Germany, Luxembourg, the Netherlands, Spain, Sweden, and Switzerland. A similar increase in computer knowledge was seen among full-time homeworkers, especially those whose regular working hours had to be either reduced or increased, those who already had in-depth IT skills before the pandemic, and those who had no prior migration experiences and thus belonged to the native population. The results further showed no influence from the national internet infrastructure on the acquisition of new computer skills for those who were working full time at home.

Based on these findings and to capture a broader picture of the effects of the type of homeworking (M8) and national broadband access (M9) on improved computer skills, we included several interaction terms for changed workload, educational background, and sex as indicators for each combination of the categories of the variables used in the equation (**Table 3**).

Here, the results revealed that respondents who had worked entirely at home since the outbreak of COVID-19 were more likely to report an improvement in their computer skills. The same applies to partial homeworkers who increased their workload since the spread of coronavirus. A similar effect could be found regarding the interaction between national broadband access and workload for those from countries with an overall better ICT infrastructure. However, respondents from Bulgaria, Croatia, Israel, France, Greece, Latvia, Lithuania, Poland, Portugal, Romania, and Slovak Republic who lived in countries with a below average distribution of broadband access but who increased their regular working hours could also benefit from improved computer skills. The same applies to employees from countries with "medium" national broadband access (Austria, Belgium, Czech Republic, Hungary, Italy, Slovenia, and Malta) who either increased or reduced their workload.

Regarding sex-specific differences, the included interactions highlight that women in general were more able to improve their computer skills since the outbreak of the pandemic, regardless of their working situation (partial or entirely at home) and country of residence. Among men, only those from countries with below-average ICT infrastructure reported an improvement in their computer knowledge.

A similar picture was observed for highly educated employees. In comparison to respondents without tertiary qualifications, those with tertiary credentials reported improved computer skills significantly more often, regardless of their working environment (entirely or partially at home) or country. However, for respondents with non-tertiary education, the results indicate that their computer skills also improved if they worked entirely at home. Simultaneously, employees with non-tertiary education but living in countries with "high" national broadband access were significantly less likely to increase their computer skills during this phase of the pandemic.

Finally, the interaction between the type of homeworking (partially or entirely) and country-specific internet access showed that, in general, respondents who were permanently working at home significantly more often improved their computer skills, regardless of the ICT infrastructure in their country. Only in countries with a comparatively above-average availability of high-speed internet does the type of homeworking play no role in learning new skills in later life.

DISCUSSION

Our analysis showed that only 12% of the respondents worked full time at home due to the COVID-19 restrictions, while 15% worked partly from home and partly at their usual workplace. The descriptives indicate that full-time homeworking was more common among those with tertiary education and who already had excellent computer skills before the pandemic. Therefore, working from home was not an option for each older worker, which underlines the possible social inequality of telework (Sostero et al., 2020).

Overall, the majority of the older workers who were working from home did not report acquiring new computer skills. However, more of those who worked full time from home reported that they acquired new computer skills than those who worked only partly from home. This reveals a certain "digital push" among the older workers who were working from home (Gallistl et al., 2021). Such a digital push suggests an increase in digital use and skills due to COVID-19 home-related use of ICT (e.g., the internet) for work or social interactions (e.g., video calls with family members). Amankwah-Amoah et al. (2021) also described COVID-19 as "the great accelerator," having fast-tracked the existing global trend toward embracing modern technologies and having ushered in transformations in work life (Amankwah-Amoah et al., 2021).

Against the background of the concept of "digital capital" (Park, 2017; Ragnedda, 2018), our analyses highlight an increase in digital capital, in this case, in computer skills, to some extent related to homeworking due to COVID-19. These new computer skills can be understood as new resources for the digitally oriented future work of older workers aged 50 years and older, and thus as enriching their digital capital set, which will open up to them better opportunities in the labor market even after the COVID-19 pandemic (Milasi et al., 2021).

Nevertheless, not all older workers reported an increase in computer skills during COVID-19-related homeworking. In fact, the results highlight that those with few or some digital experiences especially benefited from improved computer skills through pandemic-related homeworking compared to older adults with already excellent computer skills before the pandemic.

Overall, the results point out that women, younger respondents, employees with tertiary education, and those whose work was not affected by unemployment, layoffs, or even business closure acquired new computer skills significantly more often, regardless of whether they worked entirely or partly from home. The results further showed that those who worked only partly at home were less able to improve their computer skills than those who switched completely to work from home. Moreover, the previously recurring difference between men and women in the observed age group in terms of technology use (König and Seifert, 2020) was apparently narrowed with the pandemic, as women showed a higher increase in computer skills during the pandemic and regardless of whether they worked entirely or partially from home and regardless of their country of residence. Therefore, the pandemic can be seen as a push factor in acquiring computer skills in later working life, especially for women. However, to overcome the digital gap among older workers, it is important to invest in training to increase digital capital, even after the pandemic (Cros et al., 2021). This also includes a further expansion of the internet infrastructure to guarantee adequate use for everyone—even beyond a pandemic.

Even if working from home is not possible for some older workers, the current pandemic has shown that new computer skills are important in maintaining employment remotely and even non-remotely in old age, within the current scenario, but even more so in the future, in which everyone's work is expected to be digitally dominated. Against the expected accelerated development of new technologies, older workers can remain employed and be empowered to cope with new work-related digital challenges if they are able to use such technologies. Getting older adults to use ICT is one challenge, but once they are already using, for example, work-related new software, getting them to continue using other ICTs is another challenge. Maintaining the use of digital devices by older adults is an understudied but critical area for future research. When ICTs stop working properly, need repairs, require software, and password updates, and change their layout and appearance through software interface updates, some older adults may not be able to keep using them over time (Houston et al., 2019). During such times, older adults may need assistance from IT professionals in their workplace or from their social ties to resolve IT issues and continue using the technology (Kamin et al., 2020). If these sources of support are not available, older adults may end up using the technology less frequently or not at all (König and Seifert, 2020). Although the current pandemic motivated older workers to learn new computer skills, there is a need for targeted funding and programs to meet the needs of these individuals to remain connected to the labor market. This is vital because nearly all occupations are increasingly requiring digital skills, including those that have not traditionally required them, and remote work is becoming more common (Hecker et al., 2021).

As people aged 50–60 years grow older, it will be interesting to see how their technology use evolves as new ICTs continue to be developed and disseminated and whether they will be able to maintain their usage of various types of work-related ICT. Technology is constantly evolving; the fast-paced nature of technology development leaves researchers with the challenge of staying abreast of the latest developments in technology and how its use is evolving over time. This also contributes to the limited understanding of the impacts of technology use on older adults and how to maintain their use of such technology over time. Interdisciplinary research, as well as cooperative studies between technology developers and researchers in the sociology and business domains, will be needed in the future to more fully comprehend the many ways in which older adults use ICT, how their ICT use waxes and wanes over time, and the complex pathways through which ICT use may have an impact on older adults' working lives, even after the COVID-19 pandemic.

Limitations

As this study focused on Europe, our findings may have limited generalizability outside of Europe. Moreover, our dependent variable was limited (i.e., there was no information on areas, forms, and levels of computer skills), as not all possible facets of digital skills gained during the pandemic could be considered.

Hence, future studies are needed to measure in greater detail the computer skills (objectively and subjectively) of older workers in their home offices and the changes or stability of such skills over time.

Although the SHARE data allowed us to investigate an improvement in digital skills in a variety of European countries, especially among older adults, the information is limited to employees whose profession and employer allowed them to switch to a home office in the wake of the pandemic. In addition to this limitation to a certain part of the workforce, the survey also lacked several important variables, such as technology biographies, attitudes toward technology, technology acceptance, the use of technology in the household, and reasons for non-use. Moreover, the SHARE dataset used does not allow the differentiation between work locations and their technical frameworks, requirements (e.g., required employee skills), or in-house computer training provided. Furthermore, we do not know about the respondents' use of continuing education services or tools to build their digital skills during the pandemic. Future studies with representative data should focus on longitudinal settings to investigate more deeply the factors that influence the acquisition of digital skills and the educational needs of older adults in later working life.

CONCLUSION

For the European countries included in this study, our findings revealed a considerable pandemic-related increase in computer skills among workers aged 50 years and older while working from home due to the worldwide COVID-19 pandemic. Such an increase in computer skills was observed, especially for women and among people who already had some computer skills before the pandemic. Furthermore, the increases in computer skills were driven by socioeconomic and work-related conditions. Even though the COVID-19 pandemic has, to some extent, increased the "digital capital" of older (female) employees, work-related interventions (such as computer skills training among older workers) should be pursued to further promote the digital skills of workers to prepare them for remote work and, generally, for the digital transformation of work in the future.

DATA AVAILABILITY STATEMENT

Publicly available datasets were analyzed in this study. This data can be found here: http://www.share-project.org/.

AUTHOR CONTRIBUTIONS

All authors listed made substantial, direct, and intellectual contributions to the work and approved it for publication.

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Trade-Off Between Schooling and Labor for Children: Understanding the Determinative Factors Among Rural Households in Bangladesh

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This research is concerned with understanding the factors behind the trade-off between child labor and child schooling, given the well-documented links between the two. It examines parents' behavior in their decision-making on their children's schooling or practicing child labor. Depending on qualitative research methods including 28 semi-structured interviews and two focus group discussions conducted in the rural areas of Bangladesh in 2020, this study reveals the following: subsistence needs compel households, particularly the ultra-poor and the female-headed, to trade off child labor with schooling; due to higher demand of labor, parents engage their children into work instead of schooling; parents of labor-intensive occupations tend to trade off child labor with schooling; sexual division of labor remains obvious; finally, credit constraints and cultural beliefs have negative impacts on parental decision-making on child schooling. Interventions aiming to reduce child labor and increase schooling in these rural areas must remain mindful of the socio-economic and cultural needs.

Keywords: child labor, trade-off, schooling, factors, parents, rural households, Bangladesh

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INTRODUCTION

International Labor Organization's Convention No. 182 illustrates two kinds of adverse effects of child labor—one is the direct effect on the child's physical, mental, or social development and another is the indirect effect on the child's schooling (ILO, 1999). Several studies related to child labor also highlight its effect on schooling (Binder and Scrogin, 1999; Ravallion and Wodon, 2000; Ray, 2000; Parikh and Sadoulet, 2005). This research focuses on the trading-off between labor and schooling for children in a developing country context to further this understanding. Although the harmful effects of child labor are generally acknowledged by adults, parents in poor and developing economic contexts are often induced by its monetary returns. Parents often find it hard to bear the costs of schooling (Delap, 2001). Formal schooling is considered a vital contributor to human skills and capital (Mussida et al., 2019; Posso, 2020). Target 4.1 of the 2015 Global Development Agenda calls for ensuring that all girls and boys complete free, equitable, and quality primary and secondary education (Boeren, 2019). However, the growing number of school dropouts in developing countries remains a global concern (UNESCO, 2015; Hossain and Akter, 2019; Sarker et al., 2019). This qualitative investigation explores the household-level factors in the rural areas of Bangladesh to explain why parents trade off children's schooling with labor.

Previous studies have used various lenses to focus on the issue. Some works analyzed household demographic factors (Grootaert and Kanbur, 1995; Basu and Van, 1998; Salmon, 2005; Huisman and Smits, 2009), while others extensively focused on socio-cultural factors and the intra-household demand and supply of labor (Delap, 2001; Bhalotra and Heady, 2003; Emerson and Souza, 2003; Mukherjee and Pal, 2016; Hoque, 2021a). Several empirical findings indicate that parents engaged in labor-intensive occupations tend to trade off schooling with child labor in various localized contexts (Bhalotra and Heady, 2003; Haile and Haile, 2012; Yokying and Floro, 2020).

A few empirical studies have also examined the intra-household decision-making regarding children's work and labor in rural and urban areas in Bangladesh, and recognized parental occupation as a significant determinant (Amin et al., 2006; Shafiq, 2007; Tariquzzaman and Hossain, 2009). Drawing from the aforementioned works, this study contributes to the empirical literature by focusing on the parents' occupations in explaining their decisions regarding trade-offs between schooling and the labor of children in rural areas in Bangladesh. Assuming that parents who are engaged in labor-intensive occupations in low-income families in rural areas tend to engage their children in child labor, this study examines whether government interventions influence the respective parental decisions. To our knowledge, no qualitative empirical studies have purely focused on this issue. Based on this assumption, this research was led by two questions: (i) What are the factors that influence households' decisions in trading off between schooling and child labor in rural areas of Bangladesh? (ii) What government and non-government interventions are perceived to be effective? This study adopted qualitative primary research to address these questions. This paper is organized as follows. The next section outlines the review of literature followed by the research methodology. The subsequent section delineates the findings and analysis. The final section concludes with highlighting the key implications of this study.

LITERATURE REVIEW

Factors of Child Labor and Schooling

Child labor is generally considered harmful as it takes away a child's childhood and inhibits their social mobility. International Labor Organization (ILO) defines child labor as "work that is mentally, physically, socially or morally dangerous and harmful to children and interferes with their schooling" (ILO, 2002, p. 15). The latest global estimates state that about 160 million children aged 5–17—63 million girls and 97 million boys—were engaged in child labor globally in 2020 (ILO and UNICEF, 2021). Three major international conventions that set the standards for child employment/labor are—ILO Convention No. 138 on Minimum Age for Admission to Employment in 1973, ILO's Worst Forms of Child Labor Convention, 1999 (No. 182) and United Nations Convention on the Rights of the Child, 1989 (UNCRC). Following these conventions, child labor was seen as an unaccepable practice until the mid-1990s when emerging evidence started to back up a common understanding that not all work was harmful for children, and that employment in certain, safe kinds of work could be beneficial to achieve survival level of consumptions and skills (Rogers and Swinnerton, 2002). For instance, Mergos (1992) discovered that children had a positive economic contribution to farm households through peasant agriculture work in the Philipines. Bachman (2000) argues that stopping child labor may bring a halt to the survival incomes of many poor families. Recognizing schooling as a fundamental right and need of children, several studies have idenfiied child labor as a major obstacle in low-income family contexts (Ravallion and Wodon, 2000; Ray, 2000; Parikh and Sadoulet, 2005). Working hours was also found responsible for reducing children's leisure and outdoor activities (Binder and Scrogin, 1999).

Parental and household behavior regarding sending a child to school depends on a wide range of factors. Theoretical and empirical studies have interrogated the trade-off between schooling and labor mainly in low-income contexts. Basu and Van's (1998) luxary axiom states that a family engages in labor only when the imcome of adult family members is very low (Swinnerton and Rogers, 1999). Poverty was identified as a major driver of child labor. Jensen and Nielsen's (1997) study revealed that parents could not send their children to school in Zambia due to lack of monetary resources. Buchmann and Brakewood (2000) have drawn similar observations in Thailand and Kenya. Shafiq (2007) and Malik (2013) revealed the trade-off between school enrolment and child labor due to poverty in India and Bangladesh, respectively. However, evidence from various contexts also commonly indicates that the supply of child labor depends on the wage, demand, and opportunities in the market (Parikh and Sadoulet, 2005; Roy et al., 2015; Mukherjee and Pal, 2016; Tama et al., 2018).

Besides poverty, several other factors drive households to trade-off between schooling and child labor. Demographic factors like children's age, number of children and family members, and absence of a parent influence the decision (Tariquzzaman and Hossain, 2009; Malik, 2013; Khan and Lyon, 2015). Duraisamy's (2000) research based in India revealed that with age, children's participation in work increases, and schooling decreases. So, in other words, an older child is at more risk in trading-off schooling with child labor (Ray, 2000). In Bangladesh's rural areas, meanwhile, schooling of older boys depends on the number of children. If the number is high, the probability of schooling is low as the older siblings have to take care of the younger ones (Amin et al., 2006). However, several empirical researches conducted in Bangladesh showed that in many cases the older children often combine work and schooling (Alam et al., 2008; Khanam, 2008; Quattri and Watkins, 2019). It is well-established in the literature that when schools are close to where the children live, this may increase study hours and school attendance (Jensen and Nielsen, 1997; Huisman and Smits, 2009). Ray (2000) found that infrastructure such as the availability of classrooms can reduce child labor hours by increasing school hours.

Social and cultural factors are also critical. Delap (2001) argues that besides the economic factors, child labor crucially involves societal norms related to gender and culture. Children's sex, age, and place of residence appear to play important roles in

determining the type of work they perform in communities across rural and urban Bangladesh (Delap, 2000; Salmon, 2005; Tariquzzaman and Hossain, 2009; UCW, 2011; Hoque, 2021b). Perhaps interestingly, there are still some dichotomies in the literature. For example, Khanam (2005, 2008) observed that girls in rural areas must combine household work with schooling to a much greater extent than boys in Bangladesh's rural areas, while in contrast, Shafiq (2007) found no discrimination based on gender in rural households in Bangladesh.

Parents' Occupation and Education

Parental characteristics (i.e., occupation, education, type of employment, and so forth) play an important role in deciding how their children will spend their time. Evidence suggests that most children are employed by their parents for domestic help or to work in family farms and businesses (Fors, 2012; ILO UNICEF, 2021). Parikh and Sadoulet (2005) found in Brazil that self-employed or employer parents engage their children into labor more than employee parents. This indicates that availability or opportunities of work is a determinant of child labor. In Bangladesh, parents in non-labor-intensive occupations generally do not send their children to work, and wealthier rural households in Bangladesh can keep their children in school by bearing the opportunity cost (Amin et al., 2006). However, Bhalotra and Heady (2003) explained how the opposite could also happen. They called this the "wealth-paradox" phenomenon, which is that asset-rich households may engage their children into labor more than the asset-poor households. Due to credit constraints, asset-rich households may not be able to hire labor for their farm, so they may deploy their children into their farms. Several empirical research findings support this paradox (Buchmann and Brakewood, 2000; Ravallion and Wodon, 2000; Baschieri and Falkingham, 2009). Rammohan (2012) found in India that households that own agricultural lands usually let their children combine schooling and work; still, they may pull the children out of school during the harvest season when the demand for labor is higher. Salmon (2005) states that children are generally employed as unpaid labor in the agricultural sector, which indicates the high demand for child labor in labor-intensive occupations. Similarly, Rahman et al. (2010) found that children in rural Bangladesh are more likely to work in their parents' occupations in the agricultural sector.

In poor communities, households or families with disabled or illiterate parents are more likely to opt for generating income by engaging their children in child labor (Edmonds, 2007; Webbink et al., 2012). Several studies show that parents' education has a positive impact on child schooling and negative impact on child labor in Bangladesh (Ravallion and Wodon, 2000; Khanam, 2005; Shafiq, 2007; Ahmed and Ray, 2011; Hossain and Akter, 2019). Ahmed and Ray (2011) reveal that parents' level of education affects the trade-off decision-making across genders; however, a mother's education shows a significant inclination toward educating a girl child. Based on data collected from two districts of Bangladesh Hossain and Akter (2019) observe that children of educated parents left school less than less-educated parents.

Determinants of Parents' Decision-Making on Schooling or Child Labor

The return from investment of human capital is greater than the return from investing in physical assets (Schultz, 1989). However, when it comes to decision-making, parents often favor having their children combining child labor with informal learning (e.g., home education, religious studies, NGO-run non-formal education). Parental beliefs about the returns from schooling in forming human capital such as skills, knowledge, and health remain a primary determinant (Mukherjee and Pal, 2016). Many parents believe formal education fails to ensure social mobility for their children (Bazin and Bhukuth, 2009). While analyzing urban child labor among poor households in Bangladesh, Tariquzzaman and Hossain (2009) identified parental perception of the low returns from formal education as a significant influence. Poor quality educational provision, low attainment and high dropout rates among poor children are the key factors behind this perception (Tariquzzaman and Hossain, 2009). Some other recognized critical determinants are the distance of schools, low return on human capital investment, large indirect cost of schooling, and low quality of educational facilities (Jensen and Nielsen, 1997). Huisman and Smits (2009) studied 220,000 children in 340 districts of 30 developing countries to find out household and district level determinants of primary school enrolment and found that parental decisions on children's schooling are influenced by socio-economic and household demographic characteristics, including parents' education, level of wealth, level of occupation, and gender.

Basu and Tzannatos (2003) argue that for many households, child leisure or schooling is a luxury good, and if household income is not sufficient, families cannot afford to keep a child out of productive work or send them to school. Thus, child labor is often a substitute for adult labor. Diamond and Fayed (1998) discovered substitutability of adult and child labor in Egypt, and observed females are substitutes for children, but males are complements. In the case of Bangladesh, Salmon (2005) found that children and mothers are substitutes for each other as children of employed mothers were mostly working in households. Hosen et al. (2010) highlight that many poor and vulnerable parents in Bangladesh often have no alternatives to trade-off child education for paid or unpaid child work.

69.3% of rural parents engage in child labor to increase family income, 4.3% to repay loans, 3.7% for not being able to bear educational expenses, and 4.7% for children's unwillingness to study.

Intra-Household Demand and Supply of Child Labor

It is generally agreed that higher school expenditure (fees and other expenses) may induce parents to pull their children out from school (Sabates et al., 2013). However, due to seasonal variation in agricultural activities, particularly in Bangladesh, the adults of the families may be engaged in non-agricultural work to increase income. This may create the substitution effect on the children in the household activities when the adults are busy working outside (Ahmed and Ray, 2011).

Arends-Kuenning and Amin (2004) revealed that boys are mostly affected by seasonal agricultural labor demand as they are pulled out of school to meet this increased demand. This usually interrupts their school attendance and performance and thus may result into them dropping out. However, households usually tend to hire adult labor for family farming, which creates an opportunity for children to go to school. But, due to the moral hazards of managing hired adult labor, households may prefer their own family's labor as family members (especially children) are easy to supervise, and acquainted with the farm (Bhalotra and Heady, 2003). Moreover, levels of household indebtedness may have a negative correlation with child schooling. For example, if a household is in high debt, to pay it off, the adults of the households are likely to need to work longer hours which may create a necessity for children, particularly girls, to help in domestic chores (Ahmed and Ray, 2011).

CHILD LABOR AND SCHOOLING SITUATION IN BANGLADESH

In Bangladesh, the government provides the mainstream formal primary and secondary education for all public-school students. Primary education consists of a 5-year cycle, and secondary also has a 5-year cycle. The official age of entry into primary school is 6 years, although enrolment at later ages is also quite common. The country introduced compulsory primary education in 1992 along with free textbooks and tuition fee exemption for all children up to grade 5 and up to grade 8 for girls (Ahmed and Ray, 2011). According to Annual Primary School Census 2019, overall enrolment rate in primary school was 97.74–97.65% for girls, and 98.01% for boys. The overall student attendance rate was 88.66%; the primary education cycle completion rate for girls was 83.20%, for boys, this was 80.80%. The overall drop-out rate stood at 17.9%—for girls, it was 15.7%, and for boys, 19.20% (GoB, 2019). The COVID-19 pandemic has significantly worsened the situation (Emon et al., 2020; Hoque, 2020). An academic year of schooling has ∼220 school days. Because of the government incentives (i.e., free textbooks, free tuition, free food), the parents can compensate for the foregone earnings of their children (if they had worked instead), which inspires them to send their children to school.

Bangladesh Child Labor Survey 2013 estimates that the number of total working children aged 5-17 was 3.45 million (male 2.10 million and female 1.35 million), and the number of children engaged in labor was 1.7 million (BBS, 2015). The survey defined the terms "working children" and "child labor" based on the principles of the 18th International Conference on Labor Statisticians and Bangladesh Labor Act 2006.[1] The number of children aged between 14 and 17 engaged in child labor was 1.21 million. The national survey further informs that about 67% of child labor takes place in the rural areas, and of the children employed, 29.9% were engaged in the agricultural sector, while 33.3% were engaged in the manufacturing industry. Among rural child labor, 63% of children were not attending school during the reporting, 8.4% had never attended school, and the remaining 28.6% combined work and schooling. During the survey, households reported various reasons causing child laborers to drop out of school. As **Table 1** shows, 36% of child laborers dropped schooling to support their family income, 15.1% for not being able to afford the expenses, and only 16.1% left school to start working. Notably, among three age groups (6–11, 12–13, 14–17), more than 1 in 4 children aged 6–11 dropped school to start working, and a significant of children aged 6–13 reported "no school nearby" as a reason for their dropout.

The report conveys Bangladesh's national definition of child labor as:

> "Child labor is paid or unpaid work that is mentally, socially or morally conjugated with danger to children or the infliction of harm to children; activities that deprive children of the opportunity to go to school, or in addition to schoolwork and household responsibilities, loads additional work done in other places, which enslaves children and separates from their families; work performed by a child under the minimum age for entering into employment relationship with the employer according to the labor legislation of Bangladesh." (BBS, 2015, p. 16)

Bangladesh has been in active collaboration with ILO-IPEC initiatives through adopting the elimination of child labor its policy documents such as "The National Child Labor Elimination Policy, 2010" focus on the planning and implementation of various short, medium and long-term strategies and programmes for withdrawing working children, particularly from the worst forms of child labor, from the workforce, and getting them out of the vicious cycle of poverty and to get them back to school (GoB, 2010). The government has enacted some laws and legal provisions in relation to ILO Convention No. 182 and UNCRC, which include the Constitutional provisions (Art. 18, 20, 34), Penal Code (Secs. 366, 372, 373, 374), Children's Act, 2013; Suppression of Violence against Women and Children Act, 2000 (Sec. 8, 9)—amended in 2003, Suppression of Immoral Traffic Act, 1933, Bangladesh Labor Act, 2006 (Chapter VII), and the Employment of Children Act, 1938 (ILO guidance). The Bangladesh Labor Act, 2006 outlaws the employment of any child $<$14 years of age and bans anyone below 18 in some categorized list of hazardous works (GoB, 2015). Notably, on 22 March 2022, the country, as a part of the government's commitment under the National Action Plan on the Labor Sector of Bangladesh (2021–2026), ratified ILO's Minimum Age Convention keeping 14 as the minimum age of entry to work (ILO, 2022).

METHODOLOGY

The review of literature has illustrated various kinds of determinants of parents' decision-making on schooling or child labor, luxury and substitution axioms, intra-household demand and supply of child labor, opportunity cost of child labor and schooling, the relationship between human capital formation and child labor, and the picture of child labor and schooling in Bangladesh. However, households' decision-making patterns

[1]Bangladesh Labour Act 2006 defines a child as a person who has not completed his fourteenth year of age. However, the National Child Labour Survey considered the age group of 5–17 as children.

TABLE 1 | Distribution of child labor by the reasons of being dropped out, by age group in Bangladesh (Source: BBS, 2015, p. 80).

Reasons	6–11	12–13	14–17	Total
		%		
Failed examination	6.1	3.4	4.5	4.7
Not interested	8.3	10.2	16.2	15.0
To start working	26.2	15.1	14.6	16.1
To get married	0.0	0.0	3.6	3.0
To support family income	10.6	13.6	16.1	15.3
Parents did not want	8.1	0.0	3.8	4.2
No school nearby	17.8	34.5	2.0	5.0
Could not afford	20.9	20.9	38.9	36
Others	2.0	2.2	0.4	0.7
Total	100	100	100	100

about child labor or schooling and the impact of parents' labor-intensive occupation in rural contexts of Bangladesh have not yet been adequately explored with qualitative insights.

Research Design

This study aims to analyze the factors behind Bangladeshi parents' decision-making on whether to send their child to school or to work. The researchers largely depended on interpretivism (i.e., the reality is multi-layered and complex) to answer the research question. Interpretive research unpacks how people 'feel about the world and make sense of their lives from their particular vantage points' (King et al., 2019). The qualitative research strategy has dictated the in-depth case studies and interviews which the authors conducted during their fieldwork in Bangladesh. Debout (2016) notes that a qualitative case study permits an investigation to explore various interacting factors resulting in a complex phenomenon. Such studies cognize the subjective meaning that individuals bring to their complicated and multi-layered situations (De Vaus, 2001). Understanding the attitudes, beliefs, and views of the parents regarding the trade-off between child schooling and labor necessitated the exploration of the factors responsible for their respective decision-making behaviors.

Bangladesh has a large population (about 160 million) dispersed all over the country (Tama et al., 2021). The authors intentionally chose to conduct their fieldwork in two *Upazilas* (i.e., small geographical and sub-district administrative units) named *Bahubal* and *Nabinagar* which are in the districts of *Habiganj* and *Brahmanbaria*, respectively (see **Figure 1**). These areas reside in the eastern part of the country. Reportedly many children in these areas are engaged in paid work in both the formal and informal sectors (GoB, 2020).

As shown in **Table 2**, the 2011 government estimates report that Nabinagar has 220 schools for 94,871 households, while in Bahubal138 are located for 37,334 households. Children in these areas are generally engaged in labor in small businesses, agricultural and tea farms, welding, transports and so forth. The literacy rate of Nabinagar is 68.62%, while that of Bahubal is 39.4% (GoB, 2020). The representing two districts have a significant difference in geographical features. While most of

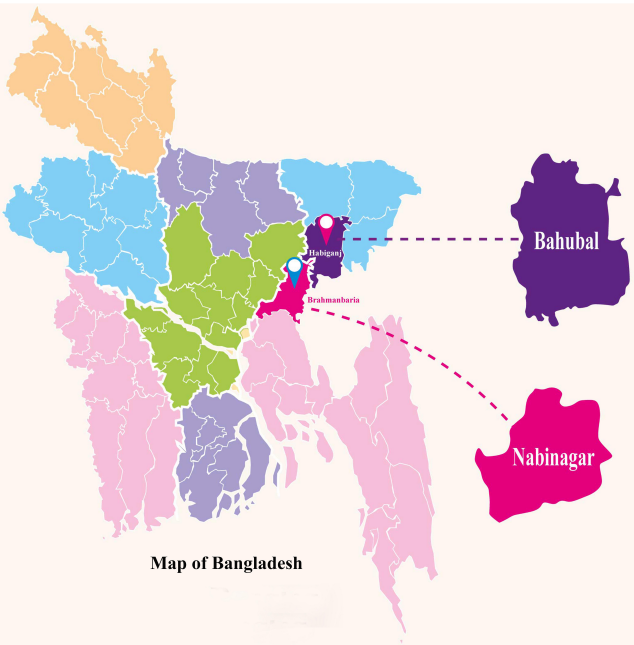

FIGURE 1 | The study areas (illustration: Authors' own).

Brahmanbaria is agricultural plain land, Habiganj has hills, tea estates, haors,[2] and forests. People in hilly regions (including Habiganj) have long suffered from regional disparities in education in the country, resulting in a low literacy rate (Khan and Islam, 2010). UNICEF Bangladesh (2020) reports the school dropout rates in the country as 5% in the 5th grade, 6% in the 8th grade and 15% in the 10th grade. These two different geographical units (Nabinagar and Bahubal Upazilas) were chosen because of their similarity in having reportedly high dropout rates (Hossain and Akter, 2019) and variation in

[2] A Haor is a bowl-shaped large tectonic depression that receives water from rivers and canals to become an extensive water body during monsoon. For more details, visit https://en.banglapedia.org/index.php/Haor (accessed on 16 April 2022).

TABLE 2 | Relevant demographics of the selected two Upazilas (GoB, 2020).

Name of the Upazila	Area (km^2)	Households	Schools (primary to higher secondary)	Literacy rate
Nabinagar	350.328	94,871	220	68.62%
Bahubal	250.66	37,334	138	39.4%

literacy rates (see **Table 2**) despite being geographically close to each other, making it an interesting proposition. Hossain and Akter (2019) revealed that the reasons behind dropouts in Brahmanbaria and Habiganj districts are poverty, early marriage, and various forms of employment for children.

Sampling and Research Methods

The existing body of literature primarily informed this qualitative study. The primary data was collected from purposively and carefully selected household cases. The conditions of being considered as cases for this study are—(i) the household must have children aged 5–17; (ii) the parents must have life experience and knowledge regarding the trade-off between child labor and schooling; and (iii) the informed consent of being a participant in this research could be obtained. The initial access to the research areas was obtained through the local government offices. The Upazila administration (UA)[3] connected the researchers with local contacts, including a few non-government workers and schoolteachers. Then, a snowball technique was employed for selecting the households and interviewees. Before selecting any household, the fulfillment of qualifying conditions was confirmed through informal discussions with its head. Two methods of data collection—semi-structured interviews and focus group discussions—were adopted to conduct the study among the selected homogenous case households and related key informants.

Interviews

Well-executed semi-structured interviews can provide the objectivity and trustworthiness of qualitative studies and deliver plausible results (Kallio et al., 2016; Hoque and Tama, 2021). Considering the data needs and nature of the study, one-on-one semi-structured interviews were chosen and conducted with 15 heads of households. Among these individuals, 10 were men and five were women, and three of the women were single females. The occupational status of the people interviewed were as follows: day-laborer (5), farmer (4), fisherman (3), and small entrepreneurs (3). Besides these people, four local government officials and two officials of local non-government organizations (NGO) having relevant work experience were also interviewed. These key informants were all male. Due to unavailability, it was not possible to ensure female representation. However, these additional interviews provided this study with complementary data, which were helpful to build the whole picture. Each interview lasted about 40–60 min; however, additional time was required to reach the households due to underdeveloped rural communication.

Focus Group Discussion

In qualitative research work, Focus Group Discussions (FGD) are considered effective tools for stimulating opinion, engaged debates, and in-depth rationale of actions and behaviors. It is conducted with a purposefully selected group of individuals to gain an in-depth understanding of social issues (Woodring et al., 2006; Nyumba et al., 2018). In such discussions, participants are normally naturalistic and tend to re-evaluate their existing position (King et al., 2019). To cross-check the validity of interview data, and to explore additional parental views, two FGDs were conducted with the parents of the affected children in the two selected Upazilas. Each group discussion included participation by six parents—four males and two females. The FGDs were conducted after completing all individual interviews. The interviewees (schoolteachers, parents and local education officers) assisted the researchers in finding suitable participants for FGDs. These FGDs were carried out in November 2020 when government restrictions on public movement and activities were already lifted (Adhikary and Habib, 2020). However, safety measures were maintained while conducting these sessions. Participants only from close distances could join the discussion. Each discussion lasts about 2 h. The topics were guided by a set of open-ended questions which allowed the participants to dig deeper into the issues and provide useful insights.

Data Analysis, Ethics and Limitations

After completing the 4-week period of data collection in October–November 2020, data were transcribed, compared, and analyzed with regards to the existing body of knowledge and the research questions. Similarities with existing theories and empirics were noted down. A narrative style of data analysis and interpretation was employed to understand the reasoning of behaviors, attitudes, and beliefs of the participants. Narrative analysis is centered on the assumption that people use stories to make sense of themselves, and deals with how the narrator justifies or makes sense of the interpretations (Frost et al., 2010). This analysis was helpful to explore the factors of making a particular trade-off decision, and to report real scenarios. The aim was to understand the interviewees' views, perspectives, and beliefs and generate deep insights, rich descriptions, and engaging exploration. Focusing on an attainable number of individual interviews and household cases allowed the analysis to realize that direction. The analysis provokes thoughts and provides directions for future research.

Ethical standards of interviewing were strictly followed while collecting data for this study. Interviews were conducted

[3]UA as a government administrative body represents the national government at the Upazila level. The country has 492 Upazilas (Mahmud, 2021).

ensuring that the local COVID-19 pandemic related health guidelines were maintained, and no psychological harm occurred. Informed consents were obtained in all cases. However, the main limitation of this data and research is that the fieldwork is based in a specific geographic area, time, and context. Readers must be aware that the findings are drawn from a relatively small number of interviews and cannot be generalized to a broader context. Neither FGDs nor the interviews are representational. These findings should neither be used to compare the two Upazilas' child labor/schooling situations. In addition, although the data collection was carried out carefully, there might be social desirability bias to it. Some data may reflect mere opinion of the participants rather than their real-life experiences. As most of the parents interviewed were illiterate, the role of parental education could not be well-examined.

FINDINGS AND ANALYSIS

The primary research and secondary review guided the examination of factors affecting parents' decision making on child's schooling or having them work. The assessment emphasized on testing some of the common issues regarding child labor and schooling in rural areas. The empirical analysis of this study is based upon the individual interviews and FGDs in rural Bangladesh. The following sections delineate the key findings and analyses.

Poverty Remains the Most Cited Factor

Parents, among all factors, mainly highlight their economic impoverishment for trading off child labor with schooling. Almost all the parents emphasized that poverty is the main reason behind their decision on not sending children to or pulling them out from school, and/or engaging in child labor. As one respondent stated:

> I have my 14-year-old son, who has studied up to class (grade) ten. He has been absent from school for one year. Now he is working in Dhaka. Due to the financial crisis, I had to stop my son's education. I had to take the decision since I could not bear the extra expenses on top of the regular fees. (*Interviewee-10*)

Shafiq (2007) noted that the average annual educational costs at primary, junior-secondary, and higher-secondary levels in Bangladesh were approximately Bangladeshi Taka (BDT) 517 (∼$ 6),[4] BDT 2515 (∼$ 30), and BDT 4559 (∼$ 53), respectively. Even including the inflations over the years, this expenditure remains considerably low. Such low expenditure may not seem to be substantial enough for stopping schooling. However, for the marginal poor households this might be challenging to bear. Furthermore, the opportunity of added income by the children may induce them to think of trading off schooling with child labor. Another respondent shared that his income is not enough to take care of his family, and he has been compelled to engage his children into labor instead of sending them to school, which is consistent with Basu and Van's (1998) luxury axiom that if the total income of a family is below the subsistence level, the children of the family are compelled to get involved in labor. Debt is also a major driver for child labor for many households. Another respondent shared:

> I have some loans. As my sons work with me, it has become easy for me to continue the installments of those loans. (*Interviewee-2*)

In some cases, children are also used as substitutes for adult laborers in family businesses where parents directly employ them. Thus, children can often be the last resort of economic resource.

Single-Headed Households Tend to Engage Child Labor

Single parent headed households are often compelled to trade off schooling with child labor. The female-headed households, particularly, cannot bear the educational expenses or the opportunity cost of foregone income by the children. Such household-heads share that their primary concern is to ensure food and shelter for their family. A widow shared her helplessness regarding her son's schooling:

> My husband died several years ago. I do not have a regular job. I found it impossible to continue my son's schooling. A local barber shop offered him a job and now, he earns too. (*Interviewee-8*)

Another female household head described similar conditions which echoes Goldin's (1979) observations for the urban labor force participation of children in the United States. However, this finding contradicts Binder and Scrogin's (1999) hypothesis that children in female-headed household have a lower chance of having to work. If the main breadwinner (the male adult in most cases) dies, the mother of the family has to struggle to manage subsistence level survival for her family. To increase the total income of the household, the household seeks for other members' support, regardless of whether they are adults or children. In such circumstances, they generally depend on the older (aged 12–17) children and, ultimately trade-off schooling with child labor.

Taking Care of Younger Siblings Is Crucial

Shedding light on why some older children do not complete school, one Upazila Education Officer (UEO) pointed out that older children often have to take care of their younger siblings at home. Households particularly dependent on agricultural farming are generally engaged with various farming-related activities. Often both parents remain busy all day with farmstead and homestead works. As a result, older children give care to younger ones in households with a comparatively large number of members. Salmon (2005) also identified the number of household members as a major factor in Bangladesh when it comes to children being engaged in labor. However, some parents argued that they do not want to stop their children's schooling, but that rather it is the children themselves who do not like to go to school for various reasons. For example, one father stated:

> My elder son is 16. He completed up to grade 6. He was weak in studies. He could not bear the pressure of studies in his school.

[4] 1 United States Dollar values ∼86 Bangladeshi Taka. Source: https://www.xe.com/currencyconverter/convert/?Amount=1&From=USD&To=BDT (accessed on 5 December 2021).

> He used to often get sick. So, he has stopped going to school. We (both parents) want him to go to school, but he says he does not like school. (*Interviewee-1*)

This statement indicates that the schools fail to attract children for various reasons. The COVID-19 pandemic has made the situation worse. The long closure of in-person schooling has pushed some children to drop out of education in Bangladesh forever.

Parental and Cultural Beliefs About Children's Roles Are Important

Most parents who were interviewed expressed their dislike of the leisure enjoyed by boys. They think boys should always be doing something productive. If any school-going child does not go to school or drops out, parents do not allow them to go idle. This tendency has been obvious during the COVID-19 pandemic. The long closure induced many poor households to send their children, particularly boys, to labor. As one respondent acknowledged:

> Due to the COVID-19 pandemic, the school has been closed. My son did not have to go to school anymore. We don't have the (digital) means to let him do the classes online. Meanwhile, he got an opportunity to work as an apprentice in the local market. (*Interviewee-7*)

Sexual division of labor is obvious as most girls were seen working inside homes while boys work outside. Several parents believed that homestead jobs should be performed by the girls, while boys should work outside in the marketplace or family farms to develop their skills. Availability of paid jobs allocated for boys, and unpaid jobs for girls is also responsible for this sexual division of labor.

The findings of this study indicates that boys are mostly pulled out from the school rather than the girls. One father of a boy and a girl studying in the same grade (7th grade) in the same school, shared that due to the growing expenditure he had to pull his son out of school and engage him in labor work. Another respondent who has two daughters and one son, kept sending the girls to school but did not allow the boy to continue. An NGO worker explained this trend:

> Nowadays parents are not interested to send their sons to school. But in case of their daughters, they are interested to some extent. Because they believe boys can earn money even without being formally educated. (*Interviewee-22*)

Probing this observation further reveals that a lot has to do with the government incentives provided for school going students. Parents find it beneficial to keep girls (as opposed to boys) enrolled through secondary schooling as they receive incentives from the government. More importantly, girls can combine homestead unpaid work with schooling. One Higher Secondary Education Officer (HSEO) reflected:

> Girls receive regular stipends from schools. While making a trade-off decision, parents tend to send sons to paid works, and ask their daughters to continue with schooling to receive government incentives. (*Interviewee-23*)

Therefore, to the parents, the opportunity cost of sending boys to school is greater than for girls, which is similar to the results that (Arends-Kuenning and Amin, 2004) found in their study on the impacts of incentive programmes on children's activities in Bangladesh. Traditionally, patriarchal norms and beliefs remained obstacles to girls' advancement and development in rural areas (Parveen, 2007; Islam and Sharma, 2021). Yet, the country has made tremendous progress in girls' education in rural areas (Tanaka et al., 2021). However, strong cultural beliefs are critically unfavorable for girls' education, including a religious convention mentioned by a respondent in FGD:

> There is a convention in Muslim community that girls do not require higher education. If they can complete primary education, then it is good enough to marry them off. (*FGD-1, Bahubal*)

Emerging evidence shows that education institutions' extended closure (nearly 2 years) has had severe negative impacts on child marriages and dropouts in Bangladesh (Hussain, 2021). A recent report reveals that the number of child marriages in Bangladesh has increased by 13% during the pandemic (Dhaka Tribune, 2021). The pandemic also led to a sharp rise in child labor (Financial Express, 2021). Moreover, parents usually send their daughters to school for immediate returns, instead of an ambition of any long-term return; they want to marry them off as soon as possible. Hence, in most cases, girls' education stops at the end of the secondary school level. One parent with the same mindset shared:

> I wish, my daughter successfully passes secondary school. Then it will be easy for us to arrange a good marriage for her. *(Interviewee-9)*

Interviews with parents of full-time working and non-school going children reveal that such parents are mostly illiterate. It indicates that parents' illiteracy may have negative impacts on their children's schooling and a positive relationship with child labor incidences (i.e., the less literate the parents, the more likely that their children are engaged in child labor).

Educational Expenditure and Structural Factors Related to Schooling Are Critical

In Bangladesh, primary-level schooling is free from tuition fees for everyone, while at the higher secondary level, schooling is free for girls only. The government provides books for free as well. However, parents must bear some extra educational expenses for buying additional books and materials. Some households also need to pay for the travels to school. Poor households find it hard to bear these expenses. The following statements clearly reflect this issue.

> I cannot afford to pay for both of my children; apart from fees, running expenses for schooling are too high for me (*Interviewee-10*).

> For educational materials government can give us allowance because we are destitute and helpless. (*FGD-2, Nabinagar*)

High school expenditure may induce parents with low incomes to pull their children out of school (Sabates et al., 2013). In Bangladesh, there is no such credit available for the poor with which they can maintain their children's educational expenditure. Though the government provides incentives for school-going girls, parents believe this support is not enough. In rural areas where government-run schools are far from home, parents sometimes send their children to non-government schools. However, as indicated in one of the above statements, non-government schools are relatively more expensive. An FGD participant raised this issue:

> The government-run school is too far to walk to. Our children attend a nearby private school, and the cost is very high. (*FGD-2, Nabinagar*)

Lack of availability and poor facilities of government-run schools also work as a crucial deterrent that drive children away from attending these schools. Huisman and Smits (2009) also noted similar observations regarding educational facilities for rural children in developing countries. One participant in FGD elaborately stated:

> In this remote village, I cannot ensure a fitting environment for my children. Teachers in school do not give them adequate time and care. If I could manage a good house tutor, they would do much better in their studies. My son was in grade four, but he left school a couple of years ago. Now, he does nothing – neither study nor work. I hope he can do some paid jobs to acquire skills in the coming years. (FGD-1, *Bahubal*)

Parents value the skill development of their children since skills have immediate demands and returns through paid jobs. On the other hand, formal education is a long-term investment that parents do not find worth the money. In addition, schooling is not always considered an investment in human capital. When parents think their children are not receiving quality education or not doing well enough, they tend to start thinking negatively about investing in human capital. One UEO stated that parents often believe that learning skills though working is more valuable than education.

Intra-Household Demand and Supply of Labor Happens

During the season of peak agricultural activities, the adults of the households (both male and female) get engaged into farmstead and homestead works. Girls are additionally employed in household work to help their mothers and boys are employed in the field to help their fathers. Generally, poor families cannot hire people to meet this higher demand for labor, so instead, they pull their children out of school. An NGO officer said that when the demand for labor increases, households use children as laborers to save on costs. One female parent in the FGD stated:

> During the harvesting season, we cannot send our children to school. We need their help to fill the labor shortage. They help to save expenses. (FGD-1, *Bahubal*)

Therefore, irregular attendance and drop-outs are normal during the harvesting season. The participants informed that the decision of using children in family farming is usually taken by both parents (if available) together. The following statement from one HSEO further illustrates this issue.

> There is a negative impact of the harvesting season on children's school attendance. In the rural areas, most poor households withdraw their children from schools and engage them in harvesting work. It has become almost a culture here. (*Interviewee-23*)

Parents Engaged in Labor-Intensive Occupations Tend to Trade-Off More Frequently

When non-parent respondents were asked to mention the type of occupations people were employed in which generally led to those households' children being more likely to be engaged in child labor, they mentioned low-income households headed by farmers, day-laborers, tea garden workers, fishermen, and rickshaw pullers. All the respondents of this study who engaged their children into labor are in low-income occupations. From our study, one male parent who runs a construction business stated:

> My elder son completed secondary school and works in construction with me. My second son studied up to class six and now works with me. My third son is in class four, and he is too young to help me in my business or works. (*Interviewee-2*)

Another father engaged in small business said that one of his sons was engaged in his shop instead of going to school which also strengthen the hypothesis that if parents need labor, they tend to engage their own children. One HSEO corroborated this by saying that low-earning parents generally engage their children in their own occupations. The six officials interviewed in this study affirmed that the rate of school dropouts from households headed by labor-intensive occupations is higher than others. One respondent in an FGD stated:

> I have my own shop. My sons help me. It helps us to earn more profit since I do not have to hire labor. This way, they can also learn how to run businesses. (FGD-2, *Nabinagar*)

This indicates that this tendency may not be merely driven by subsistence needs, and altruistic parents often want their children to follow their footsteps as well.

Which Interventions at the Government and Non-government Levels Can Be Effective?

The respondents were asked what kind of government or non-government organizational support would help them to

keep their children in schools. Many respondents mentioned credit facilities and cash and in-kind transfer support. Lack of credit facilities are associated with some of the crucial factors affecting child schooling and encouraging child labor engagement instead. If the adult members of the household can create any opportunity of sufficient earning with credit facilities, it can reduce subsistence challenges. Parents note that suitable credit facilities could help them to improve their marginal income. It would then be easy for them to send their children to school or carry on with their schooling. How credit facilities can increase opportunities for sending children to school has been described by one of the FGD participants:

> If parents can earn by investing in a small business, it will generate additional financial resources. Then, they will not be forced to utilize the labor of their children. Big families can also afford to send their children to schools. (*FGD-2, Nabinagar*)

Sometimes parents want their children to combine schooling and household work. They think that a little help from their children in homestead work will not hamper their children's studies. Credit-run businesses can allow more parents to do so. As one respondent stated:

> If I could get loans with which I could buy livestock like cows or goats, then I could send my son to school. The return from the livestock would be helpful. All our family members can work together to take care of the livestock. (*Interviewee-4*)

One NGO worker believes that if households had access to credit, they would not withdraw children from schools even in the harvesting season. They could instead afford to hire adult laborers. However, some of the respondents mentioned some procedural disadvantages regarding credit receiving and repayment. A substantial number of respondents shared their fear of managing installment repayments. To pay the installment every week or month sometimes becomes troublesome for them. They said that they worried they would not be able to make profit due to investment imperfections like failure to invest in proper fields, and consequently fall into unbearable liabilities. Some of them do not want to receive any more loans. Furthermore, the high rate of interests, especially from the NGOs, is also a concern for them. As one respondent stated:

> Some of us are afraid of getting any loans because it becomes hard for us to pay installments regularly. We have not applied for any loans in the recent past. (*Interviewee-1*).

The issue of debt remains very crucial for many households. Also, some households who received loans against their agricultural farms from NGOs could not invest in their intended purposes. For example, one household spent their entire loan amount on building a house as she had no house to live in. Another respondent said that he has spent some of his loan in buying medicines for his family. Both families depend on child labor to some extent. They think if the installment and the rate of interest would have been favorable, they could have benefitted from the loan to a greater extent. As one respondent stated:

> Paying weekly installments sometimes becomes hard for me. If it could be paid after three or four months, then it would be much easier. In addition, the rate of interest is also too high for us. (*Interviewee-2*)

Some parents believe that conventional credit facilities are not suitable for poor households. Generally, poor households receive an amount of credit which is too little to start any profitable enterprise. They think interest-free loans or government allowances would work better in terms of helping them to make their children free to go to school instead of having to work. As one FGD participant shared:

> We are afraid of loans because of their high interest rates. We need interest-free loans worth BDT. 50,000 to 100,000. Besides, government can give allowance per child of around BDT. 3,000 to 5,000 per month so that we can send them to school. We need support for our boys too. (FGD-2, *Nabinagar*)

However, they did not dig into the phenomenon that most parents having small businesses also tend to use child labor—either from their own family or from other sources. Small businesses tend to employ children to save money. Evidence suggests that transfer programs are generally more effective in reducing child labor (Dammert et al., 2018). Nevertheless, there needs to be policies that protect and support such poor households.

CONCLUSIONS

This study explored the factors behind the trade-off between children's schooling and labor. The empirical analysis also identified some crucial determinants of the issue. The results confirm earlier findings that households which are at below subsistence levels of income are more likely to trade off their child's schooling with child labor. Though the primary and secondary school expenditure in Bangladesh is relatively low, even then, the marginal poor households do struggle with the costs. Parents depend on their children's economic activities to both generate income and reduce household expenditure. Furthermore, studies also show that single parent female-headed households tend to trade off schooling with child labor to a greater extent than other household groups. In poor households, older children often have to take care of younger siblings, which affects their school attendance. Due to the sex-disaggregated division of labor, boys are mostly engaged in market work and girls in household work. Moreover, girls are sometimes discriminated against in terms of getting a proper education or being engaged in more productive work because of social and cultural beliefs. From a patriarchic social point of view, many people in rural Bangladesh believe that girls do not need higher education as they should not work outside the home. Because of this, many poor and ignorant parents tend to stop their girls' education quite early. There is also a pervading cultural

belief that children should not go idle. The combination of these social and cultural beliefs mean that parents often encourage their children (both boys and girls) to work instead of going to school. Boys are more likely to be pulled out of school rather than girls since boys have more demand for work in paid jobs (e.g., workshops, saloons, agricultural farms) away from home. Boys also do not receive adequate government allowances (compared to girls). Furthermore, parents' lack of education has a strong correlation with trading-off schooling with child labor.

In addition to these factors, the lack of adequate educational facilities, additional schooling expenses, and poor quality of teaching also influence parental decisions in terms of whether to send their children to school or not. The empirical findings from this study indicate that parental expectation on the importance of their children's education is strongly associated with children dropping out of school and practicing child labor. This means that if parents put a low value on their children's education, the more likely they are to drop out and get engaged in child labor. The findings of the study suggest that sometimes households view children as the last resort to meet their economic or labor needs. Parents employed in labor-intensive occupations are also more likely to engage their children into labor work instead of sending them to school.

Finally, the findings also suggest that parents have mixed views regarding credits and loans. Some are in favor of credit as a means of business support, while others fear it for its high interest rates. Analysis highlights that support programmes, especially cash and in-kind transfers, influence parental attitudes and behavior concerning this trade-off. However, bringing positive outcomes toward increasing child schooling would require carefully designed interventions. Since parents' decision-making on the issue does not merely depend on their household characteristics but rather on various kinds of socio-economic and cultural factors, support interventions must target the underlying causes of child labor.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors upon reasonable request.

ETHICS STATEMENT

The risk assessment and ethics of the field research of this study were reviewed and approved by the University of Birmingham, UK. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

Both authors have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Scaling up social entrepreneurship to reduce poverty: Exploring the challenges and opportunities through stakeholder engagement

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Introduction

Stakeholder engagement is critical in state-driven social entrepreneurship programs. This engagement is based on the principle of mutual benefit in partnering through the parties' contributions following their respective roles and capacities. This paper explores stakeholder engagement in social entrepreneurship programs in Indonesia. This program is a program of the Indonesian government to reduce poverty. The issue of poverty is the primary concern of the Indonesian government and the international world. The COVID-19 pandemic has impacted increasing poverty because many people have lost their jobs due to policies limiting activities (Laborde et al., 2021). In addition to the ongoing social protection program, the Indonesian government is also working to reduce poverty through the Social Entrepreneurship Program.

Social Entrepreneurship is one of the essential factors in sustainable economic development (Lateh et al., 2018). Social entrepreneurship is different from entrepreneurship because it has a social mission and is not only concerned with profit. This program improves the poor's economic welfare by combining business and social dimensions. Research in the South Punjab region of Pakistan shows that empowerment through social entrepreneurship can significantly reduce poverty (Abrar ul haq et al., 2019).

Some parts of Tehran, Iran, implement empowerment strategies through social entrepreneurship to lift marginalized people from poverty (Sadabadi and Rahimi Rad, 2021). Social entrepreneurship can contribute to 10% of the gross domestic product in Kenya (Ngare, 2021). South Korea and Malaysia can increase regional economic growth by creating jobs (Doh, 2020; Mustaffa et al., 2020). Thus, this literature argues that poverty can be overcome through social entrepreneurship. Social entrepreneurship leads to increased innovation, employment opportunities, and access to capital. In the end, social entrepreneurship will succeed with sustainable development.

The Indonesian government implements social entrepreneurship programs in collaboration with non-state actors. This is what distinguishes between developing countries and developed countries. Most entrepreneurship in developed countries is supported by large companies that do not depend on state funding. This paper explores the involvement of stakeholders from two groups, namely state, and non-state. Our research also examines the relationship between state and non-state actors in negotiating program implementation. We also look at the impact of involving different stakeholders on the beneficiary communities.

This paper will answer three main hypotheses: first, each stakeholder group's role is expected to be a complementary relationship. Second, programs offered by the state will be accepted by non-state actors. Third, programs that involve many stakeholders will have a good impact on beneficiaries.

Theoretical framework

Poverty

Poverty is a condition where the basic needs of a decent life are not fulfilled, and the facilities and infrastructure are inadequate (Govender et al., 2007). Bradshaw (2009) defines poverty as a condition where basic food, shelter, health, and safety needs are unmet based on human rights values. When viewed from an economic aspect, poverty refers to the gap between weak purchasing power and the desire to meet basic needs (Rini and Sugiharti, 2016). Anthony Hall and James Midgley (2004) convey the same thing, namely "Conditions of material and social deprivation where people fall below the minimum socially acceptable standard of living or where they experience deprivation relative to other people in society" (Yeates, 2005). The material and social deprivation that causes the individual to live below a decent standard of living or conditions in which individuals experience relative poverty compared to other individuals in society.

Poverty is conceptually divided into absolute poverty and relative poverty. Absolute poverty refers to a condition where the basic needs of a decent life are not met, both food and non-food, while relative poverty refers to the position of individuals related to the average state income (FAO, 2021). Poverty is a common problem that must be taken seriously between the government, the private sector, and the community. It is hoped that other people's concerns and awareness can help reduce poverty, so it is necessary to involve all stakeholders in poverty alleviation efforts, starting from planning, implementation, and evaluation, which are carried out on an ongoing basis (Stroe and Lincaru, 2022).

Social entrepreneurship: From discovery to exploration

In recent years, social entrepreneurship has grown in popularity (Talić and Ivanović Dukić, 2021). Apart from Indonesia, the movement has spread to other countries, such as South Africa and South Africa. To understand social entrepreneurship, we need to define it as a concept that enables the creation of alternative business models that are market-oriented and provide social good (Terziev et al., 2020). It is crucial to realize that social entrepreneurship and entrepreneurship are fundamentally different.

There is no doubt that the social aspect of a business is more challenging to be accepted in the private sector because "social" is the opposite of "profit". The private sector is characterized by profit-making. The concept of social entrepreneurship also contains elements of entrepreneurship. Commercial prospective entrepreneurial behavior theories understand social entrepreneurship as a multidimensional phenomenon in which social entrepreneurs, like non-profit organizations, display innovative behaviors, proactive actions, and risk management characteristics. However, the main focus lies on the company's social mission (Dwivedi and Weerawardena, 2018).

Based on the characteristics of the private sector and the emphasis on social aspects placed on social entrepreneurship, the public sector should be more responsive to social entrepreneurship. Social entrepreneurship can be applied to the public sector because the government must improve governance performance. Practicing social entrepreneurship contributes to social transformation (Cavalcanti, 2021). In Ukraine, for example, social entrepreneurship has been used by the state in developing its rural development strategy (Pechenuik, 2021). Entrepreneurial behavior in African countries continues to be poorly studied, leading to inappropriate policy actions and inadequate support (Urban, 2020).

The stakeholder engagement and its relationship

The above understanding shows that entrepreneurs have higher self-interest and lower social awareness. Meanwhile, social entrepreneurship has lower self-interest and higher social awareness. The social entrepreneurship program involves many stakeholders. Social purpose organizations pursue multiple missions and address heterogeneous stakeholders (Siebold, 2021). Therefore, it is important for social entrepreneurs to network and communicate effectively with stakeholders. Stakeholder participation in social entrepreneurship programs is very important because it has a direct impact on organizational management (Meyer et al., 2020). An important role as a stakeholder is to achieve organizational commitment (Rodríguez-Fernández et al., 2021). Through coordination between stakeholders and communication facilitation, solutions to social problems can be resolved which lead to systemic changes (Zhao, 2020).

Stakeholder mapping can visualize stakeholder perceptions of their values and compare them with an ideal map based on social entrepreneurial missions (Burga and Rezania, 2016). Stakeholder behavior toward social entrepreneurship will influence product, service, and program innovation (Newth, 2016). In Poland, it is seen that the involvement of stakeholders from the institutional environment is crucial in promoting social entrepreneurship programs, including both formal and informal institutions (Pacut, 2020). Thus, stakeholder participation in social entrepreneurship programs is essential (Smith and Woods, 2015).

Stakeholders who have significant influence include governments, institutions, and foreign investors (Zaid et al., 2020). Institutional interactions occur in four ways: complementary, substitutive, accommodative, and competitive (Helmke and Levitsky, 2012). In this article which emphasizes the interaction of formal and informal institutions, we modify the concept of institutional interaction by applying it to the interactions between state and non-state actors.

Methodology

The research objective is to explore the various actors involved in implementing social entrepreneurship programs in Indonesia. The various stakeholder actors studied were divided into two groups: those from government and non-governmental organizations. Our research seeks to investigate the relationship between government and non-government actors in negotiating the form of the program to be implemented. Furthermore, our research examines whether stakeholder engagement has contributed to community empowerment. This paper reports the findings of semi-structured qualitative interviews conducted with 26 informants representing all stakeholders involved in the social entrepreneurship program. Informants from elements of state institutions consist of; Ministry of Social Affairs (one person), Ministry of Industry (one person), Social Service (four people from four locations) Regional Planning Agency (four people from four locations). Meanwhile, non-state elements consist of; Social Facilitators (four people from four locations), Business Incubators (four people from four locations), Beneficiaries (four people from four locations), and Local Entrepreneurs (four people from four locations).

The interview process takes place between September and December 2022. Interviews range from 60 to 90 min, covering topics such as the role of the interviewee. At the national level, the Ministry of Social Affairs discussed the description of the social entrepreneurship program, and the Ministry of Industry discussed the role of granting business licenses. At the local government level, the Social Service discusses the implementation of the Social Entrepreneurship Program in the regions, and the Business Incubator discusses the implementation of business assistance. The social facilitator discusses social assistance for beneficiaries of the social entrepreneurship program. After that, the beneficiaries talk about their business trips.

The data collection process includes interviews (Prentice, 2017), observation (Greatorex, 2014), and documentation studies (Jones and McCoy, 2019). Interviews were conducted to gather information regarding the following topics: (a) implementation of social entrepreneurship, (b) the role of stakeholders (c) coordination between stakeholders. Documentation studies are carried out by studying reports, books, scientific journals, and other documents. This study collects data using thematic analysis (Sundler et al., 2019), presenting the collected data according to a predetermined theme, specifically stakeholder engagement. Therefore, all data collected will be aligned with stakeholder involvement in implementing social entrepreneurship.

This research has several limitations, including being conducted in four locations: Karawang Regency, Sleman Regency, Brebes Regency, and Mojokerto Regency. Thus, the situation described above does not fully represent the situation in Indonesia as a whole.

Results

Overview of program implementation

The Indonesian Ministry of Social Affairs has eradicated poverty through social entrepreneurship programs. In 2021, the government will implement a program to improve the poor's economic welfare. Through this program, the government helps low-income groups of people who receive conditional cash assistance programs. This program can improve the economy of low-income families and reduce their dependence on government assistance. In addition, social entrepreneurship can positively influence community members by increasing access to markets for the poor. A study of the characteristics of social enterprises has been carried out in the East African region, resulting in positive changes in marginalized groups' socio-economic and political conditions (Maseno and Wanyoike, 2020) and triggering social changes in society.

Social entrepreneurship has the potential to achieve social impact across multiple fronts, support Sustainable Development Goals, and rebalance "economic" and "social" fields (Warnecke, 2018). A study conducted in the Indian region explored the impact of social entrepreneurship on poverty alleviation (Shepherd et al., 2021). By applying a similar logic, social entrepreneurship is expected to accelerate poverty alleviation in Indonesia. This is a national development priority to reduce the burden on the poor and increase their income, especially in the bottom 40% of the population (Bappenas, 2017).

Stakeholders involved

Social entrepreneurship programs will not succeed without stakeholder involvement. The stakeholders are divided into two groups: state and non-state. Stakeholders in the social entrepreneurship program can be seen in Figure 1.

State actors

State actors can be grouped into two, namely, the central government and local government. This program is designed to reduce dependence on cash transfers among the poor who have received conditional cash transfers. Program beneficiaries receive capital assistance as part of the social entrepreneurship program. State elements involved in the social entrepreneurship program include the Ministry of Social Affairs, the Ministry of Industry, the Regional Development Planning Agency, and the Regional Social Service.

The Ministry of Social Affairs is a leading sector in poverty alleviation through social entrepreneurship. The Ministry of

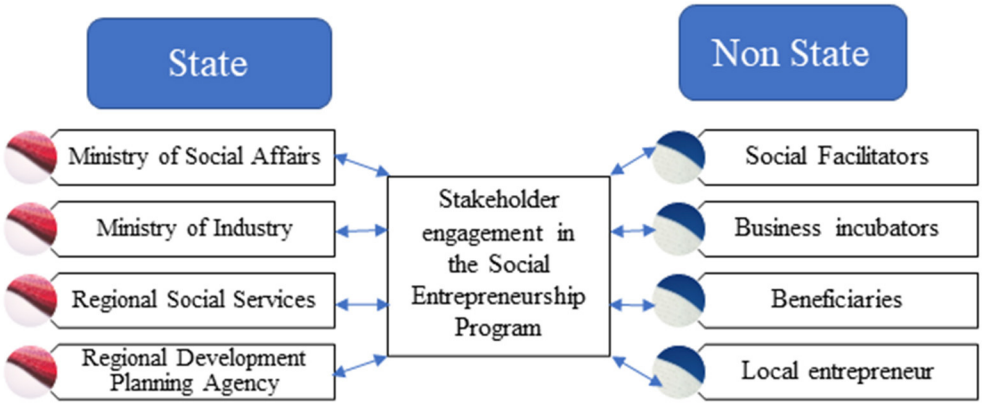

FIGURE 1
Stakeholder groups in the social entrepreneurship program, namely state and non-state.

Industry plays a role in fostering production and granting business licenses. The Regional Development Planning Agency's role is to include and budget for regional development. The Regional Social Service plays a role in implementing programs in the regions. This role will continue to develop according to conditions in the area.

Countries involved in social entrepreneurship are not only concerned with economic gains but also with social goals. So that through social entrepreneurship can solve social problems (Abdullahi et al., 2020), create solutions (Kickul et al., 2014), and solve problems (Chalmers, 2021). Thus, social enterprise is relevant to social work because it aims to solve social issues (Gray et al., 2003). In this paper, the problem that is translated through social entrepreneurship is poverty.

Non-state actors

The Ministry of Social Affairs appointed a non-governmental organization and a university as the business incubator for the Social Entrepreneurship Program. Institutions such as these have extensive experience in assisting small and medium enterprises. Apart from the business incubator, the non-state actors involved are beneficiaries. This program is intended to help beneficiaries achieve business success.

Complementary to this model is the idea that non-state actors' existence will help solve problems that are ignored by state actors, enhancing government policy programs' effectiveness in achieving the desired outcome. As with the complementary relationship, the substitute relationship involves non-state actors' participation in achieving goals that comply with the stipulations. This is evident when state institutions cannot accomplish their objectives (Yuda et al., 2021).

In the accommodative model, non-state actors create behaviors or norms that significantly alter formal rules so that the effects are "not follow the expected results". The latter is a competing model, which is deemed to be the most problematic. In this model, non-state actors in the program move in a direction contrary to the objectives of government policies, resulting in adverse effects. To explain how state and non-state actors interact and shape social entrepreneurship programs, we will elaborate on these four points together.

Relations between state actors and non-state actors

Government actors and non-government actors have a dynamic relationship. It is not uncommon for them to be interdependent when non-governmental actors need government funding, while governments depend on social organizations to assist in the implementation process. Cooperation agreements between governments and non-state actors allow governments to provide services to non-state actors. By working with non-state actors, the state empowers the poor through social entrepreneurship programs involving non-state actors as program implementers. The government determines the program, in this case, the Ministry of Social Affairs, but before deciding on the program, it is important to consider the ideas of non-state stakeholders.

Initially, state and non-state actors had a hostile relationship because of their different visions and missions. Non-state actors are less satisfied because they have to comply with the rules imposed by the state. Even though at every opportunity, the state always accommodates the ideas of non-state actors. Therefore, state actors gradually began to change in response to input from non-state actors. One example of non-state dissatisfaction is the implementation of programs that have been delayed due to the COVID-19 pandemic so that the implementation time has been reduced and the targets set have been changed.

Apart from the accommodative nature of the relationship, there is also a tendency for a substitutionary relationship because non-state actors are more experienced in empowering communities through social entrepreneurship programs with limited scope. The

state has the power to finance in a complete sense. Thus, the relationship between planning and funding is accommodative. However, technically the implementation of the program is more of a substitute.

Social entrepreneurship effects resulting from stakeholder engagement

The policies taken by the government to limit crowds during the COVID-19 pandemic certainly had an impact on MSMEs, including social entrepreneurs. It was noted that turnover decreased following the implementation of the lockdown and working-from-home policies. There has been a decrease in the number of business buyers run by beneficiaries because many fear contracting the Coronavirus. Food usually bought and consumed outside has been diverted to be cooked at home by consumers concerned about the quality of their food.

According to previous research from the Social Welfare Center, there are three conditions for receiving benefits: profits before the pandemic, benefits during the pandemic before joining the program, and benefits after participating in the program during a pandemic. Before the pandemic, the average profit was between IDR 50,000 and 99,000, the study found. During the pandemic, the average profit fell below IDR 50,000. They increased their earnings to between IDR 50,000 and 99,000 through the Social Entrepreneurship Program. Because of this, the new social entrepreneurship program has proven capable of returning to pre-pandemic conditions (Setiawan et al., 2021).

Discussion

Social entrepreneurship programs cannot run effectively without stakeholder involvement. The state's involvement is the driving force for all stakeholders in planning, budgeting, mentoring, and monitoring. Social entrepreneurship incubators originating from non-state actors are executors of technical programs from state programs. Initially, the social entrepreneurship program initiated by the central government was rejected by regional stakeholders because it was considered competition. However, through an informal discussion process, each stakeholder realized that there were similarities that became strengths during the discussion process. This meeting point is so that social entrepreneurship programs from anywhere, including from the central government, can be included in the program scheme designed by the regional government and even be developed further in the future.

Furthermore, we found that the government's concept of empowerment still mixes well with the idea of social assistance. Beneficiaries should receive social assistance in an emergency or if they are in a position where they cannot survive on their own. If these conditions are not met, empowerment programs will not be effective since they are concerned with fulfilling their basic needs. Empowerment programs are most appropriate for those whose basic needs have already been met, even if they are being met by social assistance. When persons whose basic needs have not been met are provided with empowerment, they tend to have little motivation to participate in a program. There is an alternative strategy to encourage friendship networks to internalize social risk since the replacement of welfare regimes from products has not been completed (Yuda, 2018, 2021; Yuda et al., 2021). These arrangements reflect the prevailing welfare regime in the Global South, where informal relationships interact with statutory provisions and are often conditioned to provide social welfare.

The Social Entrepreneurship Program combines two concepts in the Ministry of Social Affairs: empowerment and social protection. Capital assistance is considered to be a type of social protection program. Some evidence suggests that beneficiaries are motivated to participate in the program due to the service provided. However, social entrepreneurship programs can lead to dependency on capital assistance. A key component of strengthening the social entrepreneurship program without increasing dependence is contributing substantially to the beneficiaries. The mentoring beneficiaries will receive guidance in running their businesses through good planning.

Conclusion

In Indonesia, social entrepreneurship programs tend to be driven by the state because the paradigm of social entrepreneurship has not been widespread among the private sector or other non-state actors. In contrast, in developed countries view social entrepreneurship as a moral obligation. It is important to note that social entrepreneurship programs in developing countries are not just empowerment programs, even though they involve stakeholders, because capital assistance is still provided. These programs may have arisen as a result of beneficiary dependence on aid.

Beneficiaries who participate in programs launched by the government may receive services not because they are struggling to get out of poverty. Empowerment is defined as a strategy through effective planning so that beneficiaries do not depend on government assistance. Scientifically, the transformation from social assistance to empowerment is not easy to do. It takes a long time in the empowerment process so that beneficiaries can be empowered. this is the limitation of this research because the program is implemented in one fiscal year, so the impact of the program is not yet clearly visible. Interesting future research to study is the meaning of beneficiaries of the empowerment program. If the meaning is still like social assistance then the purpose of empowerment will not be achieved.

Nomenclature

-Resource Identification Initiative
-Life Science Identifiers

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Behind the flexibility: insufficient occupational injury protection of gig workers in China

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Objective: Occupational injury protection is essential to safeguard the basic rights of workers. This article focuses on a group of gig workers who have emerged on a large scale in recent years in China and aims to explore their status of occupational injury protection.

Methods: Based on the theory of technology-institution innovation interaction, we adopted the institution analysis to assess the work-related injury protection of gig workers. The comparative study was used to evaluate three cases of occupational injury protection in China for gig workers.

Results: Institutional innovation failed to respond to technological innovation and provided insufficient occupational injury protection for gig workers. The work-related injury insurance was inaccessible to gig workers due to they were not treated as employees in China. The work-related injury insurance was not available to gig workers. Although some practices were explored, shortcomings remain.

Conclusions: Behind the flexibility of gig work is insufficient occupational injury protection. According to the theory of technology-institution innovation interaction, we believe the reform of work-related injury insurance is increasingly essential for improving the situation of gig workers. This research contributes to expanding understanding of gig workers' situation and may offer a reference to other countries on protecting gig workers against occupational injuries.

KEYWORDS

gig economy, gig worker, flexibility, occupational injury, work-related injury insurance

1. Introduction

In recent years, the gig economy has been a prominent topic in the field of work (1). It is subordinated to non-standard work (2), and mainly contains crowdsourced work and on-demand work (3, 4). Crowdsourced work typically refers to a range of tasks that are completed through digital platforms. These platforms are connected to a variable number of organizations and individuals around the world via the internet, with all labor requirements being posted and received, tasks being submitted and payments being made (5). On-demand work is the use of apps to communicate and perform traditional work activities such as transport, cleaning, and errands based on customers' demands (6). The apps are generally considered digital platforms, too. Hence, the gig economy includes both platforms that allow remote employment and labor transacted through platforms but provided in an appointed location (7). More work opportunities have been provided by the platform. According to a report by Didi (a travel platform in China), 1.33 million unemployed people return to the labor market

to work as online drivers, with more than 12% of whom had been unemployed for more than 1 year before joining the platform. In addition, there were 1.37 million drivers from zero-employment families. In June 2020, 11.66 million registered online taxi drivers under work on the DiDi platform.

Gig workers seem to benefit a lot from the flexibility of work. However, they are facing more occupational injury risks like traffic accidents, impaired physical functioning, anxiety, depression, etc., (4, 7–9). According to the data from the project "Improving China's Institutional Capacity toward Universal Social Protection" of ILO in 2020, 2.5% of nonstandard employment workers had been involved in an accident at work, and 44.5% of these accidents occurred in the course of working on the platform. The lack of protection for gig workers is common (10–12). From January to July 2022, the number of consultations involving gig workers in Guangdong Province in China was 9,139, an increase of 50.3% year-on-year, with a monthly average of 1,305 consultations, with contract disputes, tort liability disputes, and labor disputes as the main types of consultations. In terms of tort dispute consultation, the main consultees are online car drivers and delivery workers, and the types of consultation are mostly traffic accident compensation cost standards, involving lost wages, medical (medicine) costs, repair costs, loss of transportation, etc., accounting for 30.8%, 13.6%, 13.5%, and 12.2%, respectively. It is clear that occupational injury protection has become a major concern for gig workers. With the rapid expansion of the gig economy, gig workers and their working status are in dire need of more attention.

2. Literature review

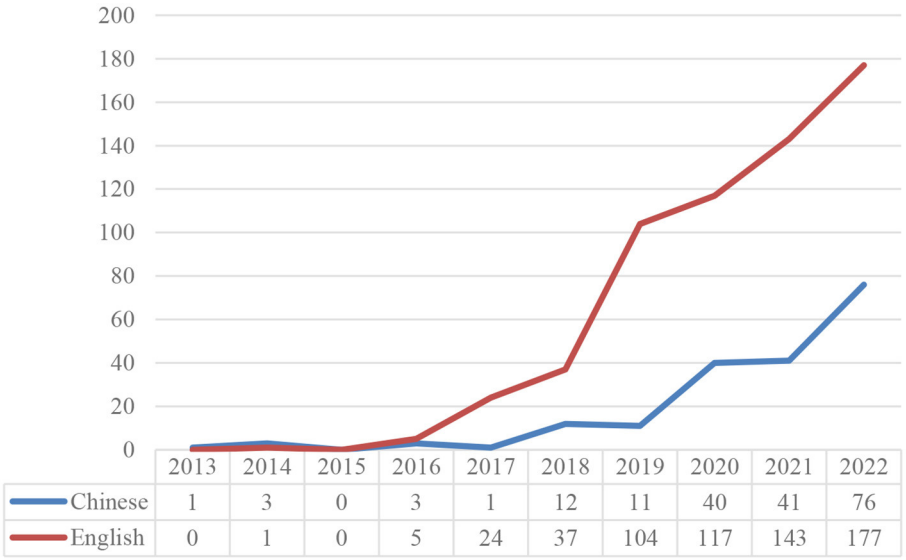
In the web of science, we searched English papers with "gig work" "gig worker," or "gig economy" as the subject words, respectively. Meanwhile, we searched the relative Chinese articles on the website of China's national knowledge infrastructure with the subject words "零工" or "零工经济," because these two words are used more commonly in China. We only selected papers published in core Chinese journals since these papers usually have better quality. All the searches were set for the last 10 years, that is from January 2013 to December 2022. We got 608 articles in English and 188 articles in Chinese. Gig work and workers are a rising segment of the economy and have piqued the curiosity of scholars, especially in the last 3 years. From Figure 1, it is shown the number of related studies were increasing and the highest number of related articles published in 2022.

In terms of research content, existing literature focused more on gig work or workers themselves. There are three primary characteristics of gig work, including project-based compensation, temporary, and flexibility in when/how/where the work is performed (13). Among them, flexibility is not only the typical characteristic of gig work and also an important motivator for workers (7, 14). The growth in gig workers is due to the personal esteem for flexibility and freedom, favoring companies to deal with uncertainty and the advancement of digital technology (15). Because of the flexibility, gig work provides persistent ambiguity about timetables and projected compensation, as well as anxiety and overwork (16). The "anytime" and "anywhere" nature of work is gradually evolving into "always" and "everywhere" (17).

At the time level, working hours are flexible (6). Gig workers have the freedom to schedule their work time and can call on their leisure to work and monetize their time. Where there is an oversupply in the platform's virtual marketplace, platforms often direct gig workers to work for the platform by increasing the reward for their work. For example, both Uber and Lyft provide incentives to drivers in terms of the number of orders taken during a specific time, which is mostly set at peak demand or in the early hours of the morning (5). Similar regulations have prompted some workers to be willing to contribute more of their free time to the platform to increase their financial returns. In a study by Liu et al. (18), it was shown that only 8.8% of full-time online taxi drivers worked <8 h per day, and full-time online taxi drivers worked approximately 1.85 times as many hours per week as part-time online taxi drivers. In a study by Zhang Chenggang (8), 86.81% of those employed on full-time platforms worked more than 6 days per week. Extended working hours are highly likely to lead to adverse health (19). The injury rate (per 100 cumulative worker-years in a specific schedule) increased in direct proportion to the hours per day (or per week) in the workers' typical schedule, indicating a high dose-response impact (20).

At the spatial level, the flexibility leads to a tendency to bring work into their lives (21, 22). In turn leads to an increased de-boundaryization of work and living spaces, with workers accepting a gradual intensification of self-exploitation (5). The high volume of work undertaken to generate more financial income will crowd out the daily life of the workers, and the high level of work stress experienced by this group over a long time will not only affect their physical and mental health but also increase the likelihood of workplace accidents (23). For on-demand workers, single tasks are completed in relatively short periods of time and require multiple workplace changes. The risk of traffic accidents has increased. Also, gig workers are usually monitored by the platform system at all times, like the completion of each step in the work of a takeaway rider needs to be fed back to the platform system with the help of a mobile phone, and consumers can view the movement of the rider, which increases the invisible pressure (24). Working from home masks the long hours' disassociation and irregularity. The high job demand of work with less job resource always leads to burnout (25). Therefore, the flexibility of the work does not equate to improved working and living conditions (9).

In summary, the occupational injury risks faced by gig workers in a state of freedom to work stem from several sources: Firstly, the lack of clear and fixed working hours for gig workers means that the normal right to take sick leave is lost. Platforms can encourage them to work at a fast pace by setting up competitive evaluation mechanisms, reducing rest time, and granting workers no right to paid leave, which may lead to an increased incidence of illness and an increased risk of occupational injury when working with illness (26). Secondly, the lack of general workplace protectiveness, as much of the work is carried out in uncertain and private places (27). Frequent changes in workplaces also further increase the occupational injury risks faced by gig workers; Thirdly, the platform's continuous real-time assessment and evaluation of gig workers' performance are akin to a "continuous monitoring system," which seriously affects the physical and mental health of this group when under prolonged work pressure and may easily lead to occupational injury (28). Statistics from the Shanghai Public



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Chinese	1	3	0	3	1	12	11	40	41	76
English	0	1	0	5	24	37	104	117	143	177

FIGURE 1
Publication of articles in Chinese and English.

Security Bureau Traffic Police Headquarters show that in the first half of 2017, there was an average of about one takeaway rider casualty every 2.5 days in Shanghai. In Nanjing, there were 3,242 takeaway-related traffic accidents in the first half of 2017, resulting in 2,473 injuries and three deaths. In this situation, the need for occupational injury protection for gig workers inevitably creates.

However, gig work is undertaken without the safety nets found in traditional employment (29). Gig workers are unable to count on consistent income and are barred from the labor rights afforded to employees, both of which have been worsened by the pandemic (30). Some academics believe that gig work poses challenges for social protection: one is the limited ability of gig workers to contribute to social security(including pension or other types), and the other is more companies will opt for informal employment, which in turn erodes social security models (31, 32). The gig economy relies on a workforce of independent contractors whose employment, representation, and social protection circumstances are at best uncertain, and at worst disadvantaged (14, 18, 23, 33). Due to the ambiguous status of gig workers, their protection against work-related injuries is lacking (34–36). There is still extensive debate as to whether gig workers are employees, collaborators, or a third category of workers (15–19, 33, 37–44) and this ultimately leads to the fragility of gig workers (2, 4, 7, 9, 11, 12, 23, 39, 41–43, 45–47). Several studies suggest that the social protection of gig workers is inadequate (11, 15, 31, 36). Only very few studies have separately examined the occupational injury protection of gig workers (12, 34, 36). The current work-related injury insurance has a mismatch with gig workers in China (12). Three main issues were put forward to be addressed for better occupational health research and practice: the first is if a contract is permanent or temporary; the second is whether a worker is a contractor or an employee; and the third is whether a contract involves more than one business (2). The scholar recommended that major occupational injury insurance be established within the framework of the work injury insurance system, focusing on the protection of gig workers against disability and death at work (34). Other initiatives are also put forward, for example, linking occupational injury protection to the single labor payment behavior, and the "behavior" is used as the base, rather than status (43).

It is found that existing studies examined the working status of gig workersm (4, 7, 9, 44, 45), and the analytical perspective is single which relies on the gig work and gig workers. The research on occupational injury protection for gig workers is insufficient which may lead to an incomplete description of gig workers' situation. We will explore occupational injury protection for gig workers to give a comprehensive presentation in this article, which may contribute to shedding light on the situation of gig workers.

3. Methods

Institution analysis and comparative study are adopted in this article. The theory of technology-institution innovation interaction sets the framework for this research, instructing us to focused on institution innovation. The institution analysis of work-related injury insurance will contribute to showing the occupational injury protection of gig workers. The comparative study is used to explore the pros and cons of three kinds of occupational injury protection and show the occupational injury protection status of gig workers furtherly.

3.1. Institution analysis

Based on the theory of technology-institution innovation interaction, we analyzed the institution of work-related injury insurance which is an important institutional arrangement to ensure the safety and health of employees in China. We examined

the accessibility and applicability of institutions separately to see the consequences of the institution's failure to innovate. The status of occupational injury protection for gig workers is shown through institution analysis.

The theory of technology-institution innovation interaction combines technology and institution because they are closely related in the innovation systems (46, 48, 49). The adaptation of the institution to the external environment is an inevitable requirement to ensure its sustainable development. In institutional economics, technological innovation and institutional innovation are two inseparable categories that drive economic development. A rational institution is conducive to promoting technological innovation. Conversely, an institution that is inconsistent with needs may derail economic development and act as a deterrent to technological innovation (47). In Marxist economic theory, institutional factors are endogenous variables of socioeconomic development, rather than independent of it. The theory classifies technological innovation as a category of productive forces and institutional innovation as a category of relations of production, with the two having a relationship of opposition and unity. When the development of productive forces is limited by the old relations of production, innovation of institutions becomes inevitable. Technological and institutional innovation are interdependent and mutually reinforcing. In the long run, technological innovation plays an important role in promoting institutional innovation, while at the same time, institutional innovation guarantees the realization of the functions of technological innovation. The development of a country's economy and the stability of its society requires both technological and institutional innovation, thus creating a virtuous circle.

In this article, the gig economy is dependent on the input of digital technology and human capital. The flexibility of gig work is generated, but with occupational injury risks for gig workers. An effective institutional arrangement is important for protecting gig workers and then promoting the development of the gig economy. It has been shown that digital technology has given rise to the gig economy, we are wondering if is there a response to digital innovation. In a state where the technology is updated but the institution is not, what is the status of occupational injury protection for gig workers? The method of institutional analysis was adopted to give the answers in this article. We tested the applicability of the work-related injury insurance to gig workers based on the institution's condition of participation settings and protection.

3.2. Comparative study

In 2017, the State Council issued the "Opinions on Doing a Good Job in Employment and Entrepreneurship for the Current and Future Period," which proposed to improve the employment and social security and other systems that adapt to the characteristics of new employment patterns; In 2020, the National Development and Reform Commission and 13 other ministries issued the "Opinions on Supporting the Healthy Development of New Business Patterns and Modes and Activating the Consumer Market to Drive Opinions on Expanding Employment," with emphasis on exploring policies to adapt to cross-platform and multi-employer flexible employment in terms of rights and benefits protection and social security.

Data in this article are collected from the official websites of central and local governments in China, the website, and the WeChat official account platform of DiDi Travel. The documents involved are "Measures on Occupational Injury Insurance for Flexibly Employed Persons (Trial)" and "Rules for the Implementation of Occupational Injury Insurance for Flexibly Employed Persons," "Trial Measures for County-wide Participation in Work-Related Injury Insurance for Employees in New Industrial" and Guanhuaibao. According to the information, three models of exploratory practice of occupational injury protection for gig workers were presented. The comparative study was used to make comprehensive presentations of the advantages and disadvantages of each exploratory practice. The covered subjects, financing options, and mode of operation are included to make a comparison among the three cases.

4. Results

The theory of technology-institution innovation interaction guides the analysis of the current state of workers' occupational injury protection. To better respond to the gig economy, the government should follow the established goals and principles for institutional innovation (50). However, work-related injury insurance failed to interact with technological innovation. Despite the particular need for workers to be covered for occupational injury protection, the current arrangement of work-related injury insurance in China does not match the situation of gig workers in many aspects, resulting in inaccessibility and a "failure" of the system. Some regions and digital companies in China have explored models of occupational injury protection for gig workers, but all have advantages and disadvantages.

4.1. The inaccessibility of work-related injury insurance

Work-related injury insurance is an important part of social security, providing employees with protection against work-related injuries through mutual assistance and risk-sharing. The work-related injury insurance is employer-contributed in China, and employees are not required to pay contributions. Workers can only be recognized as employees if they sign an employment contract with the employer. In terms of traditional labor relations, if the employer and the worker do not have an employment contract, very few companies will take the initiative to pay for work-related injury insurance for gig workers (48). The ambiguity of the employment status of gig workers makes it impossible to sign labor contracts with the platform companies and difficult for them to obtain insurance coverage for work-related injuries. Although platform companies have strict control over how gig workers provide services to their clients, enhancing the competitiveness of the company itself (49), by making workers recognize their status as independent contractors with flexible work, they avoid providing

the range of safeguards to which workers are entitled (5). The high dependency on the platform weakens gig workers' bargaining power with the platform, and they lack a voice in the development and adjustment of platform rules that affect their interests (41).

In a state where workers' work-related injury insurance is absent, platforms can also provide safety protection for those working in the gig economy by purchasing commercial insurance, but some platform companies have failed to take effective measures. If workers are insured as individuals, this means that the cost is much higher than the group schemes offered by large employers, which is linked to economies of scale and the greater bargaining power of large employers (49). According to a survey conducted by the China Academy of Labor and Social Security Sciences, 28% of all surveyed gig workers wanted to participate in the insurance for work-related injuries, more than other insurance (51). It is no doubt that the lack of work-related injury insurance for gig workers has become an urgent problem.

4.2. The "failure" protection of work-related injury insurance

First, the flexibility of working time and space makes it difficult to identify work-related accidents. The work Injury Insurance Regulations in China stipulate that the injury will only be recognized as a work-related injury if it occurs during working hours, at the workplace, and is caused by work. The working hours of gig workers are often irregular, and the completion of their work may occur at any time of a day. Meanwhile, the development of digital technology allows people and establishments to complete their work even when they are spatially separated (50). This also leads to a high degree of confusion between the workplace and the living place (34). Effective screening of working hours and workplaces has become a challenge for the implementation of the work-related injury insurance. What is more, the difficulty of identifying whether a worker has been injured by work-related causes is further compounded by the irregularity of the working space and working hours, which ultimately affects the protection of the rights and interests of gig workers.

Second, it is ambiguous who is liable as an employer for the corresponding payments. The Work Injury Insurance Regulations proposed "If an employee suffers from an accidental injury at work or an occupational disease and needs to be suspended from work to receive medical treatment for the injury, during the period of suspension from work, the original salary and benefits shall remain unchanged and shall be paid monthly by the employer." The absence of employers of gig workers is a direct result of the lack of availability of work injury benefits provided by employers.

Third, the compensation for treatment is difficult to measure when an injury occurs at work due to the unstable income of gig workers. Although the level of disability is usually used as the standard for determining compensation for treatment under work-related injury insurance, many compensation items are linked to one's monthly salary. For example, lump-sum disability benefits, disability allowances, funeral benefits, dependent's pensions, lump-sum work-related death benefit, etc., the amount of payment for these items is the worker's salary for a certain fixed number of months. As the income of gig workers is mainly based on the number of tasks completed, the income of different workers is bound to vary from one worker to another, and the monthly income of each individual is unstable, given that they are free to work at their own time and place of work. In addition, the income of gig workers is hidden, with the same worker taking on multiple jobs on multiple platforms. Hence, it is hard to determine the exact remuneration of part-time workers (12).

In short, the contents of the work-related injury insurance in terms of contributions, recognition and compensation for work-related injuries are not compatible with gig workers. Being exposed to high occupational injury risks but without the necessary protection makes gig workers more vulnerable.

4.3. Exploratory practice of occupational injury protection for gig workers

The lack of protection for gig workers has gradually received attention in China. Relevant government departments in various regions are gradually exploring, and some platform enterprises are also experimenting with it. Three main ways for gig workers to obtain safety protection against occupational injuries have been formed: Purchasing commercial insurance by platform, establishing separate occupational injury insurance by the government and following the existing work injury insurance system (see Table 1).

As can be seen from Table 1, all three models are explorations of occupational injury protection for gig workers, and each has its own advantages and disadvantages. In the commercial insurance model led by platform enterprises, certain compensation can be given to online drivers in the event of accidents such as injuries from driver-rider disputes, accidental injuries and sudden death. This model is conducive to reducing the pressure of government protection, but under the conditions of different economic strength of each platform enterprise and the non-compulsory purchase of commercial insurance, it is inevitable that all gig workers will not be able to get the occupational injury protection they deserve. At the same time, commercial insurance is by nature profit-oriented, which makes it difficult for vulnerable gig workers to obtain adequate protection. Although the commercial insurance of Guanhuaibao clearly states that medical expenses, hospital meal allowance and lost wages are covered, in practice there is uncertainty as to whether the owner will receive adequate compensation. Some ambiguous treaties in the policy can lead to ambiguity in platform liability, and platforms will use their dominant position to minimize their liability and loss. The gig workers will only be able to passively accept compensation for treatment that may not be adequate, without bargaining power.

In Wujiang, Nantong and Taicang of Jiangsu Province, the government led the establishment of occupational injury insurance. This approach is more targeted, yet it also increases the economic costs and the fragmented system will pose new challenges to the development of the national social insurance system. For example, it increases the operating cost of the social insurance system, weakens the ability of the social insurance system to help each other, and increases the inequality among people. In Wujiang, for

TABLE 1 Ways to achieve work injury protection for gig workers.

	Platform companies purchase commercial insurance	Government establishes separate occupational injury insurance	Covered by the existing work-related injury insurance
Company/region	DiDi Travel	Wujiang District, Jiangsu Province	Jiashan County, Zhejiang Province
Brands/policy documents	Guanhuaibao	"Measures on Occupational Injury Insurance for Flexibly Employed Persons (Trial)" and "Rules for the Implementation of Occupational Injury Insurance for Flexibly Employed Persons"	"Trial Measures for County-wide Participation in Work-Related Injury Insurance for Employees in New Industrial"
Covered subjects	Drivers and passengers	People work flexibly in the Wujiang area in the new economy and new business	Gig workers of new businesses operating on the platform within the administrative area of the county
Financing options	Funded by the DiDi platform	Paid by individuals, subsidized by the government	Employer contributions, no personal contributions from workers
Mode of operation	Business-led commercial insurance operating model	Government-led, commercial insurance company undertakes	Government-led social insurance model

example, in terms of coverage, anyone who is flexibly employed in the region in the form of providing labor for remuneration or earnings and who is not covered by the "Regulations on work-related injury Insurance" can be insured, with no restrictions on household registration. This means that gig workers, who mobile frequently, have the opportunity to participate in the insurance and receive protection, which is important for expanding the coverage of the work-related injury insurance system. In terms of contributions and benefits, participants pay an annual lump-sum occupational injury insurance premium of RMB 180 in March each year. During the trial period, if participants are already enrolled in flexible workers' pension insurance or medical insurance, they can be subsidized by the government to the tune of RMB 120 per person each year when they are covered by the work-related injury insurance. On the whole, the premium for work-related injury insurance for flexibly employed persons is about 50% of the average local premium for work-related injury insurance, and the treatment is also at about 50% of the treatment for occupational injury insurance. In this case, although gig workers are provided with occupational injury protection, classifying gig workers as flexibly employed actually absolves platform enterprises of their responsibility to pay contributions, increasing the burden on the government and the individual workers. At the same time, as the level of compensation is lower than that of work-related injury insurance for employees, it is also a matter of concern whether gig workers can get adequate protection from it. In terms of management and operation, the government-led model with commercial insurance companies is an innovation that can not only reduce the management burden of the government, but also help to bring into play the professional advantages of commercial insurance institutions and improve the operational efficiency of the system, while it will take a longer time to test the actual operation effect.

Jiashan county of Zhejiang province tries to include gig workers directly into the target of work-related injury insurance protection. The relevant policy stipulates: e-commerce, online taxi, network food delivery, express logistics, and other new industrial enterprises operating on the platform should establish labor relations with the employees, who can participate in separate work-related injury insurance during their employment. Considering the fact that this group may have multiple jobs, each employer should separately participate in work-related injury insurance for them. The insurance is paid by the platforms, and the contribution base is calculated according to the average monthly salary of employees in the province in the previous year, and the base is adjusted according to the month following the publication of the above data by the province, and the contribution rate is tentatively set at 1.1%. Gig workers do not pay individual contributions. The taxation department has set up a "new industry injury" directory specifically for the collection of work-related injury insurance for gig workers, the collection of the directory contribution base, rate, and the amount payable by the social security agency approved and passed to the taxation authorities for collection. In this model, workers are essentially identified as employees, and platform companies are considered employers. There is no difference in coverage for gig workers and other employees. Although this initiative in Jiashan County is easy to operate and manage, it also increases the burden on platform enterprises. The work-related injury insurance should not only protect the basic rights and interests of the workers but also take into account the economic burden of the platform enterprises. At the same time, the high mobility of gig workers will also lead to a further increase in employment costs for enterprises. The direct inclusion of gig workers in the work-related injury insurance system temporarily solves the problem of participation, after which a series of issues still need to be clarified, such as whether and how to connect between work-related injury insurance platforms and different regions.

5. Conclusion and discussion

From the demand perspective, the flexibility of the gig economy dictates that workers have more freedom, particularly at the time and space level. However, with the incentives of platforms, gig workers are motivated to work longer hours, work harder and adapt to the uncertainty of the working space to earn more income, which leads to more occupational injury risks. The need for occupational injury protection for gig workers is a necessity. From the supply perspective, we explored the occupational injury protection of gig workers through institutional analysis and comparative studies.

It is found that work-related injury insurance is inaccessible and does not apply to gig workers. Each of the protection models explored has its disadvantages. Occupational injury protection for gig workers is insufficient.

Behind the flexibility of gig work, there are increasing occupational injury risks and a lack of protection. The debate on the relationship between gig workers and platforms is the most important obstacle to gig workers' access to work-related injury insurance, and cannot be unified in the short term. However, the problem of the lack of occupational injury protection for gig workers needs to be resolved urgently. Who will provide occupational protection for gig workers? In terms of extending coverage, a government-led social insurance system is more advantageous (32). It helps to cover all gig workers in a short period of time and to achieve full coverage. The non-profit nature of social insurance allows for more adequate safety protection for gig workers. Therefore, government-led work-related injury insurance is a more reasonable option to protect gig workers from occupational injury risk. According to the theory of the interaction between technological and institutional innovation, we believe the reform of work-related injury insurance is increasingly essential to meet the needs of gig workers for occupational injury protection, and also for improving the situation of gig workers. When the system does not work as well as it should, the establishment of a new system can alleviate the problem for a while, but it is ultimately not conducive to long-term development. As the economy and society continue to develop, new issues emerge. The work-related injury insurance is not meant to be static, and in the face of changing circumstances, innovation of the institution will be the best way forward.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

XR conceptualized, designed the study, and performed the analysis. XR and YZ wrote the first draft and supervised the research. All authors have read and agreed to the published version of the manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Closing the academy–Business gap by building intellectual capital in professional formation

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Introduction: The rapid advances in technology, market pressures, globalization, and, recently, the COVID-19 pandemic show the need to find educational models that respond to these realities while improving the employability levels of young people and promoting economic growth. This research analyzes how the professional formation model, where two learning spaces, the academy, and the company, are combined, promotes the closing of gaps and economic growth, through the development of intellectual capital that arises from this relationship, in an emerging economy such as Colombia.

Methods: The methodology used corresponds to a qualitative approach, where the vision of the actors involved in the training process at the undergraduate level in Colombia is analyzed through semi-structured interviews, focus groups, and documentary analysis.

Results and discussion: The results show five major elements to consider for the formation of the intellectual capital required for the success of the relationship and the reduction in the gaps between academia and business: decision-making mechanisms, inter-organizational coordination, knowledge.

KEYWORDS

professional formation, intellectual capital, SDG 8, knowledge management, decent work and economic growth

Introduction

Technological progress, globalization, the market, and a volatile, uncertain, complex, and ambiguous environment (VUCA) have driven knowledge as the key factor that promotes competitiveness creation, growth, and wealth of the countries, contributing to facing complex problems that affect humanity and that are highlighted in the 2030 Agenda. In this context, intellectual capital must be understood as the force that allows the resolution of these problems.

One of the major issues is youth unemployment. Young people face difficulties in labor markets, precariousness and predominance of low-skilled jobs, low work experience, occupational turnover and informality, income instability, lack of legal protection, and limited training and career opportunities, which generate occupational instability and do not allow them to acquire the qualifications, experience, and skills necessary for future job stability (International Labour Office, 2020; Organización Internacional del Trabajo, 2021). In addition, they are three times more likely than adults to be unemployed (International Labour Office, 2020).

According to the International Labour Organization, young people in Latin America returned to employment possibilities more quickly than adults after the crisis generated by the COVID-19 pandemic, a phenomenon explained by youth informality in the labor market and the recovery of the activities with the highest youth employment; however, the youth unemployment rate in 2020 and 2021 was ∼22% (Organización Internacional del Trabajo, 2021), which is higher than the global rate of 13.6% in 2020, becoming this a matter of concern in the region. By 2020, globally, one-fifth of young people were not gaining experience or income from work, nor were they improving their education levels or skills (International Labour Office, 2020).

Regardless of the sector of the economy, companies require employees with knowledge and skills in information technologies that support activities and technical functions in different areas (International Labour Office, 2020). Having a university education degree reduces the risk of job displacement due to process automation, given the skills acquired for problem-solving, which generates the challenge of ensuring quality academic programs with sufficient coverage and closing the gap between business and academy, bringing, consequently, the challenge that will lead to the development of solutions to the affairs that afflict the world nowadays.

Dual training is the model that has brought the business sector and academia closer, also known as Vocational Education and Training (VET) systems. In 2001, Colombia implemented this vocational training model through a cooperation agreement between the German government and the chambers of commerce, to seek competitiveness and improve the productivity of companies in the country, closing the gaps in training.

Studies analyze this type of training in different parts of the world, and some of these focused on transfer (Euler, 2013; Gonon, 2014; Hinrichs, 2014; Gessler, 2017b); in Latin America, it is described (Rojas, 2015; Molina, 2016; Espinoza Freire, 2020; Peguera Carré et al., 2021; Zapata et al., 2021), focusing on the experience since its implementation, analyzing the gaps and challenges for its understanding, limitations, and possibilities, and being this a potential field for research considering the contribution of this model to economic growth and decent work as it has been proposed worldwide (Vélez Rolón, 2019).

Knowledge management in professional formation

Drucker (1993) suggests the relevance of understanding knowledge as the most valuable resource for economic growth, in the so-called knowledge society. In organizations, this knowledge must be created from the interaction of the tacit knowledge of each member and the explicit knowledge created in the organization (Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998; Von Krogh et al., 2000). This generates value for the organization, taking advantage of the use of knowledge as an intangible asset, the intensive use of technology and processes efficiency, and the development of innovations (Hislop et al., 2018).

This occurs from two fundamental processes: first, knowledge management, assumed as the identification, capture, systematization, and use of organizational knowledge (Nonaka and Takeuchi, 1995; Firestone and McElroy, 2003; Senge and KIm, 2013), and second, the transfer of knowledge seen as the bidirectional process flow of knowledge; from the theory of communication, this flow requires three determinants: the willingness of the transfer or the receiver; the appropriate channels of transmission; and understanding the value and use of the knowledge transferred (Gupta and Govindarajan, 2000).

Intellectual capital

Intellectual capital has been studied from the value creation and the competitive advantage of organization approaches. Edvinsson (1997) defines intellectual capital as the set of knowledge, experience, technology, customer relationships, and professional skills that an organization has; it is the knowledge assets that turn into value and create innovation (Sardo et al., 2018), from the creation and connection between expertise, experience, and competence inside and outside organizations (Do Rosario et al., 2008), and is conceived as a source of competitive advantage (Sharabati et al., 2010). This intellectual capital, understood as intangible assets, does not appear on the company balance sheets but generates more value for organizations than physical assets (Hashim et al., 2015). This generation of value and competitive advantage comes from the combination of the dimensions of intellectual capital: human capital, structural capital, and relational capital (Do Rosario et al., 2008; Kianto et al., 2017; Sardo et al., 2018; Li et al., 2021).

Human capital is considered the main source of competitive advantage (Do Rosario et al., 2008), as it is a source of renewal, creativity, and innovativeness (Sardo et al., 2018), and includes the knowledge, qualifications, skills (Zeghal and Maaloul, 2010), experience, commitment, and motivation (Kianto et al., 2017) of an organization's employees. It is the individual stock of knowledge that is further nurtured by their willingness, skills, and training (Li et al., 2021). This capital is not owned by the company since it leaves as soon as members of the organization leave (Zeghal and Maaloul, 2010; Kianto et al., 2017; McDowell et al., 2018).

On the contrary, structural capital is understood as the non-human assets of an organization, which are embodied and stored in information systems, databases, programs (Do Rosario et al., 2008), production processes, information technologies (Zeghal and Maaloul, 2010), information systems, work procedures, know-how (Edvinsson and Sullivan, 1996), innovations, business processes (Roos and Whitehill, 1998; Do Rosario et al., 2008), and organizational capabilities, culture, and intellectual property (Sardo et al., 2018). This capital is owned by the organization and remains in the organization when employees or members of the organization are no longer part of it.

Finally, relational capital, sometimes known as social capital (Subramaniam and Youndt, 2005; Kianto et al., 2017; Li et al., 2021) or customer capital (Bontis, 1998), includes relationships and knowledge with customers, suppliers, industry, partners, connections and relationships with authority (Do Rosario et al., 2008; Sharabati et al., 2010; Kianto et al., 2017; Li et al., 2021), and

stakeholders and also includes brand loyalty, image, and reputation (Sardo et al., 2018).

Professional formation

Tertiary education models have been changing and evolving in ways that allow them to respond to the needs of education and the growing demands of the market and the pressures of the complex problems of the twenty-first century. Hanna (1998) classifies these new models from the point of view of education providers, considering the abovementioned pressures, a classification that is still relevant and has given some relevance to models about contextual pressures. In this research, models that reflect the business-academy alliance are analyzed.

Etzkowitz and Leydesdorff (1995) encompassed this alliance from the triple helix model, which explains the relationship between government, industry, and universities for the production of knowledge and innovation; later, a fourth helix was included that sought to explain these relationships enclosed by social complexities (Carayannis and Rakhmatullin, 2014), arguing that the relationships between these actors must be understood within a system that allows the production and diffusion of knowledge (Lundvall, 2010). It is in this context of knowledge production, in which academy–business cooperation networks become a driver of economic growth while allowing universities to play a different role in generating value for society (De Fuentes and Dutrénit, 2012; Sam and van der Sijde, 2014; Bikse et al., 2016). Faced with this reality, this training model, developed in Germany, has taken great relevance to approach the academy–industry relations and to close the gap between academia and the productive sector.

The model is based on the training of young people in two alternate spaces: the academy and the company, implemented in different ways around the world (Eichhorst et al., 2015). Such variation in models is linked to the development of training itself, pressured by historical and cultural processes in each country, which determines the way how it should be adapted (Euler, 2013; Gessler and Howe, 2015). Some of the characteristic elements of dual training are as follows: (1) having two learning spaces, (2) job rotation during the professional internship, (3) the existence of a work plan created between teachers and company instructors, and (4) the existence of tutors in the classroom and the company.

High youth unemployment rates, coupled with the need to train competent human capital, have revived the debate on the relevance of implementing dual training models, bringing several challenges.

In this scenario, companies face obstacles when developing dual training programs. One major obstacle is financial, deepened by the crisis generated by the COVID-19 pandemic (OECD, 2021); the incorporation of technology, remote work, and flexibility to take breaks during work periods were some of the mechanisms used by companies that are expected to continue to counteract the effects of the crisis in the short and medium term and develop in this way training and VET. That is why higher education institutions are the ones that must take on the challenge of generating spaces and strategies that offer the possibility of practical learning through simulations and other information technologies, applied projects, the use of laboratories, and other experiential learning strategies (OECD, 2021). In this sense, and to ensure higher levels of employability of young people, integrated policies are required to promote research and development that foster new sectors and innovations leading to job creation and, on the contrary, to promote the updating of the educational offer taking into account market needs and trends that include personal and digital skills (International Labour Office, 2020).

In this context, the Organisation for Economic Co-operation and Development (2020) recommends actions for the construction of VET systems in future by countries. Among these, it proposes the interaction between employers and unions, planning for changes in the labor market, financial aid, availability of digital and distance education, promotion of digital badges, development of transversal competencies, incorporation of vulnerable groups, and teacher qualification (Organisation for Economic Co-operation and Development, 2020).

Research questions

The study addresses the following research question: How can professional formation contribute to the development of intellectual capital and bridge the gap between academia and business in emerging economies? case Colombia.

Data and methods

The research methodology chosen was the case study, which allows for the examination in depth of the dynamics and relationships of a phenomenon under study (Yin, 2009), allowing to establish relationships between cases (Hancock and Algozzine, 2011). For the selection of these cases, a non-probabilistic purposive sample was selected, which is characterized by allowing the researcher to define according to the need of the research. The case studies chosen for this research correspond to the five higher education institutions (HEI) that have had education programs with professional formation models in Latin America, part of the *Duale Hochschule Latinoamérica (DHLA)* (DHLA).

For each case study, the same strategy of individual analysis was established to continue with the cross-checking of data and the construction of relationships and overviews. The research presents a qualitative approach, in which different data sources and data collection techniques were used to validate the results, through a triangulation process, and the information was organized in a database analyzed through the ATLAS Ti 22 software, where the chain of evidence for each case was maintained (Yin, 2009).

The qualitative research techniques used were as follows: 16 semi-structured interviews with professors, internship supervisors, businessmen, and managers of the HEI; analysis of 43 official documents of the model corresponding to guidelines, institutional strategic plans, internship follow-up plans, web pages, and improvement plans made by students; additionally, 10 group interviews were conducted with students of the five HEI.

For the data collection, it was necessary to identify the actors such as professors, internship supervisors, entrepreneurs, and managers of the HEI and to develop profiles for each one, generating the codes for their respective identification in the matrixes where the results are compared, and the instrument and

TABLE 1 Theoretical constructs.

Variable	Definición	Autores
Knowledge management	This variable describes the activities that generate knowledge in the company, its relationship with innovation, and the knowledge cycle.	Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998
Human capital	It refers to the knowledge, skills, qualifications, experience, commitment, training, willingness, motivation, and aptitudes of the members of an organization.	Zeghal and Maaloul, 2010; Kianto et al., 2017; McDowell et al., 2018; Li et al., 2021
Structural capital	It refers to the non-human assets of an organization: information systems, databases, software, production processes, information technologies, information systems, work procedures, know-how, innovations, business processes, organizational capabilities, culture, and intellectual property.	Edvinsson and Sullivan, 1996; Roos and Whitehill, 1998; Do Rosario et al., 2008; Zeghal and Maaloul, 2010; Sardo et al., 2018
Relational capital	This variable includes relationships and knowledge of customers, suppliers, industry, partners, connections, relationships with authority, stakeholders, brand loyalty, image, and reputation.	Sharabati et al., 2010; Kianto et al., 2017; Sardo et al., 2018
Knowledge transfer	The variable refers to the mechanisms that enable the flow of knowledge.	Gupta and Govindarajan, 2000

Source: Author's elaboration.

size of the sample were also codified for each HEI, as well as the main characteristics and general information of each institution.

The methodological process was carried out from the documentary analysis and data collection through interviews based on the selected theoretical variables. Subsequently, the individual and group interviews were transcribed, generating a list of categories and assigning them to each question to finish with the analysis, categorization, and development of the reports.

Data analysis

In this process, the responses of the participants were categorized and codified, grouping them in an orderly manner, facilitating the comprehension of the categories identified theoretically (see Table 1); the variables used for the data analysis gave rise to the deductive categorization (see Figure 1), which allowed understanding the construction of intellectual capital.

The information extracted from the documents was analyzed, and both individual and group interviews and observations were transcribed, categorizing and classifying each variable proposed in a database using the qualitative data analysis software ATLAS TI v22. For this analysis, lists were constructed with the categories to be assigned to each case, as defined by Hernández Sampieri et al. (2014), giving values that facilitate the identification of each item of data; this list of codes and categories was based on the literature, taking as a basis a documentary analysis of the theoretical foundations found for the construction of the instruments used.

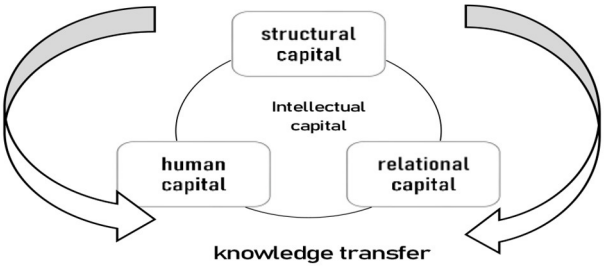

FIGURE 1
Knowledge management. Source: Author's elaboration.

Deductive encoding

This step began with the assignment of sections of interviews, individual and group, documents to each of the categories identified from the theoretical references of the research, called units of significance (US), which represent fragments of the interviews, focus groups, and documents analyzed that are associated with each theoretical category defined.

Inductive encoding

For this encoding, it was necessary to periodically review and add codes when necessary, and the 800 (US) were grouped into codes from the data, finding 37 codes that allow to understand the construction of intellectual capital in professional formation. This process concluded when the units of significance were repeated in each of the cases, and when they were assigned to the categories and finally to the codes.

Emerging categories

The analysis of the data results in the development of *five* metacategories that allow the recognition of the most important elements to consider for the development of intellectual capital in the professional formation model in Colombia, which at the same time explains how they favor economic growth when closing the *academy–business* gaps.

Results

Deductive codification

The deductive codification process was carried out by considering the variables proposed from the theory that allows the development of intellectual capital: relational capital (46.5%), human capital (21.25%), and structural capital (32.25%). A total of 800 units of meaning were found from the analysis of the different data collected (Figure 2).

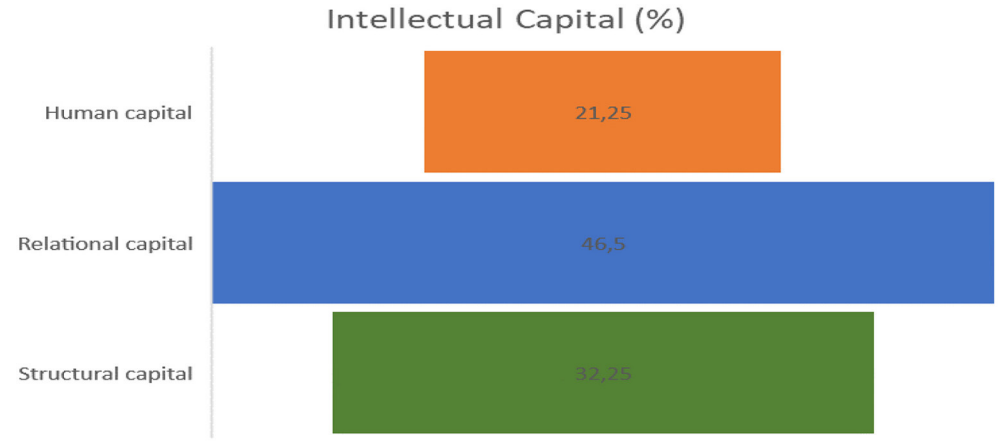

FIGURE 2
Intellectual capital. Source: Author's elaboration.

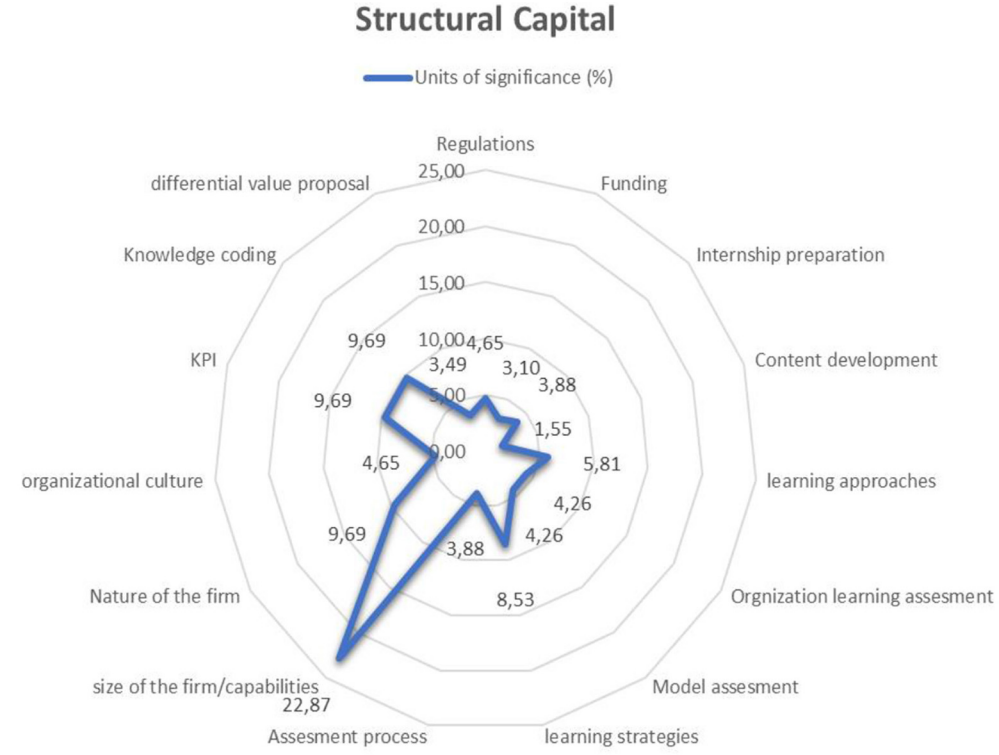

FIGURE 3
Structural capital. Source: Author's elaboration.

Inductive codification

Based on the contributions made by the participants and the analysis of the official documents, 37 indicative categories were identified, which were grouped into each of the abovementioned theoretical categories.

The structural capital built-in professional formation for the participants in the research should contain the following elements: clarity in the normativity and financing of the model, the necessary preparation process in the universities before starting the internships, and the development of contents that account for learning and approaches from the classroom and the company, having clarity in the learning evaluation models not only of the students but also of the organizations and of the model itself. This should also consider the size, capabilities, nature of the companies and their organizational culture, the measurement of the same through clarity in the KPIs, the development of knowledge codification, and the alignment with the differential value proposition that the model itself offers (Figure 3).

Some of the arguments that support these results are as follows:

> *"The ease of applying what we learn depends on the size of the company and the sector in which they are, in SMEs you can bring more knowledge (Student)."*
>
> *"The model requires harmony between the university and the companies, but as there are few companies, it is difficult for students to do their internships well applied, we have cases where they are very small companies, then they go to do one, the marketing internship, and they put them to do something about quality management or they put them to do something else, so sometimes they tend to deviate a little from the concept of the internship and they will do it more for commercial needs" (Practical Coordinator).*
>
> *Students can adequately apply their knowledge in a large company or a small company, or they can be in a large company and not apply any of the knowledge, the important thing is the accompaniment that we are doing (Decision makers).*
>
> *"There are regulatory barriers in Colombia that have very complex financial implications because in general, the dual model in all countries where it has been implemented has a strong support from the company in terms of financing the students because there is a retribution in the training process" (Program Director).*

The formation of human capital becomes the higher purpose that should mediate the academy–business relationship in professional formation, and the results show the key aspects for this to happen: the development of competencies in students, teachers, and instructors, a strong component of training in soft skills, constant feedback processes between the different actors in the process, the open willingness of employers to transfer their knowledge to students and of students to apply the knowledge acquired in the classroom, the construction of the necessary interaction to follow-up internships, and the necessary training for students to become the key candidates for generational change in organizations (Figure 4).

Some of the contributions made by participants were the following:

> *"The coordination between university professors and company instructors allows students to feel that they are learning and applying their knowledge simultaneously" (managerial focus group).*
>
> *"It would be necessary to create a proper profile or overview of the company where the best route is outlined for students and for them to apply their work proposals" (interview* internship *coordinator).*
>
> *"The DHLA teacher must be an experienced researcher and use high-level bibliographic sources in his classes; (...) He must know the level of the student at each stage to identify the appropriate teaching material and use the most appropriate methods. The DHLA teacher must know in general terms the business training plans and the objectives (according to the training framework plan) of each area." (official document DHLA_08)*
>
> *There is a formula that is very simple and practical, and it is that in this work with the company the university must select professors to do the follow-up there, but additionally, the companies must assign mentors, these mentors work together with the professors, and they are the ones who are going to facilitate this process (Program Director).*

The construction of relational capital should be understood as the differential of this type of training compared to other existing ones. The first element is the university–business articulation, the possibility of creating networks of partners, the shared coordination of the model, the closing of the gap between academia and business in terms of time and resources, the constant development of internships for students, the development of channels for the constant exchange of formal and informal knowledge, the possibility of traceability of the training and growth of students, the bidirectional flow of knowledge, the spaces in the organizations that allow the training of students and promote employability, the recognition of the value of the knowledge generated, and the development of applied research and innovation processes (Figure 5). In this regard, the participants state that:

> *"The student is implementing within the company improvements, which is a competitive advantage for the company" (entrepreneur).*
>
> *"Studying gives us the possibility to bring new and creative ideas to the company, helping in the creation of more value" (student).*
>
> *"I help them in training, but when they are already trained I want them to help me in the business as well" (entrepreneur).*
>
> *"With the university business model, what the company does is that it anticipates the training process of the workers and gains the person's study time with a learning process and when that person joins the company after finishing their studies they will be much more productive than another person who comes from a conventional model" (entrepreneur).*
>
> *"From my point of view, it depends a lot on the company where you can apply what you are seeing at the moment" (student).*
>
> *"The most valuable thing about the model is the opportunity to capitalize on the student's knowledge in the organizations, through the internship projects" (internship coordinator).*
>
> *"The company provides a contribution in knowledge management from organizational structures and the business environment to the academy in favor of competitiveness and value creation" (Program Director).*

Development of the final categories—Metacategories

A total of five final categories emerged from the codification and categorization process carried out during the analysis process. The proposed categories allow comprehending of the necessary elements for the construction of intellectual capital in professional formation, understanding that this process takes place in the academy–enterprise relationship.

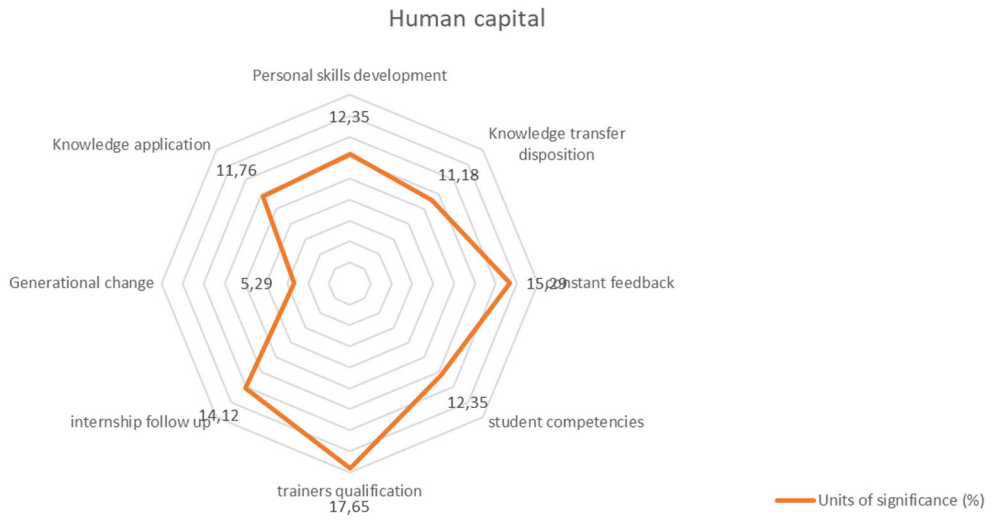

FIGURE 4
Human capital. Source: Author's elaboration.

The categories that emerge allow explaining the necessary elements that intervene in the construction of the intellectual capital academy–enterprise relationship are as follows (Figure 6):

1. Decision-making mechanisms.
2. Interorganizational coordination.
3. Knowledge transfer capabilities.
4. Knowledge systematization.
5. Added value of the professional formation model.

Discussion

This research has analyzed the point of view of the different actors involved in the professional formation process in Colombia, the way to build intellectual capital, from the relationship between academia and business. The results were grouped into three types of capital: relational capital, structural capital, and human capital, based on the processes of generation and transfer of knowledge for their analysis. The understanding of how intellectual capital developed from the implementation of professional formation makes it possible to explain how the gap between academia and business can be closed in a way that favors the country's economic growth.

Decision-making mechanisms

According to the findings, the decision-making mechanisms in the professional formation processes in Colombia are linked to the structural capital necessary for its operation, and these conditions vary in different countries where the model has been implemented; in the Latin American case, specifically in Colombia, the academia–industry relations occur at the micro-level, i.e., only between institutions. Germany, on the contrary, presents different levels of relationships, being the role of the government a relevant point, stated also by Gessler (2017a) developed by Rojas Hernández et al. (2019). This becomes a challenge for Colombia, where professional formation as an educational model has been regulated for a few years and the implementation mechanisms are still poorly understood.

Interorganizational coordination

The results show that learning spaces must be explained from their particularities and needs, it is necessary to understand the curricular model of training that must be implemented in the companies and to recognize this space as a training space rather than a practice space; on the contrary, universities must manage to incorporate the learning promoted by the business sector. Training spaces must be aligned for the proper development of training where the context plays a fundamental role (Lucas et al., 2012). Additionally, the results evidence the importance of inter-organizational dialog and the relevance of tutors, coinciding with Gessler and Hinrichs (2015).

Knowledge transfer capabilities

Knowledge transfer processes between the classroom and business are mediated by the interest of the parties, so there must be an awareness of the generation of value from them (von Krogh et al., 2001). In this regard, the participants stated that there is a high interest in sharing knowledge by the entrepreneurs; however, this is linked to the size of the company, the spaces, and channels of dialog, and the business culture, which agrees with Rodríguez Gómez (2009) who states that knowledge transfer is strongly related to the organizational culture. Regarding the channels through which knowledge transfer takes place, the informants stated that they are mostly informal, which is supported by Eom and Lee (2010) findings, who also identified that informal channels are the most used way to transfer knowledge between the academy and business,

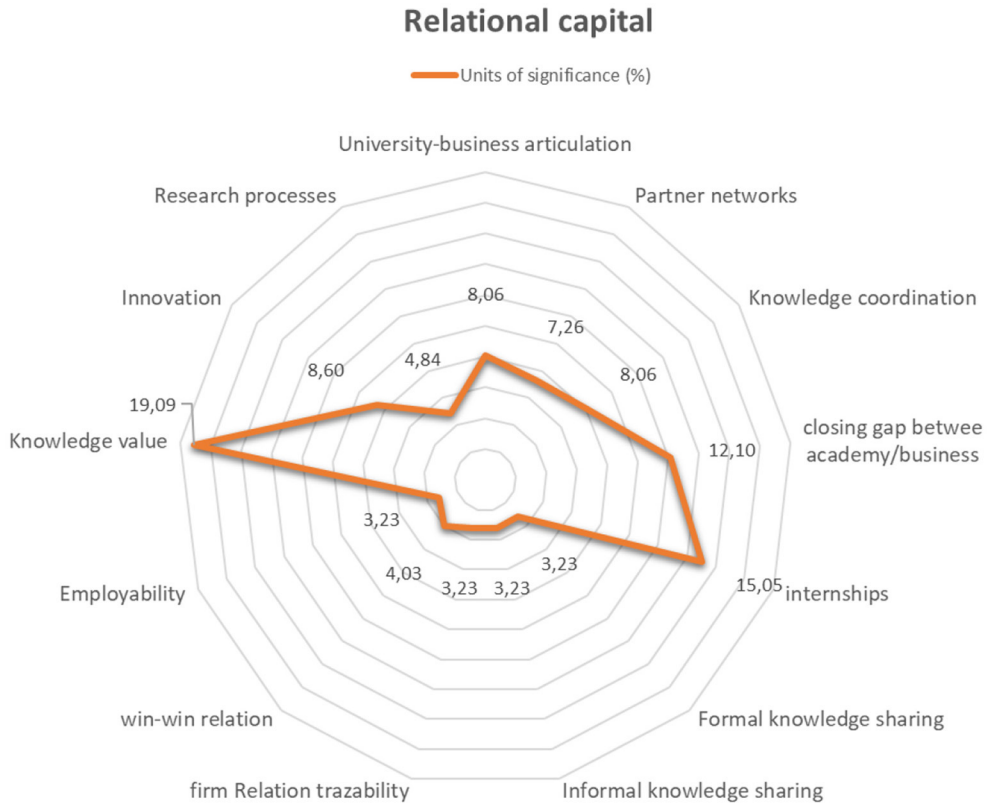

FIGURE 5
Relational capital. Source: Author's elaboration.

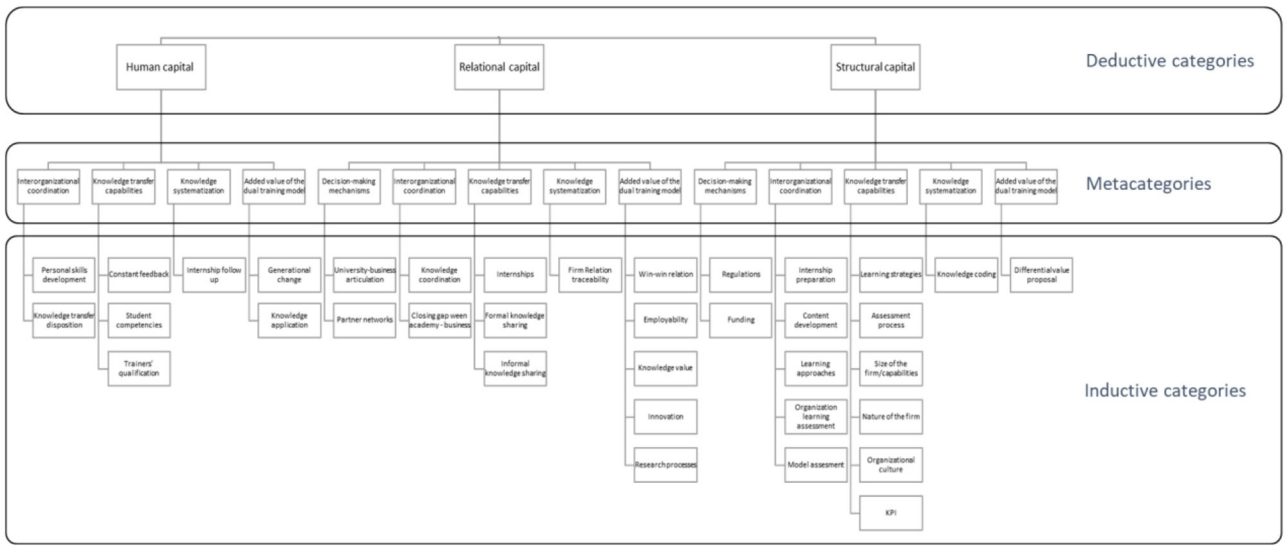

FIGURE 6
Metacategories. Source: Author's elaboration.

the communication and transfer channels must be clearly defined to capture knowledge more effectively, and the motivation to interact plays an important role for the use of these channels (D'Este and Perkmann, 2011). Concerning the use of knowledge, the findings show how this is a process that is conditioned by the type of organization, its willingness to cooperate, and the structure of the educational Institution, and on this, Kanama and Nishikawa (2017) state that companies can improve their innovative performance

when collaborating with academia, only if there is clarity about the value of knowledge.

Concerning the transfer, the most relevant issue is to understand what is the real value of knowledge, the results in this sense show that there is a high potential to use the knowledge generated in the academy–business relationship, and it is necessary to have all the structure for its use; in this sense, different studies raise the importance of activating this knowledge (Gupta and Govindarajan, 2000), and this requires the development of a coordinated strategy for this to occur.

Knowledge systematization

To understand how to create intellectual capital capable of contributing to economic development from professional formation, it is necessary to implement measurement and monitoring processes that allow not only the traceability of the process but also to demonstrate the true value of training. These findings coincide with the results obtained by different authors (Hinrichs, 2014; Gessler and Hinrichs, 2015).

The added value of the professional formation model

Professional formation value creation can be understood from different perspectives, and one of them is the possibility of generating new applied knowledge from incremental innovation processes, coinciding with the contributions of Euler (2013) regarding the implementation in other countries, and Kaiser et al. (2015), who highlights the role of networks for innovation. Thus, the academy–business relationship not only promotes cooperation and knowledge generation but also results in the generation of innovations that enable economic growth and sophistication of the productive sector (von Krogh et al., 2001; Eom and Lee, 2010). On the contrary, professional formation enables faster business response times (Gessler and Hinrichs, 2015), allows students to influence the improvement of processes through learning (Bandura, 2010), and improves knowledge transfer through collaboration (Chiaburu et al., 2010).

Intellectual capital, professional formation, and economic growth

Based on the categories analyzed, the construction of intellectual capital through professional formation is evidenced by its human capital, structural capital, and relational capital dimensions and its impact on closing gaps between business and academia.

Human capital is built mainly from the development of personal skills and the willingness to transfer knowledge, through inter-institutional coordination, student competencies, training of instructors, and constant feedback in the category of knowledge transfer capabilities, follow-up of internships, and the generational relay and application of knowledge as evidence of the added value generated by the professional formation model.

The strengthening definition of structural capital from the dual model is demonstrated across the regulations and financing as decision-making mechanisms, the implementation of inter-organizational coordination that prepares students for the internships, develops content, formulates the learning model, and establishes both organizational and the model learning assessment. Moreover, this capital is strengthened by the ability to transfer knowledge between academia and business through the proposal and establishment of learning strategies and evaluation processes, considering the capabilities and size of companies, their nature, and organizational culture, formalized in a specific measurement system and the codification of knowledge. The added value created by the professional formation model is reflected in a differential value proposition for the parties involved.

Finally, relational capital management promotes the model strengthening through the mechanisms used for decision-making from the articulation between academia and business, and the generation of networks and their traceability. Similarly, with inter-organizational and knowledge coordination, the gap between academia and business is closed, which promotes the development of successful internships, the formal and informal knowledge exchange, and the generation of value of the professional formation is evidenced by win–win relationships, the employability of young people, the creation of innovations and knowledge, and collaborative research processes.

Conclusion

Human capital is a determining factor in the economic growth of a country, especially in the so-called knowledge society, so it becomes a real factor of production. In this way, it is important for countries to commit in terms of investment in the education of competent human capital, research, innovation, and technological development, to improve the productive structure of the business (Hyde, 2015; Greiner et al., 2016; Stiglitz and Greenwald, 2016).

In the case of Colombia, it becomes a necessity, first, to train the existing labor force, which is low-skilled and much focused on low-value-added services, and this should be shifted into conceiving education as an endogenous factor in its economic growth formula (Thelen, 2006; Acevedo, 2007). Second, the great changes in organizational models, the speed with which enterprises grow, and the new normality resulted from the COVID-19 pandemic provide a favorable context for professional formation to become a model that accounts for these changes, especially because of the immediate response in academic training.

Consequently, a positive relationship is found between the development of intellectual capital through professional formation models and economic growth and decent work, through the closing of academia and business gaps. The comprehension of the business, economic and social needs by higher education institutions, and knowing their capacity to respond in an articulated manner with the company promote

the employability of young people with better working conditions given the qualifications and experience they acquire through the model.

Similarly, the company's commitment to the promotion of professional training applied to the business context generates greater creation and strengthening of the organization's intellectual capital from its human capital dimensions, training and promoting the development of personal skills in its employees; from the structural capital by establishing mechanisms, procedures, systematization of the model, innovations, and development of the organizational culture; and from the relational capital with the articulation and relationship with the academy that allows the creation of opportunities for young people and the strengthening of the educational and business system resulting into greater economic growth and internships that promote decent work and employability of young people.

Limitations and future research

Some limitations were found in carrying out this research that refers to the limited studies on professional training in Latin America since the studies that were found measure specific aspects of the training process and not the entire training system, creating opportunities for future research. A series of elements are key to understanding how intellectual capital generates value in organizations, turning them into more competitive companies that generate growth and development.

On the contrary, there is an opportunity to analyze the cases of other emerging economies that develop professional formation models, thus measuring the performance with the five factors identified and finally be able to determine how they have managed to reduce the academy–business gap and its impact on sustainable and economic development. Finally, it can lead as well to research in detail the vision of organizations, analyze the indicators of improvement, and monitor the results for the formation of intellectual capital over time.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study involving human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants in accordance with the national legislation and the institutional requirements.

Author contributions

AV-R, AP, and MM-P: conceptualization and formal analysis. AV-R: data curation and research. AV-R and MM-P: methodology. AV-R, AP, MM-P, and DN-B: writing—original draft and writing—reviewing and editing. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Transformative community projects in East Germany's rural spaces: exploring more sustainable forms of learning, working, and living

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Increasingly people experience alienation in educational institutions, in work life, and fragmentation in their personal life. This study explores more self-determined, healthy, and sustainable forms of working, learning, and living through a dynamic process that began in 2020 with the purchase of an old homestead in Eastern Germany. Through the remodeling of the buildings and grounds, the first social and cultural references emerged. Along with practical uses, the farm project sees itself as a future workshop or think tank. The resulting consideration includes ideas of compulsory schooling woven into a self-designed format and the introduction of an unconditional basic income. These components could lead to thousands of such projects in rural and urban areas. Drawing from communitarianism, the belief is that an active civil society must take on social, economic, and educational responsibilities and offer children and young people improved conditions in which to grow up. Theory development on the individual components exists, such as entrepreneurship, transformation, community-building, basic income, or self-directed learning but not on the interaction of these variables in the overall context. We tentatively call this integrated design a *transformative community project*.

KEYWORDS

civil society, community project, unconditional basic income, self-directed learning, work-life balance, utopian thinking, social transformation

Introduction

Examining decades of German society's development, one can acknowledge the existence of positive attributes such as stable state institutions, a robust public education and school system, a functioning welfare state system, and a sufficiently stable labor market. However, one realizes that there is also a shortage of skilled workers, for example, in the field of geriatric care or teaching within schools. Concurrently, signs of dissolution exist in various areas of society, disintegration of families, an unconnected coexistence of different ethnic communities, or lives that sometimes take place in escapist, virtual worlds. A common narrative or a value-based framework that could hold society together from within is scarce. The functionalized world of work yields human experiences that often lack professional self-realization. Competition, indifference, and alienation frame the work–life experience (e.g., Sayers, 2011; Shantz et al., 2014, 2015; Kalekin-Fishman and Langman, 2015; Bousquet, 2023). Parents leave their children at crèches, daycare centers, and schools, often for the workday. They rush to their 9–5 job, then retrieve their children and try to have nominal

family time together before repeating the process. A primary goal of the education system is to prepare youth to cope with such a working world of jagged, disconnected living arrangements. Responsible authorities and ministries attempt to make school lessons better and more effective, through increased management, control, performance measurement, and support. Youngsters learn in neon-lit classrooms, often reduced to sedentary and book-focused learning experiences, far away from forests, meadows, and fields. However, complex difficulties increasingly appear among youth. When adjoined with conditions of instability, including broken family relationships and complex migration backgrounds, unresolved trauma and uprooting experiences, educational careers, and successful work life are quickly at risk. Male students particularly have a high risk for low achievement, truancy, or delinquency (e.g., Hascher and Hagenauer, 2010). These often lead to a complete abandonment of school education (Harber, 2002; Hascher and Hadjar, 2018; e.g., Havik and Ingul, 2021).

Context

Contemporary schools struggle to solve and remedy the difficulties caused by societal processes. The school-based teaching profession is increasingly less attractive to young people, with dwindling numbers choosing this demanding field of work. The first author, as a teacher and school principal for 20 years, had variable success in schools supporting and keeping vulnerable youngsters in the system. These youth were mostly male adolescents in the transition to violence, delinquency, or dropping out of school. Today, even after a decade and a half of scientific research and parallel school consulting, he concludes that now is the time for alternatives. Systems operating compulsory education need options, as do other current forms of society, which include work lives beset by these difficulties. Realizing that even a differentiated welfare state system can only absorb the consequences of a capitalist economic system up to a certain point is the core of the problem. Initiating transformative community projects with solid financial resources would provide an unconditional basic income for stakeholders, who along with their own strengths and high motivation can recharge society from within. These projects bring new dynamics with the promise to embrace and create a new quality of social cohesion. The impetus for this idea began when the first author and his family bought an abandoned farm in East Germany, in Anhalt, 1 h southwest of Berlin. Situated in an underdeveloped region, the farm included a barn, a workshop, a stable building, and land. The farm's origins date from 1884, i.e., the Wilhelmine German period, although additions and extensions are from the German Democratic Republic period.

Key elements

A critical element of this model is gaining a new understanding of an active civil society and the social communities within that assume social responsibility. A second component is redefining the nature and quality of work, including the conceptual framework, with related ideas of income and work–life balance. A third aspect is the role of entrepreneurship and its embedded nature in the development of new social communities that concurrently take recursive responsibility and are based on principles of sustainability. Fourth are the concepts of self-directed and community-oriented learning, which are central components of these entrepreneurial thinking and socially responsible social units. Fifth is the binding element that holds all activities within the project framework together. This component is the idea of working on an overarching economic, social, cultural, and ecological transformation, and seeing oneself as part of such a transformation.

Rethinking civil society and social communities

Alienation and disintegration in contemporary German society and other modern developed societies can no longer be resolved by state regulation alone. That is, they can no longer be ameliorated by educational institutions and schools, by the welfare state system, or by state support. Therefore, society-wide reforms and renewal initiatives (Lehtola and Ståhle, 2014) and reassessment and redesign of the role of an active, accountable civil society are needed (e.g., Liebert and Trenz, 2009; Wright, 2010; Pérez-Díaz, 2014; Zuk and Zuk, 2022). This examination can be achieved, in part, through discourse analysis related to communitarianism, which critically examines the causes of the crisis in modern societies. A decline in values, loss of solidarity, identity, and meaning are associated with the neoliberal economic and social order. The symptoms of the crisis mentioned are regarded as the consequences of extreme liberalism (e.g., Taylor, 1989, 2012; Sandel, 2008; Walzer, 2009; MacIntyre, 2014). What is important now is that the individual person once again experiences a social embedding. Communitarianism, unlike collectivist societies, preserves the free development and independent thinking of the individual. It embraces social acceptability and takes other people into account.

Rethinking work, income, and work–life balance

To reduce alienation, we must rethink the concepts of work (e.g., Gomez-Baggethun, 2022), monthly income, and views of the work–life balance. The goal is redesigning and bringing work and personal life into a healthier relationship (e.g., Guest, 2002; Crompton and Lyonette, 2006; Bowers, 2007; Bhende et al., 2020). Introducing an unconditional basic income for all is a key element for the establishment and further development of transformative community projects. There exists a growing body of literature on this subject worldwide (e.g., McKay, 2001; Pateman, 2004; Standing, 2004; Zelleke, 2005; Birnbaum, 2010; Van Parijs, 2013; Levin-Waldman, 2018; Artner, 2019; Delsen, 2019; Torry, 2019; White, 2019; Smith, 2021). These studies support the idea that basic income enables people to collaborate and share economic, social, and educational tasks. A study conducted in India in 2015 purports that basic income positively affects personal health (Beck et al., 2015). It provides the opportunity for people to work part-time, as freelancers, independently, or in small start-ups, originating

from these work-related projects. For example, people may practice the skills of making special furniture or ecological agriculture. Ideally, people with diverse professional backgrounds coalesce, roofers and philosophers, carpenters and educators, electricians and doctors, writers, and farmers. Manual and practical work are equally valued in these projects just as much as intellectual work or the handling of financial and business matters. The roles are no longer juxtaposed, act in tandem, providing mutual care and inner balance. Relaxation and contemplation receive sufficient space and the resulting self-determination and social cohesion in professional and personal life yield benefits for the physical and emotional health of all.

Entrepreneurship and community-building

Traveling by train from Berlin to Anhalt and then cycling through the small villages to the farm, one passes abandoned farms, small businesses, such as a dairy, and vacant properties, where people are given financial stability through a basic income, could come together to build and develop. A growing base of literature on the topic of creating entrepreneurial communities exists (e.g., Markley et al., 2015; Franklin and Dunkley, 2017; Kennedy, 2021; Roulston, 2021; Biney, 2023). Community-based entrepreneurship is of great social importance and provides opportunities, especially when we are dealing with structurally weak areas (Buratti et al., 2022; Mason, 2022). Several studies out of India support the idea of developing entrepreneurs' survival skills (Deka and Goswami, 2020; Shukla et al., 2022) and adopting entrepreneurship to diverse cultural settings and community needs (Torri, 2010). Additionally, there is literature on the topic of building diverse, democratic, sustainable communities (e.g., Martusewicz et al., 2015) and on the development of urban living labs (Marvin et al., 2018). Several forward-looking models already link basic income with innovation and entrepreneurship (e.g., Yun et al., 2019). Another concept that is important for our conceptual and practical work is that of the *commons*. As early as the Middle Ages, there were pastures used jointly by the smallholders. In various regions worldwide, projects based on the idea of the commons are increasingly emerging (e.g., Bollier and Helfrich, 2012; Baldauf and Gruber, 2016; Kirwan et al., 2016; Gruber and Ngo, 2018). In addition, as with these future-oriented considerations, the current farm project is gradually establishing neighborly structures in the village and systems of mutual help and cooperation. For instance, a village farmer helps to pull out fence posts with his tractor, and in return, this farmer cultivates fields on this property. Depending on the season, he shares fresh vegetables or a neighboring family receives larger amounts of firewood for their support services on the farm.

Self-directed and community-oriented learning

Young people have only been involved in the project temporarily, but let us say that in 10 years, compulsory schooling in Germany changes into a self-designed compulsory affair. Youth could live and learn on the farm in Anhalt for longer. In such a transformed setting, they could mature working for jointly developed goals and social community values. They would live among real people, men and women, craftspeople, and academics, young and old, surrounded by animals, working with tools, experiencing nature, learning by doing, and learning cooperatively. Income stability would ensure that adults are consistently involved in a project, reduce external work, and provide adults on-site who can care for and supervise children. They would have action-oriented learning spaces and dependable adult reference persons and caregivers. Such a pedagogy contains the concepts of experiential education, self-directed learning, and learning responsibility in a social community context, like what David Weikart practiced in the summer workshops which he ran in Michigan for decades, incorporating ideas from Kurt Hahn and John Dewey (Broecher, 2015). Or let us look at the German–Polish exchange pedagogy, geared toward the ideals of international scouting, which Andrzej Jakzewski and his German cooperation partners developed at the time of the Cold War and Iron Curtain (Toczyski et al., 2022). Children grow up in the original projects into which they are born, within a stable system of adult caregivers. This context extends parental reach to represent supplementary role models. Particularly active are fathers and men, a widely underrepresented group in present educational institutions. Their absence challenges the mental and emotional development of many adolescents. Young people would learn about these transformed settings by investigating and applying for a myriad of projects. For example, in Germany, and gradually elsewhere, thousands of such projects would exist, with different profiles, documented on internet platforms so that young people could investigate them and apply for them there. They could, for example, move from a farm with a core profile on ecological livestock farming in Brandenburg to a mill in Lusatia where furniture is made, then to an urban project in Berlin where clothes are designed and tailored, where music is produced, or where jams and juices are made from organically grown fruit in a place where philosophy seminars are also taking place. Adolescence would be self-determined years of journeying. The youth remain in the project for as long as they can learn new things there, and then they move on. Such changes reimagine the concepts of apprenticeship and craft conveyance (Sennett, 2009; Patchett, 2017) and connect them with creativity, innovation, and entrepreneurship education (e.g., Shu et al., 2020).

Economic, social, cultural, and ecological transformation

Inclusive in terms of gender, disability, age, culture, tradition, religion, or language, these transformative community projects reflect a philosophy of belonging and social connectedness, such as that developed by O'Donohue (1997, 1998). The appreciation of the inner richness that each human being brings with him/her seems a helpful reference at present. Inclusive in these projects would be elders. As a result, expensive elder care facilities could

FIGURE 1
The photo shows the condition of the workshop at the end of 2020. Cleaned and redesigned, discussions are happening about using this workshop in unique novel ways. Smart technologies will be important but also the linking of old manual techniques with new forms of production.

FIGURE 2
This photo shows the barn interior where the previous contents were removed. The spacious barn could host craft activities, artistic, educational, and cultural activities. For example, in this space, there was a discussion about emotional and social geographies in Polish literature. There was also a meeting with villagers here to discuss the project and its goals.

be downsized, and the shortage of skilled workers counteracted. Children living and learning in these projects could relieve preschool facilities and schools, which increasingly suffer staff shortages. Increased contact among generations could foster

mutual learning, as was once the case in a natural way. Of course, in the past, there were often power structures, dependencies, peer pressure, or a lack of acceptance of individuality. Taking care not to revert to prior times, yet preserving the best ideas and experiences, we would combine them with a new transformative philosophy. The humane values are always decisive, the orientation toward the good, as we can learn from communitarianism or the philosophy of O'Donohue (1998). Along with these social considerations, the farm project in Anhalt is about very practical things (Broecher, 2023a,b). Learning opportunities include repairing, rebuilding, and modernizing historic buildings, farmhouses, stables and barns, and partly timber-framed buildings. These activities preserve the area's cultural heritage and start to implement ecologically valuable building materials and smart technologies (Figures 1, 2). Other learning areas under exploration are organic farming, fruit growing, and sheep farming.

Discussion

This study aims to connect the critical analysis of social structures with an outline of an alternative model for working, learning, and living, a model that aims at sustainable development for all, including nature, wildlife, and the whole planet (United Nations, 2016). Providing an unconditional basic income and converting state-controlled compulsory schooling into self-designed compulsory education are two central parameters for the change sought here. In short, we advocate the transformation of learning, growing up, working, and living, as areas narrowly intertwined. Significant support exists in German society for establishing unconditional basic income, but there is also opposition. In the United States, many deem this policy as too radical, although there are places open to discussion. Skeptical citizens distrust such a solution, fearing exploitation. Others reject basic income because they see it as a form of social redistribution which encourages passive and selfish behavior. But this project views the presence of a basic income as an incentive to act entrepreneurially and to take on social responsibility. Examining contemporary German society, the conversion of compulsory schooling into a self-designed compulsory education is divisive. Homeschooling and freer learning formats have existed in the United States over time. In Germany, however, opponents repeatedly express a fear that children and young people will resist learning on their own. Conversely, even under the current conditions, there is an emerging group of students who learn too little or who do not go to school regularly, causing a variety of problems, excessive costs, and subsequent problems. Therefore, despite everything, there is a need beyond school for alternative places of learning. This transformative community-project movement, like most reform movements, does not appear without its skeptics and critics. They question the idea of establishing transformative communities because they relate the idea to abuse of power, manipulation, and exploitation. For example, they make the connection with such abysmal projects as *Colonia Dignidad*. To be successful, government agencies must oversee them so that those involved have their human rights guaranteed, and democratic principles are a reality. Transparency and accessibility are paramount to the projects, as are clear philosophical explication and financial disclosure. These projects must prohibit the conditioning or indoctrination of youth in religious, political, and other respects. They must not subjugate ideologies, manipulate, or exploit them. Learning and age-appropriate work conditions should have voluntary participation. It is important to realize that in contemporary German society, there is still a great deal of mistrust of a concept like the commons. This mistrust recalls the socialism that existed, as was present in the GDR and other Eastern European countries. Human character flaws will remain a challenge when, for example, selfishness and egotism prevail in dealing with the resources that should be available to everyone (Hardin, 1968). We hope to stimulate discussion so that people question the fixation on the accumulation of material goods that is dominant in today's Western societies due to capitalism and the manipulation techniques that work within it (Marcuse, 2014), hoping to arrive more at a philosophy of *being* (Fromm, 2013).

Conclusion

Unconditional basic income would allow for the dismantling of the gigantic administrative apparatuses that distribute social transfer payments. Tax money released could be redirected to the projects, to the people themselves. Such a shift would allow civil society to assume maximum responsibility for itself. The state school system would continue to exist overall, but transformative community projects could reduce their capacity. Young people should never be left with no educational opportunities at all. This approach would provide options for a path to education in a traditional sense, and one to the transformative projects mentioned. Ideally, teacher education of the future could include the context of social, economic, and ecological transformation, including participatory and collaborative practices (Alsop et al., 2007). Thus, the teaching profession could be reinvigorated and charged with new attractiveness. Work would be more self-determined and therefore healthier, resulting in reduced medical expenses. Mobility on the roads could be reduced, with positive effects on the climate, as children and youngsters would no longer have to be shuttled as much, and the sedentary time during transport for adults would be less. This new pace would lead to a decelerated way of life that would benefit people currently living in stressed environments both locally and globally. However, a study from Japan (Klien, 2019) indicated that the mindset of people who long for more self-created work can be strongly influenced by the capitalist system. This study noted that people need to learn to release the mental pressure they carry from such a system. What a fascinating prospect for young people to grow into a healthier world right from the start, with solid social embedding, allowing them to develop their individual potential, always with a view to the overall context on this planet.

Data availability statement

Publicly available datasets were analyzed in this study. There are two documentation volumes published by Books on Demand, Norderstedt, Germany, about the project with a total of around 700 photos and graphics. Both books are available in print and as e-books. For bibliographic information, see the reference list Broecher (2023a,b).

Author contributions

Both authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsoc.2023.1164293/full#supplementary-material

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Tribal women empowerment through entrepreneurship: evidence from Mayurbhanj District, Odisha

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Introduction: Empowering women in a tribal context through entrepreneurship is an approach for enabling and making them economically and socially viable. This paper aims to highlight entrepreneurship in a specific tribal context and provide insight on some instances or cases relating to women's empowerment. Although there are many initiatives from international organizations and governmental institutions to support women entrepreneurs, especially tribal women, they suffer from isolation as a result of their language and lifestyle differ from the rest of society, which made the growth of their business and ability to compete arduous, and thus affected their ability to make various decisions in their lives. This study examines the pathway to a better understanding of increasing access to entrepreneurship for tribal women in Mayurbhanj district, Odisha.

Methods: The sample size was 111 Santhal tribal women entrepreneurs, and all of them were interviewed using an interview schedule and Focus Group Discussions (FGDs). Two analytical tools were used (a linear regression model to find which dependent variables influence entrepreneurs and the Women's Empowerment Index (WEI) to measure the progress in social and economic opportunities). The respondents was interviewed and asked on the various WEI indicators before and after an entrepreneurship intervention.

Results and discussion: It was observed through the results that the empowerment of women has changed in a positive direction after establishing their work; according to the indicators of the study, the Women's Empowerment Index has changed from 0.61 to 1.26. It was also found that entrepreneurship has a positive and significant impact on women's decision-making within the family, and therefore, it was suggested through research to increase the intervention from the government and related organizations with more initiatives that contribute to the possibility of increasing women's education and their financial ability to open new enterprises.

KEYWORDS

entrepreneurship, women, tribal, Women Empowerment Index, empowerment

1. Introduction

Women in India are entitled to equal rights with men according to the constitution and laws established by the government. However, rural women do not enjoy the same social and economic freedoms as men, as is the case in urban areas (Kumar, 2013; Agrawal and Khare, 2019). They still rely on men to provide the family's income and spend most of their time on household chores (Datta and Gailey, 2012). Empowering women can serve as a cornerstone for development to achieve Sustainable Development Goals (SDGs), particularly in relation to families, communities, and even nations (Williams et al., 2022). It is the process that equips

women with the knowledge and skills necessary to expand their participation, control, and decision-making (Akhter and Cheng, 2020). The trend of making women play an important role has begun to increase in the past two decades, as they started to acquire skills on an equal footing with men and attempted to create their own projects (Kapoor, 2019). Women's engagement in business enhances their capacity in three directions: asset ownership, business cycle ownership and therefore income, and achievement (Andriamahery and Qamruzzaman, 2022). Entrepreneurship has become common among women in India (Datta and Gailey, 2012). It has significantly increased in the past two decades and has become a driving force for the economy (Jahanshahi et al., 2011). Local and non-governmental organizations, as well as governmental organizations, have significantly focused on tribal women, providing numerous initiatives and political decisions, and offering many opportunities to work in poultry and livestock farming, crop cultivation, fruit and vegetable growing, and other types of entrepreneurship. Women's participation from ethnic, tribal, or indigenous backgrounds can contribute to increasing human resources in the country (Sarma, 2014). However, tribal women in India spend most of their time performing their school duties and face numerous challenges such as food insecurity, lack of education, domestic violence, and poor healthcare (Maiti et al., 2005). Therefore, entrepreneurship is not an easy option for them, especially in an environment that suffers from underdevelopment and economic weakness. Lack of funding, education, and difficulty in accessing resources make their business activities less profitable and less effective when compared to other communities.

Studies on women's empowerment through income-generating activities are commonly conducted, however, tribal studies in this area are rare and have not addressed the Santhal tribe located in the Mayurbhanj District, where women have been neglected or excluded from research. To date, there have been no studies on tribal women's leadership in the Mayurbhanj District, which is part of the state of Odisha in India, and no previous statistical studies have been conducted on the significance of the statistical relationship between entrepreneurship, women's empowerment, and decision-making. These are the research gaps that this study will address, making it distinct from other studies. The urgent need to understand how tribal women can continue their businesses is a distant vision for both the government and policy makers, and it should motivate researchers to conduct future research.

This study will contribute to addressing several questions, such as: How can tribal women entrepreneurs succeed in empowering themselves in their communities? Can tribal women really make more household decisions with increased empowerment in entrepreneurship? The relationship between tribal women's empowerment and household decision-making will be explored in order to bring about social change. This study has the potential to positively impact future research by understanding the impact of entrepreneurship on women's empowerment.

The growth of business entrepreneurship among tribal women is very limited and slow, and the study was limited to 111 tribal women, it may have been difficult to conduct an investigation about tribal society due to its special nature. The study was limited to empowering women in decision-making within the family, knowing that there are various other factors such as competence and self-determination and satisfaction with life are not taken into account.

In this perspective, in-depth research is needed to find out whether entrepreneurship increased their decision-making power and made them innovative, risk-taker, and pro-active to continue their business activities or not. Besides, scholars will get to undertake future research on that issue.

2. Literature review

Women's empowerment procedures contribute to the improvement of women and are significant change agents (Mehra, 1997). The studies have found that empowerment is an integrated process (Naila, 2005; Akhter and Ward, 2009) that contributes to increasing women's ability to reach great bargaining power when they work outside their homes (Anderson and Eswaran, 2009). Other studies have shown that giving women the opportunity increases their ability to control their income and increases the labor force in general (Field et al., 2021). To restore gender balance, training can create income for women (Creevey and Edgerton, 1997), increase their assets and earnings, and increase the supply of female labor; however, it presents many challenges (Bandiera et al., 2017).

Opportunity is one of the important concepts in entrepreneurship, as researchers consider that entrepreneurs seize opportunities because they have prior knowledge of the labor market, or as a result of developing their social networks and thus knowing the market's need, and because they are distinguished by a set of personal characteristics such as optimism that always drives them as a belief to achieve success in Entrepreneurship (Ardichvili et al., 2003; McMullen et al., 2007). Maslow's theory relies on three dimensions of human needs, including growth, connection, and connection, and that relates to linking the need-satisfaction relationship strongly (Alderfer, 1969).

There are certain tools that aid in promoting the employment of women as Agri-entrepreneurs. These include land ownership, cooperative agriculture, policy implications, and ICT tools, SHG—SME. Regarding the possibilities that can be taken advantage of, Krishi Vigyan Kendras (KVKs), non-governmental organizations, and universities that aim to advance agricultural work are a few examples (Jena et al., 2018). Microcredit is one method of assisting Entrepreneurs in the Odisha regions, and it has a significant positive effect in a number of areas. However, there are some challenges for Entrepreneurs, including the low loan amounts compared to those at the national and regional levels, their reliance on middlemen, and a lack of market access (Rajpal and Tamang, 2021).

Agricultural education in India can help encourage entrepreneurship and follow the best methodologies to succeed in it, as a study by Banerjee et al. (2020) there is a correlation between the desire to work in entrepreneurship, career planning, and agricultural labor capacity. An Indian agricultural university's students were the subjects of this study.

Using the analytical SOWT method, Revelsal and others examined the external and internal factors influencing a small

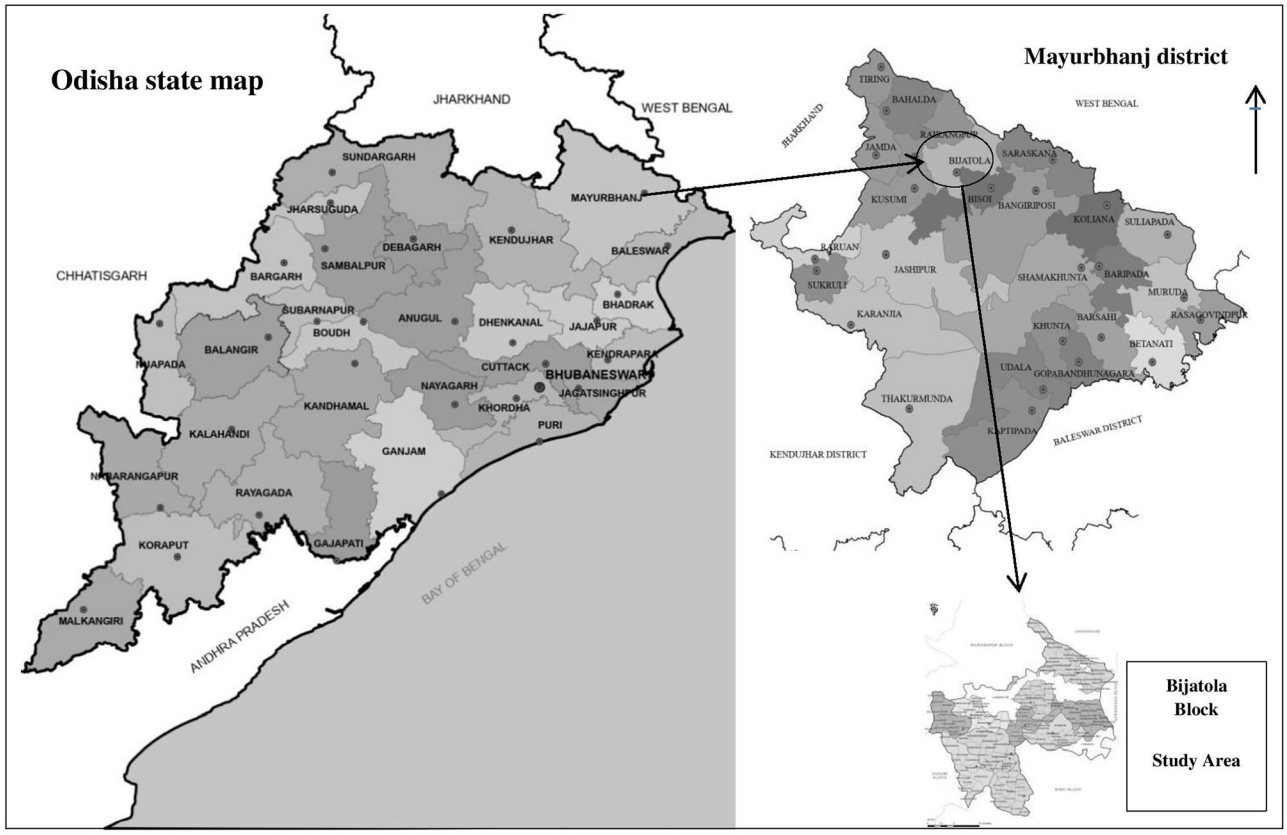

FIGURE 1
Conceptual framework.

farmer support program called youth agripreneurship development (YAD). It was discovered that both independence and knowledge can be internal factors that have an impact on the community under study, as well as external factors like imposition brought about by the program's resources and threats from both innovation and partnerships. To overcome threats, various strategies have emerged, such as increasing knowledge, using independent technology to increase knowledge, and using both of the knowledge networks (Refiswal et al., 2021).

A one-of-a-kind study by Sarangi et al. (2022) of the impact of immigrants and indigenous entrepreneurs on development in the state of Odisha. Indigenous entrepreneurs have demonstrated a positive impact by increasing overall employment opportunities and facilitating access to immediate employment and adequate livelihoods for marginalized low-skilled workers.

With the help of a structured questionnaire, a study on about 40 entrepreneurs by Agarwal et al. (2021) was carried out across various regions of India (Bungalu, Mumbai, Pune, and roughly 11 other cities). Agricultural entrepreneurs faced several problems, including high costs, shortage of skilled labor, and marketing issues. One of the most important proposals of the study was the creation of a database through which income and expenditures could be recorded for all urban entrepreneurial agricultural projects. In order to establish aquaculture production on a large scale, the study also suggests changing some policies to redistribute land uses and demonstrating greater interest in research collaboration between the public and private sectors. Encouraging the development of arable gardens and landscape design will also help to activate the roles of architects and gardeners.

Joseph Schumpeter gave one of definitions of entrepreneurship and said that every person who works to create a new project and realizes the importance of the opportunity to create a business is considered an entrepreneur (Gill and Ganesh, 2007). But this definition has changed over the years. According to Nkechi et al. (2012), the entrepreneur was described as a creative and innovative person who understands problems and finds appropriate solutions to them. He is the person who performs the entrepreneurial function. Women's entrepreneurship appeared in the late nineties and became important to researchers about 30 years ago. Stephens et al. (2021) mentioned that female entrepreneurs serve the community and bear all the risks in order to gain economic freedom and feel empowered. The research developed the hypothesis based on the concepts of empowerment and entrepreneurship.

3. Conceptual framework

This paper used the concepts of women's empowerment and entrepreneurship by following the previous methodologies with the addition of modifications commensurate with the subject of the study and the research area. The term "empowerment"

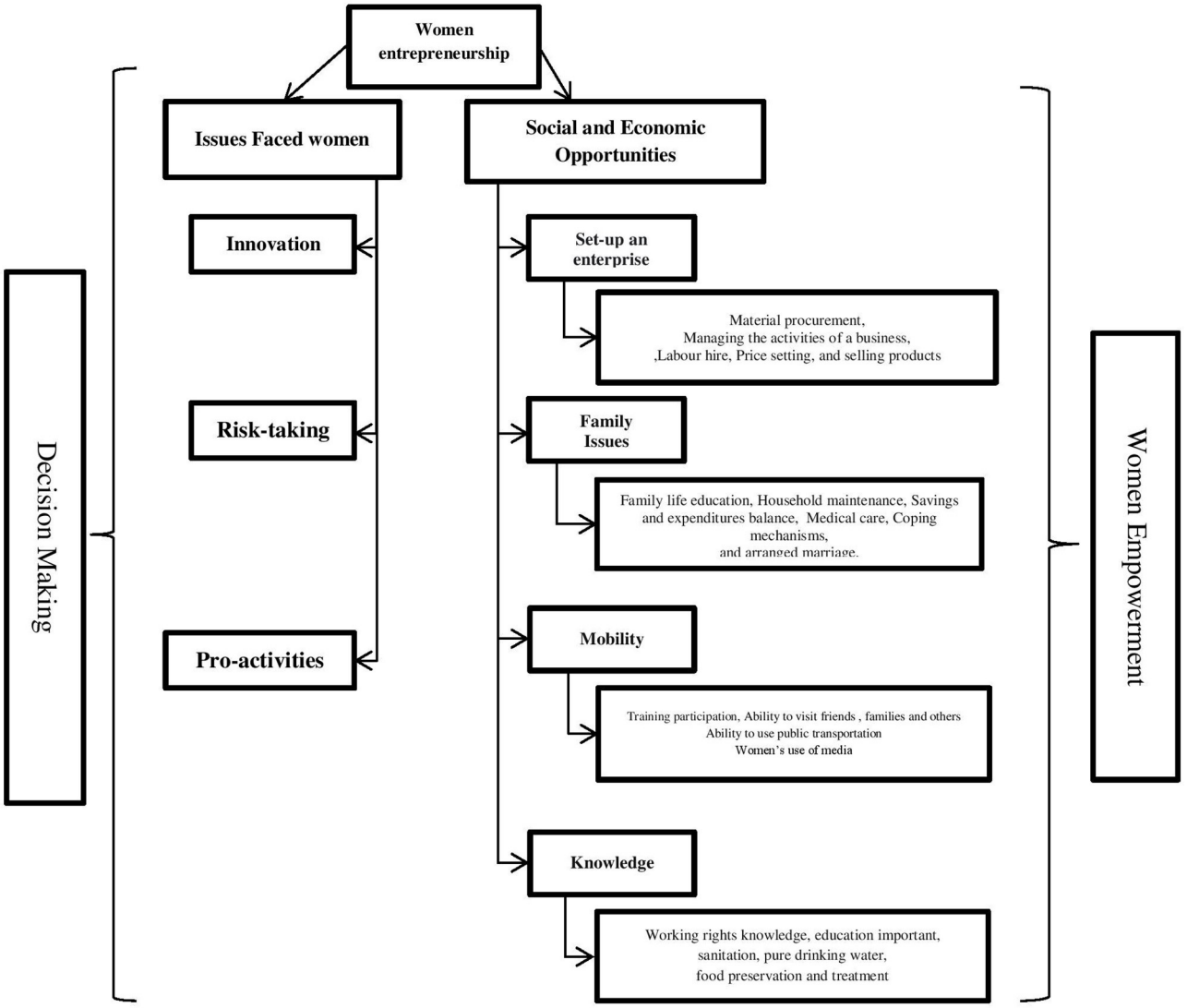

FIGURE 2
Location map of the study areas in India.

was developed so that it takes on many visions, some of whom mentioned that it is a person's ability to live as he wants (Kabeer, 1999), and it was developed to mean the ability to achieve and obtain resources, and the approach of women's empowerment was widely used by academic researchers and policy makers (Lincoln et al., 2002). It measures income, employment, and the ability of decision-makers within the family; all of these are related to the social and economic dimensions, and all studies found that women are able to achieve satisfaction through their work and provide adequate support for the family.

The process of linking entrepreneurship, empowerment, and decision-making is not easy because the concept of entrepreneurship has many dimensions and is difficult to measure. Increasing profits and the concept of empowerment must be linked to the development of entrepreneurship, as more achievements at the level of entrepreneurship will generate more profits and thus be reflected in empowerment and the decision-making process. As the empowerment tool is the main key to the success of setting up any enterprise, it is weighted by material procurement, managing the activities of a business, labor hire, price setting, and selling products. For family issues, family life education, household maintenance, savings and expenditures balance, medical care, coping mechanisms, arranged marriage, etc. are all considered. Training participation, ability to visit friends, families, and others, ability to use public transportation, and women's use of media, etc. are measured for mobility. Knowledge is weighted by working rights knowledge; education is important, as are sanitation, pure drinking water, food preservation, and treatment.

Figure 1 shows the available opportunities for entrepreneurship. In this approach, we find that entrepreneurship makes women active, risk-taking, innovative, and faces many challenges to reach a successful and profitable business, It also makes women confident in making individual decisions and feels empowered.

This research doesn't just add a new definition and meaning for "entrepreneurship" and "women's empowerment," it also provides new tools and indicators that may be used to measure the importance of tribal women in India.

TABLE 1 Characteristics of women entrepreneurs in the sample ($n = 111$).

Social characteristics		Frequencies	%
Age group	Women up to 35 years old	15	13.5
	Women from 35 to 45 years old	75	67.6
	Women above 45 years old	21	18.9
Family size	Small families (1–3 members)	22	19.8
	Medium families (4–6 members)	66	59.5
	Large families (7 and above)	23	20.7
Literacy rate	Women with literacy	16	14.41
Economic characteristics		-	-
Personal business revenue	Below Rs. 10,000	22	19.8
	From Rs. 10,000 to 25,000	70	63.1
	Above Rs. 25,000	19	17.1
Household expenditure based on the important	Children education	20	18
	Food	70	63.11
	Clothes	12	10.8
	Medicine	5	4.5
	Others	4	3.6
Type of the house	*Pucca*	95	85.6
	Katcha	10	9
	Half building	6	5.4

Own research.

The study is an analysis of reality and a translation of what exists for tribal entrepreneurship, and its aims are as follows: (1) Find the factors of entrepreneurship for women in the studied area (empowerment and decision making). (2) To estimate the relationship between empowerment and entrepreneurship. (3) To know the basics of reaching decisions within the family of tribal women.

4. Materials and methods

The study was conducted in Mayurbhanj District, which is located in Odisha state, India. The data were collected from Bijatola block, where Santhal tribes constitute about 77% of its total population (Mohanty, 2017). A multi-stage sampling technique was used to select sample farm households in the study area. The first stage was to select 13 villages in which Santhal tribes are present. In order to identify the women entrepreneurs in these villages, the second stage was to contact key informants in each village; thereafter, simple random sampling was used to select 111 women entrepreneurs. The interview schedule has been designed based on the conceptual framework to conduct face-to-face interviews and focus group discussions (FGDs) with 20 participants in each village to collect some primary data information and reach the research objective (Figure 2).

Linear regression model used to identify the influencing factors, where entrepreneurship was dependent variable (Y), and the independent variables were as follows: age (X1), family size (X2), literacy (X3), membership with NGOs (X4), number of training hours (X5), and personal business revenue (X6). Here is the formula that was used:

$$Y_i = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + B_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + U_i$$

Here, the change in one of the regressions is measured by the marginal effect (ME). Marginal effects assess discrete change as a method of predicting probability changes when independent variables are present. In this aspect, six social and economic variables—including age, education, number of training courses, business revenue, family size, and membership with NGOs—are taken into consideration to assess a reliable estimation of the extent of change in entrepreneurship. When all other variables were held constant at their means, the marginal effects demonstrated how the identified factors changed from 0 to 1.

Women Empowerment Index (WEI) used considering before and after the entrepreneurship situation. After the entrepreneurship situation. Non-entrepreneurial situations of the selected tribal women was the best for baseline data. This is based on choosing a base or end line for entrepreneurship, which ranges from 5 to 7 years of experience. Experts, relevant individuals, and researchers discussed the choice of 20 indicators for women's empowerment, which are: five for setting up an enterprise, six for family issues, four for mobility, and five for knowledge, which were used in the study, so that the highest value is 2 (women are leaders in decision-making) and is in a state of empowerment, and the lowest value is 0, which indicates men's control over decision-making is in a state of disempowerment.

Women Empowerment Index (WEI) was given in equations (Bose et al., 2009) as the following:

$$\mathbf{WEI_i} = \frac{\sum_{i=1}^{n} \mathbf{xi}}{\mathbf{n}}$$

Where women are not empowered when the WEI is ≤ 1, and they are empowered when the WEI is more than 1, and n is based on the number of dimensions under each indicator, such as family issues, n is equal to 6.

Women's entrepreneurship was evaluated on the basis of three components, including innovation, risk-taking, and pro-activities, which were further evaluated by nine items, three of each. While the four components of the decision-making process were used to understand the level of empowerment among tribal women entrepreneurs, Confirmatory Factor Analysis (CFA) was used to validate the latent construct's fitness, reliability, and validity.

TABLE 2 Maximum Likelihood Estimation (MLE) results.

Explanatory variables	Coefficient	Standard error	*Z*-statistic	Probability
Age (X1)	0.061	0.312	0.71	−0.0412
Family size (X2)	−0.045	0.111	−0.39	−0.221
Literacy (X3)	1.062**	0.323	4.50	0.614
Membership with NGOs (X4)	2.160**	0.361	8.14	1.735
Number of training (X5)	2.537**	0.482	5.91	1.435
Personal business revenue (X6)	0.00041*	0.00026	2.11	0.001
Constant	−7.553	1.257	−2.34	−12.131
Pseudo R^2	0.7518			
LR Chi square	512.22			
Log likelihood	−37.321176			

*Significant at 5% level.
**Significant at 1% level.

TABLE 3 Marginal probability results.

Explanatory variables	Standard error	*Z*-statistic	Probability	Marginal effect
Age (X1)	0.022	0.71	0.421	0.0031
Family size (X2)	0.0412	−0.39	0.564	−0.013
Literacy (X3)	0.071	4.50	0.000	0.514**
Membership with NGOs (X4)	0.05103	8.14	0.000	0.711**
Number of training (X5)	0.0776	5.91	0.000	0.513**
Personal business revenue (X6)	0.00014	2.11	0.017	0.00041*

*Significant at 5% level.
**Significant at 1% level.

Composite reliability testing was also done to guarantee the data's internal consistency.

5. Results and discussion

Entrepreneurs were divided according to age into several groups, and the highest percentage was (67.6) between 35 and 45 years old, and the percentage of women who could write and read was about 14.41%. This low percentage may be due to the difficulty of reaching tribal women, or it may be the result of the educational curricula (Mohanty, 2017), or caused by the poor financial situation of the family and their inability to go to school, because they work in collecting forest products for their livelihood (Tudu and Das, 2022). A study by Haddad et al. (2016) indicates that education is factor that can influence choice behavior and profoundly affect personal development. About 59.5% of the households in the research sample were found to have households with an average number of 4–6 members, which is higher than the national average household size based on Global Data 2021. It was also noted from Table 1 that a number of women in the sample have personal business revenue that exceeds 10,000 rupees, which is about 80.2% of the total. Women indicated that there is a priority in spending, and the importance is different, as spending on food is followed by spending on education for children, and then clothes. Table 1 shows that families live in *Pucca* houses with mud walls and tin roofs (85.6%), and some women live in houses with bamboo roofs. The sanitary system is not good, and 9% of the women houses (with half of the building) is not used. Socioeconomic status of tribal women has studied by a few researches (Subramanian et al., 2006; Mungreiphy and Kapoor, 2010); to find out their sustainable livelihood status, Kaushal and Kala (2004) conducted a study and measured their livelihood disparities.

Four of the explanatory variables that contributed to taking up entrepreneurship, success, increase income (literacy, membership with NGOs, number of trainings, and personal business revenue). Literacy and the number of training sessions helped them make more informed decisions in their enterprise by directly updating their knowledge and increasing their capacity for understanding. They were able to increase their confidence and lessen their economic vulnerability due to higher personal business revenue and membership with NGOs.

Age is one of the variables positively affecting entrepreneurship, but in the studied case, age was not significantly associated with entrepreneurship, and this may be because the majority of the research sample were middle-aged women (from 35 to 45 years old) and they were not very interested in new projects but rather in developing their traditional projects. Table 2 shows that the size of the family contributed negatively to entrepreneurship, which may be a result of the increased work that women do at home and

TABLE 4 Results of Women Empowerment Index.

Indicators	WEI before entrepreneurship	WEI after entrepreneurship
Set-up an enterprise	0.55	1.30
Material procurement	0.28	1.15
Managing the activities of a business	0.67	1.27
Labor hire	0.25	1.17
Price setting	0.71	1.49
Selling products	0.82	1.44
Family issues	0.67	1.28
Family life education	0.73	1.13
Household maintenance	0.77	1.33
Savings and expenditures balance	1.04	1.55
Medical care	0.41	1.29
Coping mechanisms	0.30	1.16
Arranged marriage	0.76	1.25
Mobility	0.61	1.32
Training participation	0.67	1.44
Ability to visit friends, families, and others	0.51	1.06
Ability to use public transportation	0.66	1.35
Women's social festival attending	0.95	1.43
Knowledge	0.62	1.14
Working rights knowledge	0.51	1.06
Education important	0.41	1.05
Sanitation	0.56	1.08
Pure drinking water	0.66	1.34
Food preservation and treatment	0.96	1.15
Overall WEI	0.61	1.26

Own research.

TABLE 5 Reliability and validity tests results.

Construct	Concept	Cronbach's alpha	Reliability test result
Entrepreneurship	Empowerment	0.501	0.146
	Decision making	0.289	0.079

Own research.

the lack of time during which they can control the project. It may also be due to a lack of money after securing the various needs of the family.

According to Table 3, the chance of starting a project increases by 0.3% as age increases 1 year. Other variables also had the same positive effect, such as changes in education, the number of trainings, and personal income, which increased by 51, 7, and 0.04%, respectively. As for the membership with organizations, it was the only one with a positive and significant effect, at 71%. Several studies have been conducted on tribals in Mayurbhanj District, Odisha, on their traditional knowledge (Panda et al., 2011), their education statue (Behera, 2015), the impact of women participants in Self-Help Groups (SHGs) microfinance programs (Rajpal and Tamang, 2014; Rajpal, 2016), and the constraints faced by them to become entrepreneurs (Mohapatra et al., 2012).

The women's empowerment index often shows the extent to which women are able to take a set of actions and decisions as a result of entrepreneurship, as they can achieve financial independence and become more powerful than before in many ways, such as making the decision to marry and children, control living expenses, and attend social festivals. With some exceptions for men, which give men the ability to make decisions, such as recruitment processes for labor to assist in entrepreneurial activities. We note from Table 4 that women entrepreneurs have been empowered to a greater extent compared to before entrepreneurship, and the women's empowerment index reached 1.26. It is noted from the table that among tribal women, women have been empowered in terms of mobility (1.32), followed by decisions related to the setup of an enterprise (1.30), then decisions related to family issues (1.28), and finally knowledge (1.14).

TABLE 6 Descriptive statistics of women's decision making.

Concept	Indicators	β	Mean	Standard deviation	*t*-value	*P*-value
Decision making	Innovation: Launch new product	0.311	1.23	0.014	21.05	0.000
	Risk-taking: Goal oriented	0.308	1.16	0.015	20.86	0.000
	Pro-activities: Initiative oriented	0.281	1.2	0.018	22.67	0.000

Own research.

To verify the reliability of the data, a set of tests, including Cronbach's alpha, which gave a low value, was run on the questionnaire and groups of questions (Table 5).

It turned out that the questions were not sufficient to know the extent of empowerment of tribal women and needed more focus, while the degree of reliability was acceptable to some extent in the study area.

The rate of women's empowerment was not as high as expected, as the results showed that it was at a low level. The results from Table 6 show that entrepreneurship increased women's ability to make decisions related to innovation, risk, and pro-activities, but despite all that, it demanded more attention from them. The implication was that tribal women gained empowerment and an enhanced intra-household decision-making process as a result of entrepreneurship.

The results show that tribal women entrepreneurs have contributed to setting up their businesses by more than 50%, followed by decisions related to transportation by 33%, while decisions related to the family are low. Therefore, the results in general are that entrepreneurship has helped empower women, which has led to a sense of creativity and increased decision-making.

6. Conclusion

One of the main objectives of this paper was to determine whether or not entrepreneurship inspired women's empowerment in tribal society, taking into account the relationship between entrepreneurship, women's empowerment, and decision-making. The study adds to the existing body of knowledge on how entrepreneurship promotes tribal women's identity and recognition in their communities. The findings show that four of the explanatory variables that contributed to making women entrepreneurs in the tribal community (literacy, membership with NGOs, training, and personal business revenue) helped increase the empowerment of women within their families and society, despite many social and cultural challenges and the difficulty of accessing resources as a result of preserving their mother tongue and being introverted. There are a set of limitations to the study, including the inability to cover more than 111 tribal women as a result of the difficulty of conducting investigations in the tribal community. There were no other dimensions, such as life satisfaction and self-determination for women entrepreneurs, that were not taken into consideration. The results of this study should be used by the government and relevant agencies to formulate special policies aimed at encouraging tribal women entrepreneurs in India by increasing the number of training and education opportunities commensurate with the privacy of these communities. The study suggests more loans and an increase in awareness of the importance of business and its potential, as well as the need for future research that includes other factors to find out how to empower women through entrepreneurship more, which leads to increased economic opportunities, participation, and educational attainment.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Exploring the concepts of decent work through the lens of SDG 8: addressing challenges and inadequacies

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Promoting decent work and sustainable economic growth within the framework of Sustainable Development Goal 8 (SDG 8) entails addressing gender inequality, the consequences of market economies, and the role of the informal sector while also considering environmental sustainability. Research on SDG 8 remains limited, often adopting an appraisal perspective, and the concept of decent work within this goal remains relatively unexplored. Additionally, the focus on the challenges and inadequacies of achieving sustainable economic growth through decent work in the context of SDG 8 is insufficient, resulting in significant knowledge gaps. To contribute to filling these gaps, this paper adopts a descriptive and critical review perspective, systematically analyzing 108 journal papers and reports to investigate the concept of decent work within SDG 8. The research addresses the challenges and inadequacies related to decent work embedded in SDG 8. The review reveals that while progress has been made in tackling gender inequality in the labor market, gender bias, income discrepancies, and underrepresentation of women in senior positions persist, hindering inclusive and sustainable economic growth, full and productive employment, and decent work for all – SDG 8. Moreover, SDG 8's focus on inclusive and sustainable development falls short of effectively addressing market economies' structural disparities, insecure working conditions, and exploitative labor practices. Additionally, support for informal sector workers, who lack essential rights such as legal protection and social security, remains insufficient. Ecological destruction is sometimes an unintended consequence of purely market-based labor markets with an emphasis on economic growth, with SDG 8 lacking sufficient integration of environmental sustainability in its framework. The novelty of this study comes from its in-depth, critical, and policy-focused analysis of the ideas around decent employment in the context of SDG 8. The findings underscore the importance of providing fair, safe, and secure employment opportunities to support economic growth and development while upholding workers' rights. In conclusion, we emphasize the crucial role of promoting decent work and sustainable growth in achieving SDG 8's overall objectives, as it directly impacts other SDGs.

KEYWORDS

decent work, sustainable economic growth, SDG 8, gender inequality, market economies, informal sector, environmental sustainability

1 Introduction

The United Nations (UN) has adopted the Sustainable Development Goals (SDGs) to guide efforts toward achieving development that is sustainable by 2030. These goals, known as "transforming our world," outline an ambitious agenda (Rai et al., 2019). Among these goals, SDG 8 promotes sustainable growth, employment, and decent work for all individuals (Küfeoğlu, 2022). One of the targets of SDG 8 is to achieve "economic growth" through the concept of "Decent Work" across all member nations of the UN (Küfeoğlu, 2022). The notion of work emerged alongside discussions on sustainability in the 1990s and its relationship with economic growth (Frey, 2017). Scholars argue that SDG 8 encompasses workforce diversity opportunities for all individuals, including people with disabilities, gender equality, and fair wages for everyone involved (Khalique et al., 2021). It emphasizes creating a safe working environment that's equally accessible to both men and women in terms of employment opportunities (United Nations, 2015). The target for ensuring work for all entails providing opportunities and fair compensation that contribute to overall economic development (Khalique et al., 2021).

Research on SDG 8 remains scarce, and the existing papers tend to take an appraisal perspective, while the concept of decent work within SDG 8 remains relatively unexplored. Further, the focus on the challenges and inadequacies of sustainable economic growth through "Decent Work" in the context of SGD 8 seems scanty, leaving significant knowledge gaps. To contribute to filling these knowledge gaps, this paper adopts a descriptive and critical review perspective. We delved into the concept of decent work and examined the challenges and inadequacies in its pursuit within the framework of SDG 8. By analyzing various perspectives and dimensions, this research aims to shed light on the complexities surrounding decent work and contribute to the ongoing discourse on sustainable development. Our analysis shows that despite the international commitment to promoting decent work and economic growth, significant challenges persist in achieving these objectives. Based on our findings, gender inequality continues to pose a considerable barrier to realizing decent work opportunities for all. The results of this review show that the injustices inherent in purely market-based labor markets also raise questions about the compatibility of economic growth with social and environmental sustainability. Additionally, neglected realities surrounding informal work and the need to integrate ecological sustainability further complicate the pursuit of decent work within the framework of SDG 8. These issues highlight the urgent need for a comprehensive understanding of the challenges and inadequacies in pursuing decent work and economic growth.

This study is significant since Pereira et al. (2019) noted that empirical research on decent work is still in its infancy and that most studies find a deficiency in decent work and do not cover the entire idea of decent labor. According to Fontana and Oldekop (2020), this is a necessary time to reflect on the SDGs. Efforts to implement initiatives connected to the SDGs have increased, but we are still in an early stage when adjustments and reorientations are feasible. Thus, now is the perfect opportunity to present ideas and facts that could inform ongoing discussions on the SDGs and their implementation (Fontana and Oldekop, 2020). Our research is a guiding light in the academic community, revealing critical aspects of decent employment under SDG 8 and, by extension, sustainable economic growth. In the continued search for a more egalitarian, inclusive, and sustainable global economic environment, its extensive analysis, critical insights, and policy relevance made it not just significant but essential. Furthermore, as global efforts to implement initiatives connected to the SDGs continue, this research offers timely and relevant information to inform ongoing discussions and adjustments.

Through this study, we contribute to the existing body of knowledge in several ways. Firstly, we critically examine the relationship between gender inequality and decent work within the context of SDG 8. By highlighting the impact of gender disparities on employment opportunities and the overall well-being of individuals and societies, this research aims to inform policy and practice for creating more equitable work environments. Secondly, this study delves into the injustices of market economies and explores their contribution to decent work. By questioning the prevailing economic system and its impact on social and environmental dimensions, this research offers insights into potential strategies for rethinking the pursuit of economic growth and decent work. Thirdly, the study addresses the challenges and neglected realities of informal employment and the economy within SDG 8. By examining the vulnerabilities and opportunities associated with informal work, we aim to inform policies that protect and empower informal workers, fostering inclusive and sustainable economic growth. Lastly, this research underscores the need to strengthen the integration of environmental sustainability within the framework of SDG 8. By analyzing the ecological dimensions of decent work, it advocates for a holistic approach that considers the long-term environmental impacts of economic activities. Our research objectives are as follows:

- To examine gender income disparity and the achievement of decent work within the context of SDG 8.
- To explore the injustices inherent in market economic systems, examining their numerous contributions to the terrain of decent labor.
- To shed attention on the complicated difficulties contained within informal employment and the larger economy, which are sometimes disregarded within the scope of SDG 8.
- To emphasize the critical need to strengthen the integration of environmental sustainability into the fundamental fabric of SDG 8.

The study starts by elucidating the data type and collecting methods used to fulfill the purpose of the investigation. The second part examines the study results and organizes them into pertinent topics relating to obstacles and shortcomings in the pursuit of decent employment and economic development in accordance with SDG 8. The discussion and conclusion thoroughly explain the intricacies of decent work and its role in attaining sustainable economic growth via a conclusion of the key results and a discussion of the study's consequences.

2 Conceptual framework: decent work within the framework of SDG 8

In 2019, the ILO outlined the concept of decent work, which spans a complex spectrum defined by equal wages, employment security, safe working conditions, and the protection of social welfare measures.

At the core of our conceptual framework is the complex intersection between gender inequality and the need for decent employment. Persistent gender prejudices, financial disparities, and the underrepresentation of women in top management positions (Khairy and Ghoneim, 2023) obstruct the achievement of SDG 8 in a glaring manner SDG 8. Complementing this component, we delve into the myriad complexity inherent to market economic systems (Xu and Chakraborty, 2021), which repeatedly generate structural disparities, insecure work circumstances, and the propagation of exploitative employment practices (Chowdhury and Żuk, 2018; Menéndez-Espina et al., 2020; Ranaldi and Milanović, 2022). Our scientific quest delves deeply into the complicated mechanisms that characterize market-driven economies, providing insight into their influence on employment quality, labor rights protection, and the long-term viability of economic ventures. In addition to our research, we examine the complex terrain of the informal sector, a domain characterized by a conspicuous lack of legal protections and social security guarantees, a solid barrier to the acquisition of decent work (Dewick et al., 2022; Padmavathi and Aruna, 2022; Singh et al., 2023). Within this dimension, we examine a repertory of policies and strategic interventions designed to empower the informal labor force and provide them with the resources to improve their economic well-being. We go beyond standard economic paradigms to consider the ecological repercussions of the unrelenting quest for economic development under purely market-based labor market frameworks (Sun et al., 2016; Adebayo et al., 2021).

The unified themes of gender inequality, the necessities of the market economy, the crucial role of the informal sector, and the inescapable requirement of environmental sustainability are unified within our complete framework. The dynamics of this framework are intrinsically interdependent, with one aspect resonating with and enhancing the others. It is observed that gender inequities penetrate economic institutions, impacting both the official and informal labor sectors. Similarly, the market economy's imprint reverberates throughout the work spectrum, influencing the quality of labor in both formal and informal circumstances. Environmental sustainability is concurrently linked with popular economic models, potentially impacting policy paradigms across industries. This detailed exegesis aims to explain the many complexities underlying decent employment within the scope of SDG 8. The meticulously crafted conceptual framework serves as the compass for our academic investigation, imparting a methodological rigor that enables us to dissect with precision the multifaceted challenges and inherent deficiencies inherent to the aspiration for decent work within the larger context of sustainable development.

3 Materials and methods

We conducted a systematic literature review (SLR) to explore the concepts of decent work through the lens of SDG 8 and to address the challenges and inadequacies of decent work embedded in SDG 8. As García-Peñalvo (2022) highlighted, SLR is a way to sift through the vast amount of available digital scientific output to find, evaluate, and make sense of the work of researchers and practitioners on a specific topic. Our foci are grounded in a methodology that provides a defined set of methods and synthesis components drawn from shared databases of high-quality, previously conducted research, arguments, and analyses (Chigbu et al., 2023). Utilizing the SLR technique allowed for a comprehensive, organized, and objective investigation of the current literature on decent employment within SDG 8. It enabled us to identify the sector's obstacles, voids, and possibilities, providing valuable insights for academics and policymakers. Our SLR process comprised four key stages: preparing research questions, literature search, critical evaluation, developing a logical structure, and data analysis for analysis.

3.1 Preparing research questions

We initiated the SLR by creating precise research questions to delve thoroughly into decent work's complexities in SDG 8. These questions were carefully prepared to drive our search and research, assuring a concentrated examination of gender inequality, the market economy's implications, the informal sector's role, and the environmental sustainability of SDG 8's goal of decent employment.

3.2 Literature search

We searched the Scopus database, grey publications from Google Scholar, and simple Google. In addition, we examined UN website publications to improve our dataset. To further our analyses and arguments, the search utilized particular terms and phrases such as "SDG 8 and decent work," "SDG 8 and limitations," and "economic growth and decent job." The search was not restricted by publication date, enabling a full coverage of the field's current literature.

3.3 Conducting critical evaluation

After considering the publication titles, the keywords and abstracts of the suggested publications were examined. Several papers' introductions and scope were assessed to determine their relevance. Then, each publication was assessed to determine its relevance to the study. Several works connected to references beyond the scope of the first search were subsequently evaluated utilizing an internet search. Figure 1 illustrates the publication selection process. We thoroughly examined and analyzed each publication's title, abstract, and keywords in relation to SDG 8 and decent work after obtaining 329 pieces. A first screening decreased the number of publications to 220. Subsequently, a thorough evaluation was conducted, eliminating 90 irrelevant papers and 22 studies lacking sufficient rigor. This investigation led to the final selection of 108 publications that served as the foundation for our research.

3.4 Developing a logical structure

In the context of decent employment, we conducted an in-depth study of the selected publications. We discovered recurring themes and patterns concerning gender inequality, purely market-based labor markets, the informal sector, and environmental sustainability. Through thorough classification, these topics were integrated into a logical structure that fully understood the obstacles and deficiencies of attaining decent work and sustainable economic growth under SDG 8.

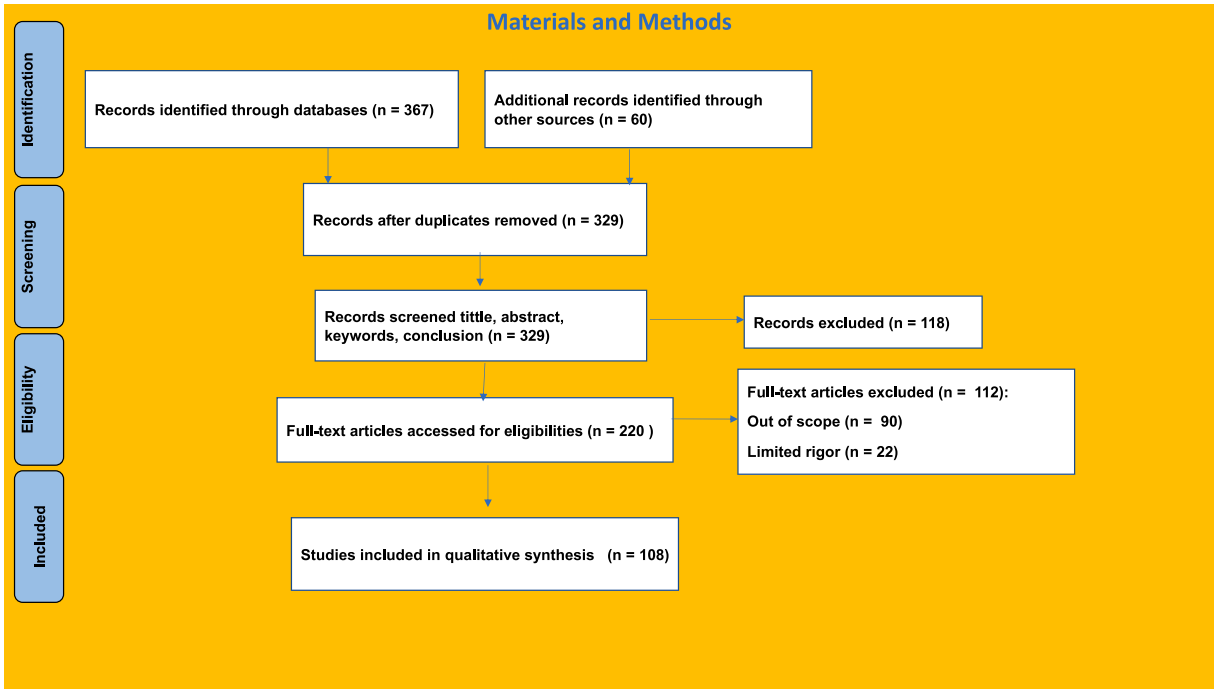

FIGURE 1
Flowchart illustrating the selection procedure of the systematic literature review.

3.5 Data analysis

Using thematic and content analysis, this study investigated the complexity of decent work within the context of SDG 8. Thematic analysis was used to find reoccurring themes and patterns in the literature. Publications were analyzed to extract underlying themes about gender inequality, the market economy's ramifications, the role of the informal sector, and environmental sustainability in the context of decent work. Content analysis was used to explore the selected publications' textual content more deeply. We used this strategy to assess textual material to extract helpful information systematically. Thematic and content analysis conclusions were based on a process that included a rigorous investigation of credible existing research, logical reasoning, and appraisals of distinct opinions from the literature reviewed for this study. By integrating content and thematic analysis, we provide a comprehensive and nuanced understanding of the literature in this SLR study.

3.6 Limitations of the study

We must recognize the limits of our study. The research relied mainly on available literature, which may contain inherent biases or coverage limitations. In addition, despite our efforts to guarantee a thorough selection procedure, the ever-changing nature of study topics and terminology may have led to an overlook in our search method. Despite these limits, the study gives valuable insights into the difficulties and shortcomings of combining decent employment and economic growth, providing a solid platform for future research and policy development in this crucial field.

4 Findings: challenges and inadequacies in pursuing decent work and economic growth

SDG8's emphasis on decent work and economic development is insufficient; productive employment and decent work for all men and women by 2030 must account for the value and costs of social reproduction since there is no following change in the gender composition of social reproductive activity (Rai et al., 2019). Tensions between productivity-enhancing and decent labor logic hinder the creation of treatments with persistent performance benefits (Hasle and Vang, 2021). The indication is that the focus of SDG 8 remains on GDP and *per capita* growth (Rai et al., 2019), which is problematic (Meurs et al., 2019; Rai et al., 2019; Eberth et al., 2023). For instance, the GDP productive boundary excludes much social reproductive work (Rai et al., 2019). Reproductive activities were not accounted for in the writings of Karl Marx; capitalists exploit workers because they must work more than is required for their reproduction; the excess effort is known as creating surplus value (See: Marx, 1972, 1981). As Frey (2017) puts it, despite the prominence of full employment and decent work in SDG 8, the 2030 Agenda supports market-centered institutional frameworks that may provide difficulties in fulfilling the target. Specifically, the grafting of human rights to full employment and decent work onto a business-oriented economic growth agenda in SDG 8 raises questions about whether the 2030 Agenda recognizes full employment and decent work as state human rights obligations or economic growth benefits (Frey, 2017).

Evidence suggests that the achievement of the rights to full employment and decent labor does not always follow economic development; in fact, studies indicate that, at least in certain

circumstances, it is more likely that the reverse causal link prevails (Frey and MacNaughton, 2016). For instance, sociologists like Hammer et al. (2022) emphasize that significant formal job increases have not been made despite industrial progress. In reality, the informal sector predominates and is characterized almost universally by subsistence pay, employment, and social instability, all of which fall under immoral work (Hammer et al., 2022). The problem is that the working conditions of those employed in the unorganized sector are risky, lack social protection, and are polluting, which increases the likelihood that employees will get sick or injured and jeopardize their health and well-being (Adei et al., 2021).

According to an ILO assessment from 2019, most countries still have a long way to go before attaining inclusive and decent employment for all, and development on SDG 8 was slowing down. According to Hammer and Ness (2021), from a socio-political perspective, the agenda of SDG 8 and similar interventions fail because not enough attention is given to the heterogeneity and complexity of intersecting social and material relations that support informal and precarious work and its role in capital accumulation. For instance, businesses intentionally alter the makeup of their workforce to limit labor's ability to negotiate and lower the value of labor power (Chigbu and Nekhwevha, 2022c). The issue is that unionized workers are more likely than their non-union colleagues to speak up against indecent workplaces, which includes an increasing preference for non-unionized female workers and rural and semi-rural workers (Hammer and Ness, 2021; Sojourner and Yang, 2022). Critical factors influencing capital accumulation with consequences for the structure and differentiation of the workforce include the asymmetrical power relations between capital and labor and the state's involvement in institutionalizing a flexible labor regime (Hammer and Ness, 2021).

Having given the introduction to this section, our research objectives are methodically constructed and accomplished to grapple with the complexity of creating decent employment within the auspices of SDG 8. First, we thoroughly examine the delicate link between gender income disparity and the achievement of decent work within the context of SDG 8. Second, our scientific investigation extensively explores the injustices inherent in purely market-based labor markets, examining their numerous contributions to the terrain of decent labor. The third goal of the study is to shed attention on the complicated difficulties contained within informal employment and the larger economy, which are sometimes disregarded within the scope of SDG 8. Finally, our research emphasizes the critical need to strengthen the integration of environmental sustainability into the fundamental fabric of SDG 8. These problems illustrate the vital need for an in-depth analysis of the challenges and shortcomings of pursuing decent employment and economic expansion.

4.1 Gender and income inequality: decent work

Gender disparities in the labor market remain a persistent challenge and should be at the heart of decent work discourse because women often face barriers to accessing decent work, including gender-based discrimination, wage gaps, and limited representation in decision-making positions. Achieving gender equality in the workplace requires addressing these challenges and promoting policies that ensure equal opportunities, fair pay, and work-life balance for all genders. Gender equality is essential for both sustainable development and economic prosperity. Keeping in mind the SDG 8 goals, the objective is to achieve full and productive employment and decent work for all women and men by 2030. The problem is that when women enter the workforce, they are less likely than males to find employment (ILO, 2017). For instance, Statistics South Africa (2021) shows that the unemployment rate for women in South Africa is 8.1% points greater than that of males. Men are more likely than women to have paid employment regardless of race. Still, women are more likely than males to be engaged in unpaid work, even in Asia and Germany, indicating that the labor market is more favorable to men than women (ILO, 2020; Toczek et al., 2021).

Many variables, such as long-standing institutional impediments, socioeconomic and technical development, and economic drive and shocks, persistently drive gender inequalities in the workforce (WEF, 2022). Because of the pervasive gender disparity in the labor market (Khairy and Ghoneim, 2023), women have fewer opportunities to advance professionally and raise their salaries than men (Khairy and Ghoneim, 2023). This is especially true in male-dominated fields such as engineering, construction, and information technology (Khairy and Ghoneim, 2023). Among the factors that make it difficult for women to get acceptable employment are the "glass ceiling" and other forms of workplace discrimination against female employees, working conditions, and occupational segregation, all of which are significant challenges to overcome (de Pryck and Termine, 2014; Khairy and Ghoneim, 2023). According to the International Labor Organization's 2017 World Employment and Societal Outlook – Trends for Women, social norms and a variety of socioeconomic obstacles, including work-life balance, marital status, and lack of transportation, are preventing women from advancing in the workforce (de Pryck and Termine, 2014). Also, economic hardships, sexism, and racism experiences have historically prevented women from accessing decent employment (Autin et al., 2022) and have been significant across industries (Fabry et al., 2022).

According to Ferrant et al. (2014), women spend 2–10 times as much time as males on unpaid care labor. The uneven allocation of caring obligations is connected to discriminatory social structures and stereotypical views on the appropriate roles for men and women. The examination of gender disparities in labor outcomes, such as labor force participation, salaries, and job quality, fails to take into account gender disparity in unpaid care work (Ferrant et al., 2014), and this is one of the missing links. As Vyas (2021) put forward, it is no longer acceptable to attribute women's stagnation in the labor market to a lack of education or concerns about their suitability for a particular position. Despite their credentials, women all over the globe are taking on the dual duty of caring for others and working, and as a result, they often have to accept insecure jobs. This is because women must perform unpaid care labor due to family commitments (Vyas, 2021). The position of women in the labor market and their status and authority inside the family are all impacted by the male–female wage gap (Witkowska, 2013; Toczek et al., 2021).

In conclusion, according to the literature, objective 8.5, which calls for full and productive employment, decent work for people of both genders and equal remuneration for labor of equal worth, has not yet been averagely attained. Objective 8.8 goal of promoting safe and secure working conditions for all employees, particularly those in

precarious employment (women), is currently difficult to achieve. SDG 8 seeks to promote decent jobs and economic prosperity for all persons, but continuing gender inequities in the labor market pose substantial hurdles to attaining these goals. Gender discrimination, income inequalities, and a lack of representation in leadership roles are just a few of how women's careers are held back (Menéndez-Espina et al., 2020; Smith et al., 2021). To promote gender equality in the workplace, sustainable development, and economic success, these obstacles must be overcome. Women already experience discrimination in the workplace because of their gender, and the salary difference, poor working conditions, and occupational segregation only worsen things. Again, women's access to safe, respectable jobs is hampered by the time and energy required for unpaid care duties.

Policymakers and stakeholders must apply various strategies to overcome these problems and realize SDG 8's goals and targets 8.5 and 8.8:

- Promoting Equal Opportunities: Enacting rules that eliminate discriminatory practices and obstacles to access in the workplace for both men and women.
- Supporting Work-Life Balance: Policies promoting work-life balance should be enacted to aid working mothers in juggling their professional and personal lives.
- Closing the Wage Gap: Equal pay for equal effort, as well as addressing the gender wage gap via equitable compensation methods, is essential to closing the wage gap.
- Reversing Gender Roles in the Workplace: Promoting female engagement in historically male-dominated fields via strategic programs and initiatives.
- Creating Safe and Secure Work Environments: Prioritizing the promotion of safe and secure working conditions, especially for women in precarious employment, is crucial to creating safe and secure work environments.
- Addressing Unpaid Care Work: Taking up the issue of uncompensated care work means advocating for an equal allocation of caregiving obligations and recognizing and respecting uncompensated care labor.
- Challenging Gender Norms: Promoting gender equality through combating the assumptions and discriminatory practices that keep women at a disadvantage in the workplace is a vital part of the movement to challenge gender norms.
- Investing in Education and Skills Development: Investing in education and training helps women acquire the knowledge and abilities they need to secure stable employment.
- Advocating for Women's Empowerment: Pushing for more opportunities for women to take on positions of influence in organizations and society.
- Data Collection and Monitoring: Strengthening data collecting and monitoring mechanisms to measure progress toward SDG 8 and eliminating gender inequalities in the workplace.

Prioritizing and executing these policy measures may help nations make substantial progress toward achieving SDG 8 and other associated SDGs by reducing the gender gap in the labor market and fostering decent employment for everyone. The labor market and inclusive and sustainable economic development are bolstered when barriers to gender equality and suitable employment are removed.

4.2 The injustices of market economy: rethinking sustainable development goal 8

The struggles for decent work and economic growth within the purely market-based labor markets have been multifaceted and debated for many years. While market economies have promoted innovation, efficiency, and overall economic growth, they also face challenges that can hinder decent work opportunities, equitable economic progress, and SDG 8. The rise of capitalism was the catalyst for both current economic expansion and the fight for decent employment. The quest for purely market-based labor markets to compete globally has led to economic concentration (Sell, 2020). Given that capitalism is inherently growth-oriented and is based on the logic of competition and accumulation (Hall and Davis, 2021), it produces the modern problems of unemployment and labor-capital conflicts (Xu and Chakraborty, 2021), as well as income inequality (Chowdhury and Żuk, 2018; Ranaldi and Milanović, 2022).

The emergence of purely market-based labor markets resulted in a significant reduction in human well-being across all areas, with salaries falling below the minimum necessary for sustenance and a decline in human size (Sullivan and Hickel, 2023). Like never before in the history of capitalism, the global economic geography has undergone a significant transformation in terms of the magnitude and content of international flows of commodities, services, and financial assets, as well as the localization of industrial activity, mainly manufacturing (Ricci, 2021). The liberalization of local and international markets for commodities, capital, and labor, pushed via a wide range of neoliberal economic policies by almost all governments worldwide, has been the defining feature of this period (Ricci, 2021). Global value chains have been claimed to lead to new types of worker poverty, and many sectors' mostly female workforces are hyper-exploited (given salaries below the level necessary for subsistence) (Selwyn, 2019). Workers in a market economy are under tremendous pressure to meet very high and rising productivity goals, receive base pay that is insufficient to cover their needs for individual and social reproduction, put in a lot of overtime, and as a result of these combined pressures, suffer physical and emotional degradation (Selwyn, 2019).

Yang et al. (2021) emphasized that capitalists are engaged in "wage theft," which is the illegal underpayment or non-payment of employees' wages and that even workers' minimal legal rights are not enforced (Cole et al., 2022). This also includes paying less than the minimum wage, refusing to pay for labor during regular business hours or authorized overtime, denying breaks, and making employees pay for supplies or damage (Bernhardt et al., 2009). As work has become more precarious, marked by uncertainty, low income, and limited social benefits and entitlements (Menéndez-Espina et al., 2020), it is regrettable that even the advanced economy with a well-established legal and institutional framework has failed to enforce even basic legal standards (Sell, 2020; Yang et al., 2021). The necessity for capital to extract surplus value from labor leads to wage theft, and most obviously, unlawful underpayment allows management to enhance actual surplus value by documenting legal salaries while reducing cash payments (Yang et al., 2021). Despite these alarming issues, workers participate in their exploitation and work in precarious conditions due to inadequate work protection, which may have severe consequences for productive employment and decent jobs, – which are essential components of Goal 8 of the SDGs (Silaban et al., 2021).

Additionally, encouraging precarious positions may make it more challenging to implement Goal 8 on decent work (Silaban et al., 2021).

Regardless of a country's degree of development, critical personnel are often underpaid by 29%, with this percentage being notably high in high-income nations that employ a significant proportion of foreign workers (ILO, 2023). Many of these employees in several essential industries have little unionization and collective bargaining coverage or none at all (ILO, 2023). These problems are seen as a sort of contemporary slavery known as labor exploitation, in which a person is made to work against their will, is under their boss's authority, and is compelled by economic circumstances to accept inadequate compensation (Yang et al., 2021). Despite the substantial economic expansion, there is constant proof of worker exploitation in the periphery of the new global economy and labor pressure in older, more established industry centers (Mayer and Pickles, 2010).

Through innovation and market competition, purely market-based labor markets offer opportunities for skills development and adaptation; however, due to its emphasis on profit-driven market dynamics, rapid technological advancements, and the allocation of resources based on market forces, market economies have impacted skills mismatch in the labor market. Due to this, there is a discrepancy between the talents that companies value and those that job seekers possess (Livingstone, 2019; Chigbu and Nekhwevha, 2022a; Chigbu et al., 2023). Due to the capacity of market economies to develop and adapt new technology, the labor market is constantly disrupted and altered (Min et al., 2019; Minbaeva, 2021; Lefèvre et al., 2022). Additionally, the emphasis on efficiency and competitiveness under capitalism pressures companies to change and continue to be successful. This need for efficiency often leads to the automation of repetitive operations and the need for higher-level abilities that can complement and collaborate with technology (Brugger and Gehrke, 2018; Ra et al., 2019; Chigbu and Nekhwevha, 2022b). The consequence might be a skills mismatch as people lacking the required abilities may struggle to find acceptable jobs. Variability and unpredictability, upskilling, deskilling, and skills polarization (Mishra et al., 2019), the replacement of people with machines in the workplace, and the "deskilling" of existing functional jobs (Braverman, 1998) are all contributing to the unskilled proletariat.

The SDGs' sustainability goals are violated by Goal 8 (Hickel, 2019: 1) because the "global growth of 3% per year renders it empirically infeasible to achieve (a) any reductions in aggregate global resource use and (b) reductions in CO2 emissions rapid enough to stay within the carbon budget for 2°C." While SDG 8 is based on the idea of enhancing the relationship between a business and its workers, job automation has the opposite impact, undermining the fundamental notion of decent employment and leading firms away from rather than toward the fulfillment of SDG 8 (Braganza et al., 2021). These are traits of degrading employment practices and market economies' labor restructuring. Many struggle to find quality employment because they lack the skills to prosper in the changing industry. To foster economic development and provide fair employment opportunities, it is critical to close the skills gap via education, training, and lifelong learning (Chigbu et al., 2023).

As production increases, the workforce does not experience the same positive growth in the manufacturing industry (Chigbu and Nekhwevha, 2022c). This might be the reason why critics have emphasized that expanding productivity as stipulated in SDG 8 has not resulted in a concomitant improvement in the standard of living of people, and sustainable development cannot be based on further economic growth (Robra and Heikkurinen, 2019). The inequities inherent to the systematic processes of exploitation that are distinctive of market economies are not considered by SDG 8 or its larger sustainability agenda (Bianchi and de Man, 2021). The logic of growth, competition, and profit-making that underpin the continuous development and expansion of specific industries are in opposition to the SDG-led agenda (Bianchi and de Man, 2021). The idea of sustained and inclusive growth reinforces the primacy of capital and market notions of justice and continues to perpetuate a growth-driven development model rather than addressing the structural injustices that entrench inequalities and reproduce exploitative labor practices (Bianchi and de Man, 2021). The SDGs are yet another international instrument, as stated by Milivojevic et al. (2020), that makes rhetorically solid commitments to the intersections of labor, migration, and exploitation but lacks the clarity and operational strength it requires to lead the path in reducing, if not eliminating, such exploitative practices.

The elements that support or contribute to the circumstances for labor exploitation are still not taken into account by this tool (Milivojevic et al., 2020). Trebilcock (2005) linked a lack of competent governance to a lack of decent work. A lack of governance, poor institutions, and contradictory political commitments may hinder progress on human rights concerns such as target 8.8's labor rights.[1] The commitment of target 8.6 to dramatically improve the labor market situation of young people of NEET by 2020 was not met; for instance, see statistics in studies by Cieslik et al. (2022) and Picatoste and Rodriguez-Crespo (2020). Political will, commitment, and the structures and mechanisms for proper governance are essential (Trebilcock, 2005) in achieving decent work within SDG 8. Sadly, the new 2030 development plan favors market-based economic growth tactics above the attainment of everyone's entitlement to full employment and a reasonable standard of living (Frey and MacNaughton, 2016). In this scenario, SDG 8's expression and measurement of economic progress continue to leave many people behind (Meurs et al., 2019) due to the ongoing rise in insecure employment (Silaban et al., 2021) and increasing worker exploitation (Selwyn, 2019).

In conclusion, of this section, the advent of market economies has been connected with contemporary economic expansion and the fight for decent labor. This complex link suggests that the objective of a decent job cannot be wholly realized within the existing economic system. Purely market-based labor markets, driven by competition and accumulation, have spawned various problems, such as unemployment, labor-capital disputes, and charges of exploitation and underpayment. Moreover, the growth of market economies has resulted in a decline in human well-being, including subsistence-level income and detrimental effects on human height. The impact of capitalism has also transformed the global economic geography, spurred by neoliberal policies that have liberalized markets and led to new types of worker poverty, which disproportionately afflict female workers. The ubiquitous problem of "wage theft," which involves illegal non-payment or underpayment of workers' wages, occurs even though the most fundamental legal norms are not enforced under

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insecure working circumstances. Despite SDG 8's focus on inclusive and sustainable development, capitalism's structural inequities and exploitative labor practices are not sufficiently addressed. In addition, the SDGs' pledges to address labor exploitation and the interconnections of labor and migration have not been translated into adequate operational capacity to minimize or eradicate exploitative behaviors. With unstable labor on the rise, securing suitable employment remains a challenge. Economic circumstances continue to promote labor exploitation, defined by forced work and insufficient remuneration, as contemporary slavery. Extreme income and wealth disparities must be addressed for human rights, health, political and economic stability, and world peace. It is vital to challenge market economies' prevailing growth paradigm and promote a counter-hegemonic discourse to address these challenges and those linked with informal labor successfully.

4.3 Challenges and neglected realities of informal work and economy within SDG 8

The SDG8 may not adequately address workers' challenges (home-based workers, street vendors, domestic workers, waste pickers) in the informal sector, who often lack legal protection, social security, and essential benefits such as healthcare and pensions. Overcoming the challenges associated with the informal economy is vital to achieving decent work and inclusive economic growth. According to Tucker and Anantharaman (2020), "informal work" refers to various income-generating activities not covered by state labor laws and wage relations. In addition, "informal sector employers are frequently harsh, ignore the law, and easily dismiss their workers with little to no recourse to legal remedies" (Bonner and Spooner, 2011). For Dewick et al. (2022), the nature of informal work is heavily polluted with illegal activities such as disguised child labor (Singh et al., 2023), which goes unmonitored by any form of government (Padmavathi and Aruna, 2022). It has been argued that the market and state have failed in delivering optimum economic welfare to informal workers even in the case of well-planned and highly urbanized cities (Singh et al., 2023), as it is sometimes stigmatized as troublesome and unmanageable (Padmavathi and Aruna, 2022). Even while the informal economy contributes to the GDP (Charmes, 2012; Dell'Anno and Adu, 2020) and overall production and consumption in both developing and developed countries (Horodnic et al., 2022), it is sometimes not included in a nation's GDP, unlike the formal sector (Padmavathi and Aruna, 2022). In a different view, women often engage in informal work, particularly in domestic services, which is undervalued and unrecognized, perpetuating negative stereotypes (Jackson, 2019). Critics have expressed worry about the escalating disparities surrounding the gender wage gap, particularly about the unpaid labor that women engaged in domestic work in the informal sector (Jackson, 2019; Singh et al., 2023). Addressing this issue involves recognizing and valuing unpaid domestic work, challenging negative perceptions, and ensuring equal opportunities for all genders (Jackson, 2019). To promote sustained inclusive and economic growth for all in line with SDG 8, it is crucial to prioritize gender equality (Jackson, 2019).

Unfortunately, trade unions and other workers' organizations undoubtedly face many real challenges in organizing the informal workforce, irrespective of sector or country (Bonner and Spooner, 2011), due to a lack of tradition of democratic functioning, financial self-reliant to pay regular membership dues, legal and regulatory framework, stable and specific workplaces, worker identity and undefined workplaces (Bonner and Spooner, 2011). The exclusionary aspect of organized trade unions inadvertently excludes a sizable segment of the workforce. The vulnerability of informal workers is exacerbated by their lack of legal recognition (Routh, 2015; Bernal-Torres et al., 2019), which contradicts the fundamental idea of decent work enshrined in SDG 8. Furthermore, SDG 8 underlines the significance of providing safe and secure working conditions for all workers, regardless of employment status. However, the lack of legal protections exposes informal workers to exploitative behaviors, undermining the promotion of fair working conditions (Williams and Youssef, 2014). Furthermore, the absence of knowledge and awareness about rights and the existence of trade unions among informal workers impedes the achievement of SDG 8. The SDGs view decent work as requiring workers to be empowered with knowledge and participate in decision-making processes, hampered by this lack of awareness.

Too often, policy elites, including those promoting sustainable development, overlook that informal workers produce urban economies with social and environmental value (Tucker and Anantharaman, 2020) and promote the circular economy and sustainable development (Di Maio and Rem, 2015). The industry is crucial to survival and, more likely, continued livelihoods for persons with low skill levels (Jackson, 2019). However, growth-oriented economies – the core of SDG 8 – reproduce environmental deterioration, economic inequality, and poverty, the exact factors that drive so many people to engage in informal labor (Tucker and Anantharaman, 2020). The fundamental problem is that policymakers still do not have a reliable KPI for boosting the informal sector (Di Maio and Rem, 2015). Despite efforts to integrate the Decent Work agenda into social policies and programs, political processes are structurally unstable; therefore, there are no precise strategic approaches for addressing a capacity gap particular to the informal sector (Dhakal and Burgess, 2021).

Our primary conclusion in this section is that SDG 8 may not sufficiently address the issues faced by workers in the informal sector, resulting in a lack of legal protection, social security, and decent working conditions. Casual workers, who constitute a substantial component of the labor population in several developing nations, engage in income-generating activities outside of official labor regulations and are vulnerable to exploitation by employers who often flout the law. Consequently, the government does not oversee several aspects of indecent labor in this area. In addition, the gender disparity gap, especially in terms of unpaid labor undertaken by women in domestic employment, is a worrying problem that reinforces negative stereotypes and necessitates equitable opportunity and acknowledgment of unpaid domestic work. Unfortunately, authorities often disregard the substantial contribution of informal labor to urban economies, social value, and environmental sustainability. In addition, unions and workers' groups confront obstacles in organizing the informal workforce, such as the absence of a history of democratic functioning, financial independence, legal and regulatory frameworks, stable workplaces, worker identity, and unclear work arrangements. For fostering sustainable development, reaching SDG 8, and contributing to reducing carbon emissions that harm the environment, it is crucial to recognize the informal sector's significance and establish appropriate metrics to support its growth.

4.4 The need to strengthen the integration of environmental sustainability within the framework of SDG 8

The phenomenon of indecent workplaces poses existential severe threats to achieving SDG 8 (Raimi, 2020). For example, due to growing unemployment rates and greater levels of precarious employment in the labor market, Sub-Saharan Africa has a low inclination toward decent work (Raimi, 2020), while their focus is on economic growth that might hamper the environment. Scholars have argued that SDG 8 is presently part of a climate delay argument since the inclusion of economic development and the emphasis on boosting employment both contribute to unsustainable and unfair results (Kreinin and Aigner, 2022), severe several environmental and human health problems (Sun et al., 2016). For example, China is the world's manufacturing powerhouse, with manufacturing accounting for approximately 30% of total economic production. The fast economic growth of China and the expanded availability of goods and services raise the need for energy, such as hydroelectricity usage. Sure, hydroelectricity consumption hurts CO2 emissions, which helps to mitigate environmental degradation; however, it also has adverse environmental and societal risks, such as degenerated wildlife habitat, worsened water quality, obstructed fish mobility, and shrunk recreational opportunities on rivers, which cannot be overlooked (Adebayo et al., 2021). China's economic development, for example, has dramatically decreased poverty in recent decades, allowing it to enter the ranks of upper-middle-income nations. Unfortunately, its economic prosperity has been accompanied by substantial decreases in air quality; in fact, its air pollution has increased far quicker than its economic development (Dang and Serajuddin, 2020). Another troubling problem is that as many as 96 nations lack data on SDG 13, "Climate Action," making it difficult to adequately assess progress across countries and time (Dang and Serajuddin, 2020).

There has been much discussion on absolute decoupling, which happens when environmental problems are decreased but economic development is maintained. Since capitalism, no matter where it is, is prone to crises, growth-dependent, and market expansion, it is impossible, according to the present state of climate science, for there to be a time of no growth or "de"-growth under market economies (Hall and Davis, 2021). However, although relative decoupling has been demonstrated in certain nations, total decoupling remains challenging owing to purely market-based labor market growth and dynamics (Ward et al., 2016). GDP growth would have to be significantly decoupled from energy and material usage and environmental repercussions for it to be sustainable; yet, there is no evidence that GDP growth can be detached in the long run (Ward et al., 2016). Nevertheless, at the core of green manufacturing is the need for the industry to combine numerous goals, including equitable development, environmental protection, and productivity, via a plethora of regulatory frameworks (Fu and Irfan, 2022).

In conclusion, while SDG 8 target 4 aims to "improve progressively, through 2030, global resource efficiency in consumption and production and strive to decouple economic growth from environmental degradation," it does not explicitly emphasize the need for sustainable economic practices that minimize environmental impacts caused by intense economic competition and growth-oriented market economies. In a neoliberal capitalist society, pursuing GDP development often comes at the price of ecological sustainability. In addition, China's industrial supremacy and economic growth have resulted in a substantial rise in energy use, notably hydroelectricity, which has had detrimental environmental effects. The difficulty is achieving complete decoupling, in which economic expansion continues but environmental consequences decline. This work becomes more complex, particularly given that many nations lack adequate data on climate action, highlighting an urgent need for enhanced monitoring and reporting methods.

5 Discussion – complex path to SDG 8: unraveling challenges and charting future courses

The global community faces numerous hurdles in achieving SDG 8. This debate goes into four crucial study findings, each of which sheds light on critical impediments impeding the achievement of SDG 8's objectives. We explore the intricate tapestry of challenges and opportunities inherent in the path toward sustainable and decent employment for all by addressing gender disparities, grappling with the nuances of market economy systems, confronting the realities of the informal sector, and navigating the intricate balance between economic expansion and environmental sustainability.

5.1 Gender disparities: breaking the chains of discrimination

The persistence of gender disparities in the labor market is a substantial impediment to achieving SDG 8. Despite tremendous progress in recent years (Fink et al., 2018; Tripathy, 2018; Samuel et al., 2020), women face formidable obstacles, ranging from systemic prejudice to socioeconomic disparities. Gender equality in the workplace is not just a moral issue; it is also a strategic necessity. Research regularly shows that economically empowered women lead to more considerable societal benefits, such as increased economic growth and social cohesion (Costa et al., 2023; Naveen et al., 2023). Comprehensive strategies and targeted activities are required to break down these barriers. Encouragement of female involvement in education and training, promotion of mentorship programs, and advocacy for equal pay are all critical steps toward making the job market a fair playing field for all women (Pignatti, 2016; Tabassum, 2019; Devadas and Kim, 2020).

5.2 Market economies paradox: balancing growth and social equity

A closer look into market economic systems shows a paradox at the heart of economic development. While purely market-based labor markets promote economic progress and innovation, they also encourage income inequality, job insecurity, and exploitation (Wray, 2009; Galanis et al., 2017; He, 2022). Because of this dichotomy, economic policy must be complex. Governments and institutions must actively lessen the negative impacts of uncontrolled capitalism by instituting progressive taxation, assuring equitable salaries, and strengthening social safety nets. Furthermore, cultivating a corporate social responsibility culture can incentivize corporations to contribute

constructively to society (Verma, 2015; Varona, 2020; Chigbu and Nekhwevha, 2022c), thereby balancing the tensions between economic growth and social equality.

5.3 The informal sector: bridging gaps in legal rights and social security

Although the informal sector employs a sizable fraction of the global workforce, it is nevertheless underserved by SDG 8. Workers in informal economies frequently lack legal rights and social security, exposing them to exploitation and poverty (Garzón-Duque et al., 2017; Dwi Winarni et al., 2019). Recognizing the enormous contribution of the informal sector to economies, governments must provide legal protections and social welfare benefits to these people. Formalizing the informal sector through accessible registration processes, tailored financial services, and vocational training can uplift millions, fostering inclusive growth and narrowing disparities (Catherine and Jacob, 2014; Khamis, 2014; Tara et al., 2020).

5.4 Balancing economic expansion and environmental sustainability: a delicate act

Economic growth, a crucial aspect of SDG 8, frequently collides with environmental sustainability imperatives. Rapid industrialization and resource-intensive production put a strain on ecosystems (Sharma, 2018; Bandurin and Bandurina, 2021), offering considerable challenges to achieving sustainable development (Kuznetsova et al., 2020). Revolutionary changes in production processes and consumption patterns are required to reach equilibrium. Embracing green technologies, developing circular economies, and investing in renewable energy sources are critical measures (Berg et al., 2018; Adeosun et al., 2023). Simultaneously, raising awareness and cultivating an environmental culture can stimulate behavioral shifts, supporting sustainable practices throughout companies and communities.

As we face these problems head-on, we set the groundwork for a more equitable, sustainable, and prosperous society in which the promises of SDG 8 become lived realities for every individual, regardless of gender, socioeconomic background, or job position.

6 Conclusion

This detailed study delves into the underlying complexity of the current labor market by evaluating the complicated web of problems within the goal of Decent Work and Economic Growth – SDG 8. Our aims were designed to elucidate the multifaceted dimensions of this pursuit, and the findings, as presented, highlight the critical need for nuanced and holistic strategies in the face of gender and income inequalities, the inherent injustices of market economies, the often-overlooked realities of informal work, and the imperative of integrating environmental sustainability into economic practices. We discovered that continuing gender gaps in the labor market pose a substantial barrier to realizing SDG 8's objective. Women continue to encounter enormous obstacles, ranging from discrimination to occupational segregation. Examining market economic systems found a perplexing link between economic development and adequate employment. While capitalism promotes economic growth and innovation, it produces income inequality, insecure work, and exploitation. Our study indicated that the informal sector, which employs a sizable proportion of the global workforce, is still underserved by SDG 8. Workers in this sector lack legal rights and social security and are frequently exploited. Economic expansion often collides with environmental sustainability, creating substantial obstacles to SDG 8. The current emphasis on GDP development, particularly in capitalist cultures, contributes to environmental deterioration, which is aggravated by a lack of decoupling of economic expansion from resource use.

To achieve decent work and economic growth in the 21st century, a paradigm shift is required – one that embraces gender equality, challenges purely market-based labor market conventions, empowers informal workers, and promotes environmental sustainability. Because of the complexities of these difficulties, coordinated efforts, new policies, and a commitment to social justice are required. By confronting these multifarious concerns head-on, nations may pave the way for a future in which decent work is not just a goal but a fundamental human right, providing prosperity for everyone and protecting the well-being of our planet for future generations. This study is a rallying cry, calling governments, scholars, and global citizens to collaborate in breaking down barriers and establishing a path toward a more equal and sustainable society.

6.1 Future research direction

Building on the findings and knowledge gaps identified in our study, some potential future research areas can be explored to deepen our understanding of decent work and sustainable economic growth within the context of SDG 8. One of these prospective study directions includes: "Case Studies on Successful Decent Work Initiatives." Conducting in-depth case studies on countries or regions that have made significant progress in promoting decent work and achieving sustainable economic growth within the framework of SDG 8 can offer valuable insights and best practices for other nations to adopt.

Author contributions

BC: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing – original draft, Writing – review & editing. FN: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Can COVID-19 mark a tipping point for home-based telework? Conflict between untact technology and rigid institutions in Korea

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Background: Previously, Korea showed a passive attitude toward home-based telework; however, this stance rapidly changed after the COVID-19 pandemic. Sustaining home-based telework entails adjusting productivity conditions, introducing performance-based evaluations, and modifying employment rules, as required by the Korean Labor Standards Act, which demand the consent of most workers. This study aims to explore the societal and institutional shifts necessary for ongoing home-based telework post-pandemic.

Methods: This study discusses the sustainability of home-based work based on survey data and materials from institutions and previous research. It used data from the Workplace Panel Survey provided by the Korea Labor Institution for 3 years (2015, 2017, and 2019) to examine the status of home-based work and business responses. It also addresses legal issues related to changes in working conditions and worker-management agreements resulting from telework implementation. Legal aspects of telework are explained using relevant sections of Korea's labor laws.

Results: To establish home-based telework as a working method relevant to the Fourth Industrial Revolution after the pandemic, essential discussions are needed regarding its fundamental applicability to specific job sectors. Moreover, to activate home-based telework without deteriorating working conditions, achieving agreement between workers and management is imperative. However, legal complexities necessitate systemic changes for effective resolution. For the sustainable continuity of telework, a blend of societal awareness and institutional transformations is indispensable.

Discussion: The growth of home-based telework through untact technology expansion is hindered by inflexible Korean labor laws, judicial precedents, and worker-management relations. The absence of necessary legal and organizational changes could lead Korea to revert to pre-pandemic norms or slow implementation. Initially prevalent in IT, home-based telework has expanded across sectors due to the pandemic. Leading the "new normal," companies creatively enhance productivity through telework, but rigid systems and outdated cultures could impede post-pandemic progress.

Conclusion: The study highlights the need for forward-looking institutional changes and adaptation to advancing technology. It provides valuable insights for organizations and policymakers to optimize work dynamics and enhance employee and employer well-being in the post-COVID-19 era.

KEYWORDS

COVID-19, home-based telework, untact technology, sustainable utilization, rigid institution

1 Introduction

With the rapid advancement of technology in contemporary society, people can now connect through the internet almost instantaneously. This has generated a growing interest in Telework, which refers to the practice of independently performing tasks at a location and during times not specifically associated with a particular company or institution (1). Telework is a work arrangement that comes with various advantages and disadvantages. One of the main advantages of telework is enhanced productivity, increased job satisfaction, and reductions in commuting time and expenses (2–4). Moreover, it has been shown to offer mental benefits, such as increased freedom in time management, reduced stress, and an improved work-life balance (3, 5).

Conversely, telework has encountered criticism stemming from its departure from the conventional office environment. These concerns encompass social isolation, the absence of face-to-face communication, and a lack of support from mentors and colleagues (2, 6–11). These criticisms also extend to apprehensions about overworking when working from home (12), and the effectiveness of productivity, which may not necessarily improve, depending on the nature of the tasks (13). Furthermore, telework faces limitations regarding its suitability across all industries, given its reliance on factors like the type of occupation, work format, and the voluntariness of participation (14, 15).

In response to COVID-19, companies are making significant efforts to prevent epidemics and preserve employment through various measures, including telecommuting and taking paid and unpaid leave (16–19). Companies have developed home-based telework manuals that incorporate information technology (IT) solutions and security guidelines to facilitate telecommuting (20–22). Concurrently, the government is actively contributing to this endeavor by providing the essential infrastructure required for telecommuting and offering wage subsidies to support companies in their efforts to prevent unemployment and assist the economically inactive population.

More specifically, while large companies in Korea can develop the necessary infrastructure, including the technology for implementing home-based telework on their own, it poses a challenge for small- and medium-sized enterprises (SMEs) to undertake such investments. To address this disparity, the government has implemented policies to support smaller enterprises, albeit with certain limitations. The COVID-19 pandemic has prompted a rapid and substantial increase in home-based telework, which has not been extensively practiced in Korea. Large companies adopted it as a self-rescue measure, and the government introduced it as a support policy for SMEs affected by the pandemic. Consequently, Korea's IT industry has made significant advancements, with IT solutions such as Zoom and Webex sufficiently upgraded to accommodate the demand for home-based telework. This transformation has led many technical experts to predict that the new technologies of the Fourth Industrial Revolution will drive the flexibilization of work-hour systems, largely influenced by home-based telework. Moreover, the integration of untact technology with well-designed online connection systems has given rise to "ontact" technology, which bears a resemblance to home-based telework practices.

Many questions have arisen regarding the potential expansion of home-based telework as a future working method post-COVID-19 (6, 23–25). Those who predict growth often emphasize its technical aspects and view it as a valuable experimental option, albeit with certain limitations in terms of its duration. However, as the saying goes, "the devil is in the detail," we must consider whether the necessary technical changes and the changes required in the work environment can occur smoothly or if they might clash and create obstacles. The introduction of home-based telework will bring about changes in the working methods of individual workers or worker groups, which must be addressed within the framework of Korean laws. Thus, a proper procedure for managing these changes is essential. If this procedure requires the consent of individual workers or worker groups, it becomes crucial to assess whether home-based telework can be expanded by effectively overcoming these consent-related challenges. If a rigid institutional barrier hinders expansion, it will be difficult to progress with the adoption of teleworking on a larger scale. Moreover, the core of the consent procedure hinges on whether workers and management can jointly select a cooperative strategy for introducing home-based telework that results in a win-win situation. The successful expansion of telework largely depends on whether Korean worker-management relations can facilitate strategic collaboration between the two parties.

This study aimed to comprehensively examine the impact of COVID-19 on the labor market in Korea and the responses of Korean companies to the pandemic. We conducted a comparative analysis between the pre-pandemic period, characterized by a passive approach toward home-based telework, and the post-pandemic period, which witnessed a rapid increase in home-based telework. Through this comparison, we sought to identify and analyze the effects of various institutional factors that play a role in determining the post-pandemic sustainability of home-based telework. Our investigation also delves into whether any consent-related procedures, mandated by labor laws and regulations, pose obstacles to adopting home-based telework. We will explore the possibility of reaching a mutual agreement between workers and management to facilitate the required consultation process for effectively implementing telework. Based on our findings, we aim to provide insights into a potential scenario in which companies' competitiveness and workers' quality of life could be simultaneously enhanced through integrating untact technology with the labor market system in each country post-COVID-19 pandemic. This study seeks to offer valuable information for fostering harmonious and strategic collaborations between stakeholders, leading to positive outcomes for businesses and workers.

2 Method

In this study, we utilize survey data from workplace panels and the content of literature on home-based telework to discuss the changing perceptions and circumstances of telework before and after the COVID-19 pandemic. We also examine the challenges associated with telework usage. Additionally, we discuss the necessity of consensus between labor and management on implementing telework and address legal matters related to working conditions. Through this multifaceted approach, this study aims to answer the following questions:

- Can home-based telework, which saw a significant increase in demand during the COVID-19 pandemic, continue to be used as a fundamental employment system even after the pandemic?
- Is there a need for societal and institutional consensus for home-based telework to establish itself as an employment system?
- What are the societal and institutional issues that need to be addressed to promote the activation of home-based telework, and in what direction should we move?

To facilitate this discussion, we have analyzed responses regarding home-based work from the Workplace Panel Survey Data. Furthermore, we have utilized survey results primarily from the Korea Chamber of Commerce and The Ministry of Employment and Labor, along with findings from published papers by these institutions. We have also cited foreign references under the corresponding tables and figures. To elucidate the legal aspects of telework, we have extracted relevant sections from Korea's labor laws, followed by explanations and discussions to provide a comprehensive understanding.

2.1 Data

The data used in this study was collected from the Workplace Panel Survey Data (WPS) obtained from the Korea Labor Institution. WPS is a dataset that conducts biennial surveys on employment, labor demand, human resources, and training in various workplaces. In this research, we used WPS data from 2015, 2017, and 2019 to examine the perception and utilization of home-based telework in businesses before and after the occurrence of the COVID-19 pandemic, stratified by company size and industry classification. The WPS survey is not conducted in the same year but rather the following year. WPS2019 was conducted during the COVID-19 pandemic, and in addition to the regular questions about home-based work, specific questions about how businesses responded to the COVID-19 pandemic were added. In this study, we utilized both the standard questions about home-based work and the pandemic-related questions to conduct our analysis.

The following are the specific questions posed to businesses in the WPS regarding home-based work:

- As of the end of the previous year, did your business operate a telecommuting or remote work system?
- In response to the spread of the COVID-19 virus, did your business utilize flexible work systems (telecommuting, flextime system, remote work, flexible work arrangements system)?
- Which flexible work systems did your business employ?

The responses to the first question are categorized into (1) Yes, employees are actually using it, (2) Yes, but no employees are utilizing it, and (3) No. The second question is answered with a simple Yes or No. In the case of the third question, respondents may choose multiple options, indicating the specific flexible work systems they have implemented, which include telecommuting, flextime system, remote work, flexible work arrangements system.

3 Results

3.1 WPS results

3.1.1 The operation status of telecommuting and remote work systems

Figure 1 represents the response results regarding the operation of telecommuting and remote work systems in businesses before the pandemic. In 2015, out of 3,431 businesses surveyed, only about 1% or 50 businesses reported that their employees were actually using telecommuting and remote work systems. In both 2017 and 2019, approximately 2 and 5% of all businesses, respectively, indicated that employees were utilizing these systems. While the number of businesses implementing these systems has gradually increased, the actual usage by employees has not seen a significant rise.

Figure 2 displays the operation status of telecommuting and remote work systems according to the size of businesses. It indicates that the actual usage proportion for telecommuting is consistently below 10% across all business sizes. In large-scale enterprises with 300 or more employees, the proportion of remote and telecommuting system implementation gradually increases, reaching up to 17%. However, it is evident that as the size of businesses decreases, the proportion of telecommuting system implementation decreases as well.

Figure 3 illustrates the proportion of businesses, categorized by the Korean Standard Industrial Classification, where employees have responded that they are utilizing remote and telecommuting systems. Notably, the utilization of telecommuting systems is relatively higher in industries such as public administration and defense; compulsory social security, Education, and Professional, scientific, and technical activities. However, the overall introduction of telecommuting systems in various industries appears to be quite low, indicating a concentration of telecommuting system usage in specific sectors.

3.1.2 The implementation status of flexible work systems after the pandemic.

To prevent the spread of the coronavirus after the pandemic, businesses aimed to maintain their operations by implementing Flexible Work Arrangement systems, Telecommuting systems, Flextime systems, or Remote Work systems. Figure 4 presents the response results regarding whether businesses adopted flexible work systems in response to the COVID-19 pandemic. Out of 2,795 total businesses, approximately 22%, or 622 businesses, implemented flexible work systems to combat the coronavirus. When analyzed by business size, it is evident that larger enterprises, at around 34%, adopted flexible work systems most extensively for COVID-19

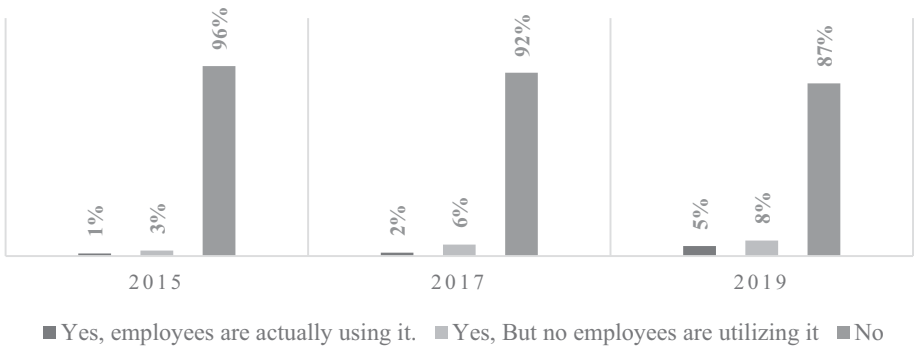

FIGURE 1
The operation status of telecommuting and remote work systems before the COVID-19 pandemic. The WPS survey is conducted in the year following the reference year, and the responses to the questions mentioned above are based on the status as of the year prior to the survey year.

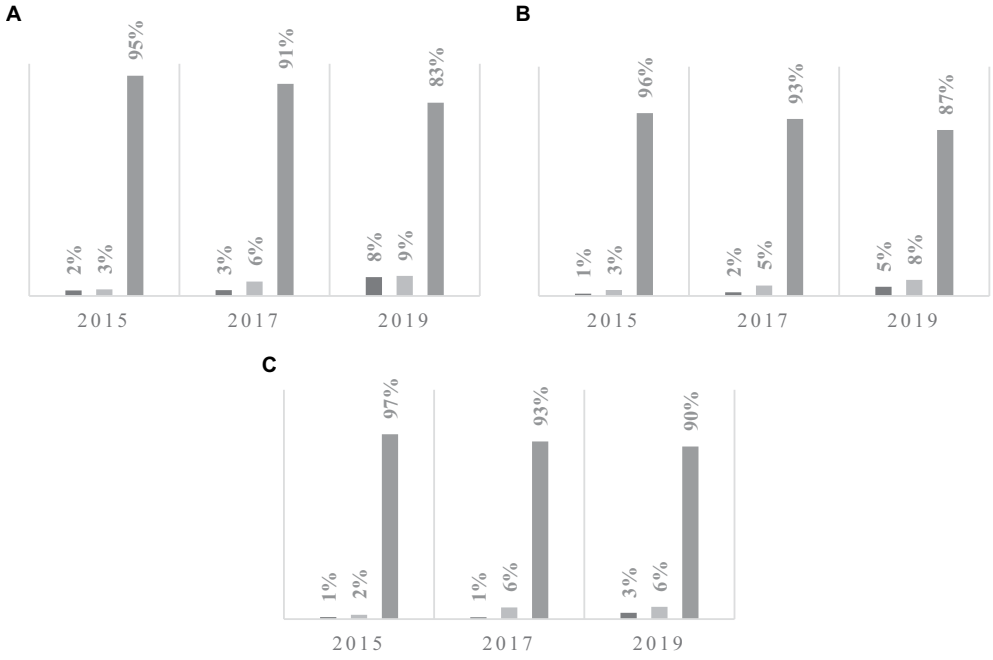

FIGURE 2
The operation status of telecommuting and remote work systems by business size. **(A)** represents businesses with 300 or more employees, **(B)** represents businesses with 50–299 employees, and **(C)** represents businesses with fewer than 50 employees. The bar graph displays the proportions of responses in the following order from left to right: (1) Yes, employees are actually using it, (2) Yes, but no employees are utilizing it, and (3) No.

prevention, while smaller businesses exhibited a lower level of response to pandemic control measures.

Figure 5 illustrates the proportion of businesses that have adopted flexible work systems for COVID-19 pandemic control and the distribution of their utilization of various work systems. Telecommuting and remote work systems, at approximately 59%, appear to be the most preferred work systems that businesses have chosen for COVID-19 pandemic prevention.

The actual usage proportion of telecommuting and remote work systems before the COVID-19 pandemic was shown to be quite low, not exceeding 10%. With the increased demand for telecommuting and remote work systems due to the onset of the COVID-19 pandemic, approximately 22% of all businesses introduced flexible work systems, resulting in an increase in usage. However, when viewed holistically, the utilization of telecommuting and remote work systems remains at a relatively low level. It also varies significantly based on business size and industry type.

3.2 Companies' response to COVID-19 and the adoption of home-based telework

In response to the COVID-19 pandemic, many countries, including Korea, implemented and expanded home-based telework as a precautionary measure to mitigate the risk of infection while ensuring that economic activities continued to

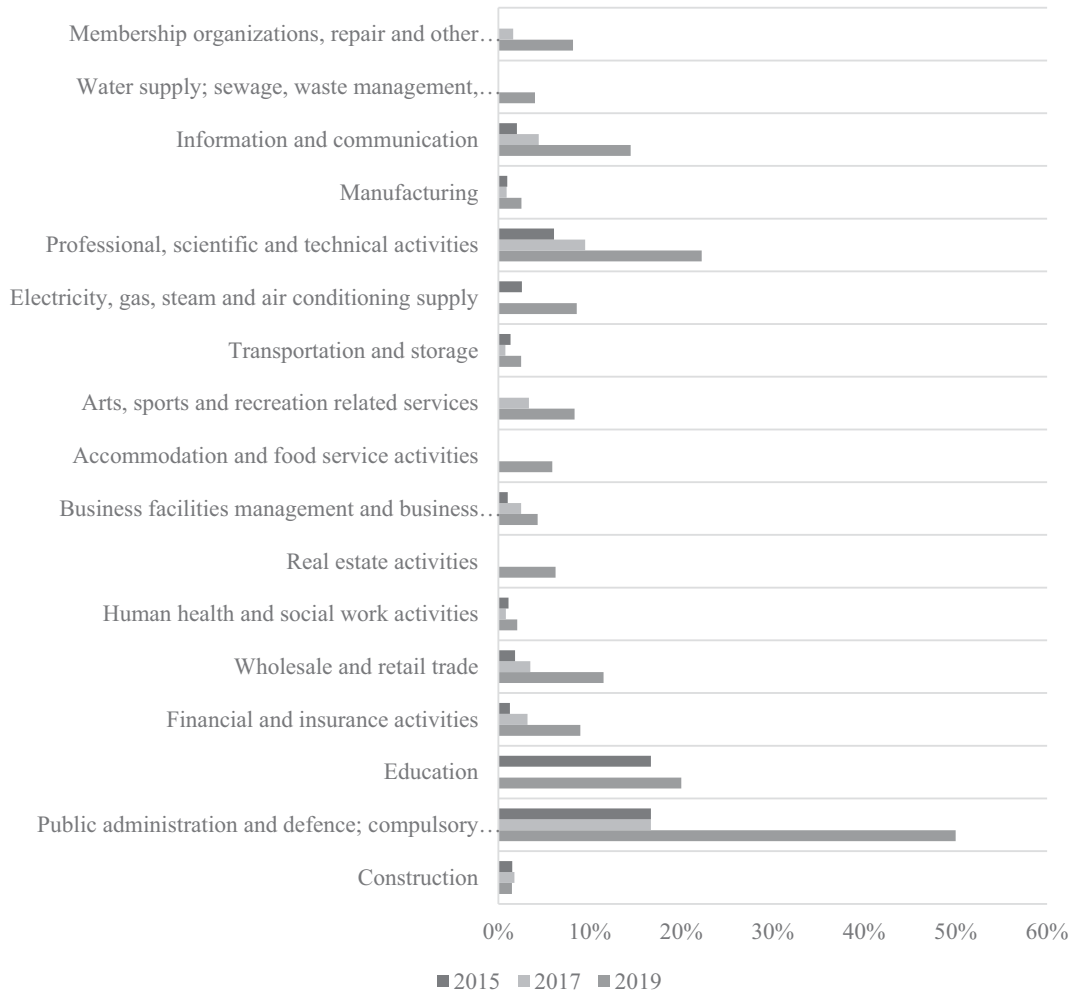

FIGURE 3
The proportion of businesses, categorized by industry classification, where employees have responded that they are actually utilizing remote and telecommuting work. The above industry classification is based on the 9th Korean Standard Industrial Classification.

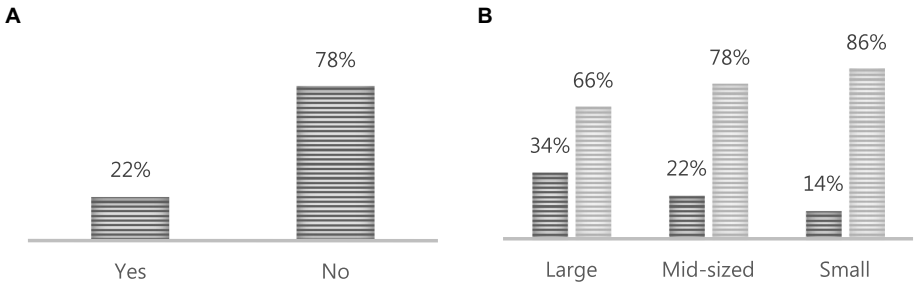

FIGURE 4
The adoption of flexible work systems for COVID-19 pandemic response. **(A)** Represents the responses from the entire set of businesses, while **(B)** indicates the responses categorized by business size.

some extent (19, 22, 26). This approach was particularly suitable for jobs that did not require physical labor at production sites (27). Major companies, such as Amazon and AT&T, responded by instructing their employees to work from home whenever possible (28, 29). In Korea, home-based telework has grown significantly (30). For instance, at the beginning of the new semester, the Korean government allowed students to attend all lessons from home online until the COVID-19 pandemic subsided (31).

3.2.1 Before the pandemic

Korea has actively promoted the implementation of a flexible working system, including home-based telework, to achieve a better

work-life balance, addressing the declining birth rate and reducing long working hours. However, despite these efforts, the adoption of flexible working systems, particularly home-based telework, has not expanded as intended. As indicated in Table 1, the utilization of home-based telework remains the lowest among various flexible working methods in Korea, and its introduction rate is considerably lower than that in other countries.

The promotion of a flexible working system policy in Korea, including recommendations for home-based telework, is ongoing. However, the actual adoption rate of such a system has seen only a marginal increase over the years and has even declined in certain periods. Table 2 provides data on the percentage of different types of flexible working systems used over time, with telecommuting, including home-based telework, displaying a decreasing trend.

Based on the responses to the question about adopting flexible working methods in the future, it appears that the preference for home-based telework or telecommuting is lower than that for other flexible working methods. Table 3 illustrates the preference for various flexible working methods to be added in the future and indicates that only 15.9% of respondents expressed a preference for home-based telework, whereas only 4.4% showed a preference for telecommuting. These data suggest that currently not only the usage of home-based telework and telecommuting is limited in Korea but these methods are also not highly favored as the preferred working methods for the future.

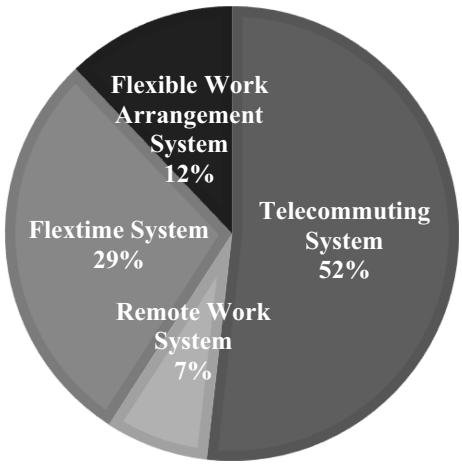

FIGURE 5
The proportion of flexible work systems implemented for COVID-19 pandemic control.

3.2.2 After the pandemic

After the COVID-19 pandemic hit Korea, there was a significant and rapid increase in the adoption of home-based telework, especially after the mass infection in Daegu. Heightened concerns about infections throughout the country led many companies to swiftly implement remote work arrangements. A report by a Korean company specializing in home-based telework and telecommuting solutions illustrates this trend. According to their findings, the usage of video conference services increased 15-fold within 1 month, from February 23, when the infection situation reached a critical level, to March 2 (40).

The implementation of a flexible working system, such as home-based telework, has been supported for SMEs in Korea through indirect labor cost subsidies. Since the outbreak of the COVID-19 pandemic, the number of businesses applying for this support has increased significantly, by approximately 20-fold. Among the various types of support applications, home-based telework constituted the majority, accounting for 52.5% (16,023 people), whereas telecommuting, which is a similar working method utilizing digital devices, accounted for only 1.3% (394 people) (41).

As a response to the pandemic, the Korean government simplified support procedures for SMEs seeking to adopt flexible working methods. This involved expediting the evaluation of business applications, reducing the burden of evidence-based procedures, and expanding the pool of eligible workers (42). Consequently, the number of companies interested in implementing home-based telework has seen a rapid and substantial increase. Figure 6 shows the number of companies applying for telecommuting infrastructure.

TABLE 1 Introduction rates of a flexible working system.

	Dimensions of flexible working system (%)			
	Korea	Europe	USA	Japan
Home-based telework	3.0	Germany 12 Belgium 20 Sweden 32	38.0	11.5
Flexible working hours	9.2	–	–	52.8
Staggered commuting	12.7	66.0	81.0	–
Part-time	11.3	69.0	36.0	–

Korea Chamber of Commerce (32). This table re-quotes the data compiled by the Korea Chamber of Commerce. "Survey on Introduction of a Flexible Working System by Companies," Korea Chamber of Commerce. Accessed May 21, 2020. http://www.fki.or.kr/Common/ Download.aspx?id = 2dfd975c-5e1f-48aa-a550-595211ae3d8f. Data provided in this table were extracted from four sources: Korea: Kim et al. (33). Europe: Eurofound, "European company survey," (2013). USA: Kenneth Matos and Ellen Galinsky, "2014 National Study of Employers," Society for human resource management, (2014). Japan: The Ministry of Health, Labor, and Welfare, "2014 Comprehensive Survey on Employment Conditions (Flexible Working Time System)," (2014) Decision of Japanese Cabinet Meeting.
"–" indicates that no data are available due to statistical limitations. However, the values shown in the home-based telework column for Europe are the introduction/use rates published by the ILO. The introduction rates of the working method using T/ICTM which enables telecommuting such as home-based telework in other European countries is shown to be 28% in Finland, 12% in France, 15% in the Netherlands [see Messenger et al. (34)]. The Ministry of Employment and Labor. Home-based telework includes telecommuting other than home-based telework.

TABLE 2 Utilization of flexible work system by type.

	Aug. 2015	Aug. 2016	Aug. 2017	Aug. 2018	Aug. 2019
Home-based telework and telecommuting	7.3	7.3	5.6	4.7	4.3
System of working reduced hours	0.4	7.8		15.1	17.1
Staggered commuting system	42.0	38.1	38.4	33.2	33.7
Selective working hour system	33.2	31.6	31.9	32.3	30.4
Flexible working hours system	26.3	23.7	26.0	27.3	32.0
Other (discretionary work system, etc.)	12.3	1.5	9.1	10.9	9.6

Data provided in this table were extracted from five sources: Kim et al. (33, 35, 36), Jeon et al. (37), and Kang et al. (38). The units of the values in the table are in percentages (%).

TABLE 3 Working methods to be added in the future (multiple responses).

Total (number of companies)	Home-based telework	Telecommuting	Selective working	Discretionary work system	Selective working hours	Staggered commuting
100.1 (15,986)	15.9 (2,536)	4.4 (696)	34.5 (5,520)	18.0 (2,882)	23.8 (3,801)	9.8 (1,573)

Jeon et al. (39).
The survey was conducted for the people in charge of personnel affairs working in the 5,049 companies selected through the stratified sampling method by business type and company size from companies with not less than five regular workers. The units of the numbers in the table are in percentages, and the units inside the parentheses are the number of companies.

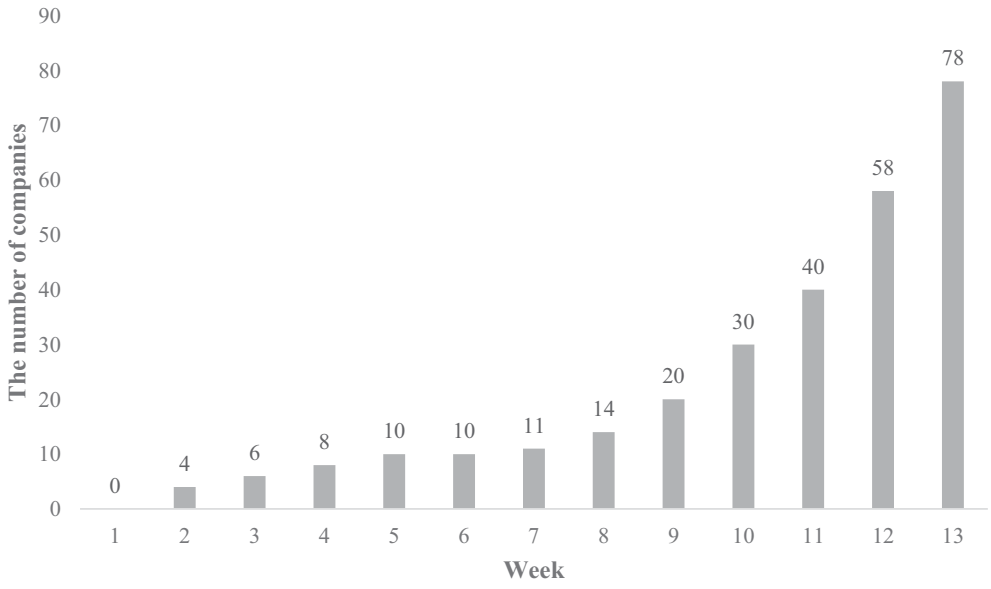

FIGURE 6
Status of the number of companies that have applied for home-based telework infrastructure construction costs (April 5, 2020; January 1–April 5, total). The Ministry of Employment and Labor (43).

3.2.3 Nature of the change

As previously discussed, a significant difference exists between home-based telework in Korea and other advanced countries. While advanced countries have implemented and experimented with remote work to some extent, Korea has been more passive in adopting telework. Such countries have conducted trial and error during the implementation of home-based telework methods.

However, in response to the COVID-19 pandemic, there has been a rapid increase in the demand for IT services for home-based telework or telecommuting in Korea. This surge can be viewed as a temporary measure to cope with the pandemic, and home-based telework has been implemented without thoroughly testing its suitability for various job roles. For instance, employees in Korean call centers, who handle sensitive customer information and require

immediate responses, were initially believed to be unsuitable for remote work. However, these jobs quickly transitioned to home-based telework when call centers became sites of mass infection (44). The pandemic has forced experimentation to determine whether home-based telework is suitable for Korea.

Some examples suggest that a surge in home-based telework may not be a temporary measure. Certain companies that have implemented telework for all employees have indicated their intentions to continue telecommuting. They envision a culture of business openness, sharing, and communication through the development of new business tools, possibly leading to their transformation into smart offices (45).

Considering this trend, it is important to explore whether home-based telework can become a method of business innovation not only during emergencies such as the COVID-19 pandemic but also in the era of the Fourth Industrial Revolution. The pandemic has acted as a turning point for organizations, prompting fundamental concerns over their methods of operation and job performance evaluation (46).

However, to determine whether the home-based telework method introduced abruptly due to the COVID-19 pandemic in Korea can last and expand in the post-pandemic era, various reviews and assessments should be conducted. We now consider the possibility of expanding home-based telework methods in Korea following this outbreak.

3.3 Review on the possibility of home-based telework methods to expand in Korea

3.3.1 The possibility for change in the passive attitude of Korea

Conducting thorough reviews from various perspectives is crucial to determine the potential expansion of home-based telework methods in Korea following the pandemic. One key aspect is identifying jobs that can be effectively conducted through home-based telework. The survey examined the reasons for the previous lack of a flexible working system in Korea and found that over half of all jobs were deemed unsuitable for such a system. Table 4 provides insight into the reasons for not utilizing flexible working methods.

According to a previous survey, the main reasons for difficulties in encouraging flexible work included the nature of the job (52.3%) and organizational culture and environment (23.0%) (47). Collectively, these results indicate that the primary obstacles hindering the introduction of home-based telework are the lack of suitable job roles and the nature of the work itself.

3.3.2 Judicial procedure required for the adoption of home-based telework in Korea

When introducing home-based telework in Korea, it is required to obtain the consent of individual workers or engage in consultation with worker groups before making any changes to working conditions. The process for implementing home-based telework includes the following scenarios:

First, if a provision concerning the implementation of home-based telework is already present in the collective agreement, employment rules,[1] or labor contract, the company can implement home-based telework by issuing an order in accordance with the relevant provision. In such cases, individual workers are considered to have implicitly agreed to home-based telework, allowing the employer to implement it by exercising the right to personnel orders. Additionally, if the individual labor contract includes a provision allowing the employer to designate the workplace, the employer can introduce home-based telework by designating the employee's home as the workplace without requiring any separate consent (Provision in Possession Method). However, such cases are rare in Korea, which has passively adopted home-based telework.

In situations without any provision related to implementing home-based telework, as previously mentioned, a company can only introduce home-based telework with the explicit consent of individual workers. As most Korean workplaces lack specific provisions for home-based telework, its implementation during the COVID-19 pandemic likely required obtaining the consent of individual workers. Nevertheless, if social distancing is imperative to prevent the spread of the infection, implementing home-based telework can be justified through consultation with workers or worker groups. Consequently, a stay-home order or home-based telework (transfer) order, in which the home becomes the workplace, can be reasonably issued[2] (Right of Personnel Order Method).

Meanwhile, if home-based telework is officially introduced for all employees or a specific job group, working conditions, such as the service regulations related to home-based telework applied to relevant employees, must be modified. In such cases, conditions cannot be altered solely by the consent of individual workers; rather, home-based telework must be introduced by amending the employment rules that apply to all employees. However, if the proposed working conditions, such as the service regulations for home-based telework, are not more disadvantageous to workers than the existing working conditions, the opinion of the labor union shall be heard if such an organization represents the majority of the workers. In its absence, the collective opinion of the majority of workers should be considered (Article 94, Paragraph 1, Main Body of the Labor Standards Act, Normal Method to Change Employment Rules). However, if the proposed

1 Employment rules specify the working conditions to be applied uniformly to the workers in a business place regardless of the designation. In Korea, the business places that employ more than 10 workers are obliged to establish employment rules (Article 94, Main Body of the Labor Standards Act). Although employment rules contain the working conditions and working discipline of the workers in business places existing in Korea and Japan, they also can also nullify the relevant contract provisions if the labor contract concluded by an individual worker falls short of the standard set by the employment rules (Article 97 of the Labor Standards Act).

2 Article 23, Paragraph 1, of the Labor Standards Act stipulates, "The employer shall not dismiss…leave of absence, or transfer…without good cause." Whether a personnel change, such as an order to work from home or a stay-home order (transfer or leave of absence), is based on a good cause is determined through business necessity, disadvantages in life, and the consultation procedure required under the principle of good faith (Supreme Court, April 11, 2000, Pronouncement of Ruling No. 99du2963; Supreme Court, Sep. 10, 2009, Pronouncement No. 2009du10440, etc.)

TABLE 4 Reasons why flexible working methods are not implemented.

Total (number of companies)	No suitable jobs	Difficulty in labor management such as worker evaluation	No workers who want it	Customer relation	Introduction procedure unknown	Introduction cost	Information security	Objection of employees
100	68.4	9.2	12.8	6.7	1.5	0.8	0.4	0.2
(565,465)	(386,719)	(51,787)	(72,278)	(38,166)	(8,586)	(4,560)	(2,297)	(1,071)

Jeon et al. (39).
The survey has been conducted for the people in charge of personnel affairs working in the 5,049 companies selected through the stratified sampling method by business type and company size from companies all over the country with not less than five regular workers. The units of the numbers in the table are in percentages, and the units inside the parentheses are the number of companies.

working conditions, such as service regulations for home-based telework, are more disadvantageous to workers than the existing working conditions (e.g., if the calculation of working hours is disadvantageous or wages decrease), the consent of either the head of the labor union representing the majority or, if there is no such labor union, that of a majority of the workers is required (Article 94, Paragraph 1, Proviso).

Notably, if the content of home-based telework being introduced is, in particular, more disadvantageous to workers, even if consent is obtained from the majority of the workers, the change in their labor contracts may not be effective if not all individual employees agree to it (Disadvantageous Change of Employment Rule Method). For example, if consent is obtained from a worker group regarding a decrease in commuting allowances and meal benefits but not all individual workers agree to the change, the introduction of home-based telework may be obstructed, and the pre-existing standards will continue to apply to those who have not agreed to it.[3] Consequently, even after introducing home-based telework, the pre-existing working conditions continue to apply to workers who have not provided consent. Furthermore, if the group agreement stipulates a procedure for advance consultation or the consent of the labor union when introducing a new working method, such as home-based telework, that procedure must be followed accordingly.

3.4 Actual introduction of home-based telework and review of the possibility of post-pandemic expansion

As mentioned earlier, numerous articles have reported that home-based telework will expand in Korea because of the COVID-19 pandemic. However, introducing and expanding home-based telework in Korea may not be straightforward, because of the prevailing passive perception of remote work. The feasibility of continuing home-based telework after the outbreak can be assessed by examining the legal aspects related to its implementation in Korea, such as the process and specifics of the introduction.

Most home-based telework in Korea is likely to be established based on the employer's right to issue personnel orders (the Right of Personnel Order Method), as seen in the judicial procedures investigated earlier. According to Korea's Labor Standards Act, when employers exercise the right to issue personnel orders, such as granting leaves or transfers, there must be a justifiable reason without exception (Article 23, Paragraph 1 of the Labor Standards Act). Instructing employees to temporarily switch to home-based telework because of stringent social distancing measures to prevent epidemics is considered a justifiable use of the right to issue personnel orders. This was performed to protect the safety of the workplace and workers from infection. The necessity of preventing COVID-19 was acknowledged based on precedents set by the Supreme Court of Korea. Moreover, there were no disadvantages because this method was implemented without altering existing working conditions or salary levels. Furthermore, it was executed after undergoing the required consultation procedure under the principle of good faith, for instance, by conducting urgent consultations with workers. Thus, it can be deemed justifiable home-based telework.

There is no guarantee that most home-based telework mentioned earlier will continue after the outbreak. To assess their usefulness and efficiency, tests should be conducted during this period to identify potential productivity issues. Thus, an appropriate method for home-based telework could be developed and expanded after the outbreak. However, workers gradually returned to industrial sites after successfully preventing the spread of the pandemic (48). During this period of increased infection rates, home-based telework was implemented in Korea as a crisis management measure, but no research has been conducted to explore its potential as a long-term replacement for face-to-face work. This situation may have hindered the possibility of conducting such research. Moreover, home-based telework was not initially designed but rather implemented as an emergency response. While the number of companies applying for support for home-based telework infrastructure increased significantly

3 Supreme Court, November 14, 2019, Pronouncement of Ruling No. 2018da200709 is a ruling that states that the application of the salary peak system to the relevant worker is not effective if the employer fails to obtain the consent of the individual worker who is against the introduction of such a system on the change in the labor contract, even though the labor union organized with a majority of the workers has agreed on such an introduction, which decreases the salary after a certain age. Recently, there has been considerable controversy regarding this ruling, and it has been argued, for example, that it is a decision that ignores the uniform and across-the-board nature, an important function of employment rules. For example, Hyungbae Kim, Disadvantageous Change of Employment Rules and Advantageous Provisions of Labor Contract, Society of Labor Law Theory and Profession, Labor Law Forum No. 29, 2020. pp. 4 onward. Joonhee Lee, Superiority and Inferiority Relation between the Effects of Employment Rules and Labor Contract – Around the Supreme Court Pronouncement of Ruling No. 2018da200709 dated November 14, 2019, Society of Labor Law Theory and Profession, Collection of Treatises related to Labor Law No. 48, 2020.4. pp. 383 onward.

during the pandemic, it is crucial to examine the nature of the changes in employment rules required for this support. If the changes only maintained the previous working conditions, they could be considered ordinary changes. However, if the conditions were lowered, this would be disadvantageous. The Korean government's limitation on qualified applicants for home-based telework support for SMEs suggests that the possibility of working conditions being lowered for these businesses is low, indicating ordinary changes. Therefore, it is more likely that the expansion of home-based telework in Korea will be limited to SMEs that have applied for infrastructure support. Larger Korean companies that were highly competitive and productive before the pandemic may have remained passive in adopting home-based telework even after the outbreak.

The most significant concern in introducing home-based telework in Korea is the potential change in working conditions. The issue revolves around whether existing service regulations can be maintained when home-based teleworking is implemented uniformly for all employees or specific job groups. If teleworking is introduced without altering the previous working conditions, it is considered an ordinary change in employment rules, with the only difference being a change in the workplace. The procedure for this change typically involves considering the collective opinions of the worker group. However, if the change in working conditions negatively affects employees, for instance, if previous conditions are downwardly adjusted, the consent of the worker group and, in some cases, that of individual workers regarding changes in labor contracts may be required. Obtaining consent can be challenging in such cases. Various factors must be considered, such as whether home-based telework will be as productive as face-to-face work and whether certain benefits such as transportation allowances or meal subsidies should continue to be provided when the nature of home-based telework. For example, if commuting allowances and meal benefits are part of the regular salary paid to all employees in Korea,[4] they are expected to be maintained even when transitioning to home-based telework. However, employers may hesitate to maintain these benefits if productivity is not guaranteed. Additionally, employers may be reluctant to pay salaries based on previous working hours because of the rigidities imposed by the Labor Standards Act, which is a method of payment per working hour, especially if there are no clear productivity or performance evaluation criteria.

Implementing blanket wage systems or discretionary work systems that allow for the flexible utilization of working hours and salaries would be ideal, but as discussed earlier, this is not a straightforward solution. Moreover, workers who have engaged in home-based telework may desire to return to face-to-face work if the home-based work environment changes or if they prefer working at the workplace. However, the procedures for transitioning between face-to-face and home-based telework cannot be resolved solely through legal principles related to disadvantageous changes in employment rules. Approaching an agreement between a company and an individual worker on the change in the working method as collective consent (protection) may lead to the possibility of future working method adjustments owing to the inflexibility of the system.

In a country such as Korea, with a pre-dominating face-to-face work culture, the introduction of home-based telework is likely to result in changes to existing working conditions. There might be concerns that teleworking may not guarantee the same level of productivity as face-to-face work because of potential issues such as poor productivity, the absence of a performance evaluation system, and difficulties in remote management, which are typically available in a physical workplace. Consequently, Korean employers may be more inclined toward adopting methods that involve certain disadvantageous changes for employees. One way to address this is through consultation between workers and management. However, worker-management relations in Korea often do not favor such cooperative approaches, leading many to prefer the resolution of such matters through legal means. Figure 7 illustrates the legal structure governing the adoption of home-based teleworking.

Indeed, during the COVID-19 pandemic, temporary home-based telework was implemented in Korea while maintaining previous working conditions. If such telework were accompanied by a reduction in salaries, many workers would likely choose to continue face-to-face work, even at the risk of infection, rather than accept the changes. Therefore, maintaining existing working conditions when introducing home-based telework in Korea is crucial for its successful adoption. A culture of negotiation and cooperation between workers and management will play a key role in navigating any potential downward changes in working conditions.

However, past worker-management relations in Korea have not been cooperative. There has been considerable distrust between workers and management, leading to emotional opposition over the division of benefits between employers and workers. According to the World Economic Forum's Global Competitiveness Report 2019, Korea ranks 130th out of 141 countries in terms of "Cooperation in Labor-Employer Relations," highlighting the challenges in achieving cooperation between the two parties (49). Given this situation, the confrontation between workers and management over the introduction of home-based telework in Korea can lead to difficulties in finding smooth resolutions.

The rapid increase in home-based telework in Korea since the COVID-19 pandemic has led to diverse assessments of its effectiveness. However, as most telework was implemented as a measure against infection, it primarily involved a change in the place of work without altering the existing working conditions, which helped avoid significant implementation issues. Additionally, as the Korean government managed to control the outbreak to some extent, many workers are returning to their workplaces despite the ongoing situation. Consequently, it is challenging to conclude that Korea has had the opportunity to fully embrace and implement home-based telework.

In Korea, a smooth and uniform introduction of home-based telework for all employees or specific workgroups can only be achieved if there are no changes to the existing working conditions. If any changes are made to working conditions that disadvantage workers, consent must be obtained following legal principles related to disadvantageous changes in employment rules. Even with the consent of the worker group, individual workers' consent regarding changes in their respective labor contracts is also necessary. If home-based telework is introduced with the consent of individual workers without changing the employment rules, any changes that are not in line with existing working conditions will be invalidated, and workers should

4 Supreme Court 1996.5.10. Pronouncement No. 95da2227, etc.

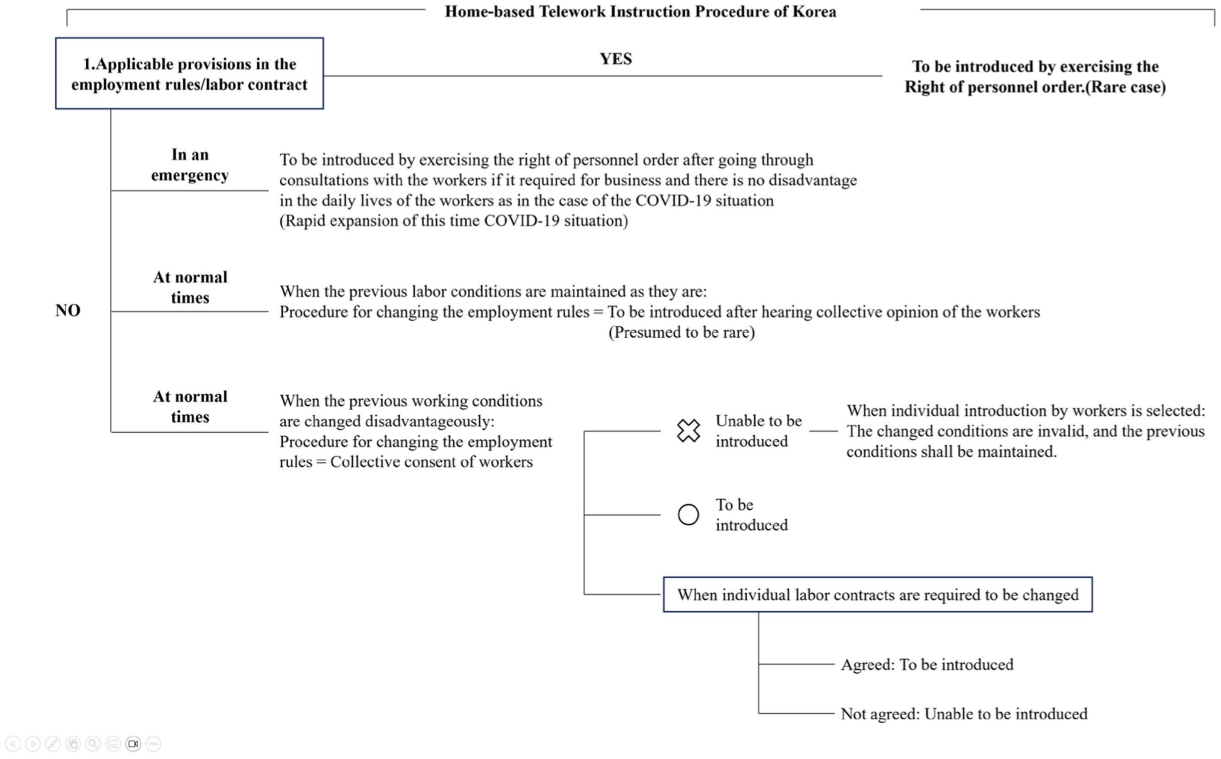

FIGURE 7
Home-based telework instruction procedure.

be treated under their previous conditions (as stated in Article 97 of the Labor Standards Act[5]).

Although Korea possesses superior technical capabilities for developing "untact" technologies (technologies that enable contactless or remote interactions), the introduction and expansion of home-based telework require a cautious approach. To ensure successful implementation, it is essential to await suitable opportunities to conduct additional experiments and establish flexible operational conditions for the system to ensure a successful implementation. An environment for introducing improvements, such as telecommuting, should be prepared to facilitate collaboration with advanced technologies and ensure effectiveness. Figure 8 illustrates this process in detail.

4 Discussion

COVID-19 may become an endemic issue, particularly considering the recent discovery of asymptomatic infections (50). The stealth characteristics of infectious diseases, combined with the changes brought about by the Fourth Industrial Revolution, emphasize the need to transition to contactless methods, such as home-based telework. The COVID-19 situation has had various impacts on the labor market in Korea, sparking a preference for novel working methods over rigid face-to-face approaches. However, home-based telework is primarily a temporary measure to combat infections, and its introduction in Korea requires careful consideration and experimentation to assess its suitability.

A major obstacle to expanding home-based telework in Korea is the lack of institutional support mechanisms. The Korean legal principles concerning disadvantageous changes in employment rules must be adjusted to accommodate future working methods. The introduction of home-based telework should not be obstructed by worker groups' failure to obtain consent for changes that may be perceived as disadvantageous. Instead, individual workers should be allowed to choose home-based telework based on their voluntary and genuine intentions. Protection should not hinder individual choices made freely. Additionally, if the consent of the worker group is obtained, pursuing further changes in individual labor contracts would be unnecessary, as coordinated worker and management autonomy has already been achieved. In the digital era, where jobs are evolving with greater autonomy and multidimensionality, group-based protection methods from traditional labor laws need to coexist with individual autonomy. A negotiation culture that ensures a win-win situation for both workers and management is crucial. Instead of strictly adhering to old worker protection methods, a more strategic and calculative negotiation culture is required to introduce home-based telework, which improves productivity and worker treatment.

5 Article 97 of the Labor Standards Act: If the working conditions set by a labor contract fall short of the working conditions prescribed in the employment rules, the part of the labor contract shall be invalid. In this case, for the part invalidated, the standard prescribed in the employment rules shall be complied with.

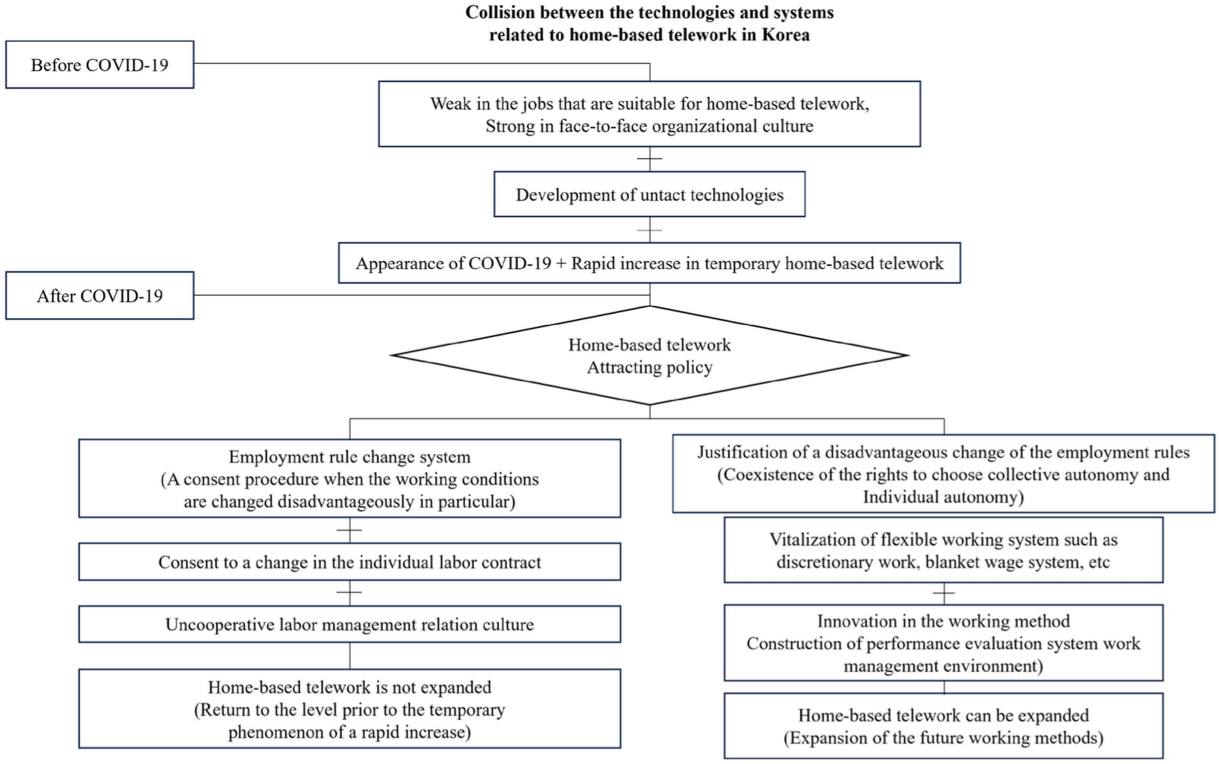

FIGURE 8
Collision between the technologies and systems related to home-based telework in Korea.

The expansion of untact technology may foster the growth of home-based telework, but it may face challenges due to inflexible Korean labor laws, judicial precedents, and worker-management relations. If untact technology is well developed, but necessary legal and organizational changes do not occur, Korea may revert to the pre-pandemic period, or implementing change may take considerable time. Originally, home-based telework was more common in IT companies, such as Facebook and Twitter. However, the COVID-19 pandemic has forced the use of untact methods in all aspects of production, including the manufacturing industry. Companies leading the "new normal" are creatively redesigning productivity through home-based telework and innovative working methods. The rigidity of existing systems and organizational cultures that fail to keep up with technological advancements may become an additional hurdle for companies to overcome after a pandemic.

5 Conclusion

This study has critically examined the profound implications of the COVID-19 pandemic on the Korean labor market, specifically focusing on the dynamics of home-based telework. It is evident that home-based telework has emerged as a transformative response to the challenges posed by infectious diseases, marked by advantages such as increased productivity and an enhanced safety framework. However, the long-term viability of home-based telework after the pandemic remains uncertain. To become a stable and enduring system in the long run, it requires legal and social consensus on issues such as labor-management agreements, legal procedures, and job conditions. Moreover, there is a need for the existing institutional framework to evolve toward a more forward-looking direction. As technology, such as untact technology, advances, the labor market needs to adapt accordingly. Lack of innovative changes in the legal and social aspects could hinder the technology's ability to establish a suitable work environment.

In this light, this study provides comprehensive insights into the contemporary work landscape post-pandemic and offers strategic guidance for optimizing the potential of home-based telework while adeptly addressing its multifaceted challenges. It sets the stage for a more efficient, harmonious, and productive workforce in the era beyond the COVID-19 pandemic. The implications of this research are instrumental for organizations and policymakers seeking to navigate the evolving work dynamics and enhance the well-being of both employees and employers.

This study focuses on the early changes during the onset of the COVID-19 pandemic and perspectives regarding those changes. The global spread of the coronavirus has led to the activation of a culture emphasizing non-contact practices. A prominent transformation in work patterns, highlighting the significance of non-contact interactions, is the adoption of telecommuting or remote work. However, it remains uncertain whether the utilization of such work forms will continue to increase after the conclusion of the COVID-19 pandemic. Therefore, future research may need to investigate changes in work patterns over an extended period. Additionally, considering the evolving nature of industry structures and work patterns over time, research taking into account both job characteristics and industry characteristics is deemed necessary.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found at: https://www.kwdi.re.kr/, https://www.moel.go.kr/english/, http://www.fki.or.kr/Common/ Download.aspx?id = 2dfd975c-5e1f-48aa-a550-595211ae3d8f.

Author contributions

JC: Conceptualization, Writing – original draft, Writing – review & editing. SL: Conceptualization, Writing – original draft, Writing – review & editing. BP: Data curation, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Determinants of financial inclusion in households in Peru

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The issue of financial inclusion considers access to and use of quality financial services by household members and different types of companies around the world, allowing us to reach the opportunities that the globalized world offers us. The objective of this research was to identify the socioeconomic factors that determined the inclusion of households in the financial system in Peru in the period of 2021. A quantitative approach was considered, which was non-experimental with a descriptive and correlational design and in which 81,441 pieces of data were obtained from the National Household Survey (ENAHO) of the National Institute of Statistics and Informatics, applying a logit binomial regression. It was determined that 47.02% of households were included in the financial system; 61.93% of those surveyed had their residence in the urban area; on average, respondents had incomplete secondary education; the age of the respondents on average was from 25 to 44 years; the average economic income of the household was less than $251 per month; 72.18% were represented by men as heads of the household and the rest by women; most of the respondents had a cohabiting marital status; the social conditions showed that 23.82% were in the group of being poor; and the majority of households did not have a property title. The determinants of financial inclusion in Peruvian households for 2021 were the area of residence, educational level, age of the respondent, economic income, gender of the respondent, marital status, social status, and property title.

KEYWORDS

inclusion, economic income, education, financial system, household

1 Introduction

At the global level, financial inclusion is a fundamental factor for the functioning of the world economy, and it is also very important, given that a country with high financial inclusion will be able to improve the economic and social growth of its most vulnerable citizens who have lower incomes, thus improving their quality of life and boosting economic activity (Galor and Zeira, 1993; Robert et al., 2013; Datta and Singh, 2019; Suresh et al., 2022). However, one of the main aspects of the current world economic panorama is the growing importance of financial markets at the international level, in which the majority of residents of different countries trade assets, shares, bonds, and financial instruments, as well as bank deposits denominated in different currencies (Stiglitz, 2009; Arun and Kamath, 2015; Huang et al., 2022; Zeraibi et al., 2023).

The aforementioned point is corroborated by Cermeño and Roa (2013), who established that most economies showed an average of 19% of people having a current credit, with a sustained growth in the number of points to carry out transactions, especially of automated teller machines (ATMs). However, there is a significant delay in the levels of access with respect to that of the most developed economies since only 65% were received in the formal financial sector.

Complementarily, there is some important evidence on financial inclusion that has showed important results; for example, Tuesta and Sorensen (2015), who established that the three dimensions that determine financial inclusion are access, since 50% of bank branches are in the capital; use, with was 47.8% receiving work or sale payments via bank branches; and barriers, in the case of Argentina. The authors Suárez and Pacheco (2017) developed the regulatory index to improve financial inclusion and compare with the Latin American countries Argentina, Brazil, Chile, Colombia, Mexico, Paraguay, Peru, and Uruguay, thus finding important results for Peru, since it was in the first position when it came to promoting credit with an index of 1.9. Finally, there was Argentina with 1.1, Brazil with 1.4, Chile with 1.25, Colombia with 1.75, Mexico with 1.35, Paraguay with 1.40, and lastly, Uruguay with 1.50.

In addition, other investigations have been conducted, such as that of Anaya-Narváez and Romero-Álvarez (2018), who demonstrated that there is an inverse relationship between monetary poverty and financial inclusion. The variable that most influences a household to have a greater probability of accessing the financial system is the educational level of the head of the household; in addition, if the household receives direct state aid and if the head of the household is a woman, the chances of financial inclusion are reduced. According to Cardona-Ruiz et al. (2018), being a woman in Colombia has a negative impact on financial inclusion. Taking into account the estimates made, it is seen that being a woman reduces the probability of an individual having an account in the financial system by 9.5 percentage points; the person having a debit card by 11.7 percentage points; a person having a debit card in her name by 10.7 percentage points; and the probability that the person uses a credit card by 3.9 percentage points (Imai et al., 2010; Arun and Kamath, 2015; Orazi et al., 2021).

Complementing the aforementioned, at the Latin American level, considering Mexico and other countries as a reference, it was determined that the level of financial inclusion reaches 38.3 percentage points for the evaluated country, which is a very low result compared to that of other continents. It is also displayed that women (35.9%), people over 60 years of age (29.6%), people from rural areas (31.7%), people with lower socioeconomic levels (31.4%), and people with lower educational levels (people who have a primary level have 35.9%) are the most financially excluded groups. Likewise, in Mexico, older adults have high financial knowledge (0.7749). In addition, it is confirmed that there is a significant relationship ($p < 0.01$) (Rodríguez-Raga and Rodríguez, 2016; Ferraz and Ramos, 2018; Grupo Crédito, 2022).

At the Peruvian level, in 2019, 44.9% of people in the Economically Active Population (EAP) and in an employed situation (people who work in the formal and informal sector) had access to a payment card or account, which shows that less than half of the employed were included in the financial system. In this regard, it is observed that inclusion is greater in the group of people aged between 25 and 40 years old (50.5%), people who have a university education (79%), and people who live in urban areas (49.2%). Likewise, it is observed that the lowest levels of financial inclusion occur in the group of people aged 56 and over (38%), people with primary education (24%), and people who live in rural areas (26%). According to INEI (2020), the number of people who have an account in the financial system increased from 43.4% of the total population in the last quarter of 2019 to 49% in the last quarter of 2020.

That is why Lahura and Alonso (2016), as of December 2014, found that 19% of all debtors had at least one loan in some entity of the financial system, which indicates that there would be a significant margin for expanding the tax base. It was also found that the rural banks Edpymes and Financial are the entities with the highest rates of informality. In addition, the loans obtained by the informal banks were granted mainly by financial institutions, municipal savings banks, and banks, while the most important amounts correspond to loans for micro and small businesses (Mypes), consumer loans, and credit cards. Moreover, the tax evasion of informal clients of the financial system would have been approximately 0.7% of the GDP in the year 2014, for which both quantitative and qualitative methods were used, and this is specifically based on the four most representative banks of the financial system, with variables such as corporate reputation (through the Merco index value) and financial solvency taken from the companies' reports (2011–2014). Managing to demonstrate that the reputation of each mentioned bank is very important because it has a positive impact on the financial results of banks in the local financial system, and this reputation would also have an effect on economic solvency.

One of the results that is closely related to financial inclusion in Peru is the one developed by Cámara et al. (2013), who estimated a series of probit-type models that allowed them to analyze the correlations between financial inclusion and some explanatory variables. The variables taken into account were possession and use of formal financial products, geographical area, being a woman, marital status, literacy, annual spending, income, age, educational level, savings level, household indebtedness level, level of annual spending on mobile phones, and the number of population centers. They used information from the National Household Survey (ENAHO) of the year 2011, and it was concluded that those groups were recognized as more vulnerable; that is, women, inhabitants of rural areas, and young people are the ones who have the greatest difficulties in entering the formal financial system.

In this sense, since there is asymmetry on the part of the people who influence their financial inclusion, it is important to answer the following question: What were the socioeconomic factors that determined that families in the Puno region were included in the financial system in the year 2021?. The objective of the research was to identify the socioeconomic factors that determined the inclusion of households in the financial system in Peru in the period of 2021.

2 Literature review

2.1 Finance

Finance is the set of economic activities that are related to money, whether in business, banking, or the stock market, taking place in a group of markets or financial institutions of national or international scope (Padilla and Manuel, 2014).

2.2 Finance system

The financial system is "A set of institutions, instruments and markets through which savings are channeled toward investment (Joaquín and González, 2008)".

2.3 Financial inclusion

Financial inclusion is the result of the interaction of factors that affect the demand for financial services by households and firms and their supply by financial institutions (Roa and Carvallo, 2018).

Financial inclusion in recent decades has gained significant relevance in the world, given that every day it is evidenced as an important tool that helps families, households, and society as a whole to boost economic prospects; therefore, this has positive consequences on the economic growth of a country, since it not only contributes to improving economic conditions but also the quality of life of its population (Jappelli and Pagano, 1994; Hassan et al., 2011; Li et al., 2013; Bruhn and Love, 2014; Bohl et al., 2015; Zeraibi et al., 2023). In addition, the use of financial services and products in these times has become very important for the private and public sector, since it makes it possible to dynamize the economy as a whole, generating greater opportunities among the individuals who participate, improving the optimal achievement of the objectives that people, companies, and organizations, among others, may have set. The products offered by financial services groups include savings loans, and insurance, among others (Loayza and Ranciere, 2006; Beck et al., 2007; Jeanneney and Kpodar, 2011; Dupas and Robinson, 2013; Robert et al., 2013; Rodríguez-Raga and Riaño-Rodríguez, 2016; Ferraz and Ramos, 2018; Kabakova and Plaksenkov, 2018; Orazi et al., 2019).

2.3.1 Asymmetric information

Asymmetric information occurs when one participant in an economic transaction has more information relevant to said transaction than the other participant. This is why asymmetric information presents three problems (Wong et al., 2012):

- *The problem of moral hazard*

Moral hazard refers to situations in which one side of the market cannot observe what the other side is doing. For this reason, it is sometimes called the hidden action problem (Varian, 2015).

- *The problem of adverse selection*

Adverse selection is the type of market failure that will occur when products of different quality are offered at a single price thanks to a lack of information; that is why a greater number of low-quality products are sold, and on the other hand, too little quantity of good-quality products are sold (Varian, 2015).

- *The problem of herd behavior*

Herd behavior refers to the fact that a certain group of people imitate a crowd during a certain period, often not considering individual information that suggests following another path (Banerjee, 1992).

2.3.2 Asymmetric information theories

2.3.2.1 Credit rationing theory

This theory detects market failures caused by moral hazard and adverse selection as the root of credit rationing when there is asymmetric information. This lack of information leads to credit rationing, when the interest rate or size of the loan chosen alters the behavior of the borrower (moral risk), or the risks that occur when matching applicants (good and bad) to the credit (adverse selection). There is also the class of customer models with affinity, with the assumption that customers with the longest time have priority access to some credit; however, these models may also need asymmetric information to generate the distribution of credit (Sánchez-Daza, 2001).

2.3.2.2 Portfolio theory

This theory, which began with Harry Markowitz in 1952, is based on plurality, which is the main concept of creating optimal portfolios, which are combinations of assets with the best risk–return relationships. This risk is evaluated by estimating the variance of the expected returns linked to the assets that are adjusted to it. On the other hand, diversification when investing in more than one asset aims to reduce the level of risk that is linked to different factors of the company, which, unlike investing in a single asset, would be less exposed. However, in any case, the risk would never be reduced to zero, since there are external factors that prevent it, so this exposure to risk makes it not diversifiable. For this, it is advisable to have a portfolio of prudent and easy-to-manage assets, and the correct number is one that, by adding an additional asset, means the risk reduction is not significant (Bejarano et al., 2013).

2.3.3 Information asymmetry in inclusive financial markets

Addressing the issue of the presence of information asymmetries is broad. Therefore, Sánchez-Daza (2001) highlights the difference that must be made between uncertainty and asymmetric information, where in the first case it is oriented toward the existence of incomplete information and in the second case to highlight the non-availability of information in the market. In the area of microfinance, the existence of these two aspects is common. Since there are moral risks and

adverse selection to which they can induce us, it is because of them that the operation of microfinance cannot achieve efficiency in the Pareto sense, which is also caused by the existence of externalities in transaction costs.

In addition, there is an imperfect financial market, which seeks to be inclusive but has as its breaking point a traditional financial system and, in some cases, high rates of informality. That is why asymmetry cannot be seen, much less quantified, while it occurs, but they it be perceived after it produces the effects of risk and uncertainty for both financial companies and users (Sánchez-Daza, 2001).

That is why, in finance, the existence of information asymmetry definitively alters the assumption of efficiency, the existence of risk neutrality, and the existence of optimizing behavior of agents whenever financial entities receive incomplete information on the solvency and credit quality of the user, which affects the credit evaluation process. That is why financial companies are suggested to approach it from a comprehensive perspective, guaranteeing the implementation of effective financial education, monitoring, and sustainability (Bejarano et al., 2013).

3 Materials and methods

3.1 Approach, type, and design of the investigation

The present investigation undertook a quantitative approach, of a non-experimental type, with a descriptive and correlational design because, in this situation, the variables were analyzed from their natural state, since there was no manipulation to be able to visualize, contrast, and verify their behavior. Likewise, the logit-type regression model was used, applying cross-sectional data from the year 2020 with data from the National Household Survey of the National Institute of Statistics and Informatics (INEI) (Waldo, 2014; Carlos and Sampieri, 2017).

3.2 Techniques and instruments for collecting information

A documentary review was carried out, which allowed for a review and compilation of information extracted from articles and books, referring to the research topic, with the purpose of selecting information to compare with the results of the work.

The data used were from a secondary source, namely, the database of the National Household Survey (ENAHO) of the National Institute of Statistics and Informatics (INEI). The processing was performed using the STATA 16.0 statistical program, which allowed us to perform a descriptive analysis and then perform the Logit model regression and the regressor selection tests necessary to validate our model.

3.3 Data

The population for this research was the number of people considered in the ENAHO database, who were registered by the INEI for the year 2021, amounting to approximately 1,237,997 people.

In addition, according to the INEI, the sample considered for the ENAHO survey for 2021 was of the probabilistic, area, stratified, multistage, and independent type in each study region at the level of Peru, where a confidence level of the sample results of 95% was considered. Moreover, to establish the determinants of financial inclusion of households in Peru, household members aged 14 years and above were considered, with defined socioeconomic characteristics and a maximum level of education achieved among those who have conditions of access to the financial system. The total sample for the study group was thus 81,441 observations.

3.4 Variables

The study variables for this research were obtained from the ENAHO-2021 database, which were financial inclusion, area of residence, level of education, age, family income, gender, marital status, social status, and property title (Table 1).

3.5 Approach to the econometric model

For the present investigation, the logit-type model was used, which is represented as follows:

$$Prob(Y=1) = e\,\hat{}\left(X\,\hat{}'\,\beta\right) / \left(1 + e\,\hat{}\left(X\,\hat{}'\,\beta\right)\right)$$

$$\begin{aligned}\text{Prob (Financial inclusion)} = 1 \\ = e^{\Lambda}(\beta\_0 + \beta\_1 \text{Area of residence} + \beta\_2 \text{Level of education} + \beta\_3 \text{ Respondent}^{\Lambda}\text{'s age} \\ + \beta\_4 \text{Family income} + \beta\_5 \text{ Respondent}^{\Lambda}\text{' s gender} \\ + \beta\_6 \text{Marital status} + \beta\_7 \text{ Social status} + \beta\_8 \text{ Title deed}) \\ /(1 + e^{\Lambda}(\beta\_0 + \beta\_1 \text{ Area of residence} + \beta\_2 \text{ Level of education} \\ + \beta\_3 \text{ Respondent}^{\Lambda}\text{' s age} + \beta\_4 \text{Family income} + \beta\_5 \text{ Respondent}^{\Lambda}\text{' s gender} \\ + \beta\_6 \text{ Marital status} + \beta\_7 \text{ Social status} + \beta\_8 \text{Title deed}))\end{aligned}$$

4 Results

To determine whether there was financial inclusion, it was arranged to ask the respondents if they had at least one savings account or salary account, fixed-term account, checking account, and time and service compensation account (CTS). According to the sample obtained, 52.98% of the respondents (43,145 people) answered that they did not have an account in the financial system in 2021, while 47.02% of the respondents (38,296 people) answered that they did have an account in the financial system, showing that the majority of households in Peru do not have access to the financial system due to various information asymmetries that hinder financial inclusion (Table 2).

In the case of the socioeconomic characterization of households in Peru, in the area of residence, it was observed that 38.07% of the surveyed population (31,006 people) of households in Peru lived in rural areas, while the remaining 61.93% (50,435 people) lived in an urban area, showing that a slight majority of homes are located in urban areas (Table 3).

Educational levels were also examined. The analysis of the results revealed that the highest percentage of those aged 18 and above had completed their secondary studies, at 19.02%, followed by those with incomplete secondary studies at 15.54%. Meanwhile, 12.10% of the

TABLE 1 Characteristics of the variables.

Variables	Indicator	Category	Data type	Measurement scale	Fountain
Dependent					
Financial Inclusion	Has access to the financial system	1: Yes 0: No	Qualitative	Nominal	INEI
Independent					
Area of residence	Household location	1: Urban 0: Rural	Qualitative	Nominal	INEI
Educational level	Level of education	1: No level 2: Initial 3: Incomplete primary 4: Complete Primary 5: Incomplete Secondary 6: Secondary complete 7: Incomplete non-university superior 8: Full non-university high school 9: Incomplete university high school 10: Full university high school 11: University postgraduate	Qualitative	Ordinal	INEI
Age	Life years	1: 18 to 24 years 2: 25 to 44 years 3: 45 to 64 years 4: 65 years and older	Quantitative	Discreet	INEI
Income level	Amount of monthly income received	1: Less than $251 2: From $251 to $502 3: From $503 to $753 4: From $754 to $1,005 5: S/1006 to $1,256 6: Above $1256.00	Quantitative	Continuous	INEI
Marital status	Marital status	1: Married 0: Single	Qualitative	Ordinal	INEI
Gender	Gender	1: Man 0: Women	Qualitative	Nominal	INEI
Social status	Level of social status	1: Poor 0: Not poor	Qualitative	Ordinal	INEI
Title deed	The household has title deed	1: Yes 0: No	Qualitative	Nominal	INEI

TABLE 2 Respondent financial inclusion, 2021.

Category	Frequency	Percentage
No	43,145	52.98%
Yes	38,296	47.02%
Total	81,441	100%

population had completed their primary level studies, and non-university higher level studies reached 5.80%, while only 5.56% of those surveyed completed university studies, as can be seen in Table 4.

For the family income variable, we considered the income generated by the person per month, this being a product of their main and secondary activity in Peru. As demonstrated in Table 5, the highest percentage of respondents generated a monthly income of less than the minimum living wage of 2021, which was $251, represented by 81.91% (66,710 people). Following this, 11.56% of those surveyed (9,416 people) generated a monthly income ranging from $251 to $502, while 3.76% (3,064 people) generated an income between $503 and $753, 1.38% (1,123 people) generated an income from $754 to $1,005, and 0.61% (499 people) generated an income from $1,006 to $1,256.

TABLE 3 Area of residence of the respondent.

Category	Frequency	Percentage
Rural	31,006	38.07%
Urban	50,435	61.93%
Total	81,441	100%

TABLE 4 Educational level.

Category	Frequency	Percentage
No level	5,707	7.01%
Initial education	3,611	4.43%
Incomplete primary	17,853	21.92%
Complete primary	9,856	12.10%
Incomplete high school	12,652	15.54%
Completed secondary	15,491	19.02%
Incomplete non-university higher education	2,422	2.97%
Complete non-university higher education	4,722	5.80%
Incomplete college	3,691	4.53%
Complete university superior	4,530	5.56%
Masters Ph.D	906	1.11%
Total	81,441	100%

TABLE 5 Monthly primary and secondary household income.

Category	Frequency	Percentage
Less than $251	66,710	81.91%
From $251 to $502	9,416	11.56%
From $503 to $753	3,064	3.76%
From $754 to $1,005	1,123	1.38%
From $1,006 to $1,256	499	0.61%
Above $1256.00	629	0.77%
Total	81,441	100%

In the case of gender, 27.82% of the people surveyed (22,655 people) were women, while 72.18% (58,786 people) were men (Table 6).

Regarding marital status, it can be seen that the highest percentage was married, being represented by 39.60% (32,254 people). On the contrary, the single population was represented by only 4.00% (3,258 people). Those in a situation of cohabitation were 33.31%, followed by widowers at 9.32%, and finally those separated or divorced at 13.77% (Table 7).

As for socioeconomic conditions, the present investigation considered non-extreme and extreme poor people as poor and non-poor people were considered as they are in the ENAHO database. When analyzing the condition of poverty or non-poverty, it was observed that the non-poor comprised a higher percentage of 76.18%, which is equal to 62,045 people, and 23.82% were considered poor, which is equivalent to 19,396 people (Table 8).

TABLE 6 Gender.

Category	Frequency	Percentage
Woman	22,655	27.82%
Man	58,786	72.18%
Total	81,441	100%

TABLE 7 Marital status.

Category	Frequency	Percentage
Single	3,258	4.00%
Widow(er)	7,593	9.32%
Separated/divorced	11,212	13.77%
Cohabitant	27,124	33.31%
Married	32,254	39.60%
Total	81,441	100%

TABLE 8 Socioeconomic status.

Category	Frequency	Percentage
Not poor	62,045	76.18%
Poor	19,396	23.82%
Total	81,441	100%

When analyzing the home ownership title, it was observed that a higher percentage of homes did not have a property title, at 49.85%, which is equal to 40,598 households; 47 79% of households had a property title, and only 2.36% were in the process of obtaining a property title (Table 9).

After analyzing the behavior of the determinants of financial inclusion in households, the analysis of descriptive statistics was conducted, with financial inclusion divided into two categories, namely, whether the respondents were included or not included in the financial system, with a minimum and maximum value of 1 if included in the financial system and 0 if not included. It was found that, on average, only 47.02% were included in the financial system; on average, 61.93% of those surveyed were in an urban area; on average, the respondents had incomplete secondary education; on average, the age of the respondents was between 25 and 44 years; the average family income was less than $251 per month; 72.18% were men; most were cohabitants; 23.82% were considered poor; and on average, they did not have a property title (Table 10).

In addition, an analysis of the correlation of financial inclusion and its determinants was conducted, which is detailed below:

- The relationship between area of residence and financial inclusion is direct; that is, given an increase in the probability that the person is from an urban area, then the probability of accessing credit will increase, which is corroborated by the value of Pearson ρ equal to 0.1284, corresponding to a low positive correlation.
- The relationship between educational level and financial inclusion is direct; that is, if a person has a higher educational level, then the probability of accessing credit and/or loans tends to increase, which is corroborated by the value of Pearson's ρ equal to 0.1809, corresponding to a low positive correlation (Table 11).

TABLE 9 Property titles of the households.

Category	Frequency	Percentage
Yes	38,921	47.79%
No	40,598	49.85%
In process	1922	2.36%
Total	81,441	100%

TABLE 10 Descriptive statistics of the variables under analysis.

Variable	Mean	Standard deviation	Minimum value	Maximum value
Financial inclusion	0.4702	0.4991	0	1
Area of residence	0.6193	0.4856	0	1
Educational level	4.9770	2.4217	1	11
Age	2.8867	0.7301	1	4
Family income	1.2954	0.7708	1	6
Gender	0.7218	0.4481	0	1
Marital status	3.9519	1.1244	1	5
Social status	0.2382	0.4260	0	1
Title deed	1.5457	0.5432	1	3

- The relationship between respondent age and financial inclusion is inverse; that is, the older the person is, then the lower the probability of accessing credit and/or loans, which is corroborated by the value of Pearson's ρ equal to −0.0049, corresponding to a low negative correlation.
- The relationship between family income and financial inclusion is direct; that is, as family income increases, then the probability of accessing credit and/or loans tends to increase, which is corroborated by the value of Pearson's ρ equal to 0.2429, corresponding to a low positive correlation.
- The relationship between respondent gender and financial inclusion is inverse; that is, given an increase in the probability that the person is a woman, then the probability of accessing credit and/or loans tends to decrease, which is corroborated by the value of Pearson's ρ equal to −0.0362, corresponding to a low negative correlation.
- The relationship between marital status and financial inclusion is inverse; that is, given an increase in the probability that the person is not married, then the probability of accessing credit and/or loans tends to decrease, which is corroborated by the value of Pearson's ρ equal to −0.0235, corresponding to a low negative correlation.
- The relationship between social status and financial inclusion is indirect; that is, given an increase in the probability that the person is poor, then the probability of accessing credit and/or loans tends to decrease, which is corroborated by the value of Pearson's ρ equal to −0.1209, corresponding to a low negative correlation.
- The existing relationship between property title and financial inclusion is indirect; that is, given an increase in the probability that the home has property title, then the probability of accessing credit and/or loans tends to decrease, which is corroborated by the value of Pearson's ρ equal to −0.1061, corresponding to a low negative correlation.

In this sense, to establish the determinants of financial inclusion in households in Peru, the general hypothesis test of the research was contrasted using logit-type binary regression, and the following results were obtained:

In the case of individual significance, the following null and alternate hypotheses were raised:

$H\_0 : \beta\_i = 0$ Each parameter is equal to zero (they are not statistically significant).

$H\_1 : \beta\_i \neq 0$ Each parameter is different from zero (statistically significant).

Performing the individual analysis of the value of Z and its probability, the following was obtained:

- The "z" value of the area of residence is 6.26, which is greater than 2 in absolute value, and its probability is 0.000; therefore, this variable is significant at 5%, so it can explain the variability of financial inclusion.
- The "z" value of the educational level is 29.06, which is greater than 2 in absolute value, and its probability is 0.000; therefore, this variable is also significant at 5%, so it can explain the variability of financial inclusion.
- The "z" value of age is −6.08, which is greater than 2 in absolute value, and its probability is 0.000; therefore, this variable is significant at 5%, so it can explain the variability of financial inclusion.
- The "z" value of family income is 51.64, which is greater than 2 in absolute value, and its probability is 0.000; therefore, this variable is significant at 5%, so it can explain the variability of financial inclusion.
- The "z" value of gender is −2.72, which is greater than 2 in absolute value, and its probability is 0.000; therefore, this variable is significant at 5%, so it can explain the variability of financial inclusion.
- The "z" value of marital status is −4.13, which is less than 2 in absolute value, and its probability is 0.000; therefore, this variable is not significant at 5%; therefore, it cannot explain the variability of financial inclusion.
- The "z" value of the social condition is −12.36, which is greater than 2 in absolute value and its probability is 0.000; therefore, this variable is not significant at 5%; therefore, it cannot explain the variability of financial inclusion.
- The "z" value of property title is −7.98, which is greater than 2 in absolute value, and its probability is 0.000; therefore, this variable is not significant at 5%; therefore, it cannot explain the variability of financial inclusion.

Therefore, all the variables proposed in the model have individual significance, given that the value of $p > Z$ is less than 0.05 or 5%.

Analyzing the global significance of area of residence, educational level, age, family income, gender, marital status, social status, and property title, the following null and alternate hypotheses were proposed:

$H\_0: \beta\_i = 0$ All parameters have no global significance.
$H\_1: \beta\_i \neq 0$ All parameters have global significance.

Analyzing the statistical tests, the LR chi2(8) = 7,482,93, and its chi-square probability was less than 5%, thus leading us to reject the null hypothesis and accept the alternate hypothesis. Therefore, it can be indicated that they have global significance, and together, area of residence, educational level, age, family income, gender, marital status, social condition, and property title explain financial inclusion. Moreover, according to Pseudo R2, which is equal to 0.2664, 26.64% of the variation in financial inclusion is explained by area of residence, educational level, age, family income, gender, marital status, social condition, and property title (Table 11).

In this sense, for the members of households in Peru, the determinants of financial inclusion are the area of residence, educational level, age, family income, gender, marital status, social condition, and property title. Therefore, given the increase in the probability that the area of residence of the person is urban, then the probability of financial inclusion will increase by 2.76 percentage points; if the educational level of the person increases by 1, then the probability of financial inclusion will increase by 2.43 percentage points; if the respondent's age increases by 1 year, then the probability of financial inclusion will decrease by 1.57 percentage points; if the family income increases by 1, then the probability of financial inclusion will increase by 18.57 percentage points; if the probability that the person's gender is that of a man increases, then the probability of financial inclusion will decrease by 1.33 percentage points; if the probability that the marital status of the person changes from cohabiting to married increases, then the probability of financial inclusion will decrease by 0.80 percentage points; if the probability that the person's socioeconomic condition is poor increases, then the probability of financial inclusion will decrease by 5.60 percentage points; and if the probability that the household member has a property title increases, then the probability of financial inclusion will decrease by 3.10 percentage points (Table 12).

5 Discussion

After evidencing the determinants of financial inclusion for the Peruvian case, the results obtained largely agree with the research carried out by Anaya-Narváez and Romero-Álvarez (2018). It has been found that the most influential variable for a household to have a greater probability of accessing the financial system is the educational level of the head of the household. However, in the present investigation, the income level of the head of the household was found to be an equally influential variable as the educational level, given that it includes other characteristics of the household as determinants, such as the possibility that the household receives direct state aid, which allows them to reduce the probability of being financially included. In addition, if the head of the household is a woman, then the probability of financial inclusion decreases in the same way.

The present investigation is also partially coincident with what was determined by Rodríguez-Raga and Riaño-Rodríguez (2016) in terms of the determinants of access to financial products, which are the level of household income, educational level, gender, and the geographic location of the household; However, these authors also considered the use of public services and the number of people per room as influential variables, which are not part of our research but may be included in future research. In this sense, we can reinforce the results obtained also with what was found by López (2023), given that the results are very similar.

On the other hand, in this scientific article, it was evidenced that gender, age, and marital status are significant variables that influence the financial inclusion process, thus contradicting what was obtained by Millán Celis and Jiménez Quitián (2016), who determined, in their research, gender and age to be non-significant. Regarding age, it was found that the older the person, the greater the probability of financial inclusion; however, this contradicts what was obtained by García-Mata and Briseño-García (2021), who indicated that older adults as having financial ignorance. In addition, they identified that having a debit card, accruing savings in the last 12 months in a financial institution, and receiving government transfers in the last 12 months allow to expand the possibility of financial inclusion in Colombia.

It is important to highlight what was found by Hoyo (2014): in terms of individual characteristics, education, income level, and gender were determinants of financial inclusion, as in our research, since they are statistically significant and have a concordant relationship in the same way. These results coincide in the same way with those of Sotomayor et al. (2020), who considered that a good economic position of the individual, a better ability to pay, having better and higher economic income, physical assets, saving money, and having Internet services contribute to access to credit from the financial system.

TABLE 11 Correlation matrix between financial inclusion and its determinants.

Variables	Financial inclusion	Area of residence	Educational level	Age	Family income	Gender	Marital status	Social status	Title deed
Financial Inclusion	1.0000								
Area of residence	0.1284	1.0000							
Educational level	0.1809	0.3205	1.0000						
Age	−0.0049	0.072	0.0597	1.0000					
Family income	0.2429	0.1799	0.2214	−0.0219	1.0000				
Gender	−0.0362	−0.1636	−0.0314	−0.0301	−0.0098	1.0000			
Marital status	−0.0235	−0.0809	0.0026	−0.0411	0.0213	0.5411	1.0000		
Social status	−0.1209	−0.2344	−0.233	−0.1408	−0.1687	0.0732	0.0609	1.0000	
Title deed	−0.1061	−0.4564	−0.252	−0.1964	−0.1315	0.0822	0.0317	0.2132	1.0000

TABLE 12 Logit model estimation.

Variables	Coefficient	Standard error	Z-value	$p > Z$	[95% Confidence interval]		Marginal effects
Area of residence	0.1,110	0.0177	6.2600	0.0000	0.0762	0.1457	0.0276649
Educational level	0.0974	0.0034	29.0600	0.0000	0.0909	0.1,040	0.0243091
Age	−0.0629	0.0103	−6.0800	0.0000	−0.0832	−0.0426	−0.0157034
Family income	0.7442	0.0144	51.6400	0.0000	0.7160	0.7,725	0.1857087
Gender	−0.0533	0.0196	−2.7200	0.0070	−0.0918	−0.0148	−0.0133154
Marital status	−0.0321	0.0078	−4.1300	0.0000	−0.0474	−0.0169	−0.0080221
Social status	−0.2257	0.0183	−12.3600	0.0000	−0.2615	−0.1899	−0.056066
Title deed	−0.1243	0.0156	−7.9800	0.0000	−0.1548	−0.0938	−0.0310105
Constant	−1.0114	0.0589	−17.1800	0,0000	−1.1268	−0.8960	–
Logistic regression			Number of obs		=	81,441	
Log likelihood = −52,564 694			LR chi2(8)		=	7482,93	
Marginal effects after logit			Prob > chi2		=	0.0000	
y = Pr(Financial Inclusion) (predict)			Pseudo R2		=	0.2664	
= 0.47829833							

6 Conclusion

We found that 47.02% of the analyzed households in 2021 were included in the financial system. Most resided in an urban area (61.93%); most had, on average, an educational level of incomplete secondary school; the average age of the respondents was between 25 and 44 years; the average household income was less than $251 per month; 72.18% of household heads were men; most had a cohabiting marital status; 23,82were are poor; and most households did not have a property title.

The determinants of financial inclusion in households in Peru for 2021 are explained in 26.64% of the study population by area of residence, educational level, age, family income, gender, marital status, social condition, and property title. Moreover, area of residence, educational level, and family income were found to explain and positively influence financial inclusion. On the contrary, age, gender, marital status, social condition, and property title were found to negatively influence and explain financial inclusion.

Finally, if a person changes their area of residence to an urban one, increases their educational level by 1, and increases their family income level by 1, then the probability of their financial inclusion in each individual case would increase by 2.76, 2.43, and 18.57 percentage points, respectively. Moreover, if a person's age increases by 1 year, if the probability of their gender being that of a man increases, if their marital status changes from cohabitation to marriage, if their probability of being poor increases, and if the probability of their household's properties being titled increases, then the probability of their financial inclusion in each individual case would decrease by 1.57, 1.33, 0.80, 5.60, and 3.10 percentage points, respectively.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

JQ conceived and carried out the study. SA and DC contributed as studio mentors. MQ, GG, GC, LV, WQ, HM, and CR participated in the design, data analysis and writing of the scientific article. All authors reviewed and approved the research paper. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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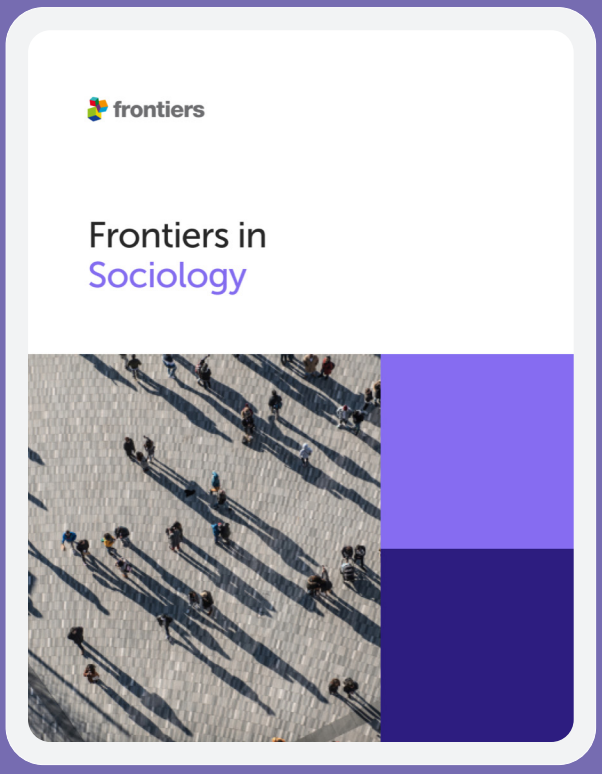

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