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Striving for Adopting and Adapting Information Technology: A Qualitative Study of Informal Skills Learners in Nepal

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Abstract

In this study, I explore how informal skills learners adopt (learn and use new digital tools) and adapt (modify their traditional learning practices to fit) these technologies in their everyday work setting. Drawing on a qualitative case study with fieldwork from pottery, metalcrafts, fast-food services, and motorcycle mechanics occupational sectors, we have used an interpretive approach guided by workplace learning theory with technological determinism insights. I have collected the data through kurakani (informal interviews) and observations with eight research participants, focusing on their experiences of using local (basic, manual) as well as information technologies. The findings reveal that although there is limited access to advanced tools and formal training, informal skills learners exhibit solid adaptability and initiative. With the technologies available, they learn new skills through different approaches, such as observation, imitation, and digital platforms like YouTube. It is explored that informal skills learners often rely on informal networks and self-directed learning to cope with technological transformations. The study concludes that there is an acute need for targeted support from the state and public institutions, including awareness programs and flexible training.

Keywords: informal skills learning, technology adaptation, SMEs, informal sector, digital devices

Introduction

Informal skills learning is an important component of Nepal's economy. Why? because there is a huge mass of the working population in the informal sector. Workers in this sector learn essential skills during the work (Baral, 2022). So, small-sized enterprises can be taken as the backbone of Nepal's informal sector. The sector provides livelihoods for many people and also sustains traditional occupational skills (Singh & Kharel, 2023). Most of such enterprises where informal skills learning happens are either private or family-run businesses. In such workplaces worker learners learn skills through different approaches such as observation, imitation, and interactions during the work. This kind of learning system is very important. As the reason, we can take

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their social mobility as well as poverty reduction in the context of Nepal.

It is obvious that the process of informal skills learning is experiential. So, it is context specific. Such learning is not like other types of non-formal and formal training which mostly depends on the types of work and the overall environment of the work. Furthermore, availability of mentors and social network also determines and quantity and quality of skills learning (Illeris, 2011). The informal skills learning process is gradual and flexible. Besides, informal skills learners face multiple challenges in getting the appropriate value of their acquired skills. They rarely get a chance to perform formal training programs (Bajracharya, 2022). So, informal skills learners are very vulnerable to rapid technological changes. We can see such challenges particularly in micro- and family-run enterprises where businesses are run with very limited resources. So, naturally, adoption of technological innovations for informal skills learners is slow (Baral, 2023).

The role of technology in informal skills learning, like in other sectors, has become very important these days. Both local traditional and modern information technologies are beginning to shape how skills are acquired and transferred in the informal sector during the work execution. Although the adoption of advanced tools such as ICT remains limited, even basic innovations can have a substantial effect on productivity, safety and security as well as learning processes (Chen, 2018; Ghimire, 2020).

Technology adoption, for informal skills learners in Nepal, means the choice to acquire and use digital tools to work and learn informally. Similarly, technology adaptation occurs when these learners reshape their daily work activities or exploit the technology to overcome existing barriers like low digital literacy, language divides, and limited internet bandwidth. Actually, successful informal learning relies on this dual process, where learners not only accept new IT tools but actively modify their practices to make the technology functional for their specific environments.

However, most of the informal skills learner's struggle in adopting and adapting to new technologies although they are motivated for this. This is more challenging for older workers and people in rural areas. Challenges include low digital literacy, poor digital infrastructure, and limited access to training opportunities (Adhikari & Molla, 2024). Besides, other economic constraints, socio-cultural factors and organizational practices also play a role in determining both the opportunities and limitations of technological use in small-sized enterprises (Chandler, 1995). Thus, there is unevenness in the process of technological adaptation. Some learners are making progress while others struggle to keep pace. In this study, I have used workplace learning theory and concepts of technological determinism to understand how informal skills learners tackle technological adoption (Illeris, 2011).

Workplace learning theory stresses on the importance of work-related learning such as experiential, socio-cultural, and informal learning, and their processes. Technological determinism stresses how the accessibility and nature of technology can shape learning opportunities and results. These theories support in understanding the dynamics of informal skills learners' challenges and opportunities presented by new technologies. So, there is an acute need to know the situation of adoption and adaptation of new technologies by informal skills learners in Nepal. The main focus of this paper is to fill this gap by collecting stories and experiences of workers in different work sectors such as pottery, metal arts and crafts, fast-food services and motorcycle service mechanics. The key research question steering this research is: How do informal skills learners in small-sized enterprises in Nepal adopt and adapt to new technologies?

This research aims to inform policymakers, practitioners, educators and students about the realities of technological change in the informal occupational sector and to propose ways to better support lifelong learning and skills development in Nepal, focusing on both local and information technologies. I review the relevant literature to provide further

background and context for this study in the following section.

Understanding Informal Skills Learners' Use of Technology: A Literature Review

Focusing on how technology influences skill development, this section provides a synthesis of key literature reviewed under the themes of informal skills learning and small-sized enterprises in Nepal. Characteristics of informal learners and their use of local and advanced technologies, together with the impact of digital transformation are covered in this section. Furthermore, theoretical perspectives on technology and its use by informal learners in their occupations are also discussed. Then, the section provides the existing research gaps that lays the groundwork for understanding the complex relationship between informal learning and technology in Nepal's informal sector.

Informal Skills Learning and Informal Skills Learners

Informal skills learning is the process by which workers acquire occupational competencies outside of formal educational or training systems, typically through workplace experience including observation, imitation, and social interaction (Baral, 2022). A huge portion of the national workforce in Nepal (about 80%) gaining skills through informal means. There are different approaches of such learning such as on-the-job training, family-based apprenticeships, and peer learning in small and micro enterprises. Workers of such organizations generally are those who could not continue their school education and dropped earlier and entered into an informal job. They do learn their occupational skills during their work activities (Bajracharya, 2022). So, their skills learning is the result of immediate workplace needs which is not based on any structured curricula and standard process.

Traditionally, skills development and occupational progression of workers in Nepal is based on family and community practices. Experienced and senior artisans, mainly family members or community people, passed down their skills and arts from the higher generation to the lower one. So, process of informal skills learning is not linear and structures as in formal education and training system. Here, learning process incorporates a dynamic interplay of action, reflection, observation, thinking and exchange of feedback (Baral, 2022). These approaches of skills learning are compatible with overall global understanding such as learning by doing, trial and error, as well as socialization process. Informal skills learning remains very less recognized within Nepal's Technical and Vocational Education and Training (TVET) system although it is very important. So, informal skills learners have very limited pathways for formal certification or recognition of skills acquired informally (Caves & Renold, 2018).

Considering career progression, informal skills learners face big hurdles for progressing their career and ensuring social mobility and decent employment. This is particularly due to the absence of sufficient support for recognition of their skills (Bajracharya, 2022). However, informal skills learning provides autonomy in learning, creativity and adaptation and enable workers to face workplace-related challenges including technological transformations. Understanding the processes and experiences of informal skills learners is essential for designing inclusive skills development policies as Nepal's economy seems continued to be dominated by the informal sector. Bridging the gap between informal and formal learning systems is inevitable (Bajracharya, 2022; Baral, 2022).

Small-Sized Enterprises in Nepal

In Nepal's economy, informal sector, particularly small-sized enterprises, play a vital role. Such enterprises incorporate most of the industrial establishments and provides employments to most of Nepali youth and contribute to national resource utilization and ultimately the poverty reduction (European Economic Chamber [EEC] Nepal (n.d.); Singh & Kharel, 2023). The size of micro, small, and medium enterprises in Nepal covers more than 95 percent. Among the registered enterprises in Nepal, there is more than 90 percent share of micro and cottage industries (Singh & Kharel, 2023). These enterprises have a contribution to the national GDP more than 20 percent.

Besides, they also contribute to women's economic empowerment and livelihood (Singh & Kharel, 2023; Verma, 2024). According to the Industrial Enterprise Act of Nepal, SMEs are classified on the basis of capital investment and workforce size. Similarly, micro and small enterprises are typically family owned, operated with minimal investment and hugely rely on local resources and traditional skills (Baral, 2020).

Although there is a high significance of small and micro-enterprises in Nepal, they face multiple challenges related to infrastructure, access to finance and technology adoption. The majority of small and micro-enterprises run with very minimal locally created tools and production methods. Such situation limits their productivity as well as competitiveness, particularly in the context of globalization (EEC Nepal, n.d.; Singh & Kharel, 2023). In this sector, use of imported advanced technologies is negligible. Particularly, financial difficulties, lack of awareness, and unavailability of technical support are the contributors for such situation (Kharel & Dahal, 2020). In addition to skills development and occupational progression, management practices are also traditional in such enterprises. We can observe very minimal authority delegation practice and capacity building activities of employees in these establishments. Mostly, such competencies are formed by experiential learning rather than formal capacity development activities. These contexts compel informal skills learners to be relied on workplace routines and arrangements to learn advanced technological skills.

Nepal is getting support of different development partners to enhance the situation of SMEs through innovative support programs, soft loans, and enterprise development services. Most of such support is for micro and small enterprises and some medium-sized forms, aiming to modernize the sector. However, the progress is very slow. Realizing the fact that SMEs remain an important means for inclusive and sustainable economic growth, promoting entrepreneurship and innovation, and acting as a bridge between traditional skills and modern market opportunities (Singh & Kharel, 2023; Verma, 2024).

Technology in Informal Skills Learning: Local and Advanced

During informal skills learning, learners use multiple tools, machines and systems to accomplish the work and solve problems. Such tools, machines and systems are very basic and are developed thorough generation to generations which have evolved in response to practical needs and socio-cultural contexts. As an example, we can take traditional pottery occupation which previously used very wooden and tyre-made flywheel operated manually which was later improvised and operated with electrical wheels. Such changes also impacted on the required skills to perform the job. The next example we can take from metalcrafts trade where the emergence of welding machines, drilling tools and grinders improved work pattern and safety requirements. Similarly, in the sector of fast-food services we can find different manual works replaced with grinders and boilers that affected the informal skills learning approaches (Baral, 2022). In such technological changes we can observe a broader pattern of adaptation of indigenous technology to local conditions and availability of resources contributing to productivity and occupational skills (Chhetri, 2023).

Despite the recognized benefits of indigenous and local technologies, the integration of advanced technologies remains largely out of reach for most small-sized enterprises in Nepal. Contributing to such situation as barriers for widespread adoption of advanced tools and equipment are financial constraints, weak infrastructures, very limited research in the sector and development activities, and a low level of digital literacy (Chhetri, 2023; Outsource Asia, 2022). While government policies and development programs have begun to promote digitalization and the use of information technology, most small and micro-enterprises continue to rely on traditional methods, with digital transformation occurring slowly and unevenly across sectors. However, it is already accepted in Nepali society that local technologies can provide a premise for further advancement in innovations which can support sustainable development through employment creation and preservation of

cultural practices in the informal sector of Nepal (Chhetri, 2023).

Information Technology and Digital Transformation

In these days, we can find somehow introduction of information technology into SMEs of Nepal, albeit in slower rate. Particularly, such technology incorporation has increased through the adoption of mobile phones, and use of YouTube materials and other social networks in performing jobs. Such adoption of IT seems not identical in all informal sector trade. For instance, in metal art and crafts sector, fast food sectors, and mechanics sector, workers use IT increasingly for skills development, whereas in traditional pottery, use of IT is very negligible (Baral, 2022). In these days, we can find that mechanics and metal artists frequently turn to YouTube tutorials and online forums to learn about new tools or repair methods. It is also found that fast-food workers frequently use IT to improve food items quality and enhance the menu. Such digital transformations support informal skills learners to avail diverse knowledge sources in their own field beyond their immediate trade community or locality promoting informal skills learning in self-directed approach (Rintala et al., 2019).

Although there is high potential of using digital tools in small and micro-enterprises of Nepal, there are several challenges hindering optimum realization of digital transformation. Such challenges include very poor digital infrastructure, difficulties in availing reliable internet access, as well as low digital literacy among informal skills learners, particularly among adult and older workers (Adhikari & Molla, 2024; Azency, 2024). Digital literacy among management and leadership levels is very crucial for the digital transformation of the sector. The reason is that digitally literate and trained leaders can better guide their workforce through the complexities of adopting new technologies and also enhance the innovative culture in the workplace (Singh & Kharel, 2023). When we talk about the satisfaction of learners with technology adoption, it varies greatly among enterprises depending upon the occupational sector and the location of the enterprise. We can find the evidence that in urban and more technologically advanced sector there can be higher satisfaction level of worker learners in comparison to rural and traditional enterprises (Adhikari & Molla, 2024). To address such challenges, there is necessity of targeted investments in digital infrastructure, provision of regular training in technology as well as management development. Only with such interventions, SMEs of Nepal can be benefited through incorporation of digital transformation in the informal sector.

Technology Use in the Informal Occupational Sector: A Theoretical Perspective

According to the empirical research conducted in the field of technology adoption in the informal sector of Nepal, we can find that there is the existence of both drivers and barriers in the field which is shaped by the country's socio-cultural, economic and infrastructure related conditions. Research in different occupational fields highlights that informal skills learners often adopt very basic local technologies during the execution of work enhancing safety and security (Chen, 2018). For example, potters in the Kathmandu Valley are limited to use improved flywheels and kilns whereas metal artists use improved welding machines in place of traditional riveting joining methods (Ghimire, 2020). Although these technological adaptations seem very basic, they indicate an increasing pattern of technology adoption that is driven by necessity and contextualized innovation and not a systematic modernization (Chhetri, 2023). Still, incorporation of advanced IT, for instance, automation and digital platforms, is rare in the field due to different reasons (Adhikari & Molla, 2024).

To understand how informal skills learners interact with technology, workplace learning theory (Illeris, 2011) and technological determinism theory of Chandler (1995) provide a convincing framework. Workplace learning theory stresses on the role of experiential, social and informal as well as non-formal learning processes in skills development which is compatible with how informal skills learners

cum workers in Nepal adapt new tools through observation, imitation, and trial-and-error (Baral, 2022). As a theoretical lens, we can also see this phenomenon with the theory of technological determinism that highlight how technology shapes and being shaped through social process. This theory also provides an insight why informal skills learners adopt certain simple tools but resist with some others (Chandler, 1995). All these mentioned theoretical perspectives stress on the complex relationship between informal skills learning and technology use.

Nepal's experience of infrastructure-related challenges and lacking digital competencies and financial hindrances in adopting broader information technologies by informal skills learners is compatible with the global scenario (Chen, 2018; Rintala et al., 2019). But it is well understood that even very basic adoption of informal technology, for instance using YouTube and other mobile application in performing work can support in skills development and increase productivity, particularly among the youth. Such findings indicate that role of technology in informal skills development is not only limited to its instrumentality but it is deeply rooted social and cultural practices.

Existing Research Gap

Although there is increasing interest of digital transformation in small and micro enterprises, we can find a considerable gap in knowledge how local as well as digital technologies contribute to informal skills learning processes in Nepal and also in similar contexts. We can find multiple literature in the sector but mostly they are focused on productivity and broader trend of adopting technologies. Such studies overlooked how technologies can be adopted and adapted, and how they influence skills development (Adhikari & Molla, 2024). Similarly, we can find multiple studies on use of traditional tools and equipment in the informal sector, but there is less researched how such technologies influence the skills learning process, including in the inter-generational skills transfer. Although Rintala et al. (2019) sheds light on non-interpersonal learning through digital platforms, there is dearth of literature explaining how such practices intersect with traditional skills transfer model in different sectors such as pottery and metalcrafts. Such research gap is found acute particularly in those trades where informal learning remains a major approach of skills development. However, it is well established that in present days technological changes are reshaping identities of occupations and competencies of workers cum learners (Ghimire, 2020). To address such research gap which is based on the lived experiences of informal skills learners as workers in SMEs of Nepal, this study utilizes a qualitative case study method.

Methodology

In this study, I posit myself within the interpretive paradigm and use a qualitative case study approach as proposed by Yin (2018). The paper is premised on my PhD research study on informal skills learning processes and dynamics in small-sized enterprises in Nepal (Baral, 2022). I believe that qualitative research is suitable for understanding the lived experiences of informal skills learners, especially because their learning processes and use of technology are deeply connected to their everyday work, workplace culture, and their sociocultural background. The main objective of the study was to explore not only what kind of technologies are used by informal skills learners in SMEs but also how these technologies are experienced, learned and adapted by the learners.

For this research, I selected eight research participants from four occupational sectors: pottery, metalcrafts, cafeteria (fast food), and two-wheeler mechanics. The participants (all pseudonyms) were Lambodar and Damodar from the pottery sector; Yuvaraj, Amod, and Gaurav from the metal arts and crafts sector; Chandrika from the cafeteria sector; and Ratna and Dinesh from the two-wheeler workshop sector. These participants were chosen because they had direct experience of using both traditional and new technologies in their work, and they were willing to share their stories and learning experiences.

The fieldwork for this study was carried out over fifteen months, from September 2018 to

November 2019. I spent long hours in the workplace, observing and talking with the participants during their work shifts, which usually lasted from early morning to evening. In this study, I have used a conversational approach of data collection which is called *kurakani.* This is a simple way of talking and having informal interaction in Nepali culture. One of the reasons for using this method of data collection was to make the participants feel comfortable and reduce any hesitation they might have about being interviewed (Dhakal, 2021). Informal skills learners are mostly busy and sometimes they can feel vulnerable or hesitant to talk to outsiders. So, I tried to be sensitive to their situation and avoided interruption in their work as much as possible (Baral, 2023). All interviews and observations were recorded with the participants' consent.

In the data analysis phase, I have used the thematic analysis process (Braun & Clarke, 2006). For this, I used Atlas.ti software (version 8) as CAQDAS. I observed patterns and themes related to the use of technology, the process of learning, and the challenges faced by the informal workers as learners. This approach of analysis supported me in giving voice to the experiences of informal skills learners and highlighting the vitality of understanding technology adoption from my research participants' perspective. I also used Perplexity AI for enhancing writing.

In the following section, I discuss how informal skills learners in small-sized enterprises in Nepal adopt and adapt to both local and information technologies, and how these experiences shape their skills learning processes. The findings of the study are organized by the occupational sector and stresses on the voices and perspectives of the participants themselves.

Findings: Use of Local and Information Technologies in Informal Skills Learning

In this section, I have presented the key findings regarding how learners engage with local and advanced technologies including IT in the processes of informal work and skills learning. There are two main sections. The first section presents the use of traditional and locally available technologies shaping skills development practices of informal skills learners. Whereas, in the second section, it is provided how informal skills learners adopt information technology and tools that influence learning and day to day execution of work. Stating briefly, these findings also offer the dynamic interaction between traditional practices and modern digital tools in the process of informal skills learning.

Use of Local Technologies in the Skills Learning Process

Technological change is an essential element in a society (Miller, 1984) that is different from place to place. Based on the field visits' information, I have concluded that informal skills learners use basic technology although we can observe some improvements there. Information obtained from the research participants supported that the informal skills learners' use of basic technology and the transfer of such technology as a socio-cultural phenomenon.

Lambodar, a senior potter, informed that they used everything manually previously. But, for two decades, they have incorporated some new but simple technologies which is also affecting skills transfer. Such change includes improvement in the fly-wheel and the use of clay mixing machine. When I asked him about the use of technology and subsequent changes in skills transfer, he mentioned to me during one of the interviews:

> *In our occupation, there are certain changes in our work which also affected our skills. One of such changes that occurred in the present days is the clay-mixing machine we are using. At that time (previous days), we had to perform clay mixing work using our feet. It was very difficult. But, at present, the machine is making our work easy and fast. The next change we experienced is the wheel for making pots. Previously, we had to work with a large wheel made from tyre and wood. But now, a small-sized flywheel is introduced. It is operated with electricity and covers less space. We have to know skills required for these technologies.* [Field note]

Reiterating what was mentioned by his father regarding technological changes in the mud mixing machine and the improved fly-wheel, Damodar, son of Lambodar, noted the use of an enhanced kiln. However, the improved kiln proposed by the government was not successful because the community of potters had to manage a common free land, which was not easy to manage by the community in costly urban locations.

Studies of Ghimire (2020) and Shrestha (2018) support the experience of the above-mentioned duo-potters that potters in the Kathmandu Valley rely primarily on their traditional mode of production. There has been little change in their adoption of new technologies. Similarly, the study of Kasten (n.d.) shows that despite efforts to introduce some advanced technology with the help of some NGOs, there has been no significant change in the potter's working style. The effect of which has been felt to some extent in the teaching and learning of skills. However, it is noteworthy that when using basic technology, there may be some differences between the potters of different regions of the same country (Mahias, 1993) which may lead to general differences in the type of skill.

Similarly, mentioning the adoption of some changes in the technologies in the sector of metal arts and crafts, Gaurav, a metal artist (son of Yuvaraj) said that the trade had welcomed certain simple technologies that are supportive in increasing productivity. *"Nowadays, tools such as welding machines, grinders, drilling machines, etc. are being used*." Gaurav provided the list of items of some technologies introduced in the sector in recent years. Chen (2018) mentions that previously sheet metal arts and crafts such as statue works were based on joining individual shapes with riveting and soft soldering. The availability of modern technologies such as welding and blowtorches has made the process easier. It also enhanced work safety. It showed that the traditional metalcraft occupation is moving from the middle path of adopting new technology and preserving the tradition of the work.

In the cafeteria, the incorporation of modern technology was limited to using a grinder for crushing fresh meat. *"This is a hand-operated machine for crushing chicken. In other activities, we only use our hands"*, Chandrika, a young café worker, informed me during one of the interviews and how simply she learned the grinder operating skills from the owner. In the motorcycle workshops, the use of new technology was also less. The only mentionable point in this sector is the use of mobile applications searching for new information. Ratna, a senior mechanic, mentioned that the changing of technology in the automobile sector is very fast, and they have to adopt those changes and learn new skills. Once, he said, *"If the technology changes in this way, within few years, an uneducated person will not be able to work as a mechanic*." However, modern technology was found more negligible, and craftspeople performed most work with manual tools. It is natural that not only in the occupations of two-wheeler mechanics and fast food but overall, using simple technology is still the characteristic of Nepali micro and small-scale enterprises. Research has already established that skills acquisition occurs not in large-sized enterprises but also in small-sized ones (Kharel & Dahal, 2020).

Use of Information Technology

Regarding the use of information technology, particularly social media, I did not observe it in the pottery sector. The informal skills learners in the other three occupational sectors adopted ICT more or less. Those IT skills were not directly related to the work processes, except in some cases. However, the need for learning and the further enhancement of IT skills was created through informal skills learning (Skule, 2004). Information technology is used basically for two purposes in the metal arts and crafts sector: searching for new art items on the internet and capturing photos of traditional art items located in different locations. *"Today, we use the internet to search and collect photos of art items from different places, including photos from museums"*, said Yuvaraj during a conversation. Similarly, Amod, another senior artist, contrasting the previous days with the present practice and changes occurred in the skills transfer told that:

> *There were no technological devices for capturing the arts and crafts in previous*

> *days. They drew from their hands. But now the situation has changed. There are so many learning sites, such as YouTube, for learning these days. Now, it is easy to learn skills. Of course, we need to be updated with the new technology; we have already started to use it.* [Interview]

The expression of Amod was one of the evidences that the present generation of informal skills learners are trying to adapt to the fast-changing ICT, which was "one of the central skills" (Ashton & Sung, 2002, p. 49) for running the enterprises successfully. Like metalcrafts occupations, two-wheeler mechanics also use information technology. However, their use is mainly to solve the problem by searching for information regarding new technologies. Dinesh considers *"Materials uploaded in the websites such as YouTube channels are very instrumental for learning new skills."* Chandrika expressed that she is learning to enhance food quality from the fast-food sector, referring to YouTube materials. She is happy that there are multiple materials available on the YouTube sites that provide additional information and skills.

"Learning from non-interpersonal sources", such as using internet facilities, is a well-recognized source of learning in the workplace" (Rintala et al., 2019, p. 36). Usually, informal sector small and micro-enterprises use simple and basic technology and ICT (Chandler, 1995; Niehm et al., 2010), which affects the way of working and learning in the informal work setting.

Expressions of the research participants of these three occupations about using YouTube indicated that in the days to come, these youth undoubtedly progress in the use of ICT as their competence will motivate them for further exploration and learning (Harter, 1978). This informal learning can also contribute to enhanced productivity. It also influences the approaches to learning how one can effectively learn essential skills.

Discussion

The findings of this study show that informal skills learners in Nepal's small-sized enterprises are coping with new technologies, even in difficult circumstances, mostly through their own effort and creativity. Although informal skills learners have very limited access to advanced tools and equipment, organized training in the field, and other dedicated support, they exhibit strong adaptability and willingness to learn these technologies. During this study, we observed gradual adoption of local and traditional as well as informal technologies. For instance, senior potters like Lambodar and Damodar found strive to incorporate simple machines such as clay-mixer and improved flywheels during their work. They were not only using newly emerged technologies but also share the skills learned by themselves. Similarly, workers in metal crafts, mechanics, and fast-food services are using digital platforms like YouTube and mobile applications to solve problems, update their knowledge, and enhance their skills, even though they often lack formal guidance or systematic training (Rintala et al., 2019).

This coping and learning process can be better understood through the lens of workplace learning theory, which stresses that much of the skill development in informal sectors is experiential, social, and context-driven (Illeris, 2011). Informal skills learners rely on observation, imitation, trial-and-error, and peer support, rather than formal instruction or standardized curricula. The technological adoption is an evitable part of informal skills learning environment. Also, technological determinism perspective suggests that how technology is available to learner, and what is its nature do shape learning opportunities and the result. In the context of Nepal where access to advanced technologies is very limited to the learners due to different reasons, they do their best in utilizing what is available to them. They combine traditional knowledge and skills with new digital resources (Chandler, 1995)

Informal skills learners do face many hindrances, despite their efforts, which limit their potential to fully benefit from the advancement of available technology. Especially aged workers have low digital literacy. Besides, there is poor digital infrastructure and lack of capacity building opportunities to informal skills learners. Such challenges and scarcity make learners difficult

to cope with fast changing technology (Adhikari & Molla, 2024). Therefore, there should be a great role of the state in supporting informal skills learners in adopting and adapting technologies not limiting promoting technology in general. This effort is possible through regular skills development and training programs including awareness raising activities. Furthermore, there should be a provision of accessible learning resources tailored to the needs of informal skills learners (Amenduni et al., 2022).

The question emerges, who can fulfil this role? Of course, as the Council for Technical Education and Vocational Training is the responsible institution for leading formal TVET, we cannot directly expect that it will take this responsibility. However, as its duty is also to attract informal skills learners to the national TVET system through RPL intervention, it can play a positive role in this regard. CTEVT can develop and launch special programs targeting recognition of informal skills learners' competencies in contemporary technologies. It can offer short duration training modules in off hours and flexible modes, and also digital literacy workshops and community campaigns (Bajracharya, 2022). Besides, CTEVT can help informal skills learners to link them to formal TVET programs in their occupational field. Particularly, it can be achieved through collaboration with industry and developing curricula with their support addressing contemporary needs in the technology adoption and adaption of the learners. Such measures certainly contribute in enhancement of employ-ability and also the productivity of informal skills learners. It also can contribute to broader goals of social inclusion and economic development of the country.

In brief, we can say that informal skills learners are not only passive recipients of technological changes but they are also the active agents who adapt, innovate and learn required skills facing multiple challenges. However, as mentioned above, their efforts alone are not sufficient. Their technological learning journey should be supported massively by the state and its institutions. At the same time, state also should be careful that technological advancement should not widen existing inequalities of the citizen, rather, they should minimize the gap between economically well off and weak people. It can be expected that Nepal can empower its informal workforce to succeed in rapidly changing global context by focusing on inclusive training, digital literacy, and thorough massive campaign of recognizing skills of learners, including traditional occupational skills.

Conclusion and Implications

This research has highlighted that informal skills learners actively engage with both local and information technologies despite of multiple barriers. These learners acquire new skills and trace the emerging technological changes in their particular trades. These findings stress that even very minimal support to these learners can make meaningful differences in the work and learning of these vulnerable groups of people. The voices collected during the data collection process of the study demonstrate that informal skills learners are not merely workers and passive learners but they are the people who constantly seek ways to improve their work, learning, and adaptation to technology.

The research findings of this research can be instrumental for policymakers in the sector of TVET as well as overall education field. It also can be supportive to practitioners working in the skills development field. The study also sheds light on the acute necessity of the state and concerned institutions like CTEVT to recognize specific challenges and strength of informal skills learners and design, develop and implement supportive programs to upgrade competencies of informal skills learners. If such happens, all informal learning can be included to the national TVET system, on one side, and on the other side, overall national production can be enhanced. Based on this research, further research can be conducted; for instance, on long-term impact of digital skills enhancement initiatives as well as effectiveness of related programs in the field of skills enhancement of informal skills learners.

Limitations

The main focus of this study was on the adoption and adaptation of technologies by informal skills learners during their work. It means, other aspects of the technology use among these individuals may not have been fully explored. As the research is based on a small number of qualitative case studies involving eight participants from four occupational sectors, its findings reflect only the specific experiences and contexts of these individuals. So, it does not represent the broader population of informal skills learners in Nepal. t captured within the scope of this study.

References

Adhikari, S. N., & Molla, N. (2024). Navigating the digital shift: Exploring the impact of technology on management practices in Nepalese SMEs. *Nepalese Journal of Management and Technology, 2*(2), 91–109. https://www.nepjol.info/index.php/njmt/article/download/68730/52539/201342

Amenduni, F., Ryymin, E., Maetoloa, K., & Cattaneo, A. (2022). Facing disruptive changes with informal workplace learning strategies: The experience of European companies. *Frontiers in Psychology, 13*, 1-16.

Ashton, D., & Sung, J. (2002). *Supporting workplace learning for high performance working*. International Labour Office. https://www.employment-studies.co.uk/system/files/resources/files/mp36.pdf

Azency. (2024, November 10). *Understanding digital marketing in Nepal: Rise and benefits*. https://azency.com/blog/digital-marketing-in-nepal/

Bajracharya, A. M. (2022). Addressing informal skill learners' challenges in skill test in Nepal. *TVET Journal*, *1 (16),* 21–33. https://www.nepjol.info/index.php/tvet/article/download/45184/33904/133153

Baral, D. P. (2020). Developing a typology of informal skills learning places in Nepal. *Journal of Training and Development*, *5*, 3–15. https://doi.org/doi.org/10.3126/jtd.v5i0.33847

Baral, D. P. (2022). *Informal Skills Learning: A Case Study of Small-Sized Enterprises in Nepal* [Unpublished dissertation]. Kathmandu University. https://elibrary.ku.edu.np/handle/20.500.14301/99

Baral, D. P. (2023). Researching informal skills learners: Considering work interruption and vulnerabilities. *Journal of Training and Development*, *17(1)*, 19–34. https://doi.org/10.3126/tvet.v17i1.52409

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.

Caves, K. M., & Renold, U. (2018). Goal-setting for TVET reform: A framework for identifying the ideal system in Nepal. *Journal of Education and Research, 8(1),* 6–28. https://doi.org/10.3126/jer.v8i1.25477

Chhetri, D. B. O. (2023, March). Improving indigenous technology for revitalizing industrialization in Nepal: A content analysis study. *Proceedings of the Second National Economists' Conference-2079* (pp. 162–179). Nepal Economic Association. https://necs.org.np/wp-content/uploads/2023/08/018.pdf

Chandler, D. (1995). *Technological or media determinism.* Aberystwyth University. http://visual-memory.co.uk/daniel/Documents/tecdet/tecdet.html

Dhakal, R. K. (2021). *Women in school governance in Nepal: An ethnographic inquiry* [Unpublished doctoral thesis]. Kathmandu University.

European Economic Chamber [EEC] Nepal. (n.d.). *Overview of Nepalese Small and Medium Enterprises*. https://www.eec-nepal.org.np/backup/ecibon/report/211/Publication/CHAPTER%203-4.pdf

Chen, M. A. (2018). Technology & urban informal workers. WIEGO. https://www.wiego.org/wp-content/uploads/2019/10/Technology%20and%20Informal%20Workers%20-%20WIEGO%20-%20Chen_2018.pdf

Ghimire, B. (2020). *Pottery industry and its prospects, with reference to Nepal* [Unpublished

manuscript]. https://www.researchgate.net/publication/340755592_Pottery_Industry_and_its_prospects_with_reference_to_Nepal

Harter, S. (1978). Effectance motivation reconsidered- Toward a developmental model. *Human Development*, *21*(1), 34–64. https://doi.org/10.1159/000271574

Illeris, K. (2011). *The fundamentals of workplace learning: Understanding how people learn in working life*. Routledge.

Kasten, A. (n.d.). *The potters of Thimi: Village ceramics traditions in flux*. Ani Kasten Ceramics. https://www.anikasten.com/page

Kharel, P., & Dahal, K. (2020). *Small and medium-sized enterprises in Nepal: Examining constraints on exporting* (ADBI Working Paper No. 1166). Asian Development Bank Institute. https://www.econstor.eu/bitstream/10419/238523/1/adbi-wp1166.pdf

Mahias, M.-C. (1993). Pottery techniques in India: Technical variants and social choice. In P. Lemonnier (Ed.), *Technological choices: Transformation in material cultures since the Neolithic* (pp. 157–180). London & New York: Routledge.

Miller, M. D. (1984). *Principles and a philosophy for vocational education.* National Center for Research in Vocational Education, The Ohio State University. https://files.eric.ed.gov/fulltext/ED250497.pdf

Niehm, L. S., Swinney, J., & Miller, N. (2010). Community social responsibility and its consequences for family business performance. *Journal of Small Business Management, 46*(3), 331–350.

Outsource Asia. (2022, January 27). The future of work in Nepal. https://www.outsourceasia.org/the-future-of-work-in-nepal/

Rintala, H., Nokelainen, P., & Pylväs, L. (2019). Informal learning at work: A review of the literature. *Vocations and Learning, 12*(1), 31–55.

Shrestha, P. (2018). Challenges and scopes of pottery industry. *Pravaha*, *24*(1), 147-158. https://doi.org/10.3126/pravaha.v24i1.20234

Singh, D., & Kharel, P. (2023). *Mapping innovation support programmes for micro, small and medium enterprise development: Findings from Nepal.* South Asia Watch on Trade, Economics and Environment (SAWTEE). https://sawtee.org/publications/SMEs-Nepal.pdf

Skule, S. (2004). Learning conditions at work: A framework to understand and assess informal learning in the workplace. *International Journal of Training and Development*, *8*(1), 8–20. https://doi.org/10.1111/j.1360-3736.2004.00192.x

Verma, A. (2024, May 16). *The critical role of SMEs in Nepal's economic development*. Friedrich Naumann Foundation for Freedom. https://www.freiheit.org/south-asia/critical-role-smes-nepals-economic-development

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE.