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AI AUTOMATION AND THE EROSION OF ENTRY LEVEL KNOWLEDGE TRANSMISSION

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Abstract
The rapid advancement of the incorporation of Artificial Intelligence (AI) automation in various industries is restructuring workplaces in particular with regards to entry-level positions that were previously tasked with acquiring basic learning and skill development. This study examines the further erosion of entry-level knowledge transmission in early-career roles and the suite of AI-based automation tools and decision support systems. Directed surveys through Google Forms were administered to recent graduates, interns, and early-career professionals from various fields to collect preliminary data from over 100 individuals. While routine workplace tasks may become trapped for early-career employees in situations devoid of the ability to be mentored, to learn, or to be exposed to new activities, the use of Automation AI in the workplace may streamline processes, require less monotony in decision-making, and increase the accuracy of outcome predictions. Some participants in the study claimed that the automation of certain processes hinders the retention of organizational knowledge, reduces adaptive problem solving, and perhaps most significantly, the automation of the acquisition of organizational knowledge. Furthermore, the study analyzes how older participants viewed AI technology as an assistant, while younger participants exhibited an indifferent empowerment and dependency on AI to complete repetitive tasks. Thus, the study aims to analyze the impact of AI in the workplace, particularly the integrated use of technology, people, and AI, and the managed cognitive flow in the knowledge structures and interdisciplinary integrated curricula to retain the essential tasks as the technological advancement of society increases.

Keywords: AI Automation, Entry-Level Skills, Knowledge Transmission, Early-Career Employees.

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1. Introduction

Driven automation is reshaping the structure of global businesses and the incorporation of new recruits into the workforce. Artificial intelligence and other tools are becoming part of the daily routines in financial analysis, customer service, healthcare, and software engineering (Ide, 2025). Business AI tools provide remarkable operational efficiencies, unmatched precision, and speed. However, the implementation of AI in business raises the concern of the loss of first-time employment positions. Entry level jobs are often the best vehicles for the training of new staff and the flow of organizational knowledge (Mahajan, 2025). Each of the task components, while perceived as unexciting and tedious, is essential in the enhancement of the industry, organizational, and analytical problem-solving knowledge.

Recent patterns in global automation indicate that artificial intelligence (AI) is either performing or diminishing the need for many simple entry-level job activities. Bushuyev and others (2024) cite the OECD, McKinsey, and UNESCO regarding a new phenomenon of 'skill bypassing', where new workers in automated workplaces lack firsthand experience in basic workflows that were once regarded as essential for professional growth. This situation reflects a considerable gap in the processes, practices, and competencies that employees are required to utilize and the skill and/or knowledge deficits resulting from inadequate early career developmental opportunities.

The absence of foundational knowledge transfer as a consequence of AI's ability to acquire a set of basic cognitive, analytical, and procedural tasks, is the focal point of this study. Imagine a young professional in a workplace devoid of automation, where the tasks of email drafting and data pattern analysis (Sutton et al., 2018) are technologically assisted. Such a workplace, integrating bottom level cognitive functions, would use advanced organizational, as well as analytical problem-solving functions. The relevant empirical level would be organizational, and from there on, the relevance would deteriorate. It demonstrates the reduction of the workforce's problem-solving capacity. Succession planning in organizations would also be adversely affected if there was a sustained lack of problem-solving capabilities in the workforce. A concerning aspect of this phenomenon is the workforce's ability, or lack thereof, to learn and improve, as well as organizational planning.

2. Literature Review

AI automation has evolved from the rule-based systems of the 1980s to machine learning and deep learning applications that increasingly shape workplace decision-making. Contemporary automation spans Large Language Models (LLMs) such as ChatGPT, predictive analytics for forecasting, robotic process automation (RPA), and workflow automation designed to remove repetitive tasks (Arias-Pérez et al., 2022). Unlike earlier waves of automation that primarily replaced manual work, today's "cognitive automation" targets routine mental tasks—often concentrated in entry-level roles—by either removing them entirely or shifting them into AI-assisted formats (Saar, 2025). As a result, AI now performs activities ranging from drafting documents to detecting financial patterns, altering how organizations structure early-career work.

Entry-level roles traditionally function as a developmental foundation where employees build soft skills and gradually acquire technical competence through observation, repetition, and participation in real tasks such as documentation, data entry, and basic analysis (Yadav, 2025). These roles resemble apprenticeships, where situated learning and mentoring support confidence, contextual understanding, and critical thinking (Rinta-Kahila et al., 2023). However, as these foundational tasks become automated, studies and major reports warn of "skill gaps at the base," which may weaken long-term workforce capability (O'Donovan, 2020). This "automation of learning" can produce employees who operate at higher levels without mastering underlying processes, reducing flexible problem-solving and readiness for non-routine work, and creating future succession and leadership risks.

Generational attitudes further shape AI adoption. Gen Z often treats AI as integral and uses it for repetitive tasks, though overreliance may reduce motivation to learn (Aoun, 2017). Millennials tend to use AI for efficiency alongside traditional methods, while Gen X and older employees may adopt it more conservatively (Watson, 2020). Conceptually, this study integrates human–technology interaction (TAM; socio-technical systems), knowledge management (Nonaka's SECI), and skill acquisition models (Dreyfus and Dreyfus) to examine how AI automation affects early-stage skill development and organizational knowledge transfer (Tyson et al., 2022).

3. Methodology

3.1 Study Design

This study uses primary data descriptive design with a cross-sectional approach to study the effects of AI on the automation of knowledge transmission at the entry-level. The study used a mixed approach whereby the quantitative component is the structured survey questions and the qualitative component is the short open-ended answers. The quantitative data analyses the levels of exposure to AI Tools and the erosion of skills on the respondents, while the qualitative data analyses the automation of learning, mentorship, and knowledge in the workforce. It is the best approach to study the phenomena of automation, mentoring, and knowledge transmission because it combines a contextual framework with a quantitative framework.

3.2 Sampling Framework

The sampling framework aims at individuals most likely to experience the impact of loss of entry-level learning opportunities, particularly targeting recent graduates, interns, and those in the early stages of their careers (up to five years of working experience). Over 100 respondents were targeted to achieve an adequate representation of various fields: business, technology, healthcare, education, and services. Because respondents were easily reachable via digital means, sampling by convenience on alumni and professional group networks was employed. While the sample may not be generalizable, the framework offers perceptive and useful insight concerning early-career respondents employed in AI-dominated environments.

3.3 Data Collection Tool

Google Forms were used to gather the information. Its versatility and ease of use and convenience for gathering qualitative and/or quantitative data is evident. Three parts made up the entire survey. Part one involved the collection of demographic data. This consists of the following: age, gender, profession, and how long they have been in the profession. Attitudes and level of the respondents' awareness of automation and Artificial Intelligence, the dependent learning model, the changing workplace, and the barriers to new skill acquisition, and the use of Artificial Intelligence were addressed in the second section of the survey. This section used a Likert scale format. Automation, artificial intelligence, and dependent learning models were the foci of the respondents' attitudes. To gather information on the respondents' automation of learning activities and the Artificial Intelligence of learning activities dependent, perceived, and believed, open-ended questions were used in the last section of the survey.

3.4 Data Analysis

The mean and other descriptive statistics have analyzed the likert scaled questions concerning the distribution and the dominant trend frequenting the responses. These were coupled with all comparative analyses across demographics and levels of exposure to AI. As for the qualitative data, thematic analysis was primary, and the coding and data attributes grouping were moderated by the principal themes. These themes were: erosion of skills, less mentorship, and AI dependency varying across generations. Qualitative and quantitative data analysis interrelationship added to the data analysis overall proficiently.

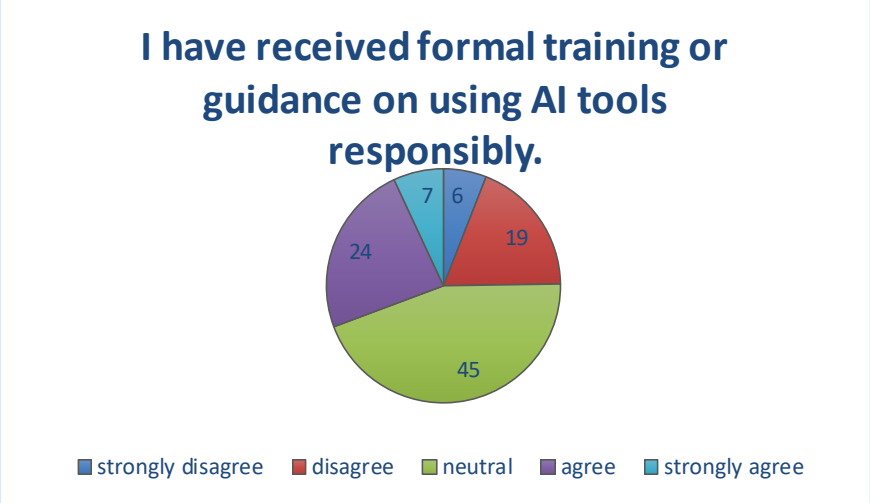
4. Results

About 38.6% of the participants are within the 30-39 age range, which, along with the 20-29 age range, represents the highest share of the responses received (N = 101). Overall, the sample is rather youthful, with nearly 70% being under 40 years old. The least represented group are the respondents aged 50 and above, accounting for only 20%.

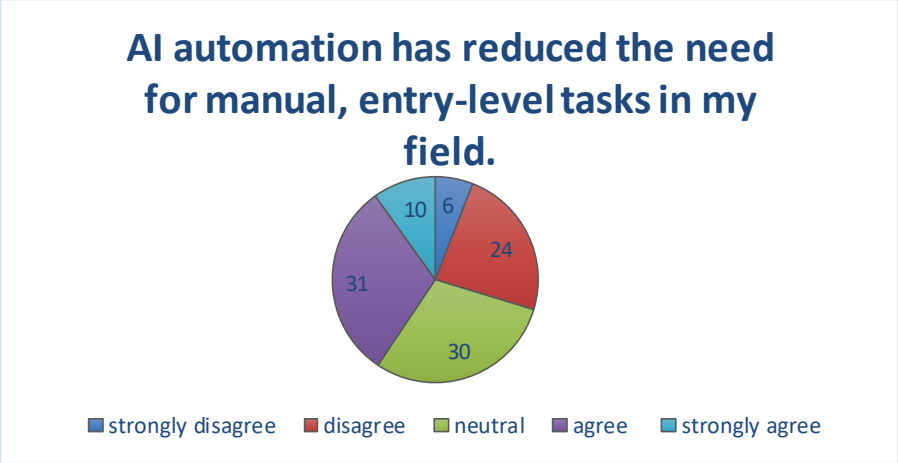
Data shows that employees with 3-7 years of experience, considered mid-level employees, represent 48.5 percent of the sample. Together with entry-level employees, they account for over 75 percent of the total respondents. This suggests that a significant proportion of the workforce is still in the early to mid-career stages.

Almost half of the respondents, 48.5%, are mid-level employees having 3–7 years of experience, and as notable as this percentage is, 45% of the sample is neutral on the question pertaining to commonality of usage of AI tools within the respondents' workplace domains.

Only 30% of participants state that there is common usage of AI tools in their professions, which implies that the adoption of AI tools on this instance is still in the incipient or uncertain phase among this predominantly mid-to-entry level professional group.

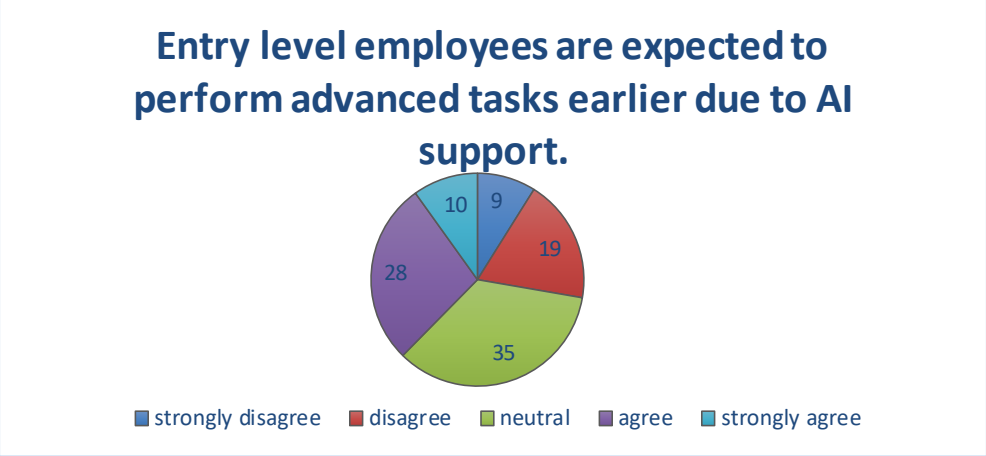


Even though nearly half of the respondents are mid-level employees, an adequate 44.6% reported being neutral with respect to whether those surveyed had received formal training on the responsible use of AI tools. Coupled with those who provide a negative response, this means about two-thirds of respondents do not feel they received training on the ethical/ responsible use of AI.



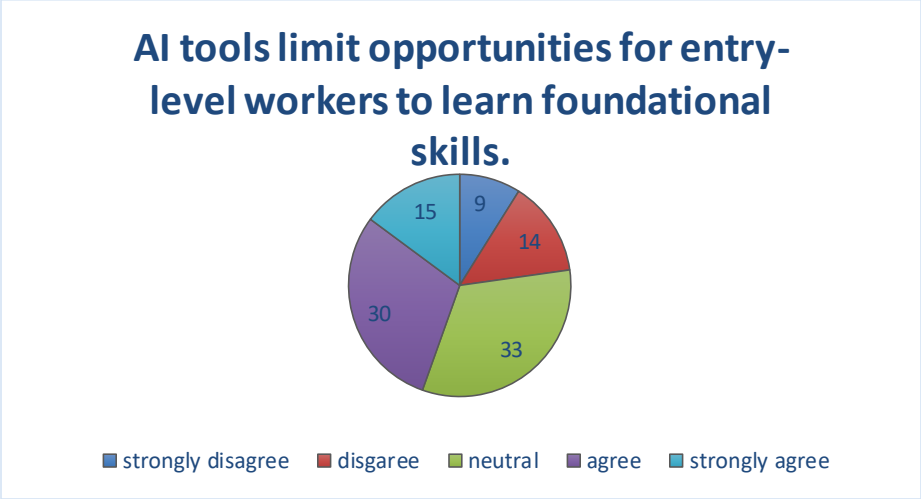
While 40.6% of respondents claim, AI minimizes the requirement for repetitive entry-level jobs, almost the same proportion (29.7%) abstained from voting. This shows that while some are being

impacted by automation and their job descriptions are changing, for a significant portion of the workforce, especially in the case of middle and junior roles, there appears to be little or no change regarding the activities that constitute their everyday work.



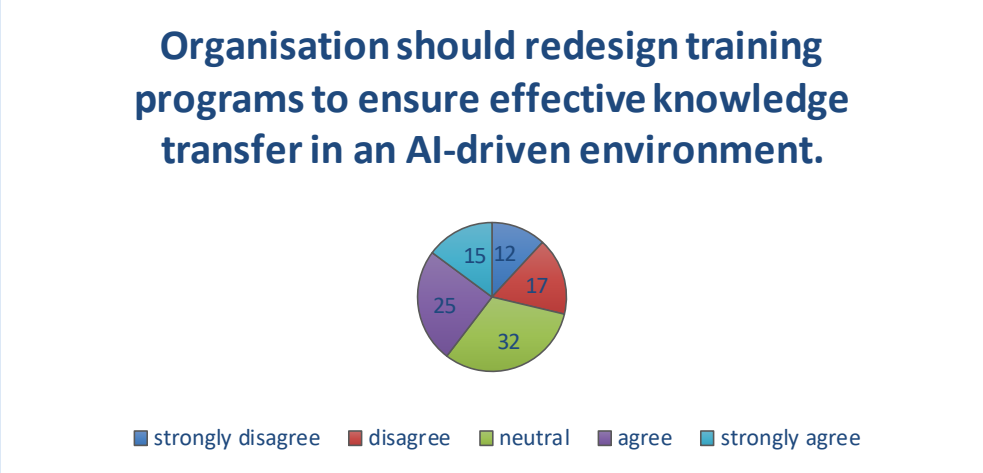
While 37.6% of survey respondents state that due to AI, entry-level workers are now required to perform more advanced job functions at an earlier stage, a significant 34.7% of respondents remained neutral. This validates an increasing level of expectations concerning what new employees are required to do, although almost one third of the entire labor force have not sufficiently observed this phenomenon.

Although 35% of participants believe that AI automation has resulted in the reduction of traditional forms of mentoring and learning through direct interaction, 39% of them seem to be indifferent to this phenomenon. It seems that there is, at the very least, some concern regarding the absence of personally directed support, but many do not seem to have had an unambiguous impact on their professional growth.



Survey data shows that even though almost a third of respondents expressed no opinion on this job-related concern, there is clear fear of automation bypassing critical early career learning stages.

While 44.5 percent of respondents believe that AI applications reduce early career workers' opportunities to learn, 32.3 percent of respondents are not able to make a claim.
Although nearly 40% of participants support the notion that entry-level workers depend more on AI than on people to learn, the nearly 33% of neutral responses in this case suggests that some respondents may be biased in their self-assessment regarding AI reliance. The majority of respondents appear to indicate the contrary; that people do not depend on the support of other people.
While it is correct that 39.6% of respondents who agree say that the optimistic position (i.e. less exposure to basic tasks) can negatively affect long term basic professional competencies is a fair position, we cannot overlook that 25.7% of participants chose to remain neutral. Given this, it is understandable that the majority of participants felt that using artificial intelligence to remove basic tasks may limit professional development, although it is troubling that more than a quarter of participants remain uncertain.
Although 42.5% of respondents believe that skill gaps are widening at both entry-level and higher positions as a result of AI automation, it is significant that 33.7% chose to remain neutral. This indicates that there are people who seem to believe that AI may be interfering with the knowledge transfer to job level gaps. However, a full third of the workforce seems to be waiting to see, if anything, how the professional ladder will change.



Although 42.5% of respondents consider the skill gaps at the entry and advanced levels to be due to AI automation, it is striking that 33.7% of respondents remained neutral. This indicates concern as to the interruption by AI of the knowledge transfer to middle levels within the hierarchy of jobs. Still, one third of the respondents in the labour market seem to be waiting to see if and how the structure of the job hierarchy will change.

5. Discussion

The present study's results corroborate prior investigations of the paradox of AI-fueled efficiencies versus post-entry-level skill-building. AI Efficiency vs. Skill Development Trade-Off: Survey participants acknowledged AI's advancements in performing tasks more precisely, speeding up workflows, and minimizing time spent on repetitive tasks (Ide, 2025). However, several participants expressed concern that such automation would diminish the learning opportunities of the employees. This apprehension is documented in several publications worldwide regarding the

skill bypassing phenomenon, where employees are economically and technologically compelled to do advanced work without the requisite skills. Thus, the paradox of automation: an increase in productivity coupled with the reduction of learning by doing.

Breakdown of Knowledge Transmission: The studies indicate less successful knowledge transfer is, in part, due to the greater challenges in transfer of tacit knowledge (or knowing how, as in the case of learning through observation and doing the pertinent literature here is the lack of apprenticeship positions in automated environments: necessary 'learning by doing' is being replaced with 'learning by doing through automation.'

Consequences for Development: Too little practice in a profession may create a permanent group of under-qualified early-career workers, who are deficient in performing non-automated tasks, and are subsequently job-locked (Mahajan, 2025). This lack of practice, consistent with research, reveals early career learning deficits are a barrier to future pathways to leadership.

Multi-Generational Perspectives: The research validated the presence of variation with respect to age. Younger generations, digital natives, and socially conditioned individuals who view AI as an integral and necessary tool to assist with everyday tasks think of AI as an assistive technology that is more than an option (Arias-Pérez et al., 2022). In contrast, older individuals view AI as a means of enhancing productivity, but prefer to complete tasks without assistance. The literature is clear regarding the AI shortcuts and cognitive offloading, and the reliance on AI is indicative of the digital natives.

Organizational and Societal Implications: More generally, the trends point to an emerging workforce where baseline skill and the skills gap decline further. Future industries are likely to be deficient in moving parts because they will lack seasoned individuals who are capable of performing complex tasks without AI assistance.

6. Recommendations

An integrative approach to handling the challenges posed by AI in an organization should try to strike a balance. Processes should be automated only after entry-level employees have gone through some manual work, so HITL systems have a human component. Automation should be included in the programs and curricula so that, in addition to internships, skills labs, and simulations, students learn the boundaries of their skills. Knowledge management systems should be more systematic, and organizations should streamline and cultivate systems of mentoring, shadowing, and task rotation that help newcomers understand the value of primary activities.

Young employees need to be guided in digital literacy training and responsible AI use, so that they consider automation an assistive technology. They should develop skills and see AI as an enhancement, not a replacement for their abilities.

7. Conclusion

Automation, specifically in AI, is impacting learning pathways necessary for workforce development. The primary data, collected from over 100 participants, described how the reduction in routine tasks constrains the learning system, diminishes the mentoring system, and increases automation dependency. The future of work needs to incorporate artificial intelligence while also focusing on essential human learning and keeping basic skills intact and them at the core learning level.

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