3rd International Symposium on Digital Transformation
September 11-13, 2024, Linnaeus University, Växjö

ENHANCING PROFESSIONAL DEVELOPMENT IN THE SWEDISH PUBLIC SECTOR: STRATEGIES FOR EFFECTIVE INTEGRATION OF MICRO-CREDENTIAL FRAMEWORKS FOR COMPETENCE MANAGEMENT

Jonas Bäckelin (master's student 2nd **cycle**)
Department of Computer Science and Media Technology, Faculty of Technology, Linnaeus University, Sweden, jonas.backelin@outlook.com

ABSTRACT

We have recently seen an increase of AI-driven tools for competence management described as skills intelligence or skills-based approaches to internal mobility in organisations. Skills intelligence can involve using generative AI (GenAI) for tagging skills in professional development programs so that we can match employees to the right learning content. The strategic agenda for the digitalization of the public sector in Sweden, also known as the "Municipal Handshake for Welfare Development through Digitalization" (SKR, 2024), has suggested that the talent pool for the public sector in 2030 must rely on upskilling and reskilling of exiting workforce. The strategy focuses on adoption of emerging technologies and apply expertise effectively (SKR, 2022). In 2022 the IBM's annual poll of global IT senior decision makers found that 39% of the participants adopt AI-solutions to mitigate labour and skills shortages (IBM, 2022). Big data analysis (BDA) can help organizations predict future trends, make proactive decisions and support informed choices (Elgendy et.al., 2021). Large Language Models (LLMs) are particularly good at handling unstructured data and can be used to extract meaningful features from documented skills with help of Natural Language Processing (NLP) technology (Min et.al., 2023). The issue identified as main focus for this study is that formal degrees as proxy for matching competences may result in poor performance of an AI-driven model. This has been addressed by Brown et.al. (2021) with micro-credential frameworks that use unbundled and stackable accreditations. An European approach to micro-credentials have also been addressed in the European Pillar of Social Rights Action Plan as a recommended strategy to achieve the 2030 target of 60% of all adults participating in training every year (Cedefop, 2023). The Swedish strategic project "The competence pass" started in September 2021 and finished in June 2024 by the Government's partnership program for skills supply and lifelong learning in Sweden. The results suggest that the integration of micro-credentials as an option to formal learning has the potential to improve competence management in municipalities (Vinnova, 2022).

The objective of this study is to find strategies that address the competence supply gap in the Swedish public sector from an adult learning perspective. By understanding the benefits of micro-credentials, we can propose effective strategies using educational technology. The research questions for this study in progress are:

ISBN: 978-91-8082-142-1

RQ1: How can micro-credentials enhance professional development and competence management in the Swedish public sector?

RQ2: How can Swedish public sector adopt emerging technologies to apply and share expertise effectively in cross-functional work teams?

Data was collected from a deductive thematic analysis during focus group interviews (n=3) with Swedish organisations that are early adopters of micro-credential frameworks. The three themes relevant to competence management were generated from a benefit analysis among key stakeholders (n=4) in a professional development initiative for public sector. This initiative already had pre-labelled data for skill levels and national authorities have ensured that the content is evidence based and relevant to the profession. The stakeholders were asked to identify potential benefits and barriers if they would integrate micro-credentials in the existing program. The responses were grouped based on similarities and we then used frequency distribution to limit the study into three themes related to the EU recommendations for integration of micro-credentials (figure 1).

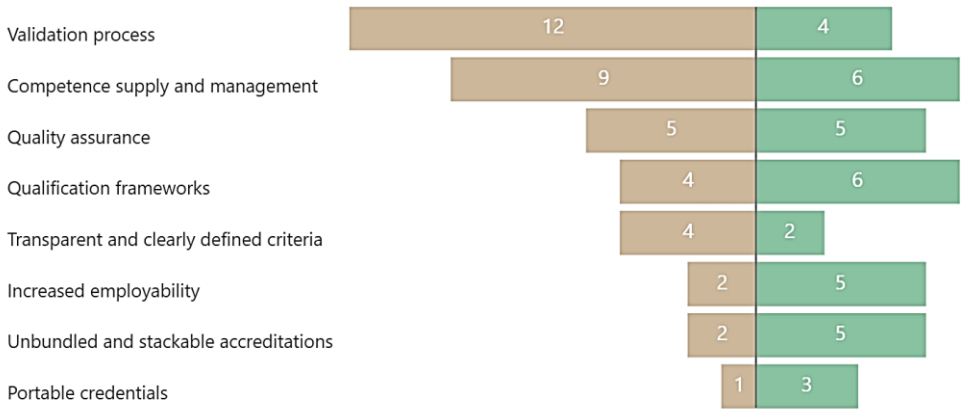

Figure 1. Tornado chart of the frequency of types divided into barriers and benefits, identified among key stakeholders (n=4) in a professional development initiative for public sector

The early adopters of micro-credential frameworks were recruited by the project coordinator for "The competence pass". The participants in the focus group interviews were asked to elaborate on challenges and their solutions to integrate micro-credentials in their organisations. This process was repeated for all three themes, but due to time restraints group 1 mainly responded to the first theme.

The key stakeholders had the theme *"Learning outcomes will have been assessed against transparent and clearly defined criteria"* [Theme 1] as the recommendation for micro-credentials with the most potential benefit to public sector. According to the early adopters the validation process should include submitting a self-evaluation as well as documentation of acquired knowledge, but to ensure a valid evaluation it is crucial with a skilled assessor to enable trust and quality. As shared by group 1: *"We created a digital platform with worked examples, assignments based on real-world scenarios and checklists for the validation process"*. This validation process was confirmed by group 3, who also added: "*The assessor should have strong*

understanding and practical experience of the competence included in the issued micro-credential". Since the government has initiated a public record in a national repository for skills (i.e. competence wallet), there was expectations from the participants in the focus group interviews that micro-credentials also will become portable between different employers.

The second most frequent recommendation was *"They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity"* [Theme 2], which was linked to competence management and a national coordination of professional skills. Despite acknowledging the importance of reskilling and upskilling to meet new demands, all participating groups admitted that their initial challenge was to match the available training with the demands of skills in the organization. These skills shortages could be communication and language skills, compliance in cyber security and data protection or health and safety. It was also mentioned that more generic skills are possible to combine with more than one micro-credential and it is beneficial if they become stackable.

The final recommendation was *"Learning experiences leading to micro-credentials are designed to provide the learner with specific knowledge, skills and competences that respond to societal, personal, cultural or labour market needs"* [Theme 3]. All three groups mentioned that they were using micro-credentials to support flexible learning pathways. Group 2 emphasised: *"Formal education is not specific enough when we need to create cross-functional work teams. The skill set is also used by employees to increase employability or follow a career path"*. The flexibility is also relevant to address the emerging skills in society and bridge the gap between formal education and employment with micro-credentials.

These preliminary findings are currently to basic for answering the research questions but will become part of my master thesis with major in educational technology at Linnaeus University. We have only addressed three specified themes that are relevant to the EU recommendations on integrating micro-credentials and the study only reached a limited number of respondents. This create less reliability, but it is common to increase coding reliability in thematic analysis with the use of multiple researchers that use a shared book of codes, which allow to apply the same codes in several data sets.

This study emphasised the importance of finding effective strategies to implement micro-credential frameworks for competence management in public sector. The findings suggested that unbundled and stackable accreditations can be portable between different employers and support flexible learning pathways. These potential benefits will make it possible to respond to emerging skills in society and support the creation of cross-functional work teams. One implication now is that the national repository for micro-credentials needs funding and governance to become available. The understanding of competence supply with micro-credentials will contribute to adult learning strategies for public sector in Sweden. Also, in the field of educational technology, the conclusions will create a better understanding of how skills intelligence can involve using generative AI for tagging skills in available

learning content with the demands of skills in the organization. Which can be translated into a computational data model.

Further research with the inclusion of the recommendations *"Micro-credentials are owned by the learner, can be shared and are portable"* and *"They may be stand-alone or combined into larger credentials"* would add further insights to this research. We appreciate the voluntary participation of key stakeholders and early adopters of micro-credential frameworks in the interviews and data collection. No potential conflict of interest has been reported regarding the publication of this study.

Keywords: Micro-credentials, skills intelligence, generative AI, professional development, public sector

REFERENCES

Brown, M., Nic Giolla Mhichíl, M., Beirne, E., & Mac Lochlainn, C. (2021). The global micro-credential landscape: Charting a new credential ecology for lifelong learning. Retrieved May 31, 2024, from https://oasis.col.org/server/api/core/bitstreams/9fbe0044-c5f8-4c62-90f8-f75b223f43af/content

Cedefop(2023). Cedefop skills forecast 2023 Sweden. Retrieved May 31, 2024, from https://www.cedefop.europa.eu/files/skills_forecast_2023_sweden.pdf

Elgendy, N., A., Elragal & T,. Päivärinta (2021). DECAS: a modern data-driven decision theory for big data and analytics, Journal of Decision Systems, 31:4, 337-373. Retrieved May 31, 2024, from https://doi.org/10.1080/12460125.2021.1894674

IBM (2022). IBM Global AI Adoption Index 2022. Retrieved from May 31, 2024, https://www.ibm.com/watson/resources/ai-adoption

Min, B., Ross, H., Sulem, E., Veyseh, A. P. B., Nguyen, T. H., Sainz, O., ... & Roth, D. (2023). Recent advances in natural language processing via large pre-trained language models: A survey. ACM Computing Surveys, 56(2), 1-40. Retrieved May 31, 2024, from https://doi.org/10.48550/arXiv.2111.01243

SKR (2024). Handslag för digitalisering, Retrieved May 31, 2024, from https://skr.se/skr/naringslivarbetedigitalisering/digitalisering/handslagfordigitalisering.6728.html

SKR (2022). Välfärdens kompetensförsörjning - Personalprognos 2021–2031 och hur välfärden kan möta kompetensutmaningen. Retrieved May 31, 2024, from https://skr.se/download/18.1eb2584e1850542abfaac29/1670940688212/Valfardens-kompetensforsorjning.pdf

Vinnova (2022). Vinnova coordinates the government's partnership programmes. Retrieved May 31, 2024, from https://www.vinnova.se/en/m/government-partnership-programmes/