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Investigating Digital Divide Impacts on the Effective Use of Artificial Intelligence (AI) Technology among SMEs in Urban and Rural Areas

Topic: Research on digital entrepreneurship has increased in prominence in recent years, coinciding with the growing influence of Artificial Intelligence (AI) on society. While discussions around the application of AI consider negative connotations of AI, such as replacing jobs, there is little research on the adoption and application of AI among Small and Medium-Sized Enterprises (SMEs), which play a vital role in many economies. Existing digital entrepreneurship literature points to a digital divide between the accessibility of digital technology in urban and rural areas. This research, therefore, investigates the impact of the digital divide on effective AI technology use by SMEs in urban and rural contexts.

Applicability to the conference theme – ‘Collaborating across Entrepreneurial Ecosystems: opportunities for inclusion, innovation, sustainability, resilience and growth’: This research aligns with the conference theme by exploring differences between urban and rural areas on effective use of AI technology among SMEs, which involves collaboration across various actors within local ecosystems, and provides a better understanding of how AI can be used by SMEs in urban and rural areas to develop innovation, resilience and growth.

Aim: A review of literature confirms that rural SMEs remain an under-researched area of digital entrepreneurship, therefore this paper aims to address comparisons between urban and rural SMEs, particularly as entrepreneurial activity among rural SMEs is impacted by the digital divide. That is, the difference between digital connectivity in urban and rural areas, particularly as digital infrastructure, notably mobile connectivity and access to broadband internet, is often less prominent in rural areas. Drawing on existing research on digital entrepreneurship in rural SMEs, this research is viewed through a resource bricolage theoretical lens, which points to the notion of making do with ‘whatever is at hand’, and has been increasingly prominent in SME research, including the resilience of SMEs in the face of global crises. Resource bricolage is considered a relevant theoretical basis for this research as it considers resource-scarce situations, and it supports businesses in overcoming limited access to resources through localised activities, aligning with the challenges of limited digital infrastructure from the digital divide, as discussed in existing literature. Considering digital entrepreneurship in the context of the digital divide, this research aims to investigate the extent to which the unequal access to AI technology and the social inequalities of rural areas has a bearing on SME innovation and growth.

Methodology: This paper uses Longitudinal Small Business Survey (LSBS) data from the UK Government to investigate the impacts of an urban and rural location on the role of AI technology in levels of innovation and growth among SMEs. A regression analysis is employed as the primary form of analysis, with treatment effects analysis also conducted to examine selection bias endogeneity. This approach is similar to those used in prior SME research, with the use of secondary data and a predictive approach. Reporting on the regression, there was $n=2,546$ urban and $n=1,203$ rural SMEs in the sample.

Contribution: Findings indicate that AI adoption leads to SME growth, with more effective AI use observed among rural SMEs, dispelling the notion of the digital divide. This research underlines that new digital technology through artificial intelligence acts to dispel existing assumptions about the digital divide, that rural areas are disadvantaged compared to their urban counterparts. While it is acknowledged that this is dependent on access to digital

infrastructure, the benefits of AI technology adoption are more pronounced among rural SMEs, with AI adoption leading to increased turnover and staff in rural SMEs compared to urban ones. These findings point to the advantages of AI technology adoption, particularly at a time when AI technology is gaining increasing traction in society. Viewed through a resource bricolage lens, the ability for SMEs, particularly in rural areas, to fully exploit these opportunities is heightened by the ability of the SME to effectively leverage the resources at hand.

Implications for practice: Practical implications from this research imply that SMEs, notably rural SMEs, can explore opportunities for growth through the effective adoption and application of AI digital technologies. This can lead to an increase in turnover and in staff levels within the business. This would depend on the awareness of the SME towards digital entrepreneurship opportunities, and a willingness to adopt AI technology.

Implications for policy: Given the pessimistic tones of discussions around the emergence of AI technology, notably through automation replacing certain jobs, there is a need to ensure that the opportunities from AI adoption are more effectively communicated to users. Thus, policy implications should ensure that SMEs are supported appropriately in effectively adopting AI technology into existing practice. Additionally, policy should ensure that optimal digital infrastructure is in place to support this.