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Ageing and Learning Agility –Mediating role of learning perception and Moderating role of technology leverage

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ABSTRACT

The future of work requires continuous upskilling and reskilling of workers for full labour force participation and productivity that has led to growing importance of learning agility. However, research on this subject is still in its infancy. This study aims to investigate the effect of ageing on learning agility and mediating effects of perception of learning. The study also examines the moderating role of technology leverage on the relationship between perception of learning and learning agility. Partial least square (PLS) structural equation modelling (SEM) approach was used to analyse the data using SmartPLS 3.0 software. The data was collected from 377 working professionals using the snowball sampling technique. The results suggested that ageing and perception of learning has a significant positive impact on learning agility. However, there is no significant mediating effect of perception of learning on learning agility. The moderating effect of technology leverage was found to be insignificant on the interaction between perception of learning and learning agility. The study will be useful for learning platforms and human resource practitioners and managers to develop effective strategies for upskilling and reskilling their workers.

KEYWORDS

Ageing; learning agility; learning; technology

Introduction

Technological innovations are among the key disruptive forces that are transforming the world of work and skills are becoming obsolete sooner than before (Park & Kim, 2020). To enable full labour force participation and transitioning into new jobs, retraining, lifelong learning and career development of workers is of prime concern for governments across the world (Ozanne, 2001). Unlike in the past, when the majority of learners were young, the number of older adults returning to education for upskilling or reskilling themselves is increasing at scale (Ke & Kwak, 2013; McIntosh, 2005). Skills are subject to early obsolescence in today's volatile, uncertain, and dynamic world of work. With less job security and increasing demand for lifelong learning, individuals have to become active agents rather than reacting passively to changes in the workplace (Harteis & Goller, 2014). Labour productivity of older workers declines faster now due to rapid changes in job skills, thereby leading to more poverty for older workers and requires careful deliberation on lifelong learning policies (Park & Kim, 2020). For many governments improving the employability and productivity of older workers will be important owing to technological disruptions on one hand and increased life expectancy on the other. For many organisations, adaptability, reskilling, and employability of their existing workforce will be as important as recruiting young workers (Field &

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Canning, 2014). Advances in healthcare have resulted in rise in the number of older adults, who are able-bodied and changing demographics in workforce has created a need for continued employment among older adults (Findsen & Formosa, 2012). It has also been recognised that continuous participation in non-formal lifelong learning enables psychological wellbeing, retention of autonomy and life fulfilment for older adults (Narushima et al., 2018).

ICT (Internet and Communication Technologies) has enabled open, online, and distance education and opportunities for lifelong learning (Thorpe, 2005). ICT revolution has resulted in easier access to knowledge and information (Van Weert & Kendall, 2006). Access, participation, and effectiveness of learning have been the key issues pertaining to leveraging technology for learning (Thorpe, 2000). Technology can make lifelong learning a reality by personalising it to suit the needs of learners across all age groups(Dinevski & Kokol, 2004). Degrees no longer serve as badges of employability and individuals are returning to education many times in their careers (McIntosh, 2005). Many commercial providers have entered higher education to serve this upsurge in demand from lifelong learners, leaving the universities as only one part of the complex educational tapestry. ICT has enabled learning content and education management in ways that were unimaginable in the past. Provisions for interaction with the instructor, fellow learners and feedback during learning will further strengthen the use of ICT for lifelong learning and acquisition of new skills any time in one's career (Mayes & Universities, 2000). Ability to use ICT and digital dexterity is hence fundamental to becoming an effective global citizen and a lifelong learner (O'Sullivan et al., 2019).

Many of these studies have used lifelong learning and lifelong education as synonymous terms, while in reality they are two distinct concepts (Billett, 2018). While there is easy access to educational content and knowledge in the modern world, for learning to occur, one must be able to successfully utilise the acquired knowledge while performing subsequent actions. Learning is a process of improving actions through better knowledge and understanding (Fiol & Lyles, 1985). For learning to occur, a person must display the learning later. Transfer of learning can be addressed pedagogically by creating conditions that stimulate reflexive transfer by triggering well-practiced routines or mindful transfers involving deliberate abstraction and search for connections (Perkins & Salomon, 1992). While lifelong education entails to creating provisions for adults getting back to acquiring new skills by engaging in intentional educational activities during the course of their careers, Lifelong learning is a process that goes beyond that arises through lifelong education (Billett, 2018). It is not tied to an institutional context, rather it takes a larger holistic perspective not limited to formal education (Tuijnman & Boström, 2002). Lifelong learning is more of a socio-personal process and a personal fact distinct from education provision that is an institutional fact (Billett, 2010).

Therefore, while lifelong education gets embraced globally with increased provisions for pursuing formal education at any stage of life, in the individual context for lifelong learning, it becomes pertinent to understand the effect of ageing on people's ability to learn. There are mixed opinions expressed by previous researchers on this aspect. On one hand, it is believed that acquiring new skills is more effective in early adolescence than in later life (Janacsek et al., 2012). On the other hand, it is believed that while the ways of learning diversify with increasing age the ability to learn remains throughout the lifespan of human beings (Guglielman, 2012). Ageing is defined biologically based on bodily functions (Mooradian, 1990), psychologically based on intelligence and memory, socio-culturally based on expectations from the society and chronologically as an indicator (Timonen, 2008). However, none of these definitions gives information to determine the individual's ability to learn (Bohlinger & Van Loo, 2010).

Learning agility, as a concept, was introduced by Lombardo & Eichinger and they defined it as the willingness and the ability of the individual to learn new competencies and perform under first time, tough or different conditions in new situations (Lombardo & Eichinger, 2000). It was conceptualised according to four dimensions: -

(1) People agility – ability to know oneself well, learn from experience, treat others constructively and remaining cool and resilient under the pressures of change.
(2) Results agility – ability to get results under tough conditions, inspire others to perform beyond normal and exhibit the sort of presence that builds confidence in others.
(3) Mental agility – ability to think through problems from a fresh point of view and being comfortable with complexity, ambiguity and explaining own thinking to others.
(4) Change agility – being curious, having a passion for ideas, experimenting with test cases, and engaging in skill-building activities

It is the ability to continuously learn from experiences and apply that learning in new or first-time conditions (De Meuse et al., 2010). It is a meta concept reflecting a range of internal cognitive and observable behavioural indicators and perceptions of an individual's ability to learn from every situation (DeRue et al., 2012) There exists a rich history of learning research in psychology dating back to early experiments of making an automatic connection between a stimulus and a response by Ivan Pavlov and B. F. Skinner. The concept of Learning agility was introduced more recently and has more to do with learning from varied experiences, application of such learning and performance success (De Meuse, 2017). Past studies have argued between whether it is the variety of experiences in their careers that lead to higher Learning agility in individuals or if it is that the people with higher learning agility end up with more varied careers. There is limited conclusive understanding on the antecedents of Learning agility and research in this area is prioritised with increasing relevance for the concept (Hezlett & Kuncel, 2012) . Learning agility is emerging as a psychological construct that is perfectly suited to capture the dynamic and evolving attributes needed to lead during these turbulent times. The VUCA (Volatile, Uncertain, Complex and Ambiguous) conditions of the 21st century will provide numerous opportunities for those individuals and companies sufficiently learning agile to see and capitalise on them (De Meuse & Harvey, 2021). Past studies have highlighted other concepts similar to Learning agility. Wang and Beier (2012) brought forth the attention to existing theories of informal development and adaptability that resemble the theory of Learning agility. Adaptability is another very similar construct to learning agility that examines the individual's ability to embrace change (Dries et al., 2012). According to I-Adapt theory, individual adaptability refers to individual's ability, skill, disposition, willingness, and/or motivation to change or fit different task, social, and environmental features (Ployhart & Bliese, 2006). Adaptability is an action and is therefore an outcome of Learning agility (Reed, 2012). Learning agility, however, is a more formative and comprehensive construct and focuses on speed and flexibility of individuals to learn and adapt to situations. It has three components – potential, motivation, and adaptability (Amato & Molokhia, 2016). There has been a debate about whether Learning agility is required for all kind of jobs, for instance, expertise-driven jobs may not benefit from Learning agility (K. P. De Meuse et al., 2012). While this may be true as long as they are using the same skills, increasing capabilities of AI and automation make specialist jobs more prone to deskilling (Escobari et al., 2019). Gaining expertise in these newly acquired skills will require seeking provisions for and repeatedly practicing them across varied situations. Having Learning agility especially comes into play with transitions – from known to unknown (Swisher, 2013). Lifelong learning requires the development of manual dexterity, skilful performance, or the deep understanding required for occupational expertise in newly acquired skills. Learning agility predicts performance and learning (Bedford, 2011; Laxson, 2018). We therefore choose Learning agility to examine the effect of ageing on an individual's ability to pursue lifelong learning.

The relationship between age and learning agility has dichotomous views. According to Haring et al. (2020), there is a steady decline in learning agility with maximum impact on mental agility in age groups above 35 years. De Meuse et al. (2011) although ascertained in their study that there is no relationship whatsoever between age and learning agility. While there are limited studies directly examining the relationship between ageing and learning agility there are other studies that indicate lower participation in education and learning

activities among older adults aged above 60 (De Donder et al., 2014) and the change in their perceptions about learning with increasing age. At the same time, there has been an explosive growth in the number of older adults in their mid-careers participating in education as they see it as a part of everyday life activities (Boulton-Lewis & Tam, 2011). Past research also highlights that there is as well as seldom influence of lifelong learning using ICT in economic growth (Tchamyou et al., 2019). As a result, paradigms of current adult education are shifting from lifelong education to lifelong learning (Barros, 2012)

How individual learners perceive learning has a significant impact on the actual learning behaviour and 20% of the variance in actual behaviour can be explained with this theory (Armitage & Conner, 2001; Gebreeyesus Hadera et al., 2007; Ho et al., 2011; N. n.d.ubisi, 2006; N. O. n.d.ubisi, 2004; Terry & O'Leary, 1995; Yu & Yu, 2010). Perception of learning is an important predictor of the transfer of learning (Velada & Caetano, 2007). Whether age affects perception about learning and thereby influences learning agility, therefore becomes important to examine.

In recent years, more and more human resource practitioners are taking a keen interest in the concept of learning agility for employee development, owing to dynamic changes happening in organisations. Ageing is a natural process and with the decline in the lifespan of skills, workers need to be agile learners and actively participate in acquiring new skills. The purpose of this study is to investigate the relationship between ageing and learning agility. There are limited studies conducted to examine this relationship and hardly any in India. It is also believed widely in India, that as we age, our perception about learning changes that in turn impedes the adoption of new technologies and continuous learning. We, therefore, examine the mediating role of learning perception and the moderating role technology leverage in this relationship using empirical methods. The findings will help advance research in upskilling and reskilling workers in organisations and in policy formulations for enabling lifelong learning.

Literature review

Ageing and perception about learning

Web-based education has changed the learner population to a more diverse group that varies in age and ethnicity. The heterogeneous mix consists of older adults who are usually employed, goal-oriented and more self-directed and younger students who are tech-savvy and dynamic by nature. But there is no significant correlation between student's age and their self-perceived technology competence level to undertake online learning (Ke & Kwak, 2013). When older workers perceive their organisation to be indiscriminative of age, they tend to have a positive perception about their own learning ability (Zaniboni, 2015). These studies have considered employed older adults in their pre-retirement life stages, other studies that focus on adults older than 60 years indicate that as people age, they participate less in further education not only due to a lack of opportunities but also due to their own perception about their ability to learn (Friebe & Schmidt-Hertha, 2013). Language learning scientists believe second language learning is constrained by maturation of age and adult learner's perception (Abrahamsson & Hyltenstam, 2009). Older students have higher self-efficacy. They are more intrinsically motivated, self-directed in online learning environments, while younger learners do better in knowledge tests (Knowles, 1989). We hypothesise that as people age, and experience different life stages, their perception of learning gets affected.

H1: Ageing affects Perception about learning.

Perception about learning and learning agility

According to Ajzen's theory of planned behaviour, Individual learning behaviours are shaped by attitude, subjective norms, and perceived behavioural control. Learning agility is a meta concept reflecting a range of internal cognitive and observable behavioural indicators and perceptions of an individual's ability to learn from every situation(DeRue et al., 2012). When students perceive that learning tasks as easy and useful, their learning agility increases. Perceived digital competence has a positive impact on learning agility (Kim et al., 2018). Individual's perspectives about one's own learning abilities affect learning possibilities and readiness. Individuals generally have little awareness about their own learning agility. Based on their experience of using 'The Choices Architect', a multi-rater instrument developed by Lombardo and Eichinger (2000) to measure learning agility, it is found that those who are more agile learners tend to underrate themselves and those who are less agile learners overrate themselves (K. P. De Meuse et al., 2010). Drinka (2018) found that the perception of peers and managers affect an individual's learning agility. We hypothesise that perception about learning affects their learning agility.

H2: Perception about learning affects learning agility.

Ageing and learning agility

Past studies have highlighted the prevailing biases and myths associated with the ability of learning and age, thereby limiting their employment opportunities. Traditionally, value systems have resulted in erroneous beliefs about the skills, abilities, and personality structure of older workers (Tuckman & Lorge, 1952). Many of these myths and stereotypical beliefs remain in the professional world impeding the effective participation of all age groups in economic activities. Several researchers have put forth these misleading beliefs as being problematic and unfounded, some of which are listed here.

*'Younger job applicants receive highly suitability ratings than older job applicants (*Fritzsche & Marcus, 2013*).'*

*'Older people demand more money than younger people and have a stronger status-quo bias (*Axelrad et al., 2016*).'*

*'Employing older people costs more for the business. It is a myth that older workers are not flexible and can't learn new technologies, in fact, their overall human capital contribution, a sum of psychological, intellectual, emotional, and social capital, is higher than the younger workers (*Peterson & Spiker, 2005*).'*

*'Employability of older workers witness seldom success, with only the more resilient ones being able to manage either using their personal network or acquiring new skills in areas where there is less competition (*Patrickson & Ranzijn, 2003*).'*

*'Those over 40 years of age are stereotyped to be less flexible, adaptable and often denied opportunities for upskilling and employment (*Wilson et al., 2007*).'*

Several personal attributes like eyesight, dexterity, and physical ability decline with age and it is perceived that ability to learn also reduces with age. Contrary to these beliefs, it was found that learning agility has no adverse relationship with age (De Meuse et al., 2008). Learning agility can be developed across all generations of workers, irrespective of age, by creating practice communities and enhancing internal mobility in organisations (Rupčić, 2018). De Meuse et al. (2008) in their study found that learning agility is unrelated to age with some evidence of younger learners scoring higher on change agility. With mixed findings, whether age affects learning agility is still non-conclusive. With increasing age of working professionals, their life and job experiences also increase. They get to work in variety of changing contexts and people. Therefore, we hypothesise that learning agility should increase with age.

H3: Ageing has a positive effect on Learning agility.

The mediating role of perception of learning

Self and other's perceptions about learning affect one's learning agility (DeRue et al., 2012; Drinka, 2018; Kim et al., 2018). Self-perception theory suggests that adults' beliefs and perceptions may be an outcome rather than a cause for their intellectual behaviours. Concern about intellectual ageing increases in later life for adults (Cornelius & Caspi, 1986). Older adults are more focused and effective in solving everyday problems particularly interpersonal problems than younger adults (Blanchard-Fields et al., 2007). Self-conceptions of academic and everyday intelligence are different for young, middle-aged and older adults(Cornelius et al., 1989). How one perceives and interprets a problem affects their everyday problem-solving (Berg & Calderone, 1994). Older adults solve emotionally salient and interpersonal problems more effectively than younger adults(Blanchard-Fields, 2007). Perception of learning affects learning agility and ageing affects perception of learning, which leads us to our fourth hypothesis that the ageing and learning agility relationship is mediated by perception.

H4: Perception of learning mediates the effect of ageing on learning agility.

The moderating role of technology leverage

Past studies have found that older students are more self-directed and better online learners (Ransdell et al., 2011). Perception of learning affects the adoption of technology for learning among older adults (Pang et al., 2021). e-learning technology promotes learning agility and organisations must adopt ICT and build a learning culture (Ghos et al., 2020). Successful organisations will master leveraging technology to develop learning agility and stay ahead of the competition (Gravett & Caldwell, 2016). Technology adoption in organisations will foster upskilling, reskilling and agile learners (Busby, 2019). Several past studies have found perceived ease of use and perceived usefulness affects the adoption of digital learning technologies (Chen et al., 2002; Kashada et al., 2018; Liao & Lu, 2008a, 2008b). Digital dexterity and the ability to leverage technology for learning is fundamental to becoming a lifelong learner (O'Sullivan et al., 2019). e-Learning adoption and leverage has a positive effect on the learning agility of students (Kishabale, 2021). Self and others' perception affects learning agility (Church, 2021). Therefore, we hypothesise that the relationship between perception and learning agility is moderated by technology leverage for learning.

H5: Technology leverage moderates the relationship between perception about learning and learning agility.

Method

Data collection

The present research considers ageing as a continuous variable and examines the impact of increasing age on the learning agility of individuals. The study population is people currently employed in companies. They are in their employable age (Between 18 and 60 years in India) and minimum educational level of graduation (eligibility for employment in India). A total of 390 working professionals participated in the study; however, 6 responses had missing information, and so they were excluded. After further securitising the data, only 377 samples were found fit for the

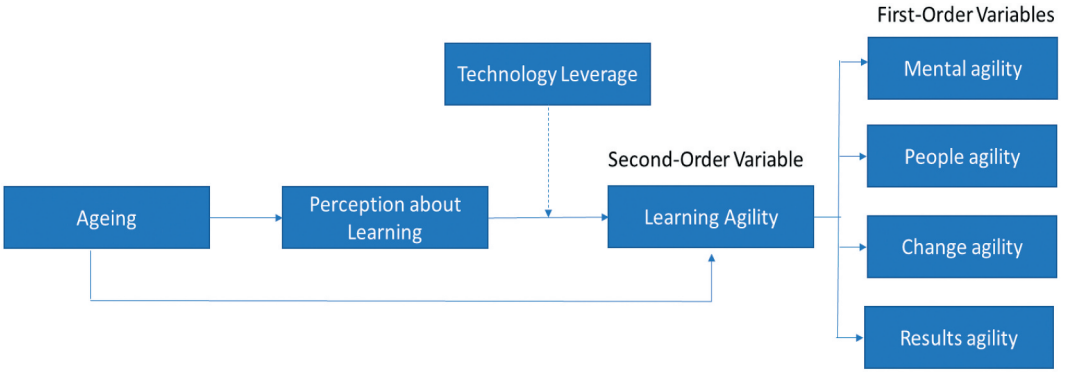


Figure 1. Research model.

Table 1. Demographic profile.

Variable	Option	Frequency (N = 372)	Percent
Gender	Female	126	33.9
	Male	246	66.1
Age groups	18–24 Years	67	18.0
	25–34 Years	167	44.9
	35–44 Years	105	28.2
	45–59 Years	33	8.9

analysis. Data were collected using a structured questionnaire on 5-point Likert scale questions for constructs and demographic question-ageing was measured on an ordinal scale. A conceptual model as shown in Figure 1 is proposed for understanding the relationship between age and learning agility mediated by the perception of learning and moderated by the technology leverage perspective. The learning agility construct was developed as a formative construct formed from the four first-order constructs-mental, people, change and result agility as suggested by De Meuse et al. (2010). The items that depict the constructs are adapted and modified from previous studies (Ajzen, 1991; Davis, 1986, 1986, 1986; De Meuse et al., 2008; Venkatesh et al., 2003). The questionnaire was administered online in English. A convenience sample technique was used to collect the data from social media networks – like LinkedIn. In addition, data was collected using printed forms (paper-pencil) from two companies. The data so collected was captured into the online Excel database. Further, the authors circulated the link of questionnaire form through email, WhatsApp, and LinkedIn to their network of working professionals. Snowball technique was used in WhatsApp requests for participation. Participants were requested to further forward the survey to their network of working professionals. The demographic details of the respondents are shown in Table 1. Most of the respondents (66%) were male and rest were female. The sample had balanced age groups that were important to estimate the results of ageing the construct. The diversity in age groups was important for the study to understand the relationship of ageing with perception of learning and learning agility. Data from only one age group or high age group, may not appropriate to conclude that the relationship will be different or same for younger employees. Hence, we could not have generalised the results.

Results

Partial Least Squares (PLS) structural equation modelling (SEM) approach was used to test the hypothesised relationship, using the SmartPLS software. PLS-SEM is convenient for testing a research framework where it is important to test the dependencies of the variable and the structure

Table 2. Model measurement.

Construct	Items	Factor loadings	Cronbach alpha	Composite reliability	AVE
Perception about learning	I believe learning a new skill is in my control	0.754	0.730	0.846	0.647
	I am aware my reputation increases through learning new skills	0.871			
	Certifications add credibility to my skill when I learn	0.784			
Leveraging Technology to learn	I use ICT (Internet & Communication Technology) to learn because I prefer this method	0.757	0.719	0.825	0.541
	Leverage ICT to learn when the content is useful to me	0.706			
	I leverage ICT to learn when my organisation provides the platform to me	0.774			
	Leverage ICT to learn when I am given technical support while learning	0.702			
Learning Agility			0.760	0.827	0.375
Mental agility	Like to take challenging new opportunities	0.820			0.682
	Conscious to pay attention to learn from complex situations	0.831			
People agility	Open to learning	0.791			0.605
	Can work with a diverse set of people	0.765			
Change agility	Comfortable to experiment new job assignments	0.820			0.580
	Take ownership to achieve my deliverables	0.698			
Results agility	Consistently delivered in first time situations	0.809			0.656
	Plan activities with results focus	0.811			

is complex and data may lack normality. The factor loadings of all three constructs were measured as shown in Table 2. All factor loading values are above the minimum acceptable value of 0.70 (Hair, Risher, Sarstedt, & Ringle, 2019) except the second item of change agility that was close to 0.7, hence accepted. The reliability of the items was evaluated through Cronbach's alpha and composite reliability and all values were above the standard value of 0.7 which is recommended (Hair et al., 2019). To test the convergent validity of data, AVE (average variance extracted) was measured, all the values were higher than the acceptable value of 0.50 (Hair et al., 2019), except the value of second-order factor learning agility. Therefore, we measured the AVE of four first-order variables and found them above the threshold value of 0.50. The confirmation AVE (average variance extracted) signifies that item measures their corresponding variable, which it is supposed to measure.

To test the divergent validity of the items, the Fornell–Larcker criteria were applied as shown in Table 3. Divergent validity means that each item measures a different construct from the other different items. The square root of all values of AVEs is higher than the correlation between constructs; therefore, divergent validity is confirmed (Fornell & Larcker, 1981). To further confirm the divergent validity, the HTMT ratio of correlations is evaluated. The divergent validity was established again as all values are below the acceptable maximum value threshold of 0.85 (Henseler, Ringle, & Sarstedt, 2015). The values are shown in the bracket in Table 3.

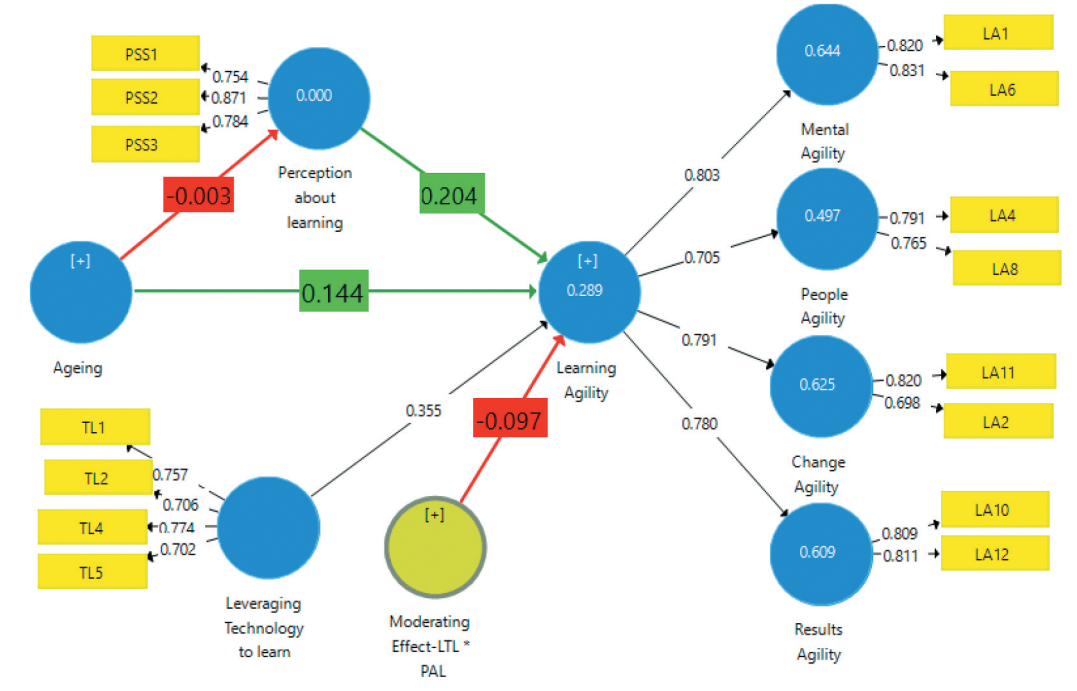
The hypothesised relationships were analysed and two hypothesised relationships-H2 & H3 were supported. There is evidence of a positive effect of perception about learning on learning agility (β: 0.204) and ageing on learning agility (β: 0.144). This means that agility of learning new skills and education changes over the period of lifespan and the perception about learning influence the agility of person to learn. Ageing shows no impact on the perception about learning, we reject our H1 hypothesis. This implies that as people age there is no impact on the perception of learning, it

Table 3. Fornell-Larcker criterion and HTMT ratio.

Constructs	Perception about learning	Leveraging Technology to learn	Learning Agility
Perception about learning	0.805		
Leveraging Technology to learn	0.40 (0.53)	0.735	
Learning Agility	0.37 (0.48)	0.46 (0.61)	0.613

Table 4. Hypothesis results.

H#	Path Relationships	β	T-values	P Values	Remarks
H1	**Ageing → Perception about learning**	−0.003	0.053	**0.958**	**Not Supported**
H2	**Perception about learning → Learning Agility**	0.204	4.947	**0.000**	**Supported**
H3	**Ageing →Learning Agility**	0.144	3.408	**0.001**	**Supported**
Mediating effect					
H4	**Ageing → Perception about learning → Learning Agility**	−0.001	0.051	**0.959**	**Not Supported**
Moderating effect					
H5	**Moderating Effect (Technology Leverage * Perception about learning) → Learning Agility**	−0.097	1.562	**0.119**	**Not Supported**



Green-Significant effect
Red-Insignificant effect

Figure 2. PLS-SEM estimations.

remains same through the age groups. The perception about learning was not found to mediate the relationship between ageing and learning agility, hence we reject the H4 hypothesis. The moderating effect of technology leverage does not influence the interaction between the perception about learning agility, therefore we H5 hypothesis is also not supported. The second-order variables-mental agility (β: 0.803), people agility (β: 0.705), change agility (β: 0.791) and results agility (β: 0.780) show strong influence of formative (second order) variable learning agility as shown in Table 4. The R^2 value of learning agility is 0.289 as shown in Figure 2. This indicates that 28% of the variance in learning agility is explained by the exogenous variables. Therefore, the low R^2 value implies that there are other factors that are responsible for determining the learning agility of learners.

Discussion

Learning agility is a relatively new concept and there is limited research available, more so in the context of leadership development. Technological innovations are redefining jobs, and skills are getting obsolete sooner than before. To maintain continuity in employment individuals are required to acquire new skills many times in their careers. Therefore, it is important to study learning agility beyond the context of leadership development to cover more pressing needs of upskilling and reskilling. Learning agility is the most important skill in the current context because a person with high learning agility is curious and motivated to learn throughout their career (Zao-Sanders & Palmer, 2019). Workers with high learning agility gain skills to be considered for other new or evolving roles(Busby, 2019). Whether a fresh graduate or an experienced professional, everyone needs to possess learning agility to survive in the professional world. Unlike the past, when one would acquire skills for a profession at a young age and hone them to advance proficiencies for

the rest of the professional life, the current dynamics and future of work are pushing individuals to periodically upskill and reskill themselves. Irrespective of their age and life stage, individuals are required to continuously learn to survive in the professional world. Therefore, it becomes pertinent to examine if ageing has an impact on learning agility. Learning agility as a subject, however, is still under-researched. Most of the studies in the past have focused on leadership development using learning agility concepts. Some of these past studies, though not conclusively, have suggested that there may be no relationship between age and learning agility(De Meuse et al., 2008; Rupčić, 2018). At the same time, there are myths and biases related to reduced ability to learn with increasing age (Wilson et al., 2007). Lombardo and Eichinger (2000) developed the Choices instrument to measure learning agility and the four key formative elements of their construct measure the individuals change agility, people agility, mental agility, and results agility.

With increasing age, people are exposed to more changes, diverse set of people and situations in their personal and professional life, thereby providing more opportunities for applying knowledge and skills and adapting new situations. Since learning agility is all about learning from experience, we argued that learning agility should increase with age, as people get opportunities to apply their knowledge and skills in varied and a greater number of contexts. The results suggest that ageing has a significant positive impact on learning agility, however the relation is weak. Learning agility is more to do with applying one's knowledge and skills in real-life diverse situations. Therefore, based on results from the present study, we argue that learning agility takes its own course of time with age to develop. With increasing age, people naturally experience more in personal and professional life. While there is no prior research to our best knowledge that support this finding; however, several studies in the past have found that older adults' ability for practical problem-solving is higher than younger adults. Real-world problem-solving abilities improve with age as adults gain increasing experience in how to solve problems better (Berg & Calderone, 1994; Blanchard-Fields, 2007; Blanchard-Fields et al., 2007; Cornelius & Caspi, 1987). Whether the quality and diversity of these experiences have a moderating impact on learning agility is an area for future research. Learning agile individuals take onus to perform, gather information, fail fast, are open to be wrong, adopt a logical and rational approach to problem-solving, look for inconsistencies, and evaluate risks in uncertain situations. They are better adept to dealing with diverse set of people and situations. Past studies over several decades have articulated the positive impact of age on many of these habits in individuals. Taylor (1975) found that age influences performance of managers more than prior experience. Older managers (among the 23–57 years age cohort) seek greater amounts of information and diagnose the value of information better than younger, are more flexible to alter their decisions when there is an adverse consequence of their choice(Taylor, 1975). Older employees are more flexible with their expectations, reciprocate with stronger job performance when their deals are honoured, are more tolerant and stronger when they experience breach in psychological contracts with other people than younger employees (Ng & Feldman, 2009). Contrary to beliefs around cognitive decline affecting skill acquisitions, it was found that young and old adults are equally adept to acquire and retain simple new skills and there is no noticeable difference in the way they perform or improve simple tasks. Experience and practice results in improved detection, discrimination and speed classification in performance of simple components of skill (Salthouse & Somberg, 1982). At the same time, there is a strong debate around whether it is age, or the experience gained while ageing that make older adults better at these skills. Our sample consisted of people working in organisations and therefore the positive affect of age on learning agility does not cater to people who do not have work experience. The role of work experience therefore cannot be ignored considering findings in the past studies. Emotional intelligence is found to be positively related to work-experience (Shipley et al., 2010). Work experience is a better indicator of performance than age in non-managerial jobs (Avolio et al., 1990). The positive correlation between age and learning agility is significant, however the low R^2 values indicate there are other crucial factors that influence learning agility besides age. Furthermore, longitudinal research is required to study the differences between age cohorts to the influence of maturation.

Past studies indicate perception affects one's learning agility. Accurate self-perception and self-awareness lead to better self-direction and this enhances learning agility. The perceptions and evaluations of others can instil confidence and enhance one's learning agility (De Meuse et al., 2010). The present study results also suggest a strong positive significant impact of perception on learning agility, which is in line with the past studies and verifies this hypothesis empirically.

Perception about learning changes and people engage in less new learning with increasing age due to self and others' perceptions (Friebe & Schmidt-Hertha, 2013; De Meuse et al., 2010). Therefore, we examined the effect of ageing on perception. However, results suggest that there is no significant effect of ageing on perception. This further corroborates with findings from prior studies that have examined the ageing impact on perception about learning and found it to be more of an inaccurate myth or belief than reality (Peterson & Spiker, 2005). So, while perception has a significant positive impact on learning agility, ageing has no significant effect on perception. Therefore, we further examined if there is a mediating effect of perception on the learning agility of ageing individuals and found it to be insignificant. While perception does impact learning agility, but it does not mediate the impact of ageing on learning agility.

Internet and Communication Technology (ICT) has simplified access to education and new skill learning. The learner community on the internet, as a result, has become more diverse and intergenerational (Ke & Kwak, 2013). There is an upsurge in the number and diversity of online learners, pursuing courses, with the increasing number of openly available knowledge, content, and certification courses available on the internet. It is also evident from past studies that older students are more self-directed and better online learners (Ransdell et al., 2011). To see if pursuing online learning and having a positive perception can further improve the effect of ageing on learning agility, we examined the combined moderating effect of perception about learning and technology leverage on the learning agility of ageing individuals. The results suggest that this effect is insignificant. This further corroborates with theories that view learning agility as a driving construct to learning. People who possess learning agility are better learners. While having a positive perception about learning and leveraging ICT to learn has a positive effect on learning agility, it does not moderate the effect of ageing on learning agility. The effect of ageing on learning agility is stronger and while perception and technology leverage do positively impact learning agility, they are unlikely to enhance the impact of ageing.

Implications of the research

The study focused on ageing and learning agility and found that ageing has a significant positive impact on learning agility. It advances research on learning agility which is still in its infancy with very few conclusive results. To the best of our knowledge, no other study has concluded with this finding. This study will help human resource practitioners and managers build effective strategies for upskilling and reskilling workers. It also opens new avenues for future research in learning agility. The study shows a positive effect of ageing on learning agility which is contrary to some prior non-conclusive findings that age and learning agility may be unrelated. Therefore, this study can be further validated by increasing the sample size.

Managerial implications

The study is helpful for policymakers of the nation and organisations to improve the employability and productivity of older workers. With changing skills landscape, businesses will continue to have tall reskilling goals for workers of all age groups. It is imperative for human resource practitioners and managers to understand, assess and develop the learning agility of workers. Managers must

create opportunities for workers to apply newly learnt skills in varied contexts and foster a culture of job rotations to develop learning agility. To enhance the effectiveness of reskilling initiatives, organisations must carefully select candidates for reskilling based on their learning agility.

Conclusion

The new world of work requires continuous upskilling, in which workers gain new skills to perform in their current roles and reskilling, in which workers gain skills to take on completely new roles. To build an ecosystem that ensures full labour force participation, employability, and productivity of workers, organisations will have to drive this transformation at scale. Learning agility is the most important skill for individuals to thrive in this dynamism; however, research on learning agility is still in its infancy with very few conclusive results. Most of the studies in the past have focused on this concept, in the context of leadership development, with extremely limited studies examining this construct in the context of upskilling and reskilling. Ageing is a natural process and has been associated with several myths and biases related to cognition, perception, performance, motivation, and ability to learn. Several studies have highlighted age-related discrimination at work. This study found that ageing has a positive effect on learning agility and hence human resource practitioners and managers must build strategies for effective utilisation of their ageing workers. The right mix of young workers with fresh ideas and older workers with their varied experience and naturally gained learning agility can help businesses adapt to the economic dynamism. The study also found that there is a positive impact of perception on learning agility. Fostering environments for building positive perceptions about learning will enhance the learning agility of workers. While there is an upsurge in numbers and diversity of online learners, it is important for organisations to create an ecosystem that ensures application opportunities of newly acquired knowledge or certifications by workers. There is no significant moderating impact of technology leverage in the relationship between perception and learning agility of ageing workers. This further indicates that the effect of ageing on learning agility remains unaltered by these mediators. The findings from this research are contradictory to earlier claims in one study that learning agility and age are unrelated. While another study found that there is no adverse effect of ageing on learning agility. We conclude that there is a positive effect of ageing on learning agility. Learning agility is gaining importance in the world of work, the academic focus on this subject must gain momentum. Therefore, we recommend further studies to validate these findings. This study was limited to examining only the relationship between ageing and learning agility. However, we also found that the formative construct for learning agility can be scope for further research to identify more exogenous variables. Developing learning agility in organisations is another area by itself for further research.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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