



Digital Culture And Neuro Management: The Repercussions To Digital Competency Among Government And Private Institution Educators In Rajasthan

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ABSTRACT

The high pace of digitalisation of education has essentially transformed the teaching-learning activities, the institutional operations, as well as the professional skills of the educators. The digital competency in modern educational settings is not limited to technical ability, but also includes cognitive control, pedagogical flexibility, critical analysis of digital information, and long-term control over digital requirements. Based on the concepts of neuro management and educational neuroscience, the paper is a conceptually based on how the digital culture affects the digital competency of the educator via cognitive and motivational processes.

Based on the Indian state of Rajasthan, the study involves a synthesis of interdisciplinary literature released in the period between 2018-2024 in the fields of digital education, neuroscience, teacher professional development, and organisational culture. The article claims that sustained exposure to digital space alters attention control, multitasking, memory processing and transferring learning- processes controlled by neuroplasticity. Although well-organized and cognitively congruent online interaction may lead to a rise in professional competence, careless digital overload . Divided attention can cause the decline in teaching quality.

The article identifies neuro management as a medium of interaction that identifies how institutional digital culture determines the motivation of educators, the ability to control attention, cognitive flexibility and resilience, thus affecting their digital competency. Comparative institutional view emphasises long-term inequalities between government and non-government institutions in terms of infrastructure delivery, professional growth, organisational freedom and leadership. The study does not provide empirical results but formulates a hypothesis-based conceptual framework that is to be followed by future comparative empirical studies.

The article is valuable with the fact that it incorporates neuro management in the discussion of digital competency, contextualizing digital transformation in Indian institutions of higher learning, and provides a theoretically sound basis of the empirical study. The implications of the research to educational policy, teacher development, and future research are addressed in accordance with the national initiatives, including the National Education Policy (NEP) 2020.

Keywords: Neuro management, digital culture, digital competency, educators, government institutions, private institutions and Rajasthan.

1. Introduction

The growing nature of digital technologies in education has changed the practices of teaching and learning, assessment, and professional collaboration, as well as institutional administration, dramatically. The digital tools are now more than supplementary aids but a part of daily teaching. The teachers, therefore, must acquire

the sophisticated digital competencies that are not limited to functional or operational levels but to the higher levels of cognitive, pedagogic and ethical aspects.

The changes take place in the Indian educational field, and especially in the region of the state of Rajasthan, where there is a strong presence of institutional diversity. There are significant differences between government and private educational institutions in terms of the availability of digital infrastructure, institutional autonomy, opportunities to engage in professional development and organisational support of innovation. Whereas in the case of private institutions, the resources and the managerial flexibility are usually more favorable. Governmental institutions are regularly faced with the drawbacks of large-scale institutions, bureaucratic procedures, and uneven access to training. The differences allow highlighting the necessity of conducting a comparative analysis of the digital competency of educators in institutional settings.

According to neuroscientific views, constant exposure to online space affects the main areas of cognition such as attention control, working memory, information processing, and decision-making. Constant multitasking, constant interruptions, and overload of information can impose a load on the cognitive resources in the event that it is not handled well. All these developments are closely connected to neuroplasticity, which is the ability of the brain to restructure neural networks via experience. Neuroplastic transformation can be beneficial to learning and flexibility, yet can also lead to cognitive exhaustion to the extent that digital interaction is incongruent with cognitive functioning.

The conceptual gap between management and the brain-based processes is represented by neuro management. In educational application, neuro management aims at linking teaching methods, professional growth models, and institutional cultures with brain principles of how the brain learns, adapts, and maintains performance. Analyzed in the context of a digital culture, neuro management provides a fruitful contribute to the topic of educators controlling attention, cognitive load, motivation, and effective integration of digital tools.

The given paper theorises neuro management as a mediating phenomenon between digital culture and digital competency of educators, and locates such a framework in a comparative institutional framework. Instead of showing empirical data, the paper has a hypothetically supported model which is based on the theory, which is to be empirically considered in future in terms of government and private institution teachers in Rajasthan.

2. Positioning of the Methodology of the study.

The current paper implements a conceptual approach to research, which is a theory-building research design, founded on the systematic synthesis and integration of existing interdisciplinary sources of knowledge. It has no intention of creating empirical information or statistical assertion. Rather, it aims to construct a theoretically sound model which describes interrelationships between digital culture, neuro management, and digital competency of educators in a particular socio-institutional setting.

This type of conceptual labour has been especially useful in new interdisciplinary areas, where theoretical consistency must be established before it can be measurement and hypothesis tests. The digital competence of teachers in India is an emerging field of research on neuro management, which is likely to be more investigated in the coming years. The paper addresses the theory development requirement by enumerating constructs, mechanisms, and relationships which are theorised and can be utilised in future empirical research.

The hypotheses that have been proposed in the given paper can thus be discussed as the theoretical ones, which will be proved by the following quantitative and qualitative studies.

3. Review of Literature

3.1 Digital Culture in Education

Digital culture has been a powerful tool in education as a marketing strategy to sell and attract consumers. Digital culture is a term that is used to refer to the constellation of practices, norms, values and organisational arrangements that are formed as digital technologies assume the status of commonplace elements of educational activity. In educational institutions, and in schools, digital culture has an impact on pedagogical choices, curriculum development, assessment systems, career development, and collaboration trends (Claro et al., 2023).

Learning environments that have high levels of digital cultures are prone to promote experimentation, reflection, and collaborative innovation. When teachers are integrated within these settings, they may be better able to share resources, experiment with new tools, and use technology in pedagogy in significant manners (Ertmer & Ottenbreit-Leftwich, 2010). On the other hand, fragmented digital cultures: the presence of the technologies, but some of these technologies are not pedagogically embedded, may lead to the superficial or inconsistent usage.

In India, policy frameworks have openly aimed at creating digital culture in learning. ICT @ Schools Scheme focused on better infrastructure, teacher development, and access to online content, whereas NEP 2020 focuses on lifelong learning, technology literacy, and inclusion that is enabled by technology (Ministry of Education, 2020). However, there is an unequal implementation of the policies. Digital culture is predetermined by local leadership, effective infrastructure, and enduring professional learning communities (Pérez-Sánchez, 2021).

Comparative research proposes that the digital culture in the private institution tends to be stronger because of the higher availability of resources and the freedom of the managerial position, and in the government institution, the digital implementation can be disrupted or uneven due to bureaucracy and infrastructure issues

(Zhao, 2019; Kumar and Mishra, 2022). Noticeably, digital culture not only affects the availability of technology, but also the quality of mindset tasks required of teachers.

3.2 The digital competency of the educators.

Digital competency is a multidimensional concept that includes technical-operational competence, didactical using of the digital tools, information and media literacy, awareness of ethics, and flexibility to the new technologies (UNESCO ICT Competency Framework for Teachers; DigCompEdu). All of these dimensions allow an educator to apply technology in manners that improve learning and not in a way that only digitizes a current practice.

Empirical studies continuously associate the digital competency of the teacher with the quality of instruction, the interest shown by the learners, and the digital literacy achievement of the students (Hew and Brush, 2007; Tondeur et al., 2012). Widely in the Indian context, research has been done to show that not all teachers have an advanced level of operational skills but a lower percentage of teachers have advanced level of pedagogical integration and critical evaluative skills (Kopcha, 2012; Kumar and Mishra, 2022).

Measurement research highlights the necessity to differentiate between superficial technical skills and the underlining pedagogical competence (Tondeur et al., 2016). There are also indicators of the comparative pattern, which point to the fact that teachers in private schools more commonly use digital tools to perform formative assessment and differentiated learning, and teachers in government schools more commonly report lower confidence and fewer practice opportunities (Claro et al., 2023; Teo and Zhou, 2019).

3.3 Neuro Management and Educator Performance.

Neuro management is an approach to organisational and educational practice that combines the knowledge of neuroscience and psychology, describing the effect of cognitive processes on performance, i.e. attention, motivation, memory, and stress regulation (Lieberman, 2018). In learning institutions, neuro management highlights the role of the working memory limit, the executive control, and reward systems in determining the ability of teachers to embrace and maintain new practice.

Theoretical constructs relevant in neuro management in education are:

- Attention and executive control - it is essential that educators need to be able to control split attention, sift distractions, and direct cognitive resources to task that are pedagogically relevant (Sweller et al., 2019; Ophir et al., 2009).
- Motivation and reward Intrinsic motivation and a sense of competence stimulate neural reward mechanisms contributing to long-term learning and risk-taking in instructional innovation (Ryan and Deci, 2000; Teo and Zhou, 2019).
- Cognitive load and instructional design - instructional designs consistent of task demands that do not exceed the working memory capacity conserve cognitive capacity to support higher-order processing (Sweller et al., 2011; Moreno and Mayer, 2000).
- Neuroplasticity and practice -The outcome of repeated, scaffolded practice is experience-related brain structural and functional changes, suggesting that long-term PD can lead to long-term competency (Draganski et al., 2004).

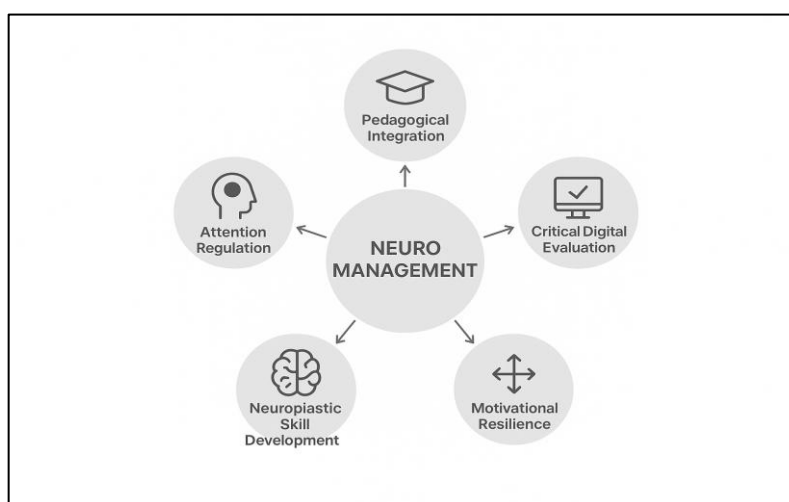


Figure 1. Neuro-Management Dimensions that Support the Digital Competency of Educators.

The diagram below (figure 1) demonstrates the multidimensional neuro-management framework, which supports the digital competency of educators. The framework brings out the role of cognitive regulation, pedagogical integration, evaluative judgment, motivational resilience, and ongoing neuroplastic development in determining the effectiveness of educators to interact well with digital culture. These dimensions are dynamically interrelated to affect long-term performances and flexibility of digital performance.

There is some evidence that longer-term and feedback-focused professional development is more likely to make a deeper change to teacher practice than short-term workshops, which is consistent with neuroplastic models of learning (Desimone, 2009; Opfer and Pedder, 2011). Neuro management thus emphasizes the significance of the cognitively aligned learning environments and the institutional practices.

4. Theoretical Bases of Neuro Management of Digital Education.

This paper relies on various schools of thought to interpret the connection between digital culture and neuro management, as well as between digital culture and digital competency:

Social Cognitive Theory highlights self-efficacy, modelling and interactions between each other and the environment (Bandura, 1986).

Self-Determination Theory: This theory explains the maintenance of intrinsic motivation by self-determination, competence, and relatedness (Ryan and Deci, 2000).

Cognitive Load Theory offers the guidelines to the design of the learning tasks in consideration of the working memory limitations (Sweller et al., 2011; Moreno and Mayer, 2000).

Mindset Theory describes the process of persistence and learning flexibility (Dweck, 2017).

Flow Theory can be used to explain the optimal engagement in case the skill and challenge are matched (Kiili et al., 2021).

Collectively, the theories form the neuro management framework that is presented in this paper.

5. Neuro Management and Digital Competency: Implication on Educator Performance.

With the theoretical backgrounds established, we are now able to explicitly relate neuro management processes to digital competency outcomes in teachers with literature that bridges the gap between neuroscience-based design and teacher practice change. The process by which institutional digital culture impacts cognitive and motivational functioning of educators is illustrated in figure 2. Patterns of digital exposure depend on organisational norms and digital expectations and, consequently, determine cognitive load, attention regulation and emotional engagement. All these neuro-cognitive processes define the quality and sustainability of the digital competency of educators.

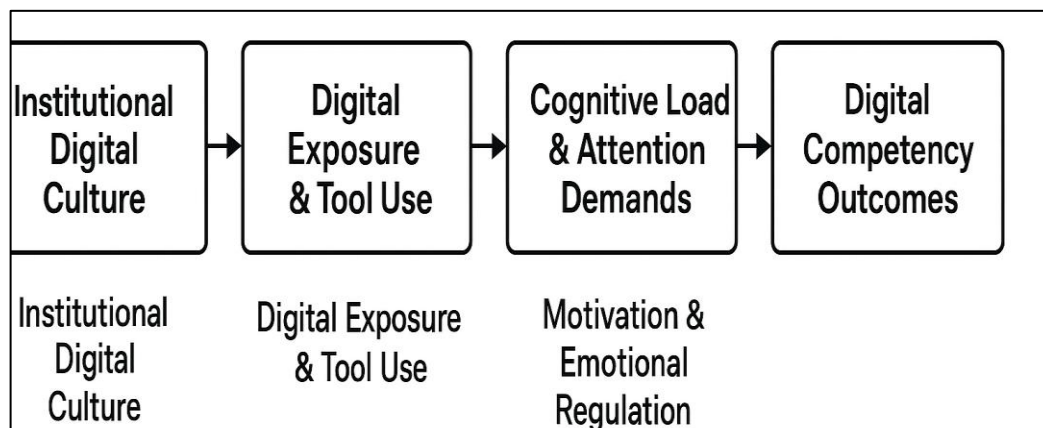


Figure 2. Effect of Institutional Digital Culture on Cognitive Processes of Educators.

•Attention control and teaching clarity: Ophir et al. (2009) and Sweller et al. (2019) postulate that the presence of heavy multitasking conditions diminishes the control of attention, neuro management is possible (e.g. lesson segments, limiting the number of distractors on screen), and as a result, working memory resources can be preserved, allowing teachers to have more control over the classroom experience and online lesson sequence.

•Instructional integration with TPACK and cognitive alignment: Mishra and Koehler (2006) and Mayer (2020) suggest that instructional technology-pedagogical knowledge needs to be deep; neuro management introduces the cognitive constraint perspective (design to reduce extraneous load), which allows teachers to translate TPACK knowledge into practice.

•Critical digital literacy and metacognition: Wineburg and McGrew (2017) demonstrate that deliberate strategies (lateral reading, source triangulation) can enhance the evaluation of the information; neuro management means that tasks are scaffolded to support the development of analytic reasoning and reflective evaluation should not consume the cognitive bandwidth.

•Motivation, long-term and sustained PD: Ryan and Deci show (2000), Teo and Zhou (2019), and Sobarb et al. (2020) that, autonomy and perceived competence predict sustained use of technology; neuro management interventions that enhance competence (scaffolding practice, formative feedback) and autonomy (PD choices made by teachers) result in long-lasting competency effects.

•Neuroplastic change due to sustained practice: Draganski et al. (2004) present neuroscientific proof that neural changes occur with repeated and well-organized practice; in this case, the mechanism that raises digital competency to embodiment and habit is sustained, spaced PD with feedback.

Combined, both empirical and theoretical literature has been able to support the argument that neuro-management-informed interventions (cognitive-aligned instructional design, autonomy-supportive PD, peer modelling, spaced deliberate practice) will lead to increased teacher digital competency and more enduring classroom practice changes. The differences in opportunities in institutional form may be considerably between government and non-government institutions, which may be reflected by comparative differences in opportunity structures (resources, autonomy, PD quality) moderating such processes (Claro et al., 2023; Zhao, 2019).

Although the national digital projects are in place, the differences in digital infrastructure, education, and institutional assistance between governmental and private educational institutions remains in Rajasthan. These disparities directly influence access to digital tools and professional development of educators, as well as their ability to incorporate technology into their work. Regarding neuro-management, the inconsistent exposure to digital affects cognitive adaptation and professional confidence.

6. Research Gap

Given that the number of research on the topic of integrating digital technology in the education sector continues to increase, there are still a number of gaps that have not been addressed. First, the existing body of research on teacher digital competency is dominated by focusing on technical capacities or pedagogical integration without considering the underlying cognitive and neuro-motivational mechanisms to influence the long-term digital engagement. Although educational neuroscience and cognitive psychology have independently addressed their concepts, their synthesis has not been fully attained in the area of teacher digital competency research.

Second, the deficiency of studies implementing neuro-management frameworks to an educational environment is apparent, especially in investigating the role of attention regulation, management of cognitive load, motivation and neuroplastic learning process in the digital competency of educators. The majority of models of professional development still tend to use short-term training methodology that is based on skills, but does not take into account neuro scientifically informed design of learning.

Third, comparative institutional studies on government and non-governmental facilities of education are limited and particularly in the Indian context. The available studies seldom take into consideration the moderating effect of institutional digital culture, organisational autonomy, and structural support on cognitive adaptation and professional technology application among teachers. Table1. gives an overview comparison of institutional conditions as influencing the digital competency of educators in government and the privately run educational institutions. The comparison identifies structural and organisational variations that shape cognitive regulation, motivation, and continued professional use of digital technologies.

Dimension	Government Institutions	Private Institutions
Digital Infrastructure	Uneven, policy-dependent	Relatively consistent
Professional Development	Periodic, policy-led	Continuous, institution-led
Autonomy in Tool Use	Limited	High
Cognitive Load Management	Often unaddressed	Frequently scaffolded
Neuro-Motivational Support	Low to moderate	Moderate to high

Fourth, empirical and conceptual studies are region-specific and there are very limited studies on a state like Rajasthan where there is a significant disparity in infrastructures, training access, as well as policy application. This disconnect restricts the local applicability of national digital education plans, such as NEP 2020, to the local institutional scale.

Lastly, the literature is plagued by the lack of conceptual frameworks integrating ideas focusing specifically on the digital culture, neuro-management processes, and digital competency in a consistent analytical system that can inform empirical validation. The consideration of such gaps is critical in formulating cognitively balanced, equitable and sustainable digital professional development models to educators.

7. Conceptual Framework and Hypotheses.

This paper hypothesizes a theoretical framework where digital culture both directly and indirectly affects the digital competency of educators as a result of neuro management. The moderating variable to these relationships is institutional type.

The model demonstrates that digital culture has a direct impact on the digital competency of educators. Moreover, the digital culture has an influence on the neuro management process including motivation, regulation of attention, and cognitive flexibility contributing to digital competency. These relationships are moderated by institutional type, which impacts on the availability of infrastructure, the opportunities of professional development, and organisational support.

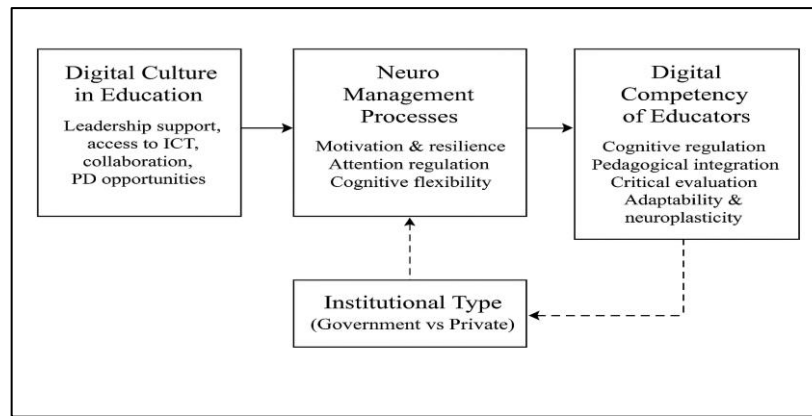


Figure 3. Provides the conceptual framework that will offer the direction of the study.

The digital culture has been hypothesised to influence directly the digital competency of educators and indirectly by influencing neuro management processes of educators such as motivation, regulation of attention, and cognitive flexibility. A mediating theory is the neuro management, which is suggested to describe the process in which digital culture is converted to competency development. The strength of these relationships is hypothesised to be moderated by institutional type (government vs private) which is an independent variable that creates access to infrastructure, professional development opportunities and organisational support.

Hypotheses (Theoretical Propositions):

H1: Digital culture has a positive effect on the digital competency of educators.

H2: Neuro management has a positive impact on the digital competency of the educators.

H3: There is a mediating role of neuro management between the digital culture and digital competency.

H4: The value of institutional type mediates the correlation between neuro management and digital competency.

H5: In the case of the schools of private institutions, educators have greater digital competency compared to the government institutions.

8. Discussion

The framework highlights the fact that the digital transformation of education is more of a cognitive and cultural than a technological phenomenon. Neuro management offers explanatory richness in that it throws light on how institutional settings affect the cognitive control, motivation, and flexibility of educators.

Government, and individual differences in Rajasthan indicate inequality of opportunity structure which determines neurocognitive interaction with digital device. These disparities can be reduced by aligning professional development with neuroscience-informed principles to facilitate competency development that is equitable.

9. Conclusion and Future Directions.

The present paper contributes to a theoretically based and interdisciplinary conception of the digital competency of educators through the systematic combination of the concepts of digital culture and neuro management in the context of a comparative institutional framework. The study relies on literature in the fields of educational technology, neuroscience, organisational behaviour, and teacher professional development, thus going beyond more technical understandings of digital competency and placing it within more general cognitive, motivational, and institutional processes. By thus doing so, it makes a conceptual contribution to a clear elucidation of the mechanisms by which organisational contexts affect cognitive regulation of educators, their professional responsiveness, and long-term participation in digital technologies.

The conceptual model of hypotheses suggested in this research provides the rational and theoretically informed basis of the future empirical research. The framework offers explanatory richness to the relationships between how digital environment influences the regulation of attention, motivation, cognitive flexibility and learning persistence in educators by placing neuro management as a mediating construct between institutional digital culture and digital competency. Concurrently, the introduction of institutional type as a moderating variable emphasizes the structural and organisational realities which distinguish the government and the private educational situations especially in access to infrastructure, independence, professional development prospects and executive support. These factors taken collectively enable the model to produce analytically meaningful propositions that can be tested in an empirical manner through comparison research designs.

Even though the current research is theoretic, it will provide a strict theoretical and methodological basis to the further empirical research. Future studies can prove the postulated relationships through a large-scale quantitative, mixed-method, or longitudinal study to understand how processes related to neuro-management changes with time. The comparative analysis between government and non-government institutions can also

be used to investigate the degree to which the contextual moderators, including institutional leadership, the policy implementation, and the ability to access the long-term process of professional development can define the pathways of educators in the digital competence. This kind of empirical confirmation is critical to the fortification of evidence-based knowledge and the transformation of theoretical knowledge into practical educational steps.

The findings have a policy and practice implication of highlighting the fact that successful digital transformation in education cannot be attained by mere infrastructure provision or introduction of technology. Rather, effective change demands the coordination between the digital efforts and the cognitive functioning, motivational needs and professional identities of educators. The neuro management offers a holistic prism according to which an educational system can better comprehend the activity of educators towards digital culture, especially in situations where newer digital complexity and cognitive demands characterise it. Through the identification of the neural and motivational basis of the teaching practice, the institutions can develop models of the professional development that are more sustainable, supportive, and attentive to the real-life issues of the educators.

These constant differences between government and private organizations in Rajasthan also indicate the need to implement a comparative and equity-based approach. The variations in the institutional capacity, organisational flexibility, and support structures directly impact the process within which educators live and adjust to digital environments. Policy interventions based on the need to address such disparities should focus more on access to technology than on cognitively matched training, continuous mentoring, and autonomy-friendly professional learning environments. Neuro management concepts that should be integrated in teacher education and on-going professional development programmes can be very critical in reducing digital fatigue, enhancing self-efficacy, and promoting long term digital adaptability in teachers.

Lastly, this paper provides a good conceptual base on an empirical comparative research on the digital competency between government and privately owned institutions educators in Rajasthan. The study aligns digital culture, neuro management, and digital competency through a single framework of analysis to the continuum of scholarly literature on sustainable practices of digital education. To the researchers, the framework provides a systematic point of reference when analyzing cognitive, motivational, and institutional predictors of teacher digital competency. As a policymaker and educational leader, it offers theoretically supported points that can guide fair resource distribution, specific interventions, and the implementation of policies that are in line with the aims of the National Education Policy (NEP) 2020. By doing so, the study not only adds to the academic body of knowledge but also the overall objective of the inclusive achievement.

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