UNVEILING EVERYDAY CHALLENGES: A DOOYEWEERDIAN EXPLORATION OF TEACHERS' ICT INTEGRATION

Completed Research Paper /Short Paper

Opeoluwa Aiyenitaju, Manchester Metropolitan University, Manchester, UK, o.aiyenitaju@mmu.ac.uk

Cathy Urquhart, Manchester Metropolitan University, Manchester, UK, Lund University, Lund, Sweden, c.urquhart@mmu.ac.uk, catherine.urquhart@ics.lu.se

Abstract

This paper investigates teachers' immediate 'everyday' challenges in integrating ICT into their classrooms, often overlooked in existing literature prioritising management, IT suppliers, and policymakers. Grounded in Dooyeweerd's philosophy, this research utilises aspectual analysis to reveal and understand the diverse everyday issues encountered by teachers using ICT. The initial findings reported here highlight the limited guidance provided by existing literature regarding the meaningful everyday issues for ICT users. In terms of originality, the paper explores the potential of Dooyeweerd's aspectual analysis as a valuable research tool for IS researchers, emphasising its capacity to unveil previously unnoticed issues in the realm of ICT use.

Keywords: *aspectual analysis, Dooyeweerd, educational research methods, life-oriented philosophy.*

1 Introduction

The utilisation of ICT in organisations is frequently mandatory rather than voluntary, as employees commonly receive directives to use it (Bhattacherjee *et al.,* 2018). IT change, driven by significant investments, often overlooks the challenges faced by users. In March 2020, the global delivery of education was profoundly disrupted by the coronavirus disease (Covid-19) pandemic. This event marked an unprecedented level of disruption in modern education systems worldwide (Zancajo *et al.,* 2022). In primary teaching, teachers' comfort with ICT directly impacts the future of education (Dogan *et al.,* 2021). The UK government's substantial investment in school ICT, particularly during the Covid-19 era, emphasises the critical role of ICTS in schools.

Despite the financial support that is given to ICTS in schools, teachers often encounter obstacles to ICT use, especially in early education. Technical issues and everyday challenges contribute to this. The perspectives of those in organisations who are obliged to use ICT are frequently overlooked. When it comes to ICTs in primary education, teachers' enthusiasm and comfort levels significantly influence the prospects of our future generations. This paper examines teachers' everyday issues with ICT, rather than high-level issues. Those everyday issues, often marginalised, are those concerns meaningful to ICT users in their daily tasks. These issues contrast with high-level concerns, which primarily capture the attention of management, ICT suppliers, and academics, often focusing on abstract aspects of use and adoption.

In this paper, we show how Dooyeweerd's philosophical framework of irreducible aspects might be utilised to unveil the everyday challenges faced by teachers in using ICT in the classroom. This framework has found applications in various fields, offering valuable insights into aspects often overlooked by conventional methodologies.

The core research question addressed by the study is: "*How can Dooyeweerd's framework for everyday issues enhance our understanding of teachers' experiences with ICT utilisation in the classroom?"*

Ahmad and Basden (2013) pioneered the use of a framework of irreducible aspects from Dooyeweerd's philosophy to understand the diverse everyday issues encountered by users. The framework has been used in other fields, including knowledge elicitation (Winfield & Basden 1996), revealing reasons for unexpected failure of a new ICT system (Eriksson, 2001) and ensuring the ecosystem is not undervalued (Gunton et al., 2017).

Our interpretive study involves twenty in-depth, unstructured interviews with primary school educators from three UK schools, adopting Dooyeweerd's philosophical framework. In this short paper, we aim to briefly showcase relevant literature and the analysis using Dooyeweerd's aspectual analysis, which we believe to be an important - and hitherto unexplored - qualitative methodology for unearthing everyday experiences.

2 Literature Review

This section briefly reviews pertinent research areas, looking at ICT integration in educational settings and the importance of employee voice in mandatory use of ICT in the classroom. We then give a detailed overview of Dooyeweerd's irreducible aspects used for our subsequent analysis.

2.1 ICT integration in education

The adoption of ICT in schools has transformed teaching policies and local administrative strategies (Anderson & Krathwohl, 2001). A substantial body of literature has emerged on technology adoption in classrooms, with empirical research underscoring the significance of digital technologies (Beach and Castek, 2016; Ditzler et al., 2016). Empirical research reveals the importance of digital technologies to early childhood classrooms; however, concerns persist about screen time, its impacts on brain functioning, and the pedagogical value of digital media (Gillen et al., 2018; Dubicka et al.,2019).

Blackwell et al., (2014) surveyed data from 1234 early childhood educators and revealed that teachers' attitudes towards technology, confidence levels, and support systems significantly influence their use of ICT in the classroom. Moreover, teachers' experiences with ICT can be categorised into high-level institutional barriers, such as inadequate training and resource allocation, and everyday challenges at the individual teacher level, including attitudes towards technology (BECTA, 2006). While addressing macro-level barriers often requires systemic changes and policy interventions (Balanskat et al., 2006), tackling micro-level challenges demands personalised support and professional development initiatives tailored to teachers' needs.

2.2 Employee voice

Analysing the importance of employee voice in the context of ICT use reveals a tendency to neglect individual experiences in mandatory organisational settings (Bhattacherjee, *et al.,* 2018; Kougiannou & Holland, 2022). Employee voice encompasses various dimensions, including the ability to contribute to work activities and decision-making processes within the organisation (Freeman *et al.,* 2007; Prouska et al., 2023). When employees lack opportunities for such expression, it can adversely affect their dignity, impacting both performance and morale (Wilkinson *et al.,* 2018). Unfortunately, management's perception of employee voice as distracting may lead to the oversight of issues faced by operational

employees, such as teachers integrating ICT in classrooms (Detert and Trevino, 2010). Teachers, when discussing ICT challenges, provide insights shaped by their values and evaluations of learners and the learning process. Understanding the impact of teachers in ICT integration is crucial for policymakers, considering teachers' knowledge, skills, beliefs, and time constraints. The pressure to cover the curriculum limits teachers' flexibility in ICT integration, compounded by inadequate training and time constraints (Abuhmaid, 2011; Vrasidas, 2015). Recognising and valuing the teacher's voice in addressing these challenges is vital for improving educational processes and outcomes.

2.3 Exploring Dooyeweerd's suite of aspects

In this section, we discuss the philosophical underpinning of our study, drawing inspiration from Dooyeweerd's notion of irreducible aspects. This philosophical framework serves as a valuable tool to navigate the intricacies of ICT use and to help us explore the everyday challenges faced by teachers in the classroom.

When it comes to understanding human experience, researchers have considered various models like Maslow's hierarchy of needs and Hartmann's four "strata" - inorganic, organic, animal-psychic, and supra-individual-cultural (Basden, 2008). Dooyeweerd's suite of aspects has an advantage over Maslow or Hartmann's models due to its more comprehensive explanation (Basden, 2008).

Dooyeweerd's philosophy offers insights into the complexities of everyday life by acknowledging a multitude of issues, encompassing both human and non-human elements within different spheres of law. For instance, humans and computers may exhibit similarities and differences within distinct spheres. Herman Dooyeweerd (1894-1977), a Dutch philosopher, did not explicitly define aspects. Basden (2008) uses Dooyeweerd's philosophy to further define aspects as distinct realms of meaning and associated laws.

Several IS studies have utilised Dooyeweerd's aspects to uncover diverse issues (Eriksson, 2001; Winfield, 1996). Eriksson (2001) demonstrated how Dooyeweerd's aspects revealed overlooked issues, while Winfield et al. (1996) proposed that a multimodal approach to elicitation, based on Dooyeweerd's philosophy, can yield deeper knowledge. These scholars specialised in Dooyeweerd's notion of irreducible aspects, which is the focus of this study.

Basden (2008) suggests a suite of fifteen aspects based on Dooyeweerd (1955), each possessing unique and irreducible meanings and laws in our daily experiences. These aspects cannot be related to one another, and provide distinct spheres of meaning, each governed by its set of ethical principles and values (good/bad). As Brooke (2009) aptly notes, these aspects go beyond mere categories; they define comprehensive spheres of meaning and ethical guidelines. Table 1 shows the aspects together with examples and precise instances from ICTs and education.

Aspects	Meanings	Technology in Education Examples	Precise Instances
Quantitative	Concerning quantity and numbers	Data analytics are utilised to gauge student performance.	The count of students enrolled in an online course amount to 100.
Spatial	The arrangement of physical learning spaces and furniture design.	Virtual classrooms and the configuration of online learning environments.	The physical classroom features rows of desks oriented toward the chalkboard.
Kinematic	Movement and change.	Animations, simulations, that aid students in grasping dynamic processes, such as physics simulations or interactive biology models.	In a physics simulation, students can observe how an object's position evolves over time.

Physical	Related to tangible, material characteristics.	Tangible resources such as textbooks, laboratory apparatus, or physical computing devices like robots employed for instructing programming.	A class is equipped with tangible resources, such as textbooks, microscopes, and whiteboards.
Biotic	Involving living organisms.	Educational applications of biology, such as virtual dissections.	Students examine ecosystems by observing and interacting with living plants and animals within a controlled classroom setting.
Sensitive	Relating to sensory experiences and emotions.	Multimedia components in e-learning, encompassing videos, audio recordings, and interactive visual content.	Virtual reality (VR) simulations offer sensory experiences in history lessons by transporting students to historical events.
Analytical	Focused on differentiation, distinctions, and analysis.	Technology supports analytical thinking through tools like spreadsheets or coding environments.	Students employ spreadsheet software to scrutinise and visualise data collected during a scientific experiment.
Formative	Dealing with the shaping and structuring of technology.	Curriculum design and lesson planning, learning management systems.	An online learning management system organises the course content and assignments.
Lingual	Communication, language, and symbols.	Language learning apps and communication tools that facilitate language practice.	Online discussion forums foster communication and language development.
Social	Collective relationships, roles, and conventions.	Online forums, social media, and collaborative tools enable students to partake in discussions, group projects, and peer learning.	Students collaborate on a group project using cloud-based tools, sharing documents, and conducting virtual meetings to discuss their progress.
Economic	Resources and prudent management.	Budgeting and resource allocation decisions.	Technology aids in financial management and online payment systems.
Aesthetic	Involving beauty, harmony, and artistic expression.	The design of user interfaces, graphics, and multimedia content that captivate and motivate learners.	An educational website employs visually appealing graphics and interactive animations to captivate students in mathematical concepts.
Juridical	Concerning norms, rules, and justice.	Matters of data privacy, and ethical technology use in the classroom.	Schools implement rigorous policies to safeguard student data privacy when using digital resources in the classroom.
Ethical	Relating to moral values, principles, and generosity.	The responsible use of technology, encompassing discussions on digital citizenship and online conduct.	Discussions on digital ethics and responsible online conduct are integrated into the school's curriculum.
Pistic	Focused on faith, commitment, belief, and vision.	Dialogues about values, ethics, and the purpose of education.	A philosophy course explores questions of meaning, purpose, and ethics in the digital age, encouraging students to reflect on their beliefs and values in relation to technology.

Table 1. Suite of aspects (Basden 2008) and examples of instances from ICTs in education

2.4 Taking a Dooyeweerdian perspective on teachers' interaction with ICTs

In our analysis, we perceive ICT use as a multi-aspectual functioning, involving both humans and objects (ICT), and their interaction with each other, particularly about students. For instance, interactions such as a teacher speaking while students listen exemplify a lingual subject-subject relationship, while instances of a teacher providing support and students receiving it represent a social subject-subject relationship. This distinction between human and non-human entities arises from their responses to different spheres of law. A key insight of Dooyeweerd's approach is its emphasis on placing the human knower at the centre of understanding. This perspective acknowledges that the knower is an integral part of what is known, rather than a detached observer. Multi-aspectual functioning goes beyond categorisation; it signifies the interconnectedness of meanings across various aspects. When viewed through a multi-aspectual lens, human behaviour offers a richer understanding than uni-aspectual perspectives typically provided by disciplines like psychology or economics.

Aspectual analysis, by its nature, focuses on the various ways in which things may hold meaning. This approach aims to answer the fundamental question of how something functions (Basden, 2008; Ahmad and Basden, 2013). According to Basden (2008), aspectual meaning is intuitively grasped, making categories based on aspects easily understandable and informative rather than misleading.

In the analysis phase, certain aspects may emerge as more significant than others, as revealed through the examination of transcribed interview data in this study. Consequently, those aspects of lesser importance might receive increased attention. It is important to consider all aspects of a system, as understanding them provides a framework for comprehending and addressing diversity and complexity (Basden, 2008).

3 Methodology

The research methodology involved conducting in-depth interviews with a sample of twenty primary school teachers drawn from three distinct schools in Salford, UK. Participants represented various subjects and year groups within the primary education system. The deductive aspect of this study, informed by the literature review, revealed existing research needs (Bell et al., 2022). However, as the literature primarily addressed broader issues, an inductive approach was adopted to uncover the meanings individuals place on events.

To foster open and candid conversations, the researcher employed unstructured interviews coupled with probing questions tailored to the interviewees' responses and did not engage participants in the use of aspects. The goal was to elicit a comprehensive and insightful perspective on the chosen topic, resulting in a rich and detailed account from each participant.

4 Examples of Dooyeweerdian Analysis

The approach employed to analyse the interview transcripts involved the identification of Extra Information Volunteered (EIV) and assigning them to relevant aspects. The rationale behind separating direct answers from EIV is to reduce research bias, and be able to elicit issues participants think are meaningful. Dooyeweerd's emphasis on 'meaning' motivated the researcher to separate what is meaningful to the researcher and to the participants. In the illustrative instance provided below, the interviewee transitions between a direct response and EIV twice, which is indicated by the '|' symbol, the EIV is in bold type.

Question	Quotes	DA/EIV	Aspects	Description
Do you have problems using these resources?	*Response: "Erm, personally I don't, | I wouldn't say I am an expert with computers but I know what I am doing. I did train as a technician; I have computer qualifications so I know what I'm doing when I*	*I wouldn't say I am an **expert** with computers but I know what I am doing. . I did **train** as a technician (DA)* ***There are always problems with computers***	Formative Juridical	The utterance on expertise and training is formative aspect. The utterance "it's just a tool" has emphasis on 'just' rather than 'tool',

	use a computer. | ***There are always problems with computers as they don't always do what you want, they decide to turn off at the wrong point ...*** | ***it's just a tool, that extra thing to use in the classroom along with the other stuff to help the children get them interested."***	***as they don't always do what you want****, they decide to* ***turn off at the wrong point*** *.* *it's* ***just a tool****, that extra thing to use in the classroom along with the other stuff to* ***help the children get them interested***	Pistic Ethical	indicating teacher's belief (pistic aspect). The utterance "to help the children get them interested", about helping, is an ethical aspect. These are instances of EIV richer than the direct answer, with more aspects that are important.

Table 2. Analysis that distinguishes EIVs and classifies into Aspects

Quotes and EIV data were associated with specific aspects, reflecting the underlying meanings. An inherent challenge when analysing with Dooyeweerd's aspects is the presence of multiple intertwined aspects in most utterances. Deciding which aspects are most salient to the speaker requires judgment, often clarified by considering the question, "What motivated them to express this particular thought?" given the socially constructed nature of reality (Thomas et al., 2014).
In Table 2, the statement regarding expertise and training pertains to the formative aspect. In the phrase "*it's just a tool,"* the emphasis lies on 'just' rather than 'tool,' indicating a belief held by the teacher (pistic aspect). The expression *"to help the children get them interested"* reflects an ethical aspect focused on aiding others. It is evident that instances of Extra Information Volunteered (EIV) contain a broader range of aspects, enriching the understanding of the content. Drawing upon EIV allows for a focus on the everyday issues that are meaningful to teachers, and has the advantage of reducing bias that can be introduced due to the researcher's direct and intimate involvement in data collection and analysis (Dwyer and Buckle 2009).

5 Conclusion and Future Work

In conclusion, the application of Dooyeweerd's framework has proven invaluable for comprehending teachers' everyday experiences with ICT in the classroom. The empirical study, which incorporates aspectual analysis and emphasises the inclusion of Extra Information Volunteered (EIV) data, highlights the framework's strengths in providing both diversity and depth. The use of EIV in our view is a potential methodological contribution on its own, as it encourages us to pay attention to all information offered by our participants, as opposed to only listening to the answers to our preconceived questions. Dooyeweerd's framework offers a comprehensive taxonomy of meaning, ensuring a nuanced understanding of the identified issues, and in our view, surpasses conventional categorisation methods by focusing on the meaning, rather than imposing an inflexible coding scheme. At the same time, we feel it is equal to inductive and more open methods of coding such as grounded theory, because first time researchers in particular find purely inductive coding challenging.

Considering the accelerated changes in education due to the COVID-19 pandemic, there exists a unique opportunity to challenge entrenched cultures that perpetuate inequalities. It is here that we see the key advantage of aspectual analysis - not only does it allow us to systematically examine different dimensions of the data through a wide range of aspects, these aspects have a philosophical foundation in ethics and a deep seated concern for the everyday experience of individuals.
The aspectual analysis significantly enhances our comprehension of employee voice by prioritising issues that hold significance for those employees. Unlike conventional approaches that often concentrate solely on tasks, profits, or systemic concerns, the aspectual approach allows for a broader exploration of pertinent issues. By accommodating users' diverse perceptions of meaningfulness in ICT use, this approach uncovers deeply embedded issues that may otherwise remain obscured. Consequently, it not only aids in understanding ICT use but also sheds light on underlying issues that users may not fully

recognise or perceive. Moreover, it concludes by underscoring the importance of embracing diverse approaches and amplifying the voices of the marginalised in educational research.

Our adoption of Dooyeweerd's aspectual analysis, yielded valuable insights beyond simply cataloguing everyday issues. It facilitated an exploration of normativity, discerning the inherent distinctions between positive and negative outcomes based on adherence to aspectual laws. Each aspect encapsulates its own set of norms, offering a lens through which to examine teachers' values and discern what they deem desirable or undesirable. For example, our findings revealed a strong value among teachers for aesthetic harmony, contrasting with the aversion to classroom chaos. This nuanced understanding of normativity may prove instrumental in assessing success and failure in ICT use, providing a deeper insight into underlying values.

Eventually, we hope that this study will offer practitioners, policymakers, and the broader research community an initial foundational understanding of the everyday challenges encountered by primary school teachers when using ICT in the classroom. Incorporating these perspectives has the potential to assist school administrators and policymakers in making more informed decisions regarding policy development and best practices.

6 References

Abuhmaid, A. (2011). ICT training courses for Teacher professional development in Jordan. Turkish Online Journal of Educational Technology, vol .10, no. 4, pp. 195-210.

Ahmad, H., Basden, A. (2013). Down-to-Earth Issues in Information System Use. Proceedings of the Pacific Area Conference on Information Systems (PACIS). Paper 191.

Anderson, L.W. and Krathwohl, D.R., 2001. A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives: complete edition. Addison Wesley Longman, Inc.

Balanskat, A., Blamire, R. & Kefala, S. (2006) The ICT impact report: a review of studies of ICT impact on schools in Europe (Brussels, European Schoolnet).

Basden A. (2008). Philosophical Frameworks for Understanding Information Systems. IGI Global Hershey, PA, USA.

Bhattacherjee, A., Davis, C.J., Connolly, A.J. and Hikmet, N., 2018. User response to mandatory IT use: a Coping Theory perspective. European Journal of Information Systems, 27(4), pp.395-414.

BECTA (2006). The BECTA Review 2006. Coventry: BECTA.

Bell, E., Bryman, A. and Harley, B., 2022. Business research methods. Oxford university press.

Beach, R. and Castek, J., 2016. Use of apps and devices for fostering mobile learning of literacy practices. In Handbook of research on the societal impact of digital media (pp. 343-370). IGI Global.

Blackwell, C.K., Lauricella, A.R. and Wartella, E., 2014. Factors influencing digital technology use in early childhood education. Computers & Education, 77, pp.82-90.

Brooke, C., (2009). Critical management perspectives on information systems. Routledge.

Detert, J.R. and Trevino, L.K. (2010) Speaking up to Higher Ups: How Supervisors and Skip-Level Leaders Influence Employee Voice. Organization Science, 21, 249-270. http://dx.doi.org/10.1287/orsc.1080.0405

Ditzler, C., Hong, E. and Strudler, N., 2016. How tablets are utilized in the classroom. Journal of Research on Technology in Education, 48(3), pp.181-193.

Dooyeweerd, H. (1955). A new critique of theoretical thought (Vols. I-IV). Jordan Station, Ontario, Canada: Paideia Press. (Original work published 1953-1958)

Dogan, S., Dogan, N. A., & Celik, I. (2021). Teachers' skills to integrate technology in education: Two path models explaining instructional and application software use. Education and Information Technologies, 26(1), 1311-1332. https://doi.org/10.1007/s10639-020-10310-4

Dubicka, B., Martin, J. and Firth, J., 2019. Screen time, social media and developing brains: a cause for good or corrupting young minds?. Child and Adolescent Mental Health, 24(3), pp.203-204.

Dwyer, S. C., & Buckle, J. L. (2009). The space between: On being an insider-outsider in qualitative research. International journal of qualitative methods, 8(1), 54-63.

Eriksson, D. M. (2001). Multi-Modal Investigation of a Business Process and Information System Redesign: A Post-Implementation Case Study. System Research and Behavioural Science 18(2), 181-196

Freeman, R.B., Boxall, P.F. and Haynes, P. eds., 2007. What workers say: Employee voice in the Anglo-American workplace. Cornell University Press.

Gillen, J., Marsh, J., Bus, J., Castro, T., Dardanou, M., Duncan, P., Enriquez-Gibson, J., Flewitt, R., Gray, C., Holloway, D. and Jernes, M., 2018. Digital Literacy and young children: towards better understandings of the benefits and challenges of digital technologies in homes and early years settings.

Gunton, R.M., van Asperen, E.N., Basden, A., Bookless, D., Araya, Y., Hanson, D.R., Goddard, M.A., Otieno, G. and Jones, G.O., 2017. Beyond ecosystem services: valuing the invaluable. Trends in Ecology & Evolution, 32(4), pp.249-257.

Kougiannou, N. and Holland, P., 2022. Employee voice and silence in the digital era. In The Emerald Handbook of Work, Workplaces and Disruptive Issues in HRM (pp. 513-531). Emerald Publishing Limited.

Prouska, R., Nyfoudi, M., Psychogios, A., Szamosi, L.T. and Wilkinson, A., 2023. Solidarity in action at a time of crisis: The role of employee voice in relation to communication and horizontal solidarity behaviour. British Journal of Management, 34(1), pp.91-110.

Thomas, A., Menon, A., Boruff, J., Rodriguez, A. M., & Ahmed, S. (2014). Applications of social constructivist learning theories in knowledge translation for healthcare professionals: A scoping review. Implement Sci, 9, 37.

Vrasidas, C. (2015), The rhetoric of reform and Teachers' use of ICT. Br J Educ Technol, 46: 370–380. doi:10.1111/bjet.12149

Wilkinson, A., Donaghey, J., Dundon, T. and Freeman, R. (2018). 'Employee voice: charting new terrain'. In A. Wilkinson, J. Donaghey, T. Dundon and R. Freeman (eds.), The Handbook of Research on Employee Voice. Cheltenham: Edward Elgar, pp. 3–16.

Winfield, M.J., Basden, A. and Cresswell, I., 1996. Knowledge elicitation using a multi- modal approach. World Futures: Journal of General Evolution, 47(1), pp.93-101.

Zancajo, A., Verger, A. and Bolea, P., 2022. Digitalization and beyond: the effects of Covid-19 on post-pandemic educational policy and delivery in Europe. Policy and Society, 41(1), pp.111-128.