

# Resource Dimensions Influencing Technological Appropriation in ESP Writing Instruction

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## Abstract

The objective of this study is to investigate the role of the material and immaterial, social, and educational resources in the appropriation of digital and AI during English to Specific Purposes (ESP) writing instructions. Informed by van Dijk's Resource and Appropriation Theory (RAT), the study will employ quantitative correlational survey research design and target ESP writing instructors who responded to a structured Likert-scale questionnaire. The findings reveal that motivation and teacher's autonomy are not the only factor to define technological appropriation in ESP settings but is also shaped by the access to institutional infrastructural resources, training facilities, and participatory decision-making environments. Material and social resources emerged as central facilitators, where immaterial resources like autonomy and flexibility remained in the periphery, but played a significant supporting role. It was demonstrated that educational abilities like the ability to adapt writing instruction through the usage of the digital tools are dependent on the access of materials and the collaborative institutional cultures. This paper reiterates that ESP writing training that necessitates task-specific and discipline-relevant instruction cannot be simply a matter of individual ingenuity it must be backed up by systemic support. The results support an integrated approach to digital integration in ESP, which is based on balanced infrastructure, empowerment, and professional development to provide technological equity in the process.

**Keywords:** Access, Technological appropriation, Inequity, ESP, Writing instruction

## Introduction

The integration of digital tools in education has changed teaching and learning experiences of various disciplines, such as English for Specific Purposes (ESP) (Herlina & Said, 2022). The increased use of digital tools in the educational

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environment has provided new conditions to enhance the effectiveness and quality of language teaching, especially in ESP situations. ESP, being a special branch of English language teaching, seeks to respond to the linguistic and communicative requirements of the learners in a particular professional or academic field (Bekturova et al., 2024; Boukhemis, 2024; Freeman et al., 2015; Zaman, 2024).

### ❖ Digital Technology in ESP

The growing use of digital technologies in everyday activities has impacted classroom performance considerably (Rachmawati et al., 2020). Digital resources including online learning platforms, educational mobile apps, virtual classrooms and multimedia have changed the form of educational delivery and have allowed more collaboration amongst students and improved participation. Nevertheless, though the use of technology in educational settings is ubiquitous, little focus has been given to its use in English specific purposes (ESP) classroom settings.

Over the last several years, the advent of Artificial Intelligence (AI) in learning environments has transformed the process of teaching and learning across the spectrum (Niemi, & Liu, 2021; Treve, 2024; Troseli et al., 2024; Walter, 2024). Artificial intelligence aids in the writing process, especially related to English as a Specific Purpose (ESP) education, which is embodied in the growing popularity of the smart writing assistant, automated error correction systems, and adaptive learning environments to improve writing abilities of students and help teachers provide personalized instructions. The research study indicated that digital technology is a potential way of enhancing the precision, effectiveness, and achievement of students in writing lessons (Alhusban, 2016; Dash, 2022; Godwin-Jones, 2018; Gocen et al., 2023; Joseph & Khan, 2020; Kukulska-Hulme et al., 2020). Due to the rapid digitalization of higher education representatives all over the world, AI-assisted pedagogy is a necessity rather than the opportunity in especially such fields of professional and academic communication as ESP.

In parallel with this digital shift, the interest in scholarly research regarding the drivers of effective adoption of technologies in education has been increasing (Alshammari, 2023; Feng, et al., 2023; Granic, 2022; Hazzan-Bishara, 2025; Oyetade, et al., 2020). Although access to devices and platforms is a prerequisite, studies constantly indicate that the integration of technologies is based on institutional support as well as on teacher's autonomy, professional growth and academic cooperation (Ertmer & Ottenbreit-Leftwich, 2010; Tondeur et al., 2017). Such a

layered quality of digital adoption suggests the necessity of more thorough theoretical approaches than mere access to the resources at hand, instead recognizing the role of material, immaterial, and social resources in facilitating or limiting teacher uptake of technology.

#### ❖ Use of AI in ESP Writing Pedagogy

Although it is evident that the concept of AI may be applied to ESP teaching, empirical studies concerning the experiences of teachers implementing AI in teaching are scarce, especially in the context of writing-orientated pedagogies. The literature is slanted either on student outcomes or technological features and functionalities and does not look at the larger institutional, resource-based factors and processes that determine how teachers use these tools in the practice of teaching (Warschauer & Matuchniak, 2010). In addition to this, limited research studies have used holistic sociotechnical models to decipher the dynamics of digital adoption through teacher lens. At that, the Theory of Resource and Appropriation (RAT) adopted by Jan van Dijk provides a useful perspective, “...a materialist and relational theory that emphasizes positions and relations instead of individual attributes” (van Dijk, 2012, p.57). According to the theory, digital inequalities are not only caused by access, but also caused by differences in motivation, resources, skills, and chances of meaningful use (van Dijk, 2005). Nonetheless, this framework has been scarcely used to examine the process of how teachers borrow AI when discussing ESP writing contexts, which represents a noticeable theoretical and practical gap in literature.

This paper aims to help resolve this gap by exploring how teachers in higher learning institutions perceive and employ AI tools when teaching writing ESP, how they use AI tools, and how their use is influenced by the diverse forms of resources. With reference to van Dijk and his Resource and Appropriation Theory (RAT), the research examines the correlation among:

**Technological Opportunities (TO):** Availability and adaptability of AI tools in ESP curriculum.

**Material Capital and Resources (MCR):** Financial and institutional resources (e.g. hardware, softwares licenses, time allocation).

**Immaterial Life Chances and Freedom (ILF):** Professional autonomy, motivation, and pedagogical beliefs of teachers with respect to AI.

**Social Position, Power and Participation (SPPP):** Faculty support networks, cooperation among faculty, faculty internal cooperation.

**Educational Capabilities and Skills (ECS):** Access to training, professional growth, and technical skillset with regards to AI-related tools.

Incorporating theoretical knowledge with empirical evidence, the study strives to present a comprehensive picture of the factors that would facilitate or hinder the process of appropriation of AI tools into ESP classrooms. It can be valuable to the academic debate regarding digital inequality as well as pragmatic action that helps to assist teachers in the dynamic environment of education.

## Review of the Literature

### ❖ AI integration in Language Instruction

Artificial Intelligence (AI) in education has become a widely popular concept, particularly when it comes to language learning and writing instruction. Such tools as AI-powered grammar checkers, feedback generators, and automated essay scoring provided an increase in the efficiency and personalization of writing education (Kukulska-Hulme et al., 2020). As it applies to ESP (English for Specific Purposes), AI technologies are particularly promising to aid domain-specific writing, including with personalized hints and feedback (Godwin-Jones, 2018). However, existing literature on the topic largely concerns technical capacities of AI-based systems themselves or student performance, with comparatively little being said about the institutional and professional settings that influence the manner in which teachers realistically incorporate and use these technologies (Al-Abdullatif, 2024; Bakhadirov, & Alasgarova, 2024; Garden et al., 2025; Hazzan-Bishara, 2025; Xu et al., 2025).

### ❖ Teacher Agency and Professional Development

AI in classrooms should not be about technology availability but teachers' autonomy, motivation, and professional support. Ertmer and Ottenbreit-Leftwich (2010) reveal that teacher beliefs, confidence, and institutional support are the key factors in the process of using any educational innovation. In addition, the quality

of professional development opportunities is directly proportional to the effective implementation and, in particular, to the implementation of technology in the conditions under which teachers have to make their way through the changing curriculum and the changing digital environment (Tondeur et al., 2017). Despite this, there is a limited literature on the influence of the career development pathways of teachers, their access to training, or decision-making ability in their institutions with bearing on the capacity of teachers to meaningful appropriate AI tools.

### ❖ **Institutional and Material Constraints**

Most institutions are ready to undergo digital transformation, yet others do not even have basic infrastructure. Warschauer and Matuchniak (2010) point out that inequities in material resources like differences in financial resources, digital infrastructure, and technical support can pose big problems to technology integration. The disadvantages in these situations are even more vivid when institutions that are poorly funded or the departments thereof lack in any resources to follow through with AI tool implementation, despite the educators being eager to use them.

The same challenge is reflected by Selwyn (2021), who cautions against what he calls “technology solutionism”: the belief that digital technologies in education alone will revolutionize education without regard to the social and material environments within which they are employed. It is of view that technology single-handedly resolves pedagogical challenges (Morozov, 2014). Typical techno-solutionist approaches in ESP settings do not take into consideration the layered prerequisites for appropriation, which should always be situated in particular disciplinary and institutional contexts. As an example, introducing AI-based language tools can empower more internet-literate students with institutional support, but marginalize those who cannot afford devices or training or even contextual information. Therefore, the integration of technology in ESP must not presuppose universal utility, but, instead, pursue situationally sensitive, resource-oriented pedagogies, that take into account different capacities of students and the systemic issues that impact the way students interact with digital instruction (Rachmawati & Irawan, 2024; van Dijk, 2020). Selwyn (2024) cautions that these solutions can be politically and institutionally expedient to the extent of substantive change.

## **Theoretical Lens: van Dijk's Resource and Appropriation Theory (RAT)**

Van Dijk (2005) presents a convincing framework that explains how the issues of inequality of access, competence, and utilization in digital practices are defined by wider material, immaterial, social, and institution resources. His theory implies that effective digital appropriation takes more than access to technology; it includes a combination of: Motivational access (Interest and perceived benefit), Material access (provision of digital tools or resources), Skills access (training and competence), and Usage access (meaningful application in practice). The model has been implemented in digital inequality research but seldom seen applied to the area of teacher experiences with AI application in ESP teaching, making it an exciting analytical perspective in the present study. In this way, it serves to not only add to theoretical discussion regarding digital inequality but also to propose practical solutions to enhancing AI integration in specialized language teaching.

## **Methodology**

The research is a post-positivism study since the study acknowledges that an objective reality exists but can only be measured imperfectly through empirical studies (Creswell & Creswell, 2017). It aims to investigate the role of material, immaterial, social, and educational resources in appropriation of AI technologies in ESP writing pedagogy by using statistical dependency between measured variables.

### **❖ Research design**

The research employs non-experimental, quantitative, correlational survey design. The design is suitable to determine relationships between constructs based on van Dijk (2005) Resource and Appropriation Theory. The objective is to explore the extent to which the various forms of digital inequality, which materialize in access to resources, contribute to the capacity of teachers to incorporate AI in learning ESP writing.

### **❖ Participants and Sampling**

A purposive sampling strategy was used to ensure that participants teach ESP writing courses, are active in higher education and have at least some exposure of AI or digital instructional tools.

❖ **Sample size**

A total of 50 English language instructors were included in the study, teaching ESP writing courses at tertiary-level institutions, which is appropriate for preliminary correlational analysis in social sciences (Table 1).

**Table 1: Demographic characteristics of the respondents**

Variable	Characteristics	Frequency (N=50)	Percent
<b>Gender</b>	F	35	70
	M	15	30
<b>Age</b>	20-29	30	60
	30-39	16	32
	40-49	4	8
<b>Experience</b>	0-3	28	56
	4 to 8	15	30
	9 to 15	5	10
	16 and above	2	4
<b>Professional Status</b>	Regular/Permanent	29	58
	Visiting Faculty	21	42
<b>Education</b>	BS	9	18
	MPhil	37	74
	PhD	4	8

### ❖ Research Instrument

A structured questionnaire was developed based on both the literature review and the dimensions of van Dijk Resource and Appropriation Theory (RAT). The questionnaire consisted of 5-point Likert scale items ranging from (Strongly Disagree) to 5 (Strongly Agree), divided in to following constructs (Table 2):

**Table 2: Constructs used to measure dimensions based on Resource and Appropriation Theory (RAT)**

Construct	Items	Description
Technological (TO)	TO1, TO2	AI integration & adaptability
Immaterial (IML)	IML1, IML2	Flexibility, autonomy, career advancement
Material (MCR)	MCR1, MCR2	Financial and educational resources
Social (SPPP)	SPPP1, SPPP2	Institutional collaboration and decision-making
Educational (ECS)	ECS1, ECS2	Training opportunities and perceived improvement in writing instruction

### ❖ Validity and reliability

#### • Validity

Content validity was established by aligning questionnaire items with existing literature and validated scales (van Dijk, 2005; Tondeur et al., 2017).

#### • Reliability

Cronbach Alpha was used to test the reliability of the questionnaire. An index of internal consistency  $\alpha = 0.809$  was found across the 10-items. This indicates that the items are accurate indicators of the constructs focusing on the inequality of resources and AI tool acquisition in ESP writing instruction.

### ❖ **Data Collection Procedure**

Participants were invited via WhatsApp group formed for the participants of ELT workshops/conference for a project of HEC. Informed consent was obtained digitally. Data were collected using an online survey tool i.e. Google Forms. Responses were anonymous and treated confidentiality. Data was saved and used solely for research purposes.

### ❖ **Data Analysis**

The study explored how resources (material, immaterial, social, and educational) impact the appropriation of AI technology as perceived by ESP instructors. Data was analyzed using SPSS 27 and AI to evaluate the psychometric properties of the research instrument and find the relationship between the constructs. Descriptive and inferential statistics were used to assess relationships.

## **Results**

### ❖ **Descriptive Analysis**

Participants reported (Table 3) high means in technological Opportunities (TO<sub>2</sub>: 4.32), Career Advancement (IML<sub>2</sub>: 4.30), and Writing Skills Improvement (ECS<sub>2</sub>: 4.06). The lowest mean was found in Financial Resources (MCR<sub>1</sub>: 3.06) and then institutional role (SPPP<sub>2</sub>: 3.56). This suggests that while digital adaptability and perceived English language writing skills benefits are high, financial resource access and ESP teacher's role in decision-making processes regarding the adoption and implementation of digital tools and AI in language teaching remains inconsistent. ESP teachers generally agreed that they have necessary resources and support to integrate AI tools in their writing instruction (TO<sub>1</sub>: 3.84). ESP teachers slightly positive perception (IML<sub>1</sub>: 3.90) regarding the autonomy in experimenting with digital tools in their writing curriculum to improve learning outcomes. Results reported moderately positive perception (MCR<sub>2</sub>: 3.68) toward access of cultural and educational resources for the effective use of AI tools. Teachers have the agreement on collaborative environment where sharing AI strategies is encouraged with a mean of SPPP<sub>1</sub>: 3.74. ECS<sub>1</sub>: 3.88 indicates teachers have positive agreement on training opportunities.

**Table 3: Measures of Central Tendency and Dispersion**

	TO <sub>1</sub>	TO <sub>2</sub>	IML <sub>1</sub>	IML <sub>2</sub>	MCR <sub>1</sub>	MCR <sub>2</sub>	SPPP <sub>1</sub>	SPPP <sub>2</sub>	ECS <sub>1</sub>	ECS <sub>2</sub>
Mean	3.84	4.32	3.90	4.30	3.06	3.68	3.74	3.56	3.88	4.06
Median	4.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00	4.00
Mode	4	4	4	4	4	4	4	4	4	4
Std. Deviation	1.037	.741	.909	.580	1.114	.891	.876	1.013	.982	.740

Most consistent responses are on career advancement opportunities with the lowest dispersion of IML<sub>2</sub>: .580, whereas highest on MCR<sub>1</sub>: 1.114, showing greatest variability in perceptions of financial resources, some rate very low, others high and SPPP<sub>2</sub>: 1.013, also shows relatively high variability in decision-making participation. Although majority of the constructs identify consistencies, the material resource and institutional power dimensions differ the most- indicating disparities or imbalance among individuals or departments. This shows that there is a high level of agreement among respondents on the positive impact of technological and educational potential, highlighting the concerns over resource limits in financial support.

In sum, constructs were aligned on median and modal score (mostly 4.0) indicating a consistently positive representation of the whole sample. The pattern confirms the validity of the scale and strengthens the internal consistency that is already established by Cronbach Alpha. The box plot of simulated distributions of score in Fig. 1, further demonstrates the symmetry and spread of responses: Constructs such as IML<sub>2</sub>, TO<sub>2</sub> and ECS<sub>2</sub> get close interquartile ranges and a small number of outliers and indicate homogenous and consistent responses. MCR<sub>1</sub> reveals the most dispersion with minimum scores of 1, and a significant number of outliers. This implies that there exist diverse perceptions concerning financial resources which may be attributed to institutional or departmental differences. Equally, SPPP<sub>2</sub> (teachers' engagement in institutional decisions) indicates quite an inconsistent result reflecting much variability (faculty members do not receive equal chances of being involved and having a voice).

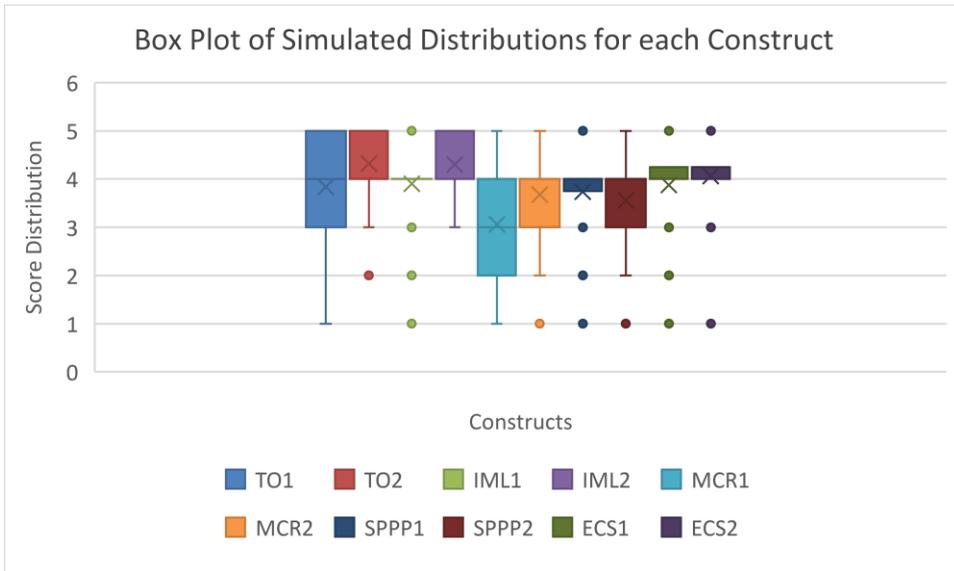


Fig. 1. Variation in teachers' perceptions of resource access and technology appropriation

❖ **Correlation Matrix Analysis**

Spearman rho correlation analysis was used to explore monotonic relationships between the five central constructs that affect appropriation of technology in ESP writing instruction: Technology Opportunities, Immaterial Life Chances, Material Capital Resources, Social Power and Participation and Educational Capabilities and Skills. Findings showed that Technological Opportunities had a significant correlation with all constructs, being the most dominant with those of Material Capital Resources ( $\rho = .607, p < .001$ ), which means that access to financial and educational infrastructure is central in fostering the integration of AI tools. There was also a moderate to strong correlation with Immaterial Life Chances ( $\rho = .522, p < .001$ ), Educational Capabilities and Skills ( $\rho = .493, p < .001$ ), and Social Participation ( $\rho = .444, p = .001$ ), indicating that technology use is also influenced by professional autonomy, access to training, and cooperative institutional settings. Interestingly, Immaterial Life Chances were weakly/insignificantly associated with Material Resources ( $\rho = 0.264, p = 0.064$ ) and Educational Capabilities ( $\rho = 0.149, p = 0.302$ ), thus reflecting a gap between perceived autonomy and assistance in building skills. Conversely, Material Resources were markedly associated with Social Participation ( $\rho = .496, p < .001$ ) and Educational Capabilities ( $\rho = .365, p = .009$ ),

further supporting the structural importance of material access as the source of both inclusion and professional development.

Similarly, Social Participation had a positive relationship with almost all constructs including Technological Opportunities ( $\rho = .444$ ), Immaterial Life Chances ( $\rho = .329$ ) and Educational Capabilities ( $\rho = .447$ ) all of which are significant at  $p < .05$  or better, underlining the enabling role of participatory and collaborative environments. Finally, both Material Resources and Social Participation also made a significant impact on Educational Capabilities, but Immaterial Life Chances did not have an impact at all, which tends to imply that despite good autonomy, institutional support of the learning process is actually more important.

Collectively, these results confirm the central principles of the Resource and Appropriation Theory (RAT) of van Dijk that, digital integration in ESP writing teaching is a function of layered access to resources, particularly material and social, and not an individual impetus or agency.

**Table 4: Spearman's correlation coefficients among key resource variables related to technology appropriation in ESP writing instruction (N = 50)**

	1	2	3	4	5
<b>Technological Opportunities</b>	1				
<b>Immaterial life chances</b>	.522**	1			
<b>Material Capital Resources</b>	.607**	.26	1		
<b>Social Position Power Participation</b>	.444**	.329*	.496**	1	
<b>Educational Capabilities Skills</b>	.493**	.15	.365**	.447**	1

Note. N= 50. \* $p < .05$ ; \*\* $p < .01$

Results indicate that Technological Opportunities are most central and correlate positively with all other factors. Material resources and social participation have a strong effect on the development of skills and institutional engagement, whereas Immaterial Life Chances (e.g. autonomy) is associated more with empowerment than direct outcomes. Structural and social provisions contribute considerably to determining Educational Capabilities instead of personal initiative. Overall, technology appropriation in ESP writing relies not solely on individual motivation

but also on equitable access, supportive environments, and long-term institution investment.

## **Discussion**

This study aimed to explore how various types of resource inequality, namely material, immaterial, social, and educational impact the appropriation of technology including AI tools in ESP writing instruction. Following the van Dijk Resource and Appropriation Theory (RAT), the results disclose that the effective introduction of technology into teaching practices cannot be based merely on the individual willingness or organizational requirements, but on the complex interplay of access, infrastructure, training, and participation.

### **❖ Material inequality- a central barrier and enabler**

The strongest correlation found in the study was between Material Capital Resources and Technological Opportunities ( $\rho = .607, p < .001$ ) which supports the argument by van Dijk that material access forms a fundamental basis to digital participation. The teachers who indicated that they had access to financial and educational infrastructure which included platforms based on AI, digital tools, or institutional financing had more chances of using technology in their educational activities. This is all the more applicable to the case of ESP writing, with discipline-specific writing paradigm models, corpora, and AI tools requiring special access specialized in engineering, medicine, or business domain.

Such types of material inequality weaken the potential of teachers to deliver in these fields with relevant, authentic instructions in the context of task-based and needs-driven oriented ESP (Hyland, 2002). The research supports the fact that there cannot be equal access to technological resources, which will impede the will of ESP writing teachers to adapt the instruction to the professional and academic writing needs of students.

### **❖ Social Participation enhances Appropriation**

A consistent finding across several correlations was the effects of social resources, including collaboration and participation in institutional decision-making. All major constructs, which were technology use, material access, and skill development, were highly correlated with Social Position, Power, and Participation. These findings confirm that a power-sharing context, in which the teacher has an

active role in the planning and decision-making processes, supports the appropriation of digital tools.

This is vital in the setting of ESP where ESP writing is specifically collaborative and contextual, and instructors will need to modify the curriculum dependent on the occupation and student specialization. When institutional planning involves teachers, they are able to negotiate curriculum design that takes into account disciplinary writing conventions of students and incorporates technology in a meaningful way. Inclusive governance, therefore, not only empowers teachers, but it is also directly connected to the culture of learner-centered, context-sensitive instructions of ESP (Dudley-Evans & St. John, 1998).

#### ❖ Educational Capabilities and Structural Support

The correlation between Educational Capabilities and Skills and the other constructs (particularly, Technological Opportunities:  $\rho = .493$ , and Social Participation:  $\rho = .447$ ) shows that training and skills empowerment are strongly related to the support provided by institutions. Those teachers exposed to professional development felt more capable of incorporating AI tools in ESP writing teaching. Since in most cases ESP writing involves genre-focused, functional writing tasks enabled by real-time tools (e.g., grammar checkers, writing analytics), training in these technologies is no longer optional but a necessity. These results help to justify the idea that ESP writing pedagogical competence development must be based on systematic and context-dependent training which is in compliance with the needs analysis and individual training offered by Hutchinson and Waters (1987). This research establishes that educational capabilities should be built up structurally—they should not be entrusted on chance or teacher initiative.

#### ❖ Immaterial Life Chances

Surprisingly, Immaterial Life Chances including autonomy, flexibility, and career advancement did not correlate with technology use ( $\rho = .149$ ,  $p = .302$ ) and demonstrated rather weak correlation with the use of technology (the corresponding  $\rho = .522$ ). It implies that although autonomy or individual freedom is valued, it may not be sufficient to result in skill development and AI incorporation without any structural support. In other words, skill development is driven by material and social support.

Autonomy has pedagogical significance, but is not enough in the ESP context, where teachers may tailor writing assignments to student needs and backgrounds. Even autonomous teachers cannot help without access to digital content that is aligned with specialized writing genres or professional discourse. This corroborates the assertion of van Dijk who states that access devoid of motivation is inadequate and reinforces the result by Belcher (2009) who observes that institutional readiness and teacher agency are key to ESP writing success.

#### ❖ **Integration of Resource Dimensions**

The outcomes also indicate the inter-dependent nature of resource access. An example includes the fact that the correlation of Material Resources and Social Participation is strong and therefore the resource-rich institutions tend to be more inclusive. This corroborates the RAT model, which views the appropriation as an incremental phenomenon not as a zone of access but a stratified escalation through material, skills, motivational, and usage realms (van Dijk, 2005). This layered access is especially necessary in the ESP environment, in which the writing instruction needs to be flexible, functional, and domain specific. Teachers should be equipped with infrastructure, training, motivation and participatory control to guide the creation of teaching that suffices both linguistic and disciplinary demands. Lack of one of these dimensions in ESP writing instruction will reduce the quality and impact of ESP writing instruction.

Altogether, the research depicts the impact of material and social inequalities as the most critical aspects of appropriation for AI technologies in ESP writing teaching. Although autonomy and motivation are significant, they cannot be effective without proper environment, which offers resources, training, sharing power structure. These results affirm the necessity of institutions to follow through on the policy-level promotion of digital tools into more comprehensive and equity-driven investment into teacher empowerment.

## **Conclusion**

The present research aimed at examining the influence of various types of resource inequality on the appropriation of AI and digital technologies into ESP writing instruction, as manifested in the domains of material, immaterial, social, and educational inequality. Based on van Dijk Resource and Appropriation Theory (RAT), the results validate the fact that successful adoption of technology in

teaching practice is not only based on individual preferences or institutional requirements but on a complex set of access, infrastructure, training, and participation.

The data indicated that material resources (e.g., financial and educational infrastructure) are the most important enabler of technological use. The incorporation of AI tools effectively was much higher in those teachers who had access to digital platforms, classroom resources, and institutional funds. Social resources, in the form of collaborative environment and participatory decision-making structure have also influenced significantly through reinforcement of engagement, motivation and professional development. In contrast, although such immaterial resources as autonomy and motivation positively correlated with the use of technology, they did not thoroughly foretell enhanced skills or training performances, accentuating the confines of motivation without structural assistance.

Collectively, such findings substantiate the layered model of RAT: digital inclusion is a complex process of equalizing access to devices with access to skills, empowerment, culture capital and institutional belonging. These disparities in the case of ESP writing, in particular, where electronic technologies provide novel opportunities to scaffold and evaluate writing proficiencies, should be resolved in a comprehensive manner to guarantee that the increased usage of technology promotes, rather than contributes to current differences in educational techniques.

### **Recommendation and Implications**

The results affirm how the basic support of material capital, including access to AI technologies, teaching platforms, and infrastructure, can help promote the use of technology in ESP writing classes. Equality in allocation of such resources between departments and campuses should be considered as a priority by institutions. There must be specific budget lines dedicated to the support AI-compatible language tools, writing software, and technology in the classrooms to make sure every teacher has the minimum of infrastructure enabling effective digital pedagogy.

Educational abilities and usage of technology are positively correlated, signaling the need to have more intense and consistent teacher training programs. Institutions need to go beyond a one-time workshop and demonstrate persistence of

professional development aligned to needs over time that is related to AI integration in writing instruction. Both technical skills and pedagogical approaches to the meaningful application of digital tools in ESP contexts should be used in training. It was found that social resources, especially cooperation and institutional involvement, had considerable significance on the capacity of teachers to adopt technology appropriation. The departments and universities ought to design systems that involve the teachers in digital planning and curriculum design. This level of involvement has the advantage of strengthening educators, developing ownership of innovation projects, and ensuring that technology decisions are aligned to on-the-ground teaching realities.

Although most institutions encourage the concept of digital innovation, unsupported policies can create high-level inequality. Policy frameworks related to AI adoption must be accompanied by material investments, training opportunities, and participation in governance diverse groups of administrators. Immaterial life chances, including teacher autonomy and motivation, ought to be equipped with the relevant material and institutional structures that will enable meaningful appropriation.

Within ESP writing, where relevancy within disciplines and language-specific assistance is needed, AI tools present the possibility of transformation. The key though is that this potential will not be achieved unless educators are provided with the resources, time, and autonomy to experiment, evaluate, and adapt such tools. Institutions ought to promote contextual innovation, and teachers can then modify the use of AI to the needs of different learners within engineering, medicine, or law. This paper develops a further application of van Dijk Resource and Appropriation Theory (RAT) to the pedagogical field noting that appropriation is not solely about gaining access to and consuming technology, but also about a pedagogical transformation of the practice of teaching with technology. This framework can be used as a basis of future studies, in order to further understand the impact of structural inequalities on the depth, quality of pedagogical innovation in language education.

The question of inequality in the use of AI and digital technologies cannot be solved by only improving the infrastructure, but by educational justice. As part of the process of digital transformation, continuous efforts should be put into adopting a

comprehensive strategy that would address the lived realities of the teachers, institutional barriers, and specificities of the ESP writing pedagogy.

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