DIGITAL LINGUISTICS IN INTERNATIONAL SIGN LANGUAGE COMMUNICATION. CASE STUDY: DIGITAL ROMANIAN SIGN LANGUAGE

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Abstract: Digital Linguistics in International Sign Language represents an influential aspect of the Development of Deaf Communication. They are the subject of research for the ability to integrate communication into Digital Sign Language Processes. However, many people recognize the importance of Sign Language in context and of the effectiveness of law in order to help increase communication strategies through relevant deaf community interactions in the education, information, and technologies video, image, and voice-to-text content on social media, such as Instagram, Facebook, X (former Twitter), TikTok, and other website platforms. This study explores different aspects of Deaf Studies and Sign Language in the field of highest scientific research for Deaf researchers and for several communication strategies across cultures, languages, and linguistics.

Keywords: Deaf Linguistics, Deaf Studies, Deaf Communication, Sign Language

1. Introduction

Digital Linguistics in International Sign Language Communication examines the use of information, technology, and accessibility for Deaf/Hoh individuals. It highlights the linguistic features of Deaf communication across social media platforms such as Facebook, Instagram, X (Twitter), YouTube, and TikTok, as well as other websites. The study also considers dedicated Sign Language social networks for NGOs and Sign Language interpreters. When developing strategic digital communication for the deaf community, it is essential to understand technological advances in sign language studies and the needs of deaf and HoH individuals. Given the presence of NGOs, e.g., A.N.S.R., and A.N.I.A.L.M.G and NGO others, public institutions, and the importance of social values in research on deaf and HoH populations — especially in Romania, the EU, the UK, the USA, and other countries — the study also discusses the current state of international sign language communication and the roles played by NGOs and institutions.

The objective of digital linguistics in international sign language communication differs across backgrounds in the corpora of Sign Language Linguistics. According to Gabrielle Hodge and Sara Goico (2022), integrating LE and CL is necessary for sociolinguistics and interactional linguistics for social networks, social life, social ecology, and social technology.

The issue of Deaf Studies related to digitalization and communication, including Sign Languages: NGT, BSL, DGS, FSL, NZSL, and SSL, is a current focus of our scientific research. However, a highly critical perspective on the increasing emphasis on Deaf Communication, as well as on technology and accessibility for deaf and HoH

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individuals, is a fundamental right in the context of digitalization and communication in Sign Languages.

This research paper emphasizes the need to understand the relationship between digitalization and communication within Deaf Studies, given the cultural and social factors that shape the diversity of Deaf individuals' lives and behaviors. This study investigates explicitly linguistic and communication challenges related to symbolic Sign Language, along with efforts to enhance Sign Language skills for deaf/HoH communities.

2. Research Focus

Research on various aspects of communication in sign language can highlight international linguistic issues, including the role of information and access to help on all social media platforms. In addition, this research examines the relationship between deaf/HoH individuals for interpreting in Sign Language. The objective of this research was to shed light on deaf communication and sign language, as identified in the preliminary sections of six (6) subchapters in the research framework. The framework is based on digital linguistics in sign language communication, which is a principle of human rights.

The researcher of this study decided to investigate the Sign Language Law in this country, along with the fundamental principles of digital sociolinguistics, communications in sign language, and technological infrastructures, such as SIGN-HUB, SignGram, and Sign Language Corpora. The study aims to develop signing systems, improve avatars, symbols, and icons, and develop translation tools and innovative information technology-based systems to support deaf students in universities and pupils in special education. It emphasizes the importance of promoting good learning practice within deaf communities and how technology can assist with communication.

2.1. Research Aims

1. To explore Digital Linguistics International Sign Language, thorough research will examine differences in variation and terminology between Linguistic Ethnography and Corpus Linguistics, prevailing typologies, the fundamental principles of sociolinguistics, and the theoretical and practical aspects of computational linguistics.
2. To explore how digitalization affects Sign Language, especially regarding its incorporation between LE and CE into the gestural linguistics model, which includes both words and voices.
3. To explore deaf communication technology infrastructure systems, efforts will be undertaken to investigate the impact of digital technology on sign language translation and interpretation.

2.2. Research Questions

1. What are the principles of Digital Sign Language communication rights?
2. What information and access do Deaf Sign Language users have when oral audiences require authorized interpreters in Sign Language for events at City Hall, Police Stations, and Justice Courts regarding Deaf/HoH communication needs?

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2.3. Research Hypotheses

1. The fundamental principles of digital communication rights, considering Deaf Studies and popular social media platforms, are essential for safeguarding human rights.
2. The fundamental principles of the state shall guarantee respect for the rights of deaf/HoH individuals, regarding those who are deaf-blind. This shall be in accordance with the law of Sign Language Statutes, including the professional authorized interpreters in Sign Language interpretation authorized services available on premises for the deaf/HoH individuals, as well as for deaf-blind persons.

2.4. Research Design

The research aims to examine two fundamental questions in the domains of deaf technologies and communication studies. The study addressed several aspects, including deaf communication, the digitalization of International Sign Language, the analysis of pilot technology, and the provision of interpretation services for video calls. The present article's focus was exclusively on the linguistic model of gestural linguistics. A variety of viewpoints concerning social media platforms such as Facebook, Instagram, Twitter, and YouTube were contemplated in the context of the transformation of sign language videos into spoken language. This is a review of information on Deaf/HoH communication and digitalization in Sign Language Linguistics. The volume features a case study on Digital Romanian Sign Language in social networking in A.N.S.R., A.N.I.A.L.M.G., and NGO other NGOs that analyze the linguistic communication of the deaf. Consequently, this research explores the significance of Digital Linguistics in International Sign Language Communication for scholarly publication.

2.5. Research Structure

First, an introduction to the fundamentals of research in digital linguistics regarding international sign language, with a focus on presenting deaf studies, and advocating for equal rights and opportunities for the deaf community. It is a structured, in-depth scientific paper that offers a comprehensive overview of the goals, research questions, hypotheses, methods, and frameworks.

In Chapter II, an analysis of the fundamental issues was conducted regarding topicality, specialized literature on digital technology in the research of linguistic communication of the deaf, and an accessible corpus of ethnolinguistic studies in sign language. The corpus network is a multidimensional object that engages in various technical, computational, educational, and linguistic projects within the domain of fundamental communication and collaboration in the contemporary context.

In Chapter III of the Tables, we have examined topics related to something intriguing, for which descriptions and texts serve as research sources for the analysis of sign language corpora and the digital archiving of hidden languages. These topics are crucial for the further development of digital sign language within the core field of linguistics.

Chapter IV discusses the digitalization of sign language on social media platforms, emphasizing social media accessibility and information access across diverse facets of social life, including the involvement of non-governmental organizations within the deaf community. It also considers how social media discourses and monologues in

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English may perpetuate prejudices against ASL (American Sign Language), particularly in contexts where communication barriers are present.

Chapters V and VI include quotations and a case study on Digital Romanian Sign Language. This case study details an integrated approach to the Deaf community, showing that the Romanian National Association of the Deaf (A.N.S.R) and the National Association of Authorized Sign Language Interpreters (A.N.I.A.L.M.G) emphasize different aspects of Deaf communication, community, and sign language interpreters.

3. Digital Technology in the Research of Linguistic Communication of the Deaf

The Digital Technology for Linguistic Communication in Sign Language includes two areas: Sign Language Corpus Linguistics and Ethnography of various National Sign Languages or International Sign Languages, both disciplines within Deaf Studies. Additionally, the Sign Language Linguistics Corpora and Sign Language Digital Tools translate sign language into spoken text within videos, notes, and other formats.

Gabrielle Hodge and Sara Goico (2022) highlight the importance of digital technology in scientific research, starting with sign language variations and documentary evidence integrated with "*Linguistic Ethnography*" (LE) and "*Corpus Linguistics*" (CL), which encompasses language typology, sociolinguistics, and computational linguistics. Therefore, collaboration between LE and CL is potentially crucial for deaf communication, highlighting benefits for deaf researchers and communities that can be considered (Gabrielle & Sara, 2022, pp. 127-128).

The Sign Language Linguistics Corpora Network, Crasborn Onno (2010), is a research project focused on encoding, capturing, and analyzing sign language data. It aims to develop modern digital innovations for sign language corpus linguistics and technology, as well as all specialties that combine technical, computational, educational, and linguistic projects in the field of humanities communication (Crasborn, 2010, p. 458).

This also influences Digital Tools for Sign Language, Fragkiadakis Manolis (2024), which converts sign language into spoken text in a video and is essential for comprehending "gestural" linguistics and the relationship between signs and words. This process involves tackling the challenge of transforming sign language videos into spoken language, necessitating the representation of spatiotemporal signs within a linguistic framework that connects spoken and written language (Fragkiadakis, 2024, p. 9).

The conclusion of this argument regarding the linguistic-ethnographic corpus within the digitization framework for deaf social communication is that modern sign language communication — ranging from spoken text to notes, videos, and written notes — has achieved the study's research objectives.

Table 1 details numerous academic research studies on Deaf Sign Language recognition communication, as well as Sign Language Acquisition publications (Ankita & Parteek, 2021, p. 788).

The research presents three tables that help Deaf/HoH individuals, educators, and scholars understand key advancements in sign language technology, such as the SIGN-HUB and SignGram frameworks. These highlight the importance of deaf research efforts, including corpus linguistic analysis, for ensuring content representativeness, historical context, compilation, and digital accessibility of text, audio, and video resources. It is also noteworthy that the initiation of signs varies across languages like NGT, BSL, DGS, FSL, NZSL, and SSL.

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No.	Title	Descriptions	Texts	Source
1.	Advances in Sign Language Corpus Linguistics	Sign Language Corpus Linguistics: - an academic perspective on corpus deaf representativeness; - compiling a Sign Language Corpus; - the history of sign language linguistic corpora.	Sign Language Linguistic Corpora develop academic grade signing and improving avatars, symbols icons, translation tools, and innovation systems (pp. 13-14).	(Ella Wehrmeyer, 2023)
2.	Hidden Languages in a Digital World: The Case of Sign Language Archives	Digital Sign Language Infrastructure: SIGN-HUB (including grammars, atlas, assessment tests, and digital archive); SignGram (a side where the grammar writer finds resources and the table of contents).	Figure 1 illustrates the workspace partitioned into 3 (three) principal mains: 1) the left area features the table of contents accompanied by the SignGram checklist. 2) the central area contains a comprehensive “rich text editor” 3) the right section provides database access to visual materials. Figures 2 and 3 depict the atlas and assessment components, including access points, measurement tools, and slides, facilitating the seamless integration of SIGN-HUB images and videos (pp. 35-36).	(Carlo Geraci & Quer, 2019)
3.	Corpus Analysis of Sign Languages	The creation of Sign Language (SL) Corpora begins: NGT (Dutch SL); BSL (British SL); DGS (German SL); FSL (French SL); NZSL (New Zeeland SL); SSL (Sweden SL).	The various types of Sign Language Corpora, such as NGT, BSL, DGS, FSL, NZSL, and SSL, are accessible through digital video formats and exist concurrently. The initial phase leading to the creation of the NGT corpus was completed in 2008. By 2009, a portion of this corpus had been fully translated or annotated in Sign Language, marking a significant development in corpus-based Sign Language linguistics research (p. 5).	(Schembri, 2010)

Table 1. Digital International Sign Language Corpora within the field of Linguistics.

Based on existing evidence from the international digital linguistics of NGT, BSL, DGS, FSL, NZSL, and SSL across various intercultural video linguistics contexts, this approach emphasizes the relationship between NGT and deaf identity. Additionally, the linguistic dimension in Deaf research introduces a new perspective for digital linguistics aimed at promoting International Sign Language communication. The fact holds considerable academic significance, particularly regarding a linguist's rights over individuals within the sign language corpus, as well as its analytical, cultural, and linguistic dimensions.

4. Digitalization of Sign Language on social media

Digitalization of sign languages improves social media access for deaf and HoH individuals, ensuring equal access to information. It encourages participation in various

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aspects of life through organizations for the deaf/HoH and deaf-blind communities. Digital accessibility fosters a deaf society where users can thrive and contribute on social media. Deaf influencers on Facebook, YouTube, Instagram, and other platforms use Sign Language in art, literature, and communication to address important topics, monologues, and presentations. Social media's role has sparked criticism over the need for the Accessible Act and prejudice against American Sign Language in English, often ignoring perspectives from various deaf and HoH communities, which may create communication barriers.

Bencie Woll and Rachel Sutton-Spence (2023) argue that Sign Languages have become more accessible on social media platforms. As a result, digital technology facilitates the editing and transmission of these languages for artistic, linguistic, literary, and creative performances, thereby advancing deaf communication, fostering development, and enhancing educational resources (Woll & Sutton-Spence, 2023, p. 207). This refers to social media platforms, like Facebook and Instagram, that can effectively reach thousands of deaf and HoH individuals for targeted promotion.

The second platform on the internet, possibly related to American Sign Language, enables deaf and hard-of-hearing individuals to create and share vlogs across various social media platforms, including Facebook, YouTube, Instagram, Twitter, and official websites. These facilitate discussions on diverse topics, including monologues, journalism, and live presentations, thereby forming a dynamic language ecology that addresses societal issues (Lynn, Ryan, & Erin, 2020, p. 34).

Crom Saunders (2016) discusses social media's role in online disinhibition and the marginalization of American Sign Language and Deaf Culture. He argues that Deaf/HoH individuals are often overlooked or criticized for valuing social media, as it favors English over other languages, except for American Sign Language, which may face prejudice. However, social media also promotes diversity awareness and enables deaf individuals to use sign language to engage with diverse perspectives, thereby enhancing civic engagement through platforms like Facebook and Twitter (Saunders, 2016, p. 6).

Digital accessibility in sign language advances digital inclusion, supports individuals who are deaf or hard of hearing, and encourages active participation across various sectors. By developing sign language technologies, organizations serving these communities can provide more effective digital content and services. Prioritizing accessibility on platforms like Facebook and Instagram fosters an inclusive society where everyone, regardless of communication ability, can participate through sign language, thereby enriching the social media experience.

5. Case Study: Digital Romanian Sign Language

The case study on digital Romanian Sign Language examines its linguistic structure and Sign Language Interpretation for the A.N.S.R. and the A.N.I.A.L.M.G. Analyzing these practitioners helps identify the best platform technologies for deaf communication. The findings can also guide the development of digital frameworks for future projects, supporting A.N.S.R. and A.N.I.A.L.M.G.'s goals.

Since its founding in 1919, the National Association of the Deaf in Romania (ANSR) has dedicated itself to fulfilling its mission for over a century. It has initiated the platform "*Voci pentru mâini*" supported by Orange Project Funds, accessible at https://vocipentrumaini.ro/

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This platform offers Video Interpretation services to enable deaf individuals to communicate with hearing persons, including healthcare professionals, law enforcement officers, banking representatives, and local government officials. Furthermore, the ANSR has developed a mobile application available on Google Play, designed to facilitate accessible communication for deaf/HoH individuals.



Figure 1. Platform the Smart-Telephone with LSR interpretation.
Sources: (Orange Website, 2025), (Voci Pentru Mâini-A.N.S.R., 2025).

The application “Voci pentru Mâini” enables communication between deaf users and authorized Sign Language interpreters via video call. Deaf/HoH individuals can access the platform by applying the A.N.S.R. After completing the login process, users can request Sign Language interpretation and connect with the next available interpreter to facilitate communication through video (Play Google "Voci pentru maini", 2025).

The A.N.S.R. engages with the deaf community through cultural, social, and sporting initiatives. Throughout its extensive history of advocating for the rights of deaf individuals, it is notable that a significant portion of its membership is associated with 37 branches of the "Filiala Surzilor" across various counties and 13 subsidiaries of the "Subfiliala Surzilor” (Site-ul despre Istoria ANSR, 2025).

In 2008, the National Association of Authorized Interpreters of Mimico Gestual Language (A.N.I.A.L.M.G), supported by the Orange Project Funds, launched the online Romanian Sign Language dictionary www.dlmg.ro. This resource serves as a valuable tool for individuals seeking to learn sign language, particularly educators in special education for the deaf and hard of hearing, as well as those pursuing certification as authorized interpreters in Romanian Sign Language. It represents Romania’s first online dictionary dedicated to Romanian Sign Language (LSR), available at www.dlmg.ro and https://ailg.ro.



Figure 2. Platform Digital Romanian Sign Language Video. Sources: (AILG, 2025), (DLMG, 2025).

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The Sign Language “DLMG” App, developed by the National Association of Authorized Interpreters in collaboration with the Orange Foundation, is an academic resource designed for deaf individuals, educators, professors, instructional staff, and children of CODA (Children of Deaf Adults) - individuals who have a hearing parent and are interested in learning and fostering a positive impact (dlmgLsr, 2025).

The A.N.I.A.L.M.G is dedicated to teaching Romanian Sign Language, emphasizing the importance of equipping aspiring authorized interpreters with the essential skills and knowledge to effectively facilitate communication for people who are deaf or hard of hearing, encompassing both linguistic and cultural aspects of the language.

The final analysis of the Case Study on Digital Romanian Sign Language provides a comprehensive overview of the deaf community, highlighting research findings, observations, implications, and outcomes. It synthesizes key aspects of the deaf and HoH community, Digital Romanian Sign Language, and insights into digital platforms, highlighting access to information to enhance communication for individuals who are deaf or hard of hearing. The analysis examines the role of digital technologies in developing Romanian Sign Language tools, such as the A.N.S.R. and the A.N.I.A.L.M.G., and assesses their impact on accessible communication practices. It also advocates for greater inclusion of the deaf community within society.

References

1. Adger, D. 2019. Language Unlimited: The Science Behind Our Most Creative Power. Oxford, United Kingdom: Oxford University Press.
2. Ankita, W., & Parteek, K. 2021. Sign Language Recognition Systems: A Decade Systematic Literature Review. Archives of Computational Methods in Engineering: https://doi.org/10.1007/s11831-019-09384-2, 788.
3. Carlo Geraci, R. P., & Quer, J. 2019. Hidden Languages in A Digital World: The case of Sign Language Archives. https://doi.org/10.17469/O2106AISV000002, 35-36.
4. Crasborn, O. 2010. The Sign Linguistics Corpora Network: towards standards for signed language resources. Radboud University: https://repository.ubn.ru.nl/bitstream/handle/2066/85933/85933.pdf, 458.
5. Dejica, D. 2020. *Dictionar englez-roman, roman-englez cu termeni si expresii utilizate in media digitala.* Editia a III-a. Timisoara: Editura Politehnica.
6. Fragkiadakis, M. 2024. Digital Tools for Sign Language Research: Towards Recognition and Comparison of Lexical Signs. Netherlands Graduate School of Linguistics: https://www.lotpublications.nl/digital-tools-for-sign-language-research-towardsrecognition-and-comparison-of-lexical-signs, 9.
7. Gabrielle, H., & Sara, G. 2022. Natural and Elicited: Sign language Corpus Linguistics and Linguistic Ethnography as Complementary Methodologies. Journal of Sociolinguistics, 26(1), 127-128.
8. Lynn, H., Ryan, L., & Erin, W. 2020. Working with ASL Internet Data. Sign Language Studies: https://www.proquest.com/scholarlyjournals/working-with-asl-internet-data/docview/2622813442/se-2, 34.
9. Saunders, C. 2016. A Double-Edged Sword: social media as a Tool of Online Disinhibition Regarding American Sign Language and Deaf Cultural Experience Marginalization, and as a Tool of Cultural and Linguistic Exposure. Social Media Society: https://journals.sagepub.com/doi/10.1177/2056305115624529, 6.
10. Schembri, A. 2010. Corpus Analysis of Sign Languages. https://www.researchgate.net/profile/Adam-

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Schembri/publication/277706773_Corpus_Analysis_of_Sign_Languages/links/5b8ea968a6fdcc1ddd0e8928/Corpus-Analysis-of-Sign-Languages.pdf, 5.
11. Suvarna, R. B., Bhavsar, R. P., & Pawar, B. V. 2023. Sign Language Machine Translation Systems: A Review. In A. Neustein, P. N. Mahalle, P. Joshi, & G. R. Shinde, AI, IoT, Big Data and Cloud Computing for Industry 4.0 (p. 258). Cham, Switzerland: Springer Nature Switzerland AG: https://link.springer.com/chapter/10.1007/978-3-031-29713-7_14.
12. Wehrmeyer, E. 2023. Sign language corpus linguistics. https://doi.org/10.1075/scl.108.01weh, 13-14.
13. Woll, B., & Sutton-Spence, R. 2023. Sign languages. In L. Wei, Z. Hua, J. Simpson, L. Wei, Z. Hua, & J. Simpson (Eds.), The Routledge Handbook of Applied Linguistics: Volume Two (p. 207). London, UK: Routledge: https://doi.org/10.4324/9781003082637-19.

Official Websites, Applications and Information:

14. AILG. (2025, 4 22). Retrieved from https://ailg.ro/ce-am-realizat/
15. DLMG. (2025, 4 22). Retrieved from https://dlmg.ro/en/dictionary/
16. dlmgLsr. (2025, 04 22). Retrieved from https://apps.apple.com/ro/app/dlmglsr/id1295779031
17. Orange Website. (2025, 4 22). Retrieved from https://www.fundatiaorange.ro/programe/lumea-prin-culoare-si-sunet/voci-pentru-maini-interpretare-video-la-distanta/
18. Play Google "Voci pentru maini". (2025, 04 25). Retrieved from https://play.google.com/store/apps/details?id=ro.vocipentrumaini.vpm&hl=ro
19. Site-ul despre Istoria ANSR. (2025, 4 22). Retrieved from https://ansr.org.ro/despre-noi/istoric/
20. Voci Pentru Mâini-A.N.S.R. (2025, 4 22). Retrieved from https://play.google.com/store/apps/details?id=ro.vocipentrumaini.vpm&hl=ro

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