DELIVERABLE T2.1

Report: Literature review on best practices, digital tools & materials per disability

CONTRIBUTORS

Dr. Marianna Karatsiori, ***University of Macedonia***

Dr. Trisevgeni Liontou, ***National & Kapodistrian University of Athens***

Dr. Karin Vogt, ***University of Heidelberg***

Dr. Ewa Domagała-Zyśk, ***Katolicki Uniwersytet Lubelski Jana Pawla II***

Dr. Milena Košak Babuder, Dr. Karmen Javornik, Dr. Mojca Poredoš, Dr. Karmen Pižorn, ***University of Ljubljana***

Dr. Ewa Domagała-Zyśk, ***Katolicki Uniwersytet Lubelski Jana Pawla II***

Final Report Compiled and Edited by:

Dr. Trisevgeni Liontou, **National & Kapodistrian University of Athens**

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CHAPTER 1: INTRODUCTION

Marianna Karatsiori
University of Macedonia

The procedure of all learning, and especially language learning, since language is the means of communication and participation in democratic life, should enable all citizens to achieve their full potential and to develop their competences through lifelong learning. The SPLENDID project aims to enhance inclusive and quality education by improving language competence development for Students with Disabilities (SwD). This initiative is built upon and aligns with key European Union policies and strategies that emphasize the importance of lifelong learning, inclusive education and digital competences in language learning.

The foundation of SPLENDID rests on several crucial EU policy documents. These policies underscore that language learning, as a means of communication and participation in democratic life, should enable all citizens to achieve their full potential and develop their competences through lifelong learning. These policy documents are structured into five key sections. By examining these policy areas, we aim to demonstrate how SPLENDID aligns with and contributes to the EU's vision for inclusive, high-quality education, particularly in the realm of language learning for SwD. This review will highlight how SPLENDID's approach to language learning for SwD incorporates key elements from these policies, including the use of digital tools, support for teachers and the promotion of inclusive educational practices.

1.1 Key Competences & Language Learning

1. Council Recommendation of 22 May 2018 on key competences for lifelong learning, Official Journal 2018/C 189/01

The document emphasizes the importance of language learning as a key competence for lifelong learning. It states that language learning is increasingly important for modern societies, intercultural understanding and cooperation. The Common European Framework of Reference for Languages (CEFR, Council of Europe, 2001) is mentioned as a tool that supports the provision of language learning and helps identify the main elements of language competence. The document also highlights the need to increase the level of language competences in both official and other languages, and to support learners in learning different languages relevant to their working and living situations. Additionally, it mentions the importance of language competences in promoting cross-border communication and mobility. To be more specific, the Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning outlines essential competences that individuals need to thrive in contemporary society and the labor market. This document, thus, serves as a framework to enhance education and training across Europe, ensuring that all citizens can develop the necessary skills for personal fulfillment, employability, and active citizenship. The Recommendation identifies **eight key competences** essential for lifelong learning:

1. **Literacy Competence**: The ability to read, write, and communicate effectively.

2. **Multilingual Competence**: Skills in multiple languages to facilitate communication in diverse contexts.
3. **Mathematical Competence and Competence in Science, Technology, and Engineering (STEM)**: The ability to apply mathematical reasoning and scientific knowledge.
4. **Digital Competence**: Proficiency in using digital technologies and tools.
5. **Personal, Social, and Learning to Learn Competence**: Skills for personal development, social interaction, and self-directed learning.
6. **Citizenship Competence**: Understanding of civic rights and responsibilities and engagement in democratic processes.
7. **Entrepreneurship Competence**: The ability to turn ideas into action, including creativity, innovation, and risk-taking.
8. **Cultural Awareness and Expression Competence**: Appreciation of cultural diversity and the ability to express oneself through various forms of art and culture.

It is worth highlighting at this point that the Recommendation emphasizes the need for **inclusive and quality education** that supports the development of these competences across all stages of life, from early childhood to adult education and encourages Member States to:

- **Support Quality Education**: Ensure access to high-quality education and training for all, making use of the European Reference Framework for Lifelong Learning.
- **Facilitate Competence Acquisition**: Implement good practices that help learners acquire the identified competences, particularly through innovative teaching methods and cross-disciplinary learning.
- **Integrate Sustainable Development Goals**: Align educational policies with the UN Sustainable Development Goals, especially in promoting sustainable practices and awareness of climate change.
- **Report and Share Best Practices**: Utilize existing frameworks to report on progress and share successful strategies for competence development across different educational sectors.

This Recommendation builds on previous frameworks, notably the 2006 Recommendation, by addressing the evolving needs of society and the economy. It highlights the importance of developing a skilled workforce capable of adapting to rapid technological advancements and globalization. The document serves as a guiding tool for policymakers, educators, and training providers, aiming to foster a European Education Area where all individuals have the opportunity to develop their competences and contribute meaningfully to society. The emphasis on lifelong learning reflects the understanding that education does not end with formal schooling but continues throughout life, adapting to new challenges and opportunities.

2. Council recommendation on a comprehensive approach to the teaching and learning of languages, 2019

The main purpose of this document is to provide a comprehensive approach to the teaching and learning of languages in the European Union. It emphasizes the importance of multilingual competence and the benefits it brings to individuals and society. The document highlights the need to improve language learning outcomes, address the challenges in teaching and learning languages, and promote the development of a European identity through language education. It calls on Member States to explore ways to help young

people acquire proficiency in at least one additional European language, and encourages the use of innovative and inclusive pedagogies, digital tools, and language awareness in schools. The document also emphasizes the importance of supporting teachers, promoting research, and strengthening cooperation between the European Union and the Council of Europe in the field of language learning. Some important key points are the following:

1. The European Commission sets out a vision of a European Education Area where high-quality, inclusive education and training are not limited by borders, and where speaking two languages in addition to one's mother tongue is widespread.
2. The European Council calls for action to improve the mastery of basic skills, including teaching at least two foreign languages from a very early age.
3. Multilingual competence is at the heart of the vision of a European Education Area, and it is essential for understanding other cultures and contributing to the development of citizenship and democratic competences.
4. Almost half of Europeans report that they are unable to hold a conversation in any language other than their first language, which hampers meaningful exchanges between public administrations and individuals, especially in border regions.
5. Only four in ten learners in secondary education reach the "independent user" level in the first foreign language, indicating an ability to have a simple conversation. Only one quarter attains this level in the second foreign language.
6. Limited multilingual competence remains one of the main obstacles to benefit from the opportunities offered by the European education, training, and youth programs.
7. Multilingual competence provides competitive advantages for both businesses and job seekers, and there is a positive correlation between foreign language skills and the likelihood of being employed.
8. New ways of learning need to be explored for a society that is becoming increasingly mobile and digital, including the use of digital tools and online resources for language learning.
9. The European Pillar of Social Rights emphasizes the right to quality and inclusive education, training, and lifelong learning, and multilingual competence is one of the key competences that foster employability, personal fulfillment, active citizenship, intercultural understanding, and social inclusion.
10. The European Commission intends to support the implementation of the teaching and learning of languages by facilitating mutual learning among Member States, developing multilingual tools and resources, strengthening the mobility of students and teachers, and cooperating with the Council of Europe and the European Centre for Modern Languages.

The Council Recommendation of 22 May 2019 is significant for several reasons, focusing on enhancing language education across the European Union. This recommendation aims to improve the teaching and learning of languages, particularly in primary and secondary education, to foster multilingual competence and support lifelong learning. By advocating for language learning from an early age, the document aims to ensure that young people acquire proficiency in at least one additional European language by the end of their secondary education, thereby fostering a multilingual culture within the EU. At the same time, the document emphasizes the importance of developing multilingual competence in the European Union. It

acknowledges that multilingual competence is essential for social, learning, and professional purposes and encourages Member States to ensure that all young people acquire a competence level in at least one other European language before the end of upper secondary education.

In addition, the recommendation advocates for comprehensive approaches to language teaching and learning. These approaches should be implemented at national, regional or local level, as appropriate. This holistic framework aims to integrate language learning across different subjects and educational contexts, enhancing the overall quality of education and ensuring that language skills are developed in a meaningful and contextually relevant manner. Recognizing the critical role of educators, the document calls for the support and professional development of teachers and trainers in language education. It encourages the adoption of innovative and inclusive pedagogical methods, such as Content and Language Integrated Learning (CLIL) and the use of digital tools, to engage learners effectively and cater to diverse learning needs. To this end, the document highlights the importance of using policy examples set out in the Annex to improve language teaching and learning.

Furthermore, the document emphasizes the need for language awareness in schools and vocational education and training institutions. This includes supporting the development of language awareness among teachers, trainers, inspectors, and school leaders. Language awareness is crucial for understanding that language learning is a dynamic process and a continuum, deeply interconnected with the learning of other languages. By encouraging schools to create language-friendly environments, the document aims to enhance students' appreciation for linguistic diversity and cultural heritage, which is crucial for developing informed and active citizens in a multicultural Europe. Moreover, the document stresses the importance of monitoring language competences acquired at different stages of education and training. It also recommends reporting on experiences and progress in promoting language learning through existing frameworks and tools. This accountability mechanism is designed to ensure that language learning initiatives are effective and that Member States can share best practices, ultimately leading to improved language education outcomes across the EU.

To sum up, the Council Recommendation of 22 May 2019 adopting a comprehensive approach to the teaching and learning of languages provides a comprehensive framework for enhancing language education in the European Union. It emphasizes the importance of multilingual competence, comprehensive approaches to language teaching, language awareness in schools, innovative pedagogies, monitoring and reporting, support for teachers and trainers, integration with other subjects, follow-up and mutual learning, and the development of language awareness in schools and vocational education and training institutions and aims to ensure that all individuals have the opportunity to develop their language skills and contribute to a multilingual and inclusive European society. In an increasingly globalized world, the recommendation acknowledges the need for effective language education to facilitate communication and collaboration across borders. By enhancing language skills, the document aims to prepare individuals for the demands of a diverse and interconnected labor market, ultimately contributing to economic growth and social cohesion within the EU. In summary, the Council Recommendation on a Comprehensive Approach to the Teaching and Learning of Languages is crucial for fostering multilingualism, enhancing educational quality, supporting

teachers, promoting cultural understanding, and aligning with broader European educational objectives. Its implementation is expected to have a lasting impact on language education across the EU, benefiting individuals and society as a whole.

Work Package 2 of the SPLENDID project aligns closely with the two documents analysed above. By developing a Collection of Best Practices in EFL per disability and CEFR level, WP2 directly addresses the importance of language learning as a key competence, while also considering the specific needs of students with disabilities. This approach supports the of the recommendation on devoping a range of language competences and supporting learners in diverse situations. The use of the Common European Framework of Reference for Languages (CEFR) in structuring the best practices ensures alignment with recognized standards for language competence. Furthermore, WP2's focus on inclusive language teaching practices promotes cross-border communication and mobility by making language learning more accessible to all students.

1.2 Inclusive & Digital Education

1. Council recommendation on blended learning for high quality and inclusive primary and secondary education, 2021

The document emphasizes the importance of adopting blended learning strategies that combine face-to- face and online education to enhance the adaptability and accessibility of learning, thus improving educational resilience in response to future crises. It places significant focus on integrating digital skills and competencies for both teachers and students to ensure that educational systems are equipped for the digital age. The recommendation stresses the importance of equity and inclusivity in education, particularly ensuring equal opportunities and addressing the needs of vulnerable groups to prevent the widening of educational disparities highlighted during the pandemic. It advocates for comprehensive support for teachers and trainers, including professional development opportunities that enable effective implementation of blended learning. Additionally, there is a recognition of the need for psychological support and well-being initiatives for students, acknowledging the mental health impacts brought on by the pandemic. Lastly, the document underscores the necessity of developing key competences that support personal, social, and professional fulfillment, reinforcing democratic values, social cohesion, and employability, which are critical for the holistic development of learners.

The Council Recommendation on Blended Learning for High Quality and Inclusive Primary and Secondary Education**,** adopted on November 29, 2021, is significant for several reasons, particularly in the context of the evolving educational landscape shaped by the COVID-19 pandemic. Here are the key aspects of its importance:

1. Response to the COVID-19 Pandemic

The recommendation addresses the urgent need for educational systems to adapt to the challenges posed by the COVID-19 pandemic. It recognizes that the crisis has highlighted gaps in accessibility, equity, and quality in education. By promoting blended learning approaches, the document aims to

enhance educational resilience and ensure continuity in learning, regardless of external circumstances.

2. Definition and Promotion of Blended Learning

Blended learning combines traditional face-to-face teaching with online learning, offering a flexible and personalized approach to education. The recommendation encourages Member States to adopt blended learning strategies that cater to diverse learning needs and preferences, thereby fostering a more inclusive educational environment. This approach allows for the integration of various teaching methods and resources, enhancing student engagement and learning outcomes.

3. Focus on Inclusivity

One of the core objectives of the recommendation is to promote inclusivity in education. By advocating for blended learning, the document aims to ensure that all learners, including those with disabilities and those from disadvantaged backgrounds, have access to high-quality education. The recommendation emphasizes the need for tailored support and resources to meet the diverse needs of students, thereby reducing educational inequalities.

4. Enhancement of Digital Competence

The recommendation highlights the importance of digital competence for both educators and students. It encourages the development of digital skills necessary for effective participation in blended learning environments. By fostering digital literacy, the document aims to prepare students for the demands of the modern workforce and society, where digital skills are increasingly essential.

5. Support for Educators

Recognizing the pivotal role of teachers in implementing blended learning, the recommendation calls for professional development and support for educators. It emphasizes the need for training in digital tools and pedagogical strategies that facilitate blended learning. By equipping teachers with the necessary skills and resources, the recommendation aims to enhance the quality of education and improve student outcomes.

6. Framework for Policy Implementation

The recommendation provides a framework for Member States to develop and implement effective blended learning policies. It encourages collaboration among stakeholders, including educators, policymakers, and civil society, to share best practices and experiences. This collaborative approach aims to create a cohesive strategy for integrating blended learning into primary and secondary education systems across Europe.

7. Alignment with European Education Goals

The recommendation aligns with broader European educational goals, such as the European Education Area and the Digital Education Action Plan. By promoting blended learning, the document supports the vision of a more integrated and inclusive educational framework that enhances cooperation among Member States and fosters a sense of European identity.

8. Long-term Vision for Education

Beyond immediate responses to the pandemic, the recommendation sets a long-term vision for the future of education in Europe. It encourages continuous innovation and adaptation in teaching and learning practices, ensuring that education systems remain relevant and effective in a rapidly changing

world. This forward-looking approach is essential for preparing students for the challenges and opportunities of the future.

In summary, the Council Recommendation on Blended Learning for High Quality and Inclusive Primary and Secondary Education is significant for its comprehensive approach to enhancing educational quality and inclusivity in the wake of the COVID-19 pandemic. By promoting blended learning, the document aims to address existing inequalities, support educators, and prepare students for a digital future, ultimately contributing to a more resilient and equitable education system across Europe.

2. Commission's 2020 Digital Education Action Plan for 2021-27

The Digital Education Action Plan (2021-2027) is an EU initiative to promote high-quality, inclusive digital education across Europe. It aims to help Member States adapt their education systems to the digital age, with a focus on cooperation, addressing challenges from the COVID-19 pandemic, and fostering innovation. The plan sets two main priorities: developing a robust digital education ecosystem and enhancing digital skills. Key actions include improving digital infrastructure, updating competence frameworks, and promoting digital literacy. It supports broader EU goals like the European Education Area by 2025 and addresses digital inequality and capacity gaps.

The Action Plan represents a significant shift in how education is approached in Europe, emphasizing the integration of digital technologies into teaching and learning processes. This transformation is essential for preparing students for a rapidly changing job market and society. By promoting collaboration among Member States, the Action Plan fosters a unified approach to digital education. This cooperation is crucial for sharing best practices, resources, and experiences, ultimately leading to improved educational outcomes across the EU. In addition, the focus on digital skills and competences is vital for ensuring that students are equipped to navigate the digital landscape. As technology continues to evolve, the ability to adapt and utilize digital tools effectively will be essential for personal and professional success. Furthermore, the Action Plan's commitment to inclusivity aims to bridge the digital divide and ensure that all learners have access to high- quality digital education. This focus on equity is crucial for promoting social cohesion and reducing disparities in educational opportunities. Moreover, the framework established by the Action Plan supports lifelong learning, recognizing that education does not end with formal schooling. By fostering digital skills and competences throughout an individual's life, the plan contributes to personal and professional development in an increasingly digital world. In conclusion, the Digital Education Action Plan (2021-2027) is a comprehensive initiative that aims to transform education and training systems in the EU to meet the challenges of the digital age. Its strategic priorities, concrete actions, and emphasis on inclusivity and cooperation make it a vital framework for enhancing digital education and preparing individuals for the future.

SPLENDID aligns closely with the objectives of both these documents. By developing a video game and other digital resources for language learning, SPLENDID contributes to fostering a high-performing digital education ecosystem. The focus of our project on creating accessible digital content addresses the Action

Plan's concern for equity in digital access. Through its teacher handbook and training sessions, SPLENDID aims at enhancing educators' digital competencies, supporting the Action Plan's priority of improving digital skills. Recognizing the economic and geographical barriers that participants might face, SPLENDID incorporates the use of digital tools and technologies (i.e webinars) to facilitate access. This approach not only supports learning in less serviced or remote areas but also ensures that participants, who are economically disadvantaged or those who cannot participate in physical settings due to various constraints, can still benefit from the programme.

1.3 Teacher Development & Support

1. Commission communication "School Development and Excellent Teaching for a Great Start in Life" (2017)

The document emphasizes that high-quality education is crucial for young people's prospects and life chances. It highlights the need to address weaknesses in competence development, such as reading, mathematics, and science skills, as well as the lack of digital skills among many young people. It also mentions the importance of promoting equity and social fairness in education, as well as the need to adapt to technological and digital changes. To support the development of language competences, the document proposes policy experimentation on multilingual pedagogies and teaching in diverse classrooms. It also mentions the importance of promoting linguistic and cultural diversity in schools and supporting integration. The document highlights the role of eTwinning that promotes cross-border education projects and intercultural contacts between teachers and students in enhancing language competences and opening up classrooms.

In terms of supporting teachers, the document emphasizes the need to make teaching careers more attractive. It suggests improving selection and recruitment processes, addressing the gender imbalance in teaching and attracting new teachers from other professions and underrepresented groups. It also highlights the importance of providing ongoing professional development opportunities for teachers, particularly in the areas of collaborative work, diversity in the classroom and the use of digital technologies. It mentions the availability of online communities, resources, and training courses for teachers, as well as the support provided through the Erasmus+ program for teacher training and job shadowing activities abroad.

It is worth highlighting at this point that the Commission Communication "School Development and Excellent Teaching for a Great Start in Life" (2017) is a pivotal document that outlines the European Commission's vision for enhancing the quality of education across Europe. It emphasizes the importance of effective teaching and school development in ensuring that all children receive a strong foundation for lifelong learning. To be more specific, the communication emphasizes the necessity for high-quality education as a fundamental right for every child. It advocates for educational systems that not only impart knowledge but also foster critical thinking, creativity, and social skills. By prioritizing quality education, the document aims to ensure that all students, regardless of their background, have access to the resources and support they need to succeed.

The document also promotes a comprehensive approach to school development that encompasses various aspects of the educational environment, including curriculum design, teaching methods, and school leadership. This holistic perspective recognizes that effective education requires collaboration among all stakeholders, including teachers, parents, and the community. By fostering a collaborative environment, schools can better address the diverse needs of their students. A significant focus of the communication is on the professional development of teachers. It acknowledges that excellent teaching is crucial for student success and calls for ongoing training and support for educators. The document encourages Member States to invest in teacher education programs that equip educators with the skills and knowledge necessary to adapt to changing educational demands. This emphasis on teacher excellence is vital for improving educational outcomes and ensuring that students receive the best possible instruction.

Additionally, the communication highlights the importance of inclusive education, advocating for systems that accommodate the diverse needs of all learners, including those with disabilities and those from disadvantaged backgrounds. By promoting inclusivity, the document aims to create equitable educational opportunities that allow every child to thrive. This commitment to inclusivity is essential for fostering social cohesion and reducing disparities in educational achievement. What is more, the document aligns with broader European educational goals, such as the European Education Area and the Europe 2020 strategy, which emphasize the importance of education and training in achieving economic growth and social inclusion. By supporting the development of high-quality education systems, the communication contributes to the EU's overarching objectives of promoting sustainable development and enhancing the competitiveness of the European workforce.

Without doubt, in an increasingly interconnected world, the communication addresses the need for education systems to prepare students for global challenges, including technological advancements and societal changes. It encourages the integration of digital skills and competencies into the curriculum, ensuring that students are equipped to navigate the complexities of the modern world. This forward- thinking approach is crucial for fostering a generation of learners who are adaptable and resilient. The communication also underscores the importance of lifelong learning as a key component of personal and professional development. By advocating for educational systems that support continuous learning, the document aims to cultivate a culture of curiosity and self-improvement among students. This emphasis on lifelong learning is essential for equipping individuals with the skills necessary to thrive in a rapidly changing job market. Finally, this document calls for the use of evidence-based approaches in the development and implementation of educational policies. By promoting research and data-driven decision-making, the document aims to enhance the effectiveness of educational initiatives and ensure that resources are allocated efficiently. This commitment to evidence-based practices is vital for fostering accountability and transparency within educational systems.

In summary, the Commission Communication "School Development and Excellent Teaching for a Great Start in Life" (2017) is a significant document that outlines a comprehensive vision for enhancing education across Europe. Its emphasis on quality education, holistic school development, teacher excellence, inclusivity,

alignment with European goals, response to global challenges, promotion of lifelong learning, and evidence-based policies underscores its importance in shaping the future of education. By addressing these critical areas, the communication aims to ensure that all children receive the support and opportunities they need to succeed in life.

2. Council conclusions on European teachers and trainers for the future, 2020

The Council Conclusions on European Teachers and Trainers for the Future, adopted on November 30, 2020, underscore the vital role that educators play in shaping effective and inclusive education systems across Europe. This document outlines strategic recommendations aimed at enhancing the professional development of teachers and trainers, ensuring they are well-equipped to meet the challenges of the 21st century. To be more specific, the conclusions recognize that the quality of education is intrinsically linked to the quality of teaching. By focusing on the professional development of teachers and trainers, the document aims to ensure that educators possess the necessary skills, knowledge, and competencies to foster high- quality learning environments. This emphasis on teacher quality is crucial for improving student outcomes and ensuring that all learners receive a robust education. Moreover, the conclusions align with the broader European agenda on lifelong learning, emphasizing the need for continuous professional development for educators. By promoting lifelong learning among teachers and trainers, the document encourages a culture of ongoing improvement and adaptation to new educational challenges. This alignment is essential for preparing educators to respond effectively to the evolving needs of students and society.

The document also highlights the importance of inclusive education, advocating for training that equips teachers to address diverse learning needs. By promoting strategies for inclusive teaching practices, the conclusions aim to ensure that all students, including those with disabilities and those from disadvantaged backgrounds, have access to quality education. This commitment to inclusivity is vital for fostering social equity and cohesion within European societies. Furthermore, in recognition of the increasing role of technology in education, the conclusions emphasize the need for digital competence among teachers and trainers. By advocating for training in digital tools and pedagogies, the document aims to prepare educators to effectively integrate technology into their teaching practices. This focus on digital competence is essential for equipping students with the skills necessary to thrive in a digital world. Moreover, the conclusions encourage the establishment of collaborative learning environments among educators. By fostering collaboration and sharing of best practices, the document aims to enhance professional learning communities within schools and training institutions. This collaborative approach is crucial for creating a supportive network that empowers educators to learn from one another and improve their teaching practices. Additionally, the conclusions address the need for education systems to be resilient and adaptable in the face of global challenges, such as the COVID-19 pandemic. By promoting flexible teaching and learning approaches, the document aims to ensure that educators can effectively respond to disruptions and continue providing quality education. This responsiveness is essential for maintaining educational continuity and supporting students' learning journeys. The conclusions also promote cooperation among Member States in the field of teacher and trainer development. By encouraging the exchange of best practices and

experiences, the document aims to foster a unified approach to enhancing education across Europe. This cooperation is vital for addressing common challenges and ensuring that all Member States benefit from shared knowledge and resources.

In summary, this document is significant for the emphasis it places on teacher quality, alignment with lifelong learning goals, support for inclusive education, integration of digital competence, promotion of collaborative learning environments, response to global challenges, strengthening European cooperation, and providing a foundation for future educational policies. By addressing these critical areas, the document aims to enhance the effectiveness of educators across Europe, ultimately leading to improved educational outcomes for all learners.

SPLENDID and the deliverables of WP2 align well with several key aspects of the Commission communication "School Development and Excellent Teaching for a Great Start in Life" (2017) and the "Council Conclusions on European Teachers and Trainers for the Future" (2020) documents. More specifically, SPLENDID focuses on developing inclusive foreign language teaching practices for students with diverse learning needs, directly addressing the challenge of "working in linguistically and culturally diverse classrooms and learning environments, with learners from a variety of socioeconomic backgrounds, with different needs, including special education needs". The Collection of Best Practices in EFL per disability & CEFR level developed in WP2 (T2.2) could contribute to "up-to-date and relevant national comprehensive competence frameworks for teachers and trainers." and resonates with the Council's recommendation for ongoing teacher training and support. SPLENDID's approach of combining research findings with practical applications supports the idea of "strenghtening teachers' and trainers' link with researchers". By providing teachers with resources and support for inclusive language teaching, SPLENDID contributes to improving teachers' "personal and professional wellbeing, motivation and feeling of value." In addition, SPLENDID's approach of involving teachers in the development and testing of resources aligns with the recommendation to "involve teachers and trainers in creation of education and training policies".

1.4 Language Education Practices

1. The thematic report: Education begins with language, 2020

This report delves into several aspects of language education essential for fostering multilingual competencies across Europe, supporting the EU's vision for a European Education Area by 2025. It begins with an introduction to the significance of mastering multiple languages, which enhances personal mobility, lifelong learning, and social inclusion. The document provides a detailed context of language teaching in the EU, highlighting the ubiquity of foreign language learning in schools and setting the stage for policy recommendations. It emphasizes the importance of reaching adequate language competence levels, promoting language awareness, and adopting multilingual approaches in both general and vocational education settings. Additionally, it focuses on supporting educators through enhanced teacher education programs that equip them to manage linguistic diversity effectively. The document concludes with a summary of discussions and strategic recommendations aimed at strengthening language learning initiatives

to ensure comprehensive language education policies and innovative, inclusive teaching methods.

This report is a significant document that highlights the foundational role of language in the educational process. It emphasizes the importance of language as a key component of learning and development, particularly in early childhood education. To be more specific, the report underscores that language is the primary medium through which learning occurs. It argues that proficiency in language is crucial for cognitive development, social interaction, and academic success. By emphasizing that education begins with language, the document advocates for early language acquisition as a critical factor in a child's overall development, setting the stage for lifelong learning. The report also encourages the promotion of multilingualism in educational settings. It recognizes that exposure to multiple languages can enhance cognitive flexibility, cultural awareness, and communication skills. By advocating for multilingual education, the report aligns with the EU's broader goals of fostering linguistic diversity and cultural exchange, which are essential for social cohesion in an increasingly globalized world. Moreover, the report highlights the importance of language in supporting inclusive education practices. It emphasizes that language development is particularly vital for children from disadvantaged backgrounds or those with special educational needs. By addressing language barriers, educational systems can create more equitable opportunities for all learners, ensuring that every child has the chance to succeed. In addition, the report serves as a valuable resource for policymakers and educators by providing insights and recommendations for effective language teaching practices. It encourages the integration of language development into all areas of the curriculum and stresses the need for teacher training focused on language pedagogy. This guidance is essential for shaping educational policies that prioritize language as a core component of learning. It should be noted that the report aligns with existing European educational frameworks and initiatives, such as the European Education Area and the Council Recommendation on a Comprehensive Approach to the Teaching and Learning of Languages. By reinforcing the importance of language in education, the report supports the EU's commitment to high-quality, inclusive education that prepares learners for the challenges of the 21st century. Moreover, the report identifies key challenges in language education, such as insufficient resources, lack of trained educators, and varying language policies across Member States. By highlighting these challenges, the document calls for concerted efforts to improve language education systems, ensuring that they are equipped to meet the needs of diverse learners. Finally, the report advocates for innovative teaching practices that enhance language learning, such as the use of digital tools and collaborative learning environments. By promoting creativity and adaptability in language education, the document encourages educators to explore new methodologies that engage students and facilitate effective language acquisition whereas by emphasizing the foundational role of language in education, the report highlights its long-term impact on society. Proficient language skills contribute to better educational outcomes, increased employability, and enhanced civic engagement. By investing in language education, societies can cultivate informed, active citizens who are equipped to participate fully in democratic processes and contribute to their communities.

To sum up, this thematic report is significant for its emphasis on the foundational role of language in education, promotion of multilingualism, support for inclusive practices, guidance for policy and practice,

alignment with educational frameworks, identification of challenges, encouragement of innovative practices, and recognition of the long-term societal impact of language education. By advocating for a strong focus on language in educational settings, the report aims to ensure that all learners have the opportunity to develop essential language skills that will serve them throughout their lives.

2. The future of language education in Europe – Case studies of innovative practices, 2020

The primary purpose of this document is to explore innovative language teaching practices across Europe that promote plurilingualism and enhance students' language competencies. It aims to inspire educators and policymakers to implement forward-looking policies and practices in language education. While not explicitly focused on students with diverse learning needs, the principles and approaches outlined in this report can be adapted to support teachers working with learners who have various disabilities or learning differences. The emphasis on flexible, personalized, and inclusive language teaching strategies aligns well with the needs of diverse learners, offering potential pathways for making language education more accessible and effective for all students, regardless of their individual challenges.

The plurilingual approaches and practices described in the case studies emphasize flexibility, personalization, and the use of diverse teaching methods, which align well with the principles of inclusive education and to a certain extent with the principles of Universal Design of Learning. For instance, the focus on language awareness across all subjects and the integration of students' existing linguistic repertoires into classroom practices can be particularly beneficial for students with diverse learning needs. These approaches allow teachers to capitalize on students' strengths and prior knowledge, regardless of their specific challenges, potentially making language learning more accessible and engaging for all learners.

For students with visual impairments, the emphasis on oral communication and the use of multilingual audio resources (as seen in the Studi/Binogi case, https://app.binogi.com/dashboard) could be adapted to provide rich language learning experiences. For deaf students, the focus on visual learning and gestures (as in the AIM method and the gesture approach: https://us.aimlanguagelearning.com/pages/about-us) could be expanded to incorporate sign languages as part of students' plurilingual repertoires. The language-sensitive curriculum approach from Finland could be particularly beneficial for students with dyslexia or ADHD, as they allow for more individualized learning paths and the use of varied learning strategies. Moreover, the emphasis on creating inclusive learning environments and valuing all languages could help boost the confidence and motivation of students who might otherwise struggle in traditional language learning settings.

This report is a significant document because it highlights successful case studies and practices that can serve as models for enhancing language learning and teaching. To be more specific, the report presents a collection of innovative practices in language education from various European countries. By showcasing these best practices, it provides valuable insights into effective teaching methodologies, curricular designs, and assessment strategies. This sharing of successful approaches can inspire educators and policymakers to implement similar initiatives in their own contexts, ultimately improving language education across Europe.

At the same time, in a continent characterized by linguistic diversity, the report emphasizes the importance of multilingualism as a core value. It advocates for educational practices that not only teach multiple languages but also promote an understanding of cultural contexts and intercultural communication. This focus on multilingualism is essential for fostering social cohesion and mutual respect among diverse populations, which is increasingly important in the context of globalization and migration. The report also addresses contemporary challenges in language education, such as declining interest in foreign language learning and disparities in language proficiency among students. By highlighting innovative solutions, it provides a roadmap for educators and institutions to tackle these issues effectively. This proactive approach is crucial for ensuring that language education remains relevant and engaging for learners.

Additionally, the report aligns with broader European educational objectives, such as those outlined in the European Education Area and the Digital Education Action Plan. By promoting innovative language education practices, it supports the EU's commitment to enhancing educational quality, inclusivity, and accessibility. This alignment is vital for creating cohesive educational systems that prepare students for the challenges of the 21st century. It goes without saying that the report emphasizes the importance of lifelong language learning as a key component of personal and professional development. By showcasing innovative practices that promote continuous language education beyond formal schooling, the document encourages individuals to engage in lifelong learning. This focus on lifelong learning is essential for equipping citizens with the skills necessary to thrive in a rapidly changing world. Moreover, the report highlights the need for ongoing professional development for language educators. By emphasizing innovative teaching practices, it encourages the training and support of teachers to enhance their pedagogical skills and adapt to new educational technologies. Investing in teacher development is crucial for improving the quality of language instruction and ensuring that educators are well-equipped to meet the diverse needs of their students. In the context of increasing digitalization, the report further underscores the importance of integrating digital tools and resources into language education. By showcasing innovative practices that leverage technology, it encourages educators to adopt digital pedagogies that enhance language learning experiences. This focus on digital competence is essential for preparing students for a digital future and ensuring that language education remains relevant in a technology-driven society.

In summary, this report is significant for its emphasis on best practices, promotion of multilingualism, response to educational challenges, alignment with European goals, encouragement of lifelong learning, fostering teacher development, promotion of digital competence, and support for policy development. By highlighting innovative approaches to language education, the report aims to enhance the quality and effectiveness of language teaching and learning across Europe, ultimately contributing to a more linguistically and culturally rich society. The report also serves as a valuable resource for policymakers by providing evidence-based recommendations for enhancing language education. In addition, by highlighting successful case studies, it offers insights into effective policies and practices that can be scaled and adapted across different contexts. This support for policy development is crucial for creating an educational framework that prioritizes language learning and addresses the diverse needs of learners.

3. Commission Communication on Achieving the European Education Area and the subsequent Council Resolution on a Strategic Framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030)

The Commission Communication on Achieving the European Education Area and the subsequent Council Resolution on a Strategic Framework for European Cooperation in Education and Training towards the European Education Area and Beyond (2021-2030) are pivotal documents that outline a comprehensive vision for education across Europe. More specifically, both documents set forth a clear vision for the establishment of a European Education Area (EEA)**,** where educational systems are interconnected and collaborative. This vision promotes the idea that education should transcend national borders, facilitating mobility for students and educators. By fostering a unified educational framework, the EEA aims to enhance the quality of education and training across Member States, ensuring that all citizens can benefit from high standards of learning. In addition, a central theme of the communication and resolution is the commitment to inclusivity and equity in education. They emphasize the need for educational systems to cater to diverse learners, including those from disadvantaged backgrounds, migrants, and individuals with special educational needs. By promoting inclusive practices, these documents aim to reduce educational inequalities and ensure that every learner has the opportunity to succeed, thereby contributing to social cohesion and stability within the EU. Furthermore, both documents advocate for improving the quality and relevance of education and training to meet the demands of the labor market and society. They call for the integration of key competences, including digital skills, critical thinking, and intercultural understanding, into curricula. This focus on quality ensures that learners are equipped with the skills necessary to navigate the complexities of the modern world, enhancing their employability and adaptability in a rapidly changing job market.

At the same time the importance of lifelong learning as a fundamental principle of the European Education Area is underlined while Member States are encouraged to create flexible learning pathways that allow individuals to pursue education and training throughout their lives. By promoting lifelong learning, these documents aim to foster a culture of continuous personal and professional development, which is essential for individuals to thrive in an increasingly dynamic and interconnected world. Moreover, by recognizing the critical role of educators in achieving educational goals, the documents emphasize the need for ongoing professional development for teachers and trainers. They advocate for policies that support the training and upskilling of educators, ensuring that they are well-prepared to implement innovative teaching practices and address the diverse needs of their students. This investment in teacher development is vital for enhancing the overall quality of education. The documents also reflect the EU's commitment to promoting shared values, such as democracy, human rights, and cultural diversity, through education. By fostering a sense of European identity and citizenship among learners, the EEA aims to strengthen social cohesion and mutual understanding among Member States. This alignment with European values is crucial for building a united and resilient Europe.

To conclude, both documents are significant for their vision of a unified, inclusive, and high-quality education system across Europe. By emphasizing inclusivity, quality, lifelong learning, teacher development, alignment with European values, response to global challenges, and cooperation, these documents provide a comprehensive framework for enhancing education and training in the EU, ultimately contributing to the development of informed, engaged, and capable citizens. The documents also provide a strategic framework for cooperation among Member States, encouraging the exchange of best practices and experiences in education and training. By fostering collaboration, they aim to enhance the effectiveness of educational policies and initiatives across Europe. This cooperative approach is essential for addressing common challenges and ensuring that all Member States benefit from shared knowledge and resources.

SPLENDID aligns closely with the EU's Strategic Framework for European Cooperation in Education and Training towards the European Education Area (2021-2030). By developing inclusive language learning resources for students with diverse learning needs, SPLENDID directly addresses the framework's priority of improving quality, equity, inclusion and success for all in education. The focus of our project on accessible digital tools, such as the video game and online materials, supports the digital transition in education while making lifelong learning more achievable for students with diverse learning needs. Through its teacher handbook and training sessions, SPLENDID enhances educators' competences in inclusive practices, contributing to the framework's goal of enhancing motivation in the education profession. The project's collaborative approach, involving experts from different countries, training sessions and webinars, aligns with the framework's emphasis on cooperation. Moreover, SPLENDID's research and outcomes have the potential to inform EU-level monitoring of progress in inclusive education, particularly in areas such as reducing the share of low-achieving students in basic skills and improving digital competencies. By addressing these key aspects of the EU's educational strategy, SPLENDID aims to make a significant contribution to the broader goals of the European Education Area, fostering a more inclusive and equitable approach to language education across the EU.

1.5 Conclusion

The first introductory chapter of the SPLENDID T2.1 Literature Review Report, authored by Marianna Karatsiori and edited by Trisevgeni Liontou, sets out the foundational goals and objectives of the initiative, emphasizing the significance of language learning as a cornerstone for democratic participation and lifelong learning. The chapter highlights the project's alignment with European Union (EU) policies aimed at enhancing inclusive and high-quality education, particularly for Students with Disabilities (SwD). Key aims outlined in this chapter include:

1. **Promoting Lifelong Learning and Language Competence**: The SPLENDID project seeks to enhance language learning as a crucial skill for personal development and active citizenship, supporting the EU's vision for lifelong learning.
2. **Supporting Inclusive Education**: The project aims to create inclusive educational practices that accommodate SwD, ensuring that all students can reach their full potential through improved language competence.

3. **Aligning with EU Policies**: SPLENDID builds on several key EU policy documents, integrating their recommendations to foster a comprehensive approach to language education. These policies advocate for lifelong learning, inclusivity, and the use of digital tools in education.
4. **Enhancing Teacher Support and Digital Competence**: The project emphasizes the importance of supporting educators through professional development and the integration of digital tools, aligning with the EU's goals for modernizing education and addressing the digital divide.
5. **Fostering Cross-Border Communication and Mobility**: By promoting language competence, SPLENDID aims to enhance communication and mobility within the EU, facilitating greater intercultural understanding and cooperation.
6. **Utilizing the CEFR Framework**: The project adopts the Common European Framework of Reference for Languages (CEFR updated companion 2018) to ensure that language competence development aligns with recognized standards, making language learning more structured and effective.
7. **Focusing on Key Competences**: SPLENDID addresses essential competences identified by EU recommendations, such as literacy, multilingualism, digital skills, and citizenship, to ensure a well- rounded educational approach.
8. **Incorporating Digital and Inclusive Strategies**: The project emphasizes the use of blended learning and digital resources to enhance the adaptability and accessibility of education, especially in response to challenges highlighted by the COVID-19 pandemic.

By setting these aims, the SPLENDID project intends to contribute significantly to the EU's educational strategies, fostering a more inclusive and equitable approach to language learning across Europe. The review on policy documents is crucial as SPLENDID aims at increasing the inclusiveness and quality of education and training and improving the language competence development of SwD. To this end, the review on pre- existing European projects, best practices in European countries, ICT tools, assistive technologies is fundamental in building meaningful learning experiences in different environments and for learners of different ages, abilities and circumstances as well as supporting broad competence development appropriate to learner needs for global society today and in the future, supporting well-being and supporting educators and schools to adapt and keep improving their own pedagogical approaches, for the benefit of all learners.

CHAPTER 2: SUPPORTING LEARNERS WITH DYSLEXIA

Milena Košak Babuder & Mojca Poredoš
Univerza v Ljubljani

2.1 Introduction

Dyslexia is the most common cause of reading, writing, and spelling difficulties. Dyslexia is also one of the most researched disorders in the group of Specific Learning Difficulties (SLDs), which are considered to extend on a continuum from mild to severe, and from short to lifelong (Magajna *et al*., 2008). It is an intrinsically (neurophysiologically) determined reading-writing difficulty, and it stems from developmental or central nervous system specificities. It involves a group of diverse but interrelated factors that are part of the individual and affect him/her and his/her functioning throughout life (Raduly-Zorgo, 2010). There are several causal theories of dyslexia, but most researchers argue that the main cause of dyslexic difficulties is a lack of phonological awareness, which manifests itself as a poorer ability to recognise, discriminate and manipulate sounds, and a poorer ability to learn how to match sounds and letters. This is also underlined by the many definitions of dyslexia which contain similar components. Dyslexia is described as either a learning difficulty or a neurological condition that affects the development of reading and writing skills (Košak Babuder, 2013). The International Dyslexia Association (IDA, 2002) defines dyslexia as a specific learning disability of neurobiological origin. To be more specific, dyslexia is rooted in the brain's structure and function, indicating that it is not simply a result of inadequate teaching or environmental factors. Research has shown that individuals with dyslexia exhibit differences in brain areas associated with language processing and reading skills. These neurobiological differences lead to the characteristic challenges faced by those with dyslexia. At the same time, as a specific learning disability, dyslexia affects particular academic skills, primarily reading and writing, while other cognitive abilities may remain intact. This specificity distinguishes dyslexia from broader learning disabilities that may impact multiple areas of learning. Individuals with dyslexia can often excel in areas such as mathematics or creative thinking, indicating that their difficulties are not reflective of overall intelligence.

The IDA defines dyslexia as being characterized by difficulties with accurate and fluent word recognition since individuals with dyslexia often struggle with recognizing words quickly and accurately, which can hinder their reading fluency, and poor spelling and decoding abilities since dyslexia typically involves challenges in decoding words, which is the ability to translate written text into spoken language. This can lead to difficulties in spelling as well. These difficulties are often unexpected compared to the individual's overall cognitive abilities and the quality of instruction they receive. In addition, a significant aspect of dyslexia is a deficit in the phonological component of language. Phonological processing refers to the ability to recognize and manipulate the sounds in spoken language, which is crucial for reading and spelling. This deficit can manifest in challenges such as difficulty rhyming, segmenting words into phonemes, and blending sounds to form words.

Beyond the primary challenges, dyslexia can lead to secondary consequences, including reading comprehension issues since struggles with word recognition and decoding can impede overall reading comprehension, making it difficult for individuals to understand and retain information from texts alongside reduced reading experiences given the fact that difficulties in reading can discourage individuals from engaging with text, leading to less exposure to language and literature. This can further limit vocabulary development and background knowledge. The problems are not limited to reading and spelling. There are also problems with sustaining attention, with automating new knowledge and with gross- and fine-motor skills. In addition to neurological differences, there are also cognitive difficulties that can affect organisational skills, numeracy and other cognitive and emotional abilities. Individuals with dyslexia can be extremely talented and creative in solving different types of problems, and often have good visual skills (Nijakowska, 2016).

The difficulties of students with dyslexia are often unexpected and surprising, as they can be successful in other school subjects despite difficulties with reading and spelling, and are present despite adequate teaching of reading and spelling skills. Understanding these elements is crucial for developing effective interventions and support strategies for individuals with dyslexia, ensuring they receive the necessary resources to succeed academically and beyond. The International Dyslexia Association estimates that 15% to 20% of the population has a language learning disability or some dyslexia symptoms, and 5% to 10% of the population has dyslexia. Similarly, the European Dyslexia Association estimates that 5-12% of the European population is affected by dyslexia. This would put the number of people with dyslexia in Europe between 37.3 million and 89.5 million (The Dyslexia Compass). There are no reliable statistics concerning how many are actually affected by dyslexia because countless cases go underdiagnosed (Kopp-Duller & Pailer-Duller, 2011 cited in Maunsell, 2020).

Country	Base rate	Upper rate
Romania	0.1 %	17 %
Germany	1.3 %	15.6 %
Spain	2.4 %	17.5 %
Sweden	3 %	10 %
Latvia	3 %	21%
United Kingdom	4 %	15 %
Norway	5 %	10 %
Croatia	5 %	10 %
France	5 %	10 %
Denmark	6 %	9 %
Hungary	7 %	10 %
Chech Republic	8 %	10 %
Netherlands	10 %	19 %
Italy	4 %	17%
Ireland	10%	19%

Table 1: *Prevalence of dyslexia in European Countries (extracted from The Dyslexia Compass – Erasmus + National Dyslexia Measurements Across Europe Report).*

How dyslexia is defined varies from country to country, as regulations, diagnostic procedures, and resource structures differ. There are many organizations or associations that provide a wide range of services and opportunities for individuals with dyslexia (Mather *et al*., 2020). The first and oldest organization dedicated to supporting individuals with dyslexia is the International Dyslexia Association (IDA), founded in 1949. IDA develops standards for teachers, hosts conferences, promotes evidence-based practices, supports the dissemination of relevant research, and provides numerous high-quality resources to the community. The second organization to mention is the European Dyslexia Association (EDA), a nonprofit umbrella organization for 44 different member organizations from 25 European countries. The EDA focuses on informing people and policy makers about how to provide appropriate support and education for people with dyslexia. The main goal of this organization is to support all people with dyslexia as they move through the education and training system to reach their full potential. The third organization, Dyslexia International, focuses on improving teacher training around the world and is recognized by UNESCO. In addition, there are many national associations since many countries have their own national association, and some have more than one (e.g., Australia, Austria, India, France, Spain; Mather *et. al*., 2020). The international and national associations provide support and advice to students, parents and teachers, organize events to promote dyslexia, raise awareness about dyslexia, develop teacher trainings, etc.

2.2 Dyslexia & Foreign Language Learning

Dyslexia not only affects the acquisition of first language skills, but can also affect the acquisition of additional languages. In order for learners with dyslexia to be as successful as possible in learning a foreign language, their special needs must be taken into account and foreign language teachers must be trained to use effective teaching programmes (Nijakowska, 2019).

Many learners with dyslexia have greater difficulty in learning a foreign language. Although some make good progress in foreign language learning, they still lag slightly behind their peers without dyslexia (Ganschow & Sparks, 2001; Sparks *et al*., 2006). Because foreign language proficiency is based on strong first language skills, the foreign language literacy of learners with dyslexia is hindered, while learners with strong first language skills are potentially better able to achieve high levels of foreign language learning. Each learner's weaknesses and strengths are transferred from the first language to the foreign language (Sparks & Ganschow, 1991). For example, if a learner has phonological weaknesses in his or her first language, he or she is likely to have similar difficulties in the foreign language (Simon, 2000). Learners who have difficulties with reading, writing, spelling, grammar, listening or reading comprehension in their first language may also have difficulties when learning a foreign language. Learners' development follows a certain path, although the speed and efficiency of learning varies greatly for each learner (Tsakalidou, 2022). The degree of difficulty may depend mainly on the nature and severity of the learner's deficits in the various areas mentioned above (Ganschow & Schneider, 2006a; Tsakalidou, 2022). Some of the mistakes that foreign language learners make are systematic and in many cases stem from the first language.

The correlation between first language and foreign language performance is also suggested by the Linguistic

Coding Differences Hypothesis (Sparks & Ganschow, 1993). The Linguistic Coding Differences Hypothesis (Sparks and Ganschow, 1993) proposes that first language and foreign language are interdependent and that success in learning a foreign language is largely dependent on skills in the first language that were developed before learning the foreign language. The hypothesis is that first language skills form the basis for foreign language learning and difficulties with one component of the first language, e.g. phonological processing, affect both the first and second language (Sparks *et al*., 1989). Research (Sparks, 2013) demonstrates that there is a strong relationship between early levels of first language skills, particularly first language literacy, and foreign language ability and proficiency.

The varying degrees of difficulty that learners with dyslexia have in learning a foreign language and in foreign language literacy, both in the classroom and in special education settings, is confirmed by a large body of research (Schneider & Crombie, 2003; Kormos, 2017a, 2017b; Nijakowska, 2020; Reid, 2016).

The learning of a foreign language for learners with dyslexia is also influenced by the time at which they start learning the foreign language. The ideal age for learning a foreign language is between 10 and 16 years (Lanzinger, 2006 cited in Tsakalidou, 2022). There are two different views on when is the best time for learners with dyslexia to start learning a foreign language. One view advocates learning a foreign language when they have already overcome the greatest difficulties in their first language and have largely acquired it, while the other view argues that learning a foreign language should be done at an early age because the ability to recognise and discriminate sounds is lost with age (Lanzinger, 2006 cited in Tsakalidou, 2022). The view of early foreign language learning for learners with dyslexia is also supported by Sambanis (2002 cited in Tsakalidou, 2022), who emphasises the need to use appropriate methods.

Research on inclusive foreign language teaching for learners with dyslexia and on the readiness of foreign language teachers to include these learners in mainstream teaching confirms that foreign language teachers are not sufficiently trained to teach foreign languages to learners with dyslexia (Nijakowska *et al*., 2018). In addition to the qualification itself, the important issue of foreign language teachers' readiness to successfully include learners with dyslexia in mainstream classrooms consists of two underlying factors, namely 1) teachers' beliefs about their knowledge of dyslexia and their self-efficacy in inclusive teaching in relation to teachers' behaviour towards learners with dyslexia (knowledge and skills) and 2) beliefs about the inclusion of learners with dyslexia in mainstream classrooms in general (attitudes/attitudes).

To be more specific, foreign language teachers believe that they have limited knowledge and understanding of the nature of language learning difficulties resulting from dyslexia, that they are not trained to meet the needs of these learners and that they have not been and are not provided with sufficient training in this area (Nijakowska *et al*., 2018). Foreign language teachers would need knowledge about the nature of dyslexia as a specific learning disability, its impact on foreign language learning, effective teaching techniques and inclusive teaching practises, as well as the basic theoretical principles of effective reading intervention programmes and available adaptations for teaching and testing (Nijakowska *et al*., 2018). Teachers' language knowledge necessary to understand the nature of language learning difficulties of learners with dyslexia and the principles of effective teaching approaches includes knowledge of language and literacy concepts,

principles of explicit reading instruction, phonological awareness, orthographic awareness and phonics (Nijakowska *et al*., 2018). Teachers who have this kind of knowledge are more successful in inclusive settings and in providing instruction that is appropriately tailored to the educational needs and abilities of learners with dyslexia (Washburn *et al*., 2011a).

Therefore, it is crucial to provide adequate and sufficient initial teacher training and continuous professional development opportunities for foreign language teachers to prepare them to adequately identify and respond to the needs of learners with dyslexia in foreign language learning educational contexts (Nijakowska *et al*., 2018). This would effectively change teachers' attitudes towards teaching learners with dyslexia and increase their self-efficacy beliefs and attitudes towards the inclusion of this group of learners in the foreign language classroom (Kormos cited in Nijakowska, 2017). Appropriate professional development for teachers effectively increases teachers' background knowledge (cf. Goldfus, 2012; Kormos cited in Nijakowska, 2017), 2017), teachers' self-efficacy in using inclusive teaching practises and attitudes while it also reduces concerns about inclusion (Kormos cited in Nijakowska, 2017; Nijakowska, 2020; ; Peebles cited in Mondaglio, 2014). There is no doubt that teachers who are not trained to recognize the signs of dyslexia may overlook the challenges their students keep facing, leading to inadequate support for affected students. Training programs that focus on dyslexia can help educators differentiate between common misconceptions and the realities of the condition, enabling them to adopt effective teaching strategies. Moreover, the shift towards inclusive education necessitates that teachers are equipped with the skills to support diverse learners, including those with dyslexia. Research shows that inclusive teaching practices not only benefit students with learning disabilities but also enhance the learning environment for all students. By fostering an inclusive classroom culture, teachers can promote understanding and acceptance among peers, which is crucial for the social and emotional development of dyslexic learners. Continuous professional development opportunities can provide foreign language teachers with practical tools and strategies tailored to the needs of dyslexic students. For instance, training programs can introduce teachers to specific techniques for teaching vocabulary, grammar, and reading comprehension that accommodate the learning styles of dyslexic learners.

2.3 Common Dyslexia Challenges in Language Learning

Learners with dyslexia may experience different difficulties in acquiring literacy skills in a foreign language. For example, when learning a foreign language they may have difficulties with reading, spelling and grammar, while learning new words is often much less of a challenge for them (Helland in Kaasa, 2005, in Tsakalidou, 2022; von Suchodoletz, 2007b in Tsakalidou, 2022). Difficulties in learning a foreign language are also influenced by the difference in the orthographic system between the first and second language and by difficulties in cognitive factors such as difficulties in phonological processing, long-term memory, serialisation and visual and auditory discrimination (Crombie, 2000, 1997; Tsakalidou, 2020) etc.

2.3.1 Impact of L1 Orthography on Dyslexic EFL Learners

Phonological processing problems are transferred from the mother tongue to the foreign language. Phonological processing in the mother tongue and in the foreign language has been shown to be linguistically interdependent, meaning that phonological processing skills in one language predict word recognition skills within and across languages (Geva, 2000 cited in Nijakowska, 2016). This also means that people with dyslexia have phonological processing difficulties in all languages, with the intensity and nature of these difficulties depending on the language or its orthographic system.

The orthographic system of a language affects the learning of reading and writing in that language. Languages with shallow or transparent orthographic systems, where there is a consistent mapping of sounds and symbols, are more learner-friendly, while languages with deep orthographic systems make it more challenging and difficult for learners with dyslexia to learn to read and spell in these languages (Nijakowska, 2016). The more transparent languages such as Italian, Spanish, Finnish, Greek and even Slovenian have clear sound-letter relationships, while the non-transparent or deep languages such as English and French have unpredictable and unambiguous sound-letter relationships and complexities such as graphemes with multiple letters, more spelling possibilities and irregularities (ibid.). In transparent languages, a single letter or sequence of letters is often pronounced in the same way, whereas in English, a non-transparent language, there are several different pronunciations. Similarly, a single phoneme may be spelled in different ways in non-transparent languages, while it is always spelled the same way in transparent languages (Frost & Ziegler 2007). In highly transparent orthographies, there is a one-to-one correspondence in both spelling (phonology-orthography) and reading (orthography-phonology). In English, however, there is no such correspondence in either spelling or reading (Nijakowska 2016).

2.3.2. Cognitive Factors in L1 and L2 Literacy Development and Learning

The presence of cognitive deficits and difficulties with psychological processes are also mentioned in definitions of dyslexia by associations such as the British Dyslexia Association, the European Dyslexia Association and the International Dyslexia Association. Although people with dyslexia by definition do not have intellectual delays or impairments, they may have cognitive deficits (impaired information processing) in the areas mentioned above. They are characterised by poorer learning performance due to deficient and/or impaired cognitive and metacognitive strategies (ability to organise and structure learning demands) and/or impaired learning speed (speed of information processing). Processing speed difficulties in learners with dyslexia are manifested in the speed and ability to process visual and auditory information, but a key deficit in dyslexia is naming speed, which affects language fluency. Learners with dyslexia also lack awareness of metacognitive strategies and are less likely to use appropriate metacognitive strategies. They urgently need training and support in metacognitive strategies to overcome their deficits.

Learners with dyslexia usually have lower working memory capacity and reduced phonological and morphological awareness, and they may have difficulty processing linguistic input and output under time pressure. Therefore, it is reasonable to assume that they may be less efficient in developing their second

language skills due to their different cognitive abilities (Kormos, 2017). Dyslexia also affects the processing of written and spoken input for comprehension and subsequent second language learning. One way to use input for learning is through reading. Limited phonological awareness and difficulties with rapid word naming might lead to problems in decoding words in the second language. Difficulties in comprehending longer texts may be due to either word-level reading problems or a global language comprehension deficit (Geva & Massey-Garrison, 2013).

Learners with dyslexia often have difficulty in acquiring new knowledge, not only incidentally but also intentionally. Language learners with dyslexia and their teachers report that students with dyslexia require a large number of encounters and many practise activities in order for them to memorise new words (Sarkadi, 2008). Their difficulties in storing second language words in long-term memory are related to their reduced capacity of phonological short-term memory (Service & Kohonen, 1995). Phonological short-term memory has been found to play an important role in the learning of form-meaning associations and to help in the "formation of stable long-term representations of novel phonological material" (Martin & Ellis, 2012). Phonological short-term memory and working memory are also closely related to students' ability to infer grammatical regularities and use them productively (Martin & Ellis, 2012), which also explains the difficulties many students with dyslexia may have in acquiring second language grammar.

2.3.3 Language Learning Strategies for Learners with Dyslexia

Most students with dyslexia can be successfully integrated into the educational system if certain adjustments are made, but even those cannot remove all barriers for all students (Nijakowska *et al*., 2016). In this regard, thoughtful and meaningful use of language learning strategies is essential for students with dyslexia. Nijakowska (2022) states that inclusive teaching practices are most effectively implemented by teachers who are confident in their competencies (skills and knowledge), have a positive attitude toward inclusion and have few worries or concerns. Presented below are some strategies and adjustments that have been shown to be effective in integrating students with dyslexia into the foreign language learning context. In this regard, Smith (2014) and Nijakowska *et al.* (2016) highlight four key areas: classroom environment, classroom communication and interaction, course content and materials, developing independent study skills.

1. Classroom environment

Some students with dyslexia are very sensitive to environmental stimuli such as room temperatures that are too high, lights that are too bright (which can cause vision problems and headaches for some students), noisy environments (e.g. personal stereo systems with quiet music can help), too much visual information (it is useful to make sure that there is no other information on the wall next to the board, that printed materials are not too cluttered with text, pictures, and the amount of tasks or, in the case of this type of material, to use a 'text window' that covers the rest of the page). It is useful to keep in mind that some students with dyslexia need more space than others. They may also benefit from aids such as a writing desk set at an angle (so that the paper is in the eye-line and the hand and wrist are supported while writing) (Nijakowska *et al*.,

2016; Smith, 2014).

2. Classroom communication and interaction

Communication and interaction in class are also very important. Working in pairs or small groups gives students plenty of time to practise new vocabulary and structures, but it is important that the pairs or groups are designed thoughtfully, taking into account the nature of the work (e.g., a group of students with different skills, the possibility of a student with dyslexia starting in a small group with classmates he or she knows well). In the interactions between the student with dyslexia and the teacher, it is important that instructions are absolutely clear and unambiguous and that feedback is clear, showing that the progress of the student with dyslexia has been noticed. Both students with and without dyslexia benefit from knowing what comes next in the lesson, that is having an overview of the content, a view of the bigger picture, and being able to break down the larger tasks into smaller parts that are easier for students to manage and focus on (Nijakowska *et al*., 2016; Smith, 2014).

3. Course content and materials

When working with students with dyslexia, it is also important to pay attention to course content and materials. It is useful to break larger tasks into smaller, more manageable chunks. Students with dyslexia may process information more slowly, need more time to think, and have weaker short-term memory. Therefore, it is important to pay attention to the pace of the lesson and find a reasonable balance between a lively, engaging pace and a pace that students can comfortably follow, needing many opportunities to recap and revise new language points. Differentiation at the level of tasks or materials is important, as well as differentiation at the level of support from the teacher or others involved (explaining, helping, encouraging) and other resources such as the use of specific software. It is important that our expectations for students with dyslexia are not generally lower, but match their abilities in specific areas. So we also make sure to differentiate at the level of expectations. For example, we need to be realistic about the amount of text a student with dyslexia will be able to read, how accurate, or how well designed the final product will be (Nijakowska *et al*., 2016; Smith, 2014).

When teaching students with mild to moderate foreign language learning difficulties, it is beneficial to apply the key principles of the Structured Literacy approach:

- repetitive principle (providing frequent opportunities to practice and review a concept),
- structured, sequential principles (teaching language concepts in a logical sequence, helping students to categorize and organize language concepts from simple to complex),
- cumulative principle (building on students' prior knowledge and making the connection with the new information clear),
- alphabetic/phonetic principle (systematic, explicit, and direct teaching of the sounds of the letters in the foreign language and the letter(s) the sounds represent),
- metacognitive principle (showing students how to think about a language concept they are learning and asking them to explain the concept in their own words),
- analysis principle (modeling how to break apart words while reading),

– synthetic principle (modeling the way word parts are put back together for spelling).

(*The International Dyslexia Association – IDA, 2020*)

4. Developing independent study skills

It is important to focus on developing the independent study skills of students with dyslexia. According to the common areas of difficulty of these learners, memorization strategies that can help them learn languages are often useful. Strategies in the areas of time management, organisation, and others are also often relevant (Nijakowska *et al*., 2016; Smith, 2014). One of the most effective teaching methods is one that provides multisensory learning for all students. Multisensory teaching/learning techniques are often used in the teaching process for students with dyslexia because they most effectively promote learning by engaging students on multiple levels. They encourage students with dyslexia to use some or all of their senses to (Praveen, 2015):

– gather information about a task;
– connect information to ideas and knowledge they already know and understand;
– perceive the logic involved in solving problems;
– learn to solve problems;
– use non-verbal reasoning skills
– understand the relationships between concepts;
– store information for later recall, etc.

For students with dyslexia it is recommended to use the Multi-sensory structured language learning (MSL) approach. It involves highly structured teaching (from simple to more complex); direct, explicit teaching and clear explanation and demonstration of the rules in every aspect of foreign language; training in learning strategies; drills, frameworks and models; small cumulative steps, multi-sensory activities; frequent repetition, ample practice and revision (Nijakowska, n. d.).

Students with special educational needs most often have difficulties in reading, writing, spelling and arithmetic, listening comprehension and language expression. Multisensory learning allows them to use their own areas of strength to help them learn. Learning is facilitated when more than one sensory channel, preferably at least three, are activated. It is typical for many students with dyslexia to require kinesthetic and tactile learning. Language learning in particular (native and foreign) requires the simultaneous use of visual, auditory, and kinesthetic feedback to support memory and enable knowledge automation. This is even more important for early foreign language learning. When learning to pronounce words, form sentences, or practice vocabulary, it is important for teachers and learners to use as many senses as possible, especially touch and movement. Multisensory teaching methods allow students with dyslexia to maximise activation of strong areas to compensate for weak areas of learning, while helping them to make sense of information in different ways. Later, in foreign language literacy, the multisensory approach also plays an important role. The so-called structured language approach is derived from Orton's approach. The basic idea is that students with dyslexia have a better chance of achieving the objectives of the curriculum if they learn to use all their senses. This allows them to process information using the senses that represent their strongest areas while strengthening their weak areas. The multisensory structured language approach is particularly effective for

learners with dyslexia, language processing difficulties, and disorders that manifest in weak phonological-orthographic skills (Sparks & Miller, 2000; Birsh, 2005). In this approach, teachers teach direct and explicit pronunciation of sound-letter patterns, words, and sentences, as well as the meaning of prefixes, suffixes, and word roots in a foreign language. This approach emphasises skill development in a carefully predefined sequence and a deliberate focus on the structure of the language. Teaching based on a multisensory approach and techniques, as well as a wide range of activities, makes early foreign language teaching most effective for all children in the classroom, including those with dyslexia and other specific learning difficulties.

2. 4 Dyslexic Students & Foreign Language Learning

Although there is a considerable amount of research and applications for students with dyslexia, there is still a lack of research related to foreign language learning for learners with dyslexia using applicationas and assistive technology. Most of the available applications are focused on improving language skills in mother tongues. In addition, most applications are in English language, designed for students whose first language is English. Therefore, there is little research on how dyslexic students acquire foreign languages, in terms of developing all language skills in English as a foreign language and beyond.

A research paper entitled '*The impact of assistive technologies on the reading outcomes of college students with dyslexia*' by Goldfus and Gotesman (2010) describes a study that investigated whether assistive technologies, specifically text-to-speech software, can be used to help learners with dyslexia master academic texts in English. The results of the study show that text-to-speech software improves students' academic reading performance immediately and in the long term. For students with dyslexia, reading texts in their mother tongue is often very difficult and almost impossible in English as a foreign language. The aim of this study was to enable learners with dyslexia to learn to read and comprehend texts fluently with the help of assistive technology, and thus achieve reading fluency and academic success. The study aimed to confirm the suitability of assistive technologies to address the difficulties of dyslexic learners. The study evaluated the effectiveness of two text-to-speech software programmes (ReadPlease and TextAloud) in helping students with dyslexia read academic texts in English. It also aimed to show that the use of the programmes helps and motivates students to read longer English texts. Assistive technology (AT) in this context includes a wide range of software that helps learners to read, write, edit information and spell. The results of the survey showed that 96% of the students were satisfied with the performance of TextAloud. They found the software more user-friendly and efficient than the tapes/CDs they had previously used to listen to texts. All students confirmed that using AT improved their English reading skills. The use of TextAloud helped the dyslexic pupils:

- decode/read English texts, as their word recognition and reading comprehension improved significantly;
- improve their reading fluency;
- learn, apply, develop, maintain and generalise new reading strategies;

- be motivated to read in English;
- increase their participation in class or homework;
- achieve better grades;
- be better prepared to read articles in their particular field of study; and
- increase their confidence.

In the chapter entitled '*Foreign languages for learners with dyslexia–Inclusive practice and technology' (in* book *Inclusive Language Education and Digital Technology)* Crombie (2013) highlights the areas of difficulty for many people with dyslexia and how these difficulties can be addressed or overcome through the use of appropriate assistive technology to enable them to communicate adequately in the foreign language. In the chapter, the author suggests ways of using assistive technology and ICT alongside traditional methods to improve learning opportunities and promote foreign language learning for those who find learning a foreign language difficult. The author also highlights the past belief that because dyslexia affects reading and writing in the first language, it does not affect speaking and listening skills, so avoiding reading and writing and focusing on speaking and listening is the right way to learn foreign languages. The findings of various studies (Schneider and Crombie, 2003; Sparks *et al*., 2000) show that removing reading and writing takes away useful learning pathways, so it is important to ensure that accessibility to all four skills is included in any teaching programme, whether by people or through ICT. Crombie highlights the principles of teaching and learning a foreign language to dyslexic learners, which are well researched and inclusive:

- multi-sensory learning and teaching - hear, see, say, do (write, draw, act, dance);
- over-learning (no boredom!);
- learning the phonology of a new language (introducing phonics from the start);
- incorporating visual and kinesthetic material whenever possible (pictorial cues, photographs, video (simultaneous visual and auditory presentation of material (video with subtitles, avatars with speech bubbles, cartoons with auditory output).

The reason for learning a language in the first place is to communicate, and Crombie believes that it is important to consider how those who have significant learning difficulties can communicate successfully and without embarrassment. Technology plays an important role in all of our lives in the 21st century, but this role is particularly important for people with dyslexia, as it can give them a level of accessibility to language learning that would have been impossible just a few decades ago. Technology can provide a motivational learning tool that can provide the appropriate support. For example, enabling multisensory learning to a level of automaticity with opportunities for overlearning without boredom.

However, it is important that tools are continuously evaluated to ensure that they do what is intended. Otherwise, we risk discouraging learners who find it difficult to learn languages because of dyslexia. Technology will not solve all teaching and learning problems. Teachers need to consider the learners and that what they do with technology is at least as good as what they do without technology. The author invites us to consider whether the advantages of using technology over more conventional teaching and learning tools and techniques are beneficial in terms of integrating learners with dyslexia into the life of the

classroom and the community, and whether the tools discussed are appropriate for the learning styles and learning needs of the learners. We need to ensure that learners are truly included and are not inadvertently excluded in the passion to ensure that they use the latest technologies available (Warschauer, 2003). The range of digital tools and techniques is increasing at an accelerating pace as we move forward into the 21st century. The author therefore advises taking the time to think carefully about the best ways to do this.

In the article *'The Good Start Method for English' or how to support the development of, prevent and treat the risk of dyslexia in children learning English as a second language,* the authors Bogdanowicz and Bogdanowicz (2016) present the Good Start Method, which is one of the most effective prevention methods to overcome dyslexia. The authors draw on the findings of the research literature, which concludes that pupils with dyslexia need phonological awareness training and multisensory learning. Pupils with developmental dyslexia have difficulties in acquiring foreign languages, especially opaque English, which relate to various aspects of the language system and in particular to reading and spelling skills. The authors point out that prevention and early treatment are more effective than therapeutic interventions, which are most commonly used with pupils. Experts in the field of foreign language acquisition recommend that pupils should be exposed to longer oral texts and lively language (e.g. songs and nursery rhymes). The Good Start Method for English' is the authors' original programme for teaching English to children aged five to seven, which also promotes children's psychomotor development and leads to faster learning progress. The authors highlight the results of scientific research and reports from the field which show that learners with dyslexia have difficulties in acquiring foreign languages due to problems which may relate to one of the five linguistic subsystems:

- phonology (learners with dyslexia have difficulties in discriminating and forming phonemes; also in different types of accents, rhythm and intonation patterns and in understanding the meaning they carry);
- morphology (learners with dyslexia have difficulty understanding the role of some important linguistic units, such as affixes, and have difficulty forming new words based on their knowledge of certain word-formation rules);
- lexical (learners with dyslexia often have difficulty remembering vocabulary and recalling it when needed);
- syntax (learners with dyslexia have difficulty mastering grammar);
- stylistic (learners with dyslexia often have difficulties with written expression).

In this article, the authors also highlight recommendations for effective teaching of English as a foreign language to learners with dyslexia:

- Teachers should be given tools and strategies to use the language of instruction from the earliest grades.
- To rapidly improve pedagogical practises in the English language teaching, it is recommended to introduce oral texts that are longer than single words, phrases or sentences (e.g. at the very beginning of language teaching, children's literature in the language of instruction).
- Motivation for language learning should be aroused in young children and maintained until the end of Key Stage 2 by working with texts that match their interests and present them with appropriate

intellectual challenges.

– The amount of authentic material should be increased so that learners become familiar with the accent, rhythm and intonation of natural speech in a foreign language.

– Learners should be given opportunities to form longer sentences as often as possible. This can be achieved already in the early grades by activating them through songs, rhymes, poems, dialogues, theatre games or other role-playing tasks.

The Good Start Method (GSM) for English is designed to stimulate visual, auditory, tactile and kinaesthetic-motor functions simultaneously and to develop the integration of all psychomotor functions, i.e. perceptual-motor integration, that contribute to the process of learning to read and write (Bogdanowicz, 2000), and meets most of the above recommendations. The GSM for English consistently integrates linguistic units with visual, graphic and motor elements. This is expressed in the form of sign patterns during singing and corresponds to one of the main goals of the method: the coordinated execution of movements in a given time and space. GSM is an excellent example of good pedagogical practise that ensures the important use of English for communication in the classroom.

The GSM programme encourages learners with dyslexia to learn English through linguistic material (nursery rhymes and songs) and graphic material (illustrations of nursery rhymes). The GSM programme includes traditional nursery rhymes and songs from the UK and the USA, which have a simple linguistic structure and include repeated repetition of simple words and syllables, as well as onomatopoeic elements to facilitate memorisation and singing of the songs. The graphic patterns are matched to the children's songs and the order of the songs is based on the complexity of the pattern. The child's attention is focused on learning the song, so the graphic patterns are primarily used to facilitate this process. The illustrations in the GSM relate to the content of the poems. A pattern is drawn on the picture, making this abstract shape a sign with special meaning, e.g. a circle symbolises a plate. During the introductory exercises and the motor-auditory- visual activities, the illustrations facilitate discussion of the themes associated with the song and stimulate association of meaning, facilitating recall and replay of the pattern.

In the *'Non-game like training benefits spoken foreign-language processing in children with dyslexia'* by Junttila, Smolander, Karhila, Kurimo and Ylinen (2023), the authors aim to investigate whether children with dyslexia develop plastic changes more quickly after targeted training with a digital language learning game or after similar training without game-like elements. In a previous study, Ylinen *et al.* (2019) found a correlation between mother tongue literacy skills and foreign language representation of words in the brain, suggesting that typical readers may benefit more from classroom instruction and exposure than dyslexic readers. Children with dyslexia often have difficulty learning foreign languages, resulting in weaker neural activation. The authors believe that digital language learning applications could support the plastic changes in the brain induced by learning. In a study involving 24 Finnish-speaking learners with dyslexia and 24 peers without reading difficulties, auditory event-related potentials (ERPs), specifically mismatch negativity (MMN), were used to investigate the changes in brain responses induced by learning. During the ERP measurements, learners were taught English sounds and words for five weeks by learning "Say it again, kid!". During the game, players explored the game boards and formed English words aloud, while receiving stars as

feedback from the automatic speech recogniser. In the study, the authors also wanted to compare the effectiveness of training through game and the effectiveness of training through non-game. For this reason, they incorporated some non-game levels into the game, excluding any game-like elements. The results show that learners with dyslexia benefit more from simple visual training than from visually rich training with games, in contrast to typically reading learners. In the group of learners with dyslexia, training without play increased the amplitude of MMN more than training with game. In the control group, the opposite was true. Training with game increased the MMN response more than training without game in the normal readers. In the dyslexic group, the increase in MMN with training without game was related to phonological awareness, as learners with dyslexia with poorer phonological awareness showed a greater increase in MMN response. The improved neural processing of foreign speech sounds evident in the increase in MMN suggests that targeted training with simple application may alleviate some of the difficulties in learning spoken foreign languages associated with phonological processing in learners with dyslexia.

Finally, the article entitled '*The language learning experiences of students with dyslexia: Lessons from an interview study*' by Kormos, J., Csizér, K. and Sarkadi, A. (2009) states that the field of second language acquisition has neglected language learners with dyslexia. The article presents the students' perspective obtained through in-depth interviews with 15 Hungarian foreign language students. The study highlights students' negative experiences of learning in groups, especially in larger groups. The main problem with learning in groups was the lack of differentiated learning, which meant that their individual needs were not met. Another problematic aspect of language learning for students with dyslexia is the negative behaviour of teachers, which may be due to teachers being unaware of the nature and severity of the problems that dyslexia can cause in language learning. On the other hand, a helpful attitude and special attention to the student was highly valued by the participants.

2.5 Digital Considerations for Dyslexia Support

In the increasing reliance on technology for communication and access to information, people with dyslexia also face a widening digital divide. Society should work to ensure that all people have access to general and specialised resources that are easy to use and make completing everyday tasks easier and more efficient. Digital products should be accessible at the physical level as well as at the sensory and cognitive levels. The WCAG guidelines, based on four main areas: perceptible, operable, understandable, robust (W3C Web Accessibility Initiative (WAI), 2018), make digital products accessible for people with dyslexia.

When designing materials in books, textbooks and online for people with dyslexia, it is advisable to follow the guidelines compiled in the Dyslexia friendly style guide of British Dyslexia Association (2023). The British Dyslexia Association's Style Guide provides guidelines to help people with dyslexia to address their difficulties and use text-to-speech to make reading easier. Following these principles for readers with dyslexia will facilitate written communication in all the different contexts in which written messages are used, such as e-mails, presentations, websites and printed material, as well as in a variety of applications. It is recommended that the British Dyslexia Association Principles are considered in conjunction with other

accessibility guidelines such as the Web Content Accessibility Guidelines (WCAG).

2.5.1 Recommendations for E-books and E-textbooks

The following are recommendations for the style of writing e-books and e-textbooks (BDA, 2023). What's good for readers with dyslexia is good for most students with reading disabilities.

Readable Fonts

- Sans-serif fonts such as Arial and Comic Sans (as the letters can appear less crowded). Alternatives include Verdana, Tahoma, Century Gothic, Trebuchet, Calibri, Open Sans.
- Font size should be 12-14 point or equivalent (e.g. 1-1.2em / 16-19 px). Some dyslexic readers may require a larger font.
- Increased spacing between letters /characters (sometimes called 'tracking') improves readability, ideally around 35% of the average letter width. Too much space between letters can affect readability.
- Spacing between words should be at least 3.5 times the letter spacing.

Headings and Structure

- Use headings and styles to create consistent structure to help people navigate through your content. For headings, use a font size that is at least 20% larger than the normal text. If further emphasis is required, then use bold.
- Add extra space around headings and between paragraphs.
- Ensure hyperlinks look different from headings and normal text.

Colour:

- Monochrome backgrounds. Avoid background patterns or images and distracting borders.
- Use sufficient contrast between background and text and avoid black and white contrasts (black letters on a white sheet or background).
- Use dark coloured text on a light (not white) background (dark brown text on e.g. yellowish colour or cream).
- Avoid green and red/pink as these colours are difficult for people with colour vision deficiencies (colour blindness).
- Consider alternatives to white backgrounds for paper, computers and visual aids such as whiteboards. White can be too dazzling. Use cream or soft pastel shades. Some people with dyslexia have their own colour preference.

Use Layout:

- Text left-aligned, without justification.
- Avoid multiple columns (as in newspapers).
- The lines should not be too long: 60 to 70 characters.
- Use white space to eliminate clutter near the text and group related content.
- Structure the text using regular section headings in long documents and include a table of contents.

Writing style (The following instructions are aimed at authors rather than designers)

- Use the active rather than the passive voice.
- Be concise; avoid long, dense paragraphs.
- Use short, simple sentences and a direct style.
- Use pictures to support the text. Flowcharts are ideal for explaining procedures. Pictograms and graphics can help locate and support information in the text.
- Consider using bullet points and numbering instead of continuous prose.
- Give clear instructions.

Accessibility of material on the platform:

- *Choice of colour theme*: consider alternatives to white backgrounds for paper, computers and visual aids such as whiteboards. White can be too dazzling. Use cream or soft pastel shades. Some people will have their own colour preferences.
- *Allow choice of font size (12 to 14 point) and typeface* (offer at least three different typefaces).
- *Layout and navigation of the content:* Simplify the structure. Good learning environments have very simple navigation that is hierarchical, always visible and consistent throughout the material. Orientation can be facilitated by navigation indicators, breadcrumb trails, highlighted/bold headings or progress indicators so that individuals know exactly where they are within the structure of the material.
- *Enabling access to the material using assistive devices:* Text-to-speech software.

2.5.2 Assistive Technology

Technological aids can help learners with dyslexia by bridging the gap between their reading and writing skills and grade-level materials. Assistive technology helps people with dyslexia save time and overcome difficulties such as slow note-taking and poor handwriting, and allows them to show their abilities in ways that were once unimaginable. The following are examples of technology that are suitable for people with dyslexia of all ages (The Dyslexia Association, n.d.):

- **Speech recognition software**. This allows dyslexic users to dictate or speak to a computer that converts the speech into text using software. For people with dyslexia who have difficulty with spelling or writing, this is a suitable tool for formatting emails, reports or other written communications.
- **Text-to-speech software**. It enables the person with dyslexia to understand the written material presented to them and to correct or proofread their work themselves.
- **Mind mapping software**. This software is specially designed to help people with dyslexia plan their work better.
- **Scanning software and hand reading pens**. This allows people with dyslexia to save and listen to text in books and other documents.
- **Spell-checkers**, which are specifically for dyslexics and automatically correct written messages.
- **Smart pens** that can be used to write text but keep track of the written text and reproduce the notes in

digital form. The pen can then download the text to a smartphone, PC or tablet for further processing or electronic distribution. Several different models are available on the market with different advantages and disadvantages.

– **Tablets, smartphones and apps**. There are many different hardware platforms and software applications that can help individuals manage their time and to-do list more efficiently, or work with other hardware devices such as smart pens.

– **Computer-based learning programmes**. These are specifically designed for dyslexic learners to improve reading, writing, touch-typing and numeracy skills.

There is a great number of assistive technologies available that can help access the curriculum and enhance the abilities of students with dyslexia and reading difficulties. Many of these technologies are readily available in the classroom, but they can also be used at home to support a student who has difficulties with reading, writing and organisation. The art of assistive technology is in finding the right amount of support to help a student with dyslexia based on his or her needs. The table below gives examples of tools and resources for correction and compensation available for the four key functions in which students with dyslexia have difficulties: decoding and comprehension in reading, and spelling and composing in writing. Not all students with dyslexia benefit from all aids. Careful consideration is needed to determine the appropriate level of support (FCPS, 2017). In the following table (Table 5.2) we can see examples of remediation and compensation tools and resources available for the four key functions which students with dyslexia may find difficult: decoding and comprehension in reading, and spelling and composition in writing (FCPS, 2017).

STRATEGIES	READING DECODING	READING COMPREHENSION	WRITING SPELLING	WRITING COMPOSITION
REMEDIATION: These strategies support the students' use of written language to make it more accurate or automatic.	▪ Expanded spacing between words ▪ Screen Readers ▪ Microsoft Word strategies	▪ Rewordify ▪ Graphic organizers	▪ Word prediction software ▪ Spell check	▪ Graphic organizers ▪ Draft builder ▪ Microsoft Word Outline view
COMPENSATION**:** These strategies rely on students' strengths in oral language to demonstrate their command of written text.	Audio Books: ▪ FCPS digital libraries ▪ Bookshare ▪ Learning Ally ▪ Accessible Instructional Materials	▪ Text compactor	▪ Speech to text ▪ Google typing	▪ Write Outloud ▪ Speech to text ▪ Google typing

2.6 CEFR & UDL: Creating Inclusive Language Learning Environments for Students with Dyslexia

Creating inclusive language learning environments for students with dyslexia is an essential endeavour that

aligns well with the principles of the Common European Framework of Reference for Languages (CEFR) and Universal Design for Learning (UDL). Dyslexia, a specific learning disability that affects reading and language processing, presents unique challenges in language acquisition. Therefore, integrating CEFR and UDL can significantly enhance the educational experience for these learners, ensuring that they receive equitable access to language education.

To begin with, the CEFR provides a comprehensive framework for assessing language proficiency across various levels, from A1 to C2. It emphasizes an action-oriented approach, focusing on the ability to use language effectively in real-life situations. This framework promotes a positive formulation of educational aims and outcomes, which is crucial for students with dyslexia who may struggle with traditional assessments. By framing language learning in terms of what learners can do, rather than what they cannot, CEFR fosters a more supportive and encouraging learning environment. The implementation of the Common European Framework of Reference for Languages (CEFR) is particularly important for students with dyslexia due to its structured approach to language learning and assessment that can significantly aid teachers in tailoring their instruction for students with dyslexia. This framework provides several benefits that directly address the challenges faced by dyslexic learners. To be more specific, CEFR outlines specific language proficiency levels, from A1 (beginner) to C2 (mastery), through clear "can-do" statements. These statements help dyslexic students understand what is expected of them at each level, allowing for more focused and achievable learning goals. This clarity can reduce anxiety and build confidence, as students can see their progress in a structured manner. At the same time, given the fact that dyslexia often results in varied learning speeds and styles, the CEFR framework supports personalized learning pathways by allowing educators to tailor instruction according to the specific needs of dyslexic students. Teachers can select appropriate materials and activities that align with the students' current proficiency levels, making learning more accessible and relevant. Moreover, the CEFR emphasizes the practical use of language in real-world contexts rather than rote memorization of rules. This focus is beneficial for dyslexic students, who may struggle with traditional language learning methods. By engaging in meaningful communication and practical applications, dyslexic learners can develop their language skills in a more functional and less stressful environment.

In addition, the CEFR encourages diverse assessment methods that go beyond traditional testing. This flexibility allows dyslexic students to demonstrate their language skills in various ways, such as through oral presentations, projects, or interactive activities. Such assessments can provide a more accurate reflection of a student's abilities and reduce the pressure associated with conventional exams. Furthermore, the CEFR promotes the use of diverse teaching materials and methods, including visual aids, audio resources, and interactive activities. This multisensory approach aligns well with the learning preferences of many dyslexic students, who often benefit from engaging multiple senses to reinforce language concepts. By incorporating various modalities, educators can enhance comprehension and retention for these learners. The structured nature of CEFR, combined with its focus on achievable goals and practical language use, can significantly boost the confidence of dyslexic students. When they experience success in reaching specific milestones, it fosters a sense of accomplishment and motivation to continue learning. This positive reinforcement is crucial

for students who may have faced challenges in previous educational experiences. By breaking down language learning into manageable chunks and focusing on core vocabulary and grammar, educators can help students build confidence and competence gradually. This method aligns well with the needs of dyslexic learners, who may require more time and support to master new concepts. The CEFR also promotes the importance of formative assessment, which involves providing ongoing feedback throughout the learning process. For dyslexic students, regular check-ins and constructive feedback can help identify areas for improvement and reinforce their learning. This continuous support is crucial for building confidence and motivation, as it allows students to see their progress over time.

To sum up, the implementation of the CEFR in language learning classrooms is essential for supporting dyslexic students. By providing clear objectives, individualized pathways, practical applications, flexible assessments, multisensory learning opportunities, and fostering confidence, CEFR creates a more inclusive and effective learning environment. This approach not only benefits dyslexic learners but also enhances the educational experience for all students, promoting a more equitable and supportive language education framework.

Universal Design for Learning (UDL) is an educational framework that aims to optimize teaching by providing multiple means of engagement, representation, and action and expression. This approach is particularly relevant for students with dyslexia, as it recognizes the diverse needs of learners and promotes flexibility in teaching methods. Some of the key principles of UDL are the following:

1. **Multiple Means of Engagement**: UDL encourages educators to motivate and engage students through various methods. For dyslexic learners, this might include the use of technology, interactive activities, and collaborative learning environments that cater to different learning styles.
2. **Multiple Means of Representation**: Providing information in multiple formats (e.g., visual, auditory, and kinesthetic) is crucial for students with dyslexia, who may struggle with traditional text-based materials. UDL promotes the use of multimedia resources, such as videos and interactive software, to enhance comprehension.
3. **Multiple Means of Action and Expression**: UDL allows students to demonstrate their knowledge in various ways, which is particularly beneficial for those with dyslexia. This could involve oral presentations, creative projects, or the use of assistive technologies to support written expression.

Implementing these three core principles of UDL in language learning classrooms is particularly important for students with dyslexia due to the unique challenges they face in acquiring literacy skills. Dyslexia affects the way individuals process language, making traditional learning methods less effective and often leading to frustration and disengagement. To be more specific, some of the reasons that render UDL essential for dyslexic students are the following:

- **Addressing Diverse Learning Needs**: Dyslexic students often have distinct learning profiles that require tailored instructional strategies. UDL's emphasis on providing multiple means of engagement, representation, and action allows educators to create flexible learning environments that

accommodate these diverse needs. By offering varied instructional methods, such as visual aids, auditory resources, and hands-on activities, teachers can better support dyslexic learners who may struggle with traditional text-based materials.

- **Reducing Barriers to Learning**: Dyslexia can create significant barriers to reading and comprehension, which can hinder academic success. UDL aims to remove these barriers by providing alternative ways for students to access content. For example, using text-to-speech technology and providing materials in multiple formats can help dyslexic students engage with the curriculum more effectively. This approach not only aids comprehension but also fosters a more inclusive classroom environment where all students can thrive.
- **Enhancing Motivation and Engagement**: Students with dyslexia often experience feelings of inadequacy and frustration in traditional learning settings. UDL principles encourage the use of multiple means of engagement, allowing teachers to tap into students' interests and strengths. This can include offering choices in assignments, using gamified learning experiences, or incorporating collaborative projects. By fostering a sense of autonomy and relevance in learning, UDL can significantly enhance motivation for dyslexic students.
- **Supporting Skill Development**: Dyslexic students frequently face challenges in decoding, reading fluency, and comprehension. UDL provides a framework for integrating specific instructional strategies that target these areas. For instance, using graphic organizers and scaffolding techniques can help students break down complex information and improve their reading skills. Additionally, UDL promotes the use of assistive technologies that can facilitate learning and support skill development in a more personalized manner.
- **Fostering a Growth Mindset**: The inclusive nature of UDL encourages a growth mindset among students, including those with dyslexia. By emphasizing that learning is a process and that mistakes are part of that process, educators can help dyslexic students develop resilience and a positive attitude toward learning. This shift in mindset is crucial for students who may have previously felt discouraged by their challenges with literacy.

To sum up, the integration of CEFR and UDL principles creates a robust framework for developing inclusive language learning environments for students with dyslexia. This approach emphasizes the importance of personalized learning experiences that cater to individual strengths and challenges and acknowledges the unique challenges faced by dyslexic learners while providing them with the tools and support necessary for success. To be more specific, by adopting UDL principles alongside the CEFR, educators can create more accessible learning environments that accommodate the specific needs of dyslexic learners. This includes providing alternative formats for assessments and instructional materials. Additionally, the combination of CEFR's clear objectives and UDL's flexible teaching strategies can lead to increased student engagement. Dyslexic learners are more likely to participate actively in their education when they feel supported and understood. By aligning CEFR and UDL, educators can ensure that all students, regardless of their learning differences, have the opportunity to thrive in language learning.

2.6 Conclusion

Dyslexia, a specific learning disability of neurobiological origin, is the most common cause of reading, writing and spelling difficulties. The main cause of the difficulties is the lack of phonological awareness. On the other hand, the demonstration of proficiency of foreign language and fluency is significantly impaired by deficits in naming speed.

The acquisition of foreign languages poses unique challenges for learners with dyslexia, primarily due to the interplay between their first language proficiency and cognitive processing difficulties. Mastery of a foreign language is deeply rooted in a strong foundation of the first language, which dyslexic learners may struggle to develop. Cognitive deficits associated with dyslexia, such as difficulties in phonological processing, working memory, and rapid naming, can significantly hinder the ability to learn new languages. The intensity and nature of these difficulties are influenced by various factors, including the specific language being learned, its orthographic system, and the instructional strategies employed in the classroom. The orthographic complexity of a language can impact the learning experience for dyslexic students; for example, languages with transparent orthographies, such as Spanish, may be easier to acquire than those with opaque systems like English, where irregular spelling and pronunciation rules can exacerbate learning difficulties. Furthermore, the phonetic structure of a language can also play a role; languages with a high degree of phonetic variance may present additional challenges for dyslexic learners who already face difficulties in distinguishing and processing sounds. To effectively support dyslexic learners in foreign language acquisition, it is recommended that instruction aligns with the Structured Literacy approach and the multisensory structured language learning approach. These methodologies emphasize explicit instruction in phonics, vocabulary, and grammar while incorporating visual, auditory, and kinesthetic learning modalities, helping to bridge the gap between the learners' existing knowledge and the complexities of a new language. The thoughtful and meaningful use of various language learning strategies is essential for students with dyslexia. Teachers can implement strategies such as multisensory techniques, which engage multiple senses to enhance memory retention and understanding; repetition and practice, which solidify knowledge through regular reinforcement; collaborative learning, which fosters a more inclusive environment by encouraging group work and peer support; and the use of technology, which provides interactive and adaptive learning experiences tailored to individual needs. In conclusion, the acquisition of foreign languages by learners with dyslexia is significantly impacted by their foundational language skills and cognitive processing challenges. By recognizing the unique needs of these learners and implementing structured, multisensory instructional approaches, educators can create a more equitable learning environment that facilitates language acquisition. Continued research into effective teaching methodologies and the development of tailored resources will further enhance the educational experiences of dyslexic students in foreign language contexts.

Studies show that assistive technologies can significantly improve the learning experience of students with dyslexia. For instance, students with dyslexia can utilize various forms of assistive technology to enhance their reading and comprehension skills, allowing them to engage more fully with academic content. One notable example is text-to-speech software, which has been found to enhance students' academic reading

performance both immediately and over the long term (Goldfus and Gotesman, 2010). This technology not only aids in decoding text but also supports comprehension by allowing students to hear the text read aloud, thereby reducing the cognitive load associated with reading. Moreover, technology can serve as a motivating learning tool that provides adequate support tailored to the needs of dyslexic learners. Many students find that interactive software and applications make learning more engaging, which can lead to increased motivation and persistence in their studies. However, it is crucial to ensure that learners are genuinely included in the educational process and not further marginalized. There is a risk that the eagerness to implement the latest technological advancements may inadvertently create barriers for these students, particularly if the tools are not accessible or appropriately integrated into the curriculum (Warschauer, 2003).

In addition to the benefits of assistive technology, recent research has highlighted the importance of understanding how dyslexic learners respond to different types of instructional strategies. A study by Junttila et al. (2023) found that learners with dyslexia tend to benefit more from simple visual training than from visually rich training that incorporates games and complex visuals. This finding is particularly interesting because it stands in contrast to the experiences of typical reading learners, who often thrive in more visually stimulating environments. This suggests that while technology can be a powerful ally in supporting dyslexic students, it is essential to tailor the approach to their specific learning needs. In conclusion, the integration of assistive technologies in the learning experiences of students with dyslexia can lead to significant improvements in reading and comprehension. However, educators must remain vigilant to ensure that these technologies are implemented in a way that promotes inclusion rather than exclusion. By focusing on effective, tailored strategies—such as simple visual training and appropriate use of text-to-speech tools— educators can create a more supportive and effective learning environment for students with dyslexia. Continued research and adaptation of teaching methods will be vital in ensuring that all learners can benefit from the advancements in educational technology.

Foreign language teachers need more knowledge and a deeper understanding of the nature of language learning difficulties caused by dyslexia. This understanding is crucial as it enables educators to implement effective and inclusive teaching techniques tailored to the unique needs of dyslexic learners. Research indicates that dyslexic students often have shorter memory spans for processing language input, leading to challenges in identifying and manipulating sounds and sound structures within words. This necessitates that foreign language teachers not only recognize these challenges but also adapt their teaching strategies accordingly. To address these needs, it is critical to provide adequate and sufficient initial teacher training as well as ongoing professional development opportunities focused on dyslexia and language acquisition. Such training should encompass the neurobiological origins of dyslexia, the specific challenges faced by dyslexic learners, and effective pedagogical strategies that can enhance language learning. By equipping foreign language teachers with a deeper understanding of dyslexia and the tools to accommodate diverse learning needs, we can create a more inclusive educational environment. This not only benefits students with dyslexia but also enriches the learning experience for all students, fostering a classroom culture that values

diversity and promotes effective language acquisition. As we move forward, continuous research and collaboration among educators, specialists, and dyslexic learners will be essential in developing best practices that support effective language learning for all students.

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CHAPTER 3: SUPPORTING LEARNERS WITH PHYSICAL & MOTOR IMPAIRMENTS

Karin Vogt
University of Heidelberg

3.1 Introduction

Worldwide, an estimated 1.3 billion people experience disability (World Health Organisation, 2022), with numbers estimated to rise further due to demographic changes with aging populations (e.g. in Europe) or epidemiological conditions. People with disabilities are defined by the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) as "those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (United Nations, n.d.). The CRPD as the core human rights treaty that has helped reframe disability with respect to human rights and that has established the norm of participation of persons with disabilities in society on an equal basis with others (WHO, 2023, p. 5) is not only limited to healthcare-related aspects but extends to all fundamental aspects of life, including education.

3.2 Education for Learners with Physical & Motor Impairments

There are no comprehensive statistics on the world population other than the WHO figures on disability in general. The figures from selected countries are presented as examples. In the USA, the percentage of humans with any physical functioning difficulty amounts to 15.0% of the population (Disabled World, 2022). In Germany, by contrast, 58% of the 7.9 million people who had an impairment of some sort had a physical disability (4.6 m people, Bundeszentrale für politische Bildung, 2022).

While in different educational systems across Europe, more mainstreaming can be observed with learners with diverse learning needs (DLN), the separation maintained in the German educational system in terms of the separation of the individual special educational areas in the German education system provides a differentiated view of the group of foreign language learners with physical and motor impairments. Therefore, the statistics of types of special educational needs (SEN) related to Germany are detailed in Table 1, designed to show the proportion of learners in the different, highly compartmentalised types of SEN schools.

In the German context, a separate system with various types of special needs schools existed alongside the "general" mainstream school system. After the implementation of the UNCRPD, various federal states in Germany made an effort to provide inclusive education for learners with diagnosed special needs in regular, mainstream schools. In some federal states, special needs schools were given up altogether, although regular schools and special needs schools coexist in many other federal states.

Type of SEN	Total number of students	Number of students at special schools	Number of students at regular schools	Percentage of students at special schools vs regular schools
Learning	232,888	110,975	121,913	47.7% vs 52.3%
Developmental language disorders	59,276	30,346	28,930	51.2% vs 48.8%
Blind and vision impaired	9,771	4,756	5,015	48.7% vs 51.3%
Deaf and hard of hearing	21,841	9,976	11,865	45.7% vs 54.3%
Physical and motor development	39,293	25,154	14,139	64% vs 36%
Cognitive development	103,607	89,399	14,208	86.3% vs 13.7%
Emotional and social development	103,520	44,277	59,243	42.8% vs 57.2%

Table 3. 1: Number of students in different SEN and type of schooling in different SEN in Germany in 2021/2022 from https://www.kmk.org/fileadmin/Dateien/pdf/Statistik/Dokumentationen/Aus_Sopae_2021.pdf

Learners with physical and motor developments make up one of the special needs orientations. The word "disabilities" is avoided; instead, there is a focus on learners' development. The same is true for learners with physical and motor disabilities where the official term is "physical and motor development".

Learners with physical and motor impairments represent a rather heterogeneous group of pupils, because in addition to children and young people with movement impairments, this group also includes learners for whom a disability is not observable at first glance. This includes, for example, learners with severe organic damage, developmental and perceptual disorders as well as chronic illnesses. Recently, the number of very severely and severely disabled children has risen significantly (Hansen, 2015). Around the world, the United International Children's Emergency Fund (UNICEF) contends, there are nearly 240 millions of children with disabilities (UNICEF, 2021). In this 2021 report (UNICEF, 2021), 49% are more likely to have never attended school, 47% are more likely to be out of primary school, 33% are more likely to be out of lower-secondary school and 27% are more likely to be out of upper secondary school. So, children with disabilities are falling behind regarding access to schooling in general. The rates of children dropping out of school or not getting access to schooling are even higher among children with multiple disabilities and become even more significant with severity of the disability (UNICEF, 2021). This also regards language learning since children who do not have sufficient access to quality education will have no access to language education either.

Education in the context of people with physical disabilities must take into account disabilities by providing adequate educational opportunities through tuition, education and support. As the history of education for the physically disabled and the individual situation of many people with physical disabilities has shown, the education of people with physical disabilities requires the special consideration of therapy and care options. As a result of the disability, a special educational need arises in order to prevent developmental processes which could have a negative impact on the people concerned and their independent, self-determined lives. From a medical point of view, the prevention of comorbidities or secondary diseases should also be mentioned in this context.

3.3 Categorizing Physical & Motor Impairments

There are various ways of categorizing physical and motor disabilities, and with many learners a clear-cut assignment to a certain category is not possible due to e.g. comorbidities or a medical condition that result in mobility impairment. As mentioned before, the group of learners with physical and motor impairments is heterogenous, and caution should be exerted when discussing types of impairments.

Despite a large number of individual syndromes and rare diseases, the following disabilities and developmental peculiarities in particular will be described in more detail. These include children with cerebral movement disorders, children with epilepsy, chronic diseases, children with spina bifida, progressive diseases, children with developmental and perceptual disorders and children with the most severe disabilities. They will be detailed in the next section.

The more severe the impairment, the more likely the learner will receive their schooling at a special school, at least in the German context. In a global context and according to the UNICEF report (2021), the learners are more likely to drop out of education the more severe their impairment is. In 2022, a total of 143,821 learners at special needs schools in Germany received instruction in a foreign language, most of the learners are to be found from years 3 to 9 (age bracket 8 to 15 years, Destatis.de, 2022). In contrast, a total of 411,408 learners attended special needs schools in 2022 (Destatis.de, 2022), which implies that only 35% of the total student body at special needs schools has access to foreign language education in Germany. It has not been possible to retrieve statistics on language learners with specific disabilities like physical disabilities for Europe or for certain partner countries.

Learners with mobility impairments can be categorised into children with cerebral movement disorders, children with epilepsy, chronic diseases, children with spina bifida, progressive diseases, children with developmental and perceptual disorders and children with the most severe disabilities (based on Boenisch, 2016). Conclusions for foreign langugage teaching will be drawn for the whole group of learners with mobility impairments, using exemplary cases.

3.3.1 Cerebral movement disorders

Learners with cerebral movement disorders usually have a sensorimotor disorder developed due to early childhood brain damage. The causes of peri- or postnatal brain damage can be oxygen deprivation, infections, medication, meningitis or a brain haemorrhage. Sensorimotor dysfunction manifests as abnormal muscle tension, which may be too high, too low or erratic. Although this group of people receives physiotherapy, purposeful movements can often only be carried out to a limited extent, or sudden reflexes occur, e.g. in the form of uncontrollable co-movements of body parts that should not actually be moved. These movement disorders can occur on one side of the body, on lower or upper extremities or on all extremities. Spasticity is the most common form of cerebral movement disorder, often associated with athetosis, i.e. fluctuating muscle tone, or ataxia, muscle tone that is too low, which is responsible for a swaying gait, angular or seemingly awkward movements and constant directional correction. In severe forms

of infantile cerebral palsy, other disorders occur at the same time, such as eating disorders, swallowing disorders, speech disorders, visual or hearing disorders, epilepsy or learning disorders.

Cerebral movement disorders are a subset of movement disorders that arise from dysfunction in the brain, particularly affecting the areas responsible for controlling voluntary and involuntary movements. These disorders can manifest in various ways, including tremors, rigidity, bradykinesia (slowness of movement), and abnormal postures. As mentioned above, the underlying causes of cerebral movement disorders are diverse and can include genetic factors, neurodegenerative diseases, traumatic brain injuries, and cerebrovascular events such as strokes. The brain regions most commonly implicated in cerebral movement disorders include the basal ganglia, cerebellum, and motor cortex. The basal ganglia play a crucial role in initiating and regulating voluntary movements, while the cerebellum is essential for coordination and balance. Damage to these areas can lead to a range of symptoms, depending on the specific type of movement disorder present. For instance, Parkinson's disease, a well-known hypokinetic movement disorder, is characterized by tremors, stiffness, and difficulty with balance and coordination. In contrast, hyperkinetic movement disorders, such as chorea and dystonia, involve excessive or uncontrolled movements.

Cerebral movement disorders can be classified into two main categories: hypokinetic and hyperkinetic disorders. Hypokinetic disorders are marked by a decrease in movement and include conditions like Parkinson's disease and bradykinesia. These disorders often result in muscle rigidity and a shuffling gait. Hyperkinetic disorders, on the other hand, are characterized by increased movement, which may be involuntary. Examples include dystonia, which involves sustained muscle contractions leading to abnormal postures, and chorea, which consists of rapid, irregular, and unintentional movements. Diagnosis of cerebral movement disorders typically involves a comprehensive evaluation that includes a detailed medical history, neurological examination, and various diagnostic tests. These tests may include imaging studies like MRI or CT scans to identify structural abnormalities in the brain, as well as electroencephalograms (EEGs) to assess electrical activity. Accurate diagnosis is essential, as treatment options can vary significantly depending on the specific disorder and its underlying cause. Treatment for cerebral movement disorders often involves a multidisciplinary approach. Medications are commonly used to manage symptoms, with options varying based on the type of disorder. Physical therapy and occupational therapy can also play a vital role in helping individuals improve their mobility and daily functioning.

Living with cerebral movement disorders can present significant challenges, not only in terms of physical limitations but also in the psychological and social aspects of life. Individuals may experience anxiety, depression, and social isolation due to their condition. Therefore, comprehensive care that addresses both the physical and emotional needs of patients is crucial. In summary, cerebral movement disorders encompass a range of neurological conditions that affect movement due to dysfunction in the brain. Understanding the complexities of these disorders, including their causes, symptoms and treatment options, is essential for providing effective care and improving the quality of education and life for those affected.

3.3.2 Epilepsy

Epilepsy has many causes that are not always known to the people affected. It manifests itself in the form of seizures of which the affected children and adolescents are not immediately aware. During an epileptic seizure, brief disturbances of consciousness occur with a fixed gaze (less than 30 seconds). Only individual parts of the body can be affected as tonic-clonic twitches or the entire body as generalised seizures. Children and adolescents can become virtually seizure-free by means of medication, although this has side effects and leads to slowed learning.

Epilepsy can occur alone or as a concomitant disease, for example in cerebral palsy, severe disability, spina bifida or hydrocephalus. Epilepsy is a chronic neurological disorder characterized by recurrent, unprovoked seizures resulting from abnormal electrical activity in the brain. It is one of the most common neurological conditions, affecting approximately 50 million people worldwide, including about 3.4 million in the United States alone. The condition can manifest at any age, but it typically begins in childhood or later in life, particularly in individuals over 60 years old. Seizures in epilepsy can vary widely in their presentation and severity, depending on the area of the brain involved. They are generally categorized into two main types: generalized seizures, which affect both sides of the brain simultaneously, and focal seizures, which originate in a specific area of the brain. Generalized seizures can include tonic-clonic seizures, characterized by loss of consciousness and violent muscle contractions, while focal seizures may involve alterations in awareness or sensations without loss of consciousness. The underlying causes of epilepsy are diverse and can include genetic factors, structural brain abnormalities, head injuries, infections, and metabolic disorders. In many cases, however, the exact cause remains unknown. Approximately 50% of individuals diagnosed with epilepsy do not have a clearly identifiable cause. This unpredictability can contribute to the stigma and misunderstanding surrounding the condition, leading to social and educational challenges for those affected.

Diagnosis of epilepsy typically involves a thorough medical history and neurological examination, alongside diagnostic tests such as electroencephalograms (EEGs) to measure electrical activity in the brain, and imaging studies like MRI or CT scans to identify any structural abnormalities. These tests help differentiate epilepsy from other conditions that may cause seizures, such as metabolic disturbances or infections. While there is currently no cure for epilepsy, the condition can often be effectively managed with antiepileptic medications. Approximately 70% of individuals with epilepsy can achieve seizure control with appropriate medication. Living with epilepsy can pose various challenges, including the risk of injury during seizures, potential psychological impacts such as anxiety and depression, and social stigma. Individuals with epilepsy may experience higher rates of physical injuries, such as fractures or bruises, due to falls during seizures. Overall, epilepsy is a complex condition with a significant impact on the lives of those affected.

3.3.3 Chronic diseases

Chronic diseases include diabetes, rheumatism, asthma, neurodermatitis, coeliac disease and heart and blood diseases. For these learners, frequent visits to the doctor and hospital stays are part of everyday life, plus permanent or frequent pain, itching, shortness of breath or similar, so that their emotional burden is

very high. Typical behaviours are therefore the search for strong emotional bonds, security and safety; there are often close family ties. The emotional stress of the children is reflected in various behaviours ranging from bedwetting, psychosomatic pain, feelings of guilt to aggressive or regressive behaviour. Musical and artistic means of expression have proven to be effective for learners alongside linguistic ones, for example through free painting, creative (digital) music production in order to relieve stress. These options can be adopted for foreign language teaching, for example, by combining communicative activities with creative tasks.

For learners living with chronic diseases, the cumulative impact of frequent doctor visits, hospital stays, and ongoing symptoms can create a substantial emotional burden. The need to manage their health on a daily basis can lead to feelings of frustration, helplessness, and isolation. Additionally, the unpredictability of their conditions can affect their ability to engage fully in educational and social activities, further exacerbating feelings of anxiety and depression. Support systems, including healthcare providers, family, and peers, play a crucial role in helping individuals cope with the emotional challenges associated with chronic diseases. Access to mental health resources, counseling, and support groups can provide valuable assistance in managing the psychological impact of living with a chronic condition. Furthermore, educational programs that promote self-management skills can empower individuals to take an active role in their health, ultimately improving their overall quality of life.

Stress reduction is very important for the learners because of their persistently high physical and mental stress, so that Boenisch (2016) considers computer games in the children's leisure time, even those that are rejected by outsiders as glorifying violence. In general, the teacher has to engage with the learners and their emotions, this requires pedagogical empathy and a good knowledge of the learners and their needs to find out what the learners cannot express through words (e.g. if they cannot verbalise their own feelings such as fear or if they as chronically "ill" also want to find themselves in a position of power). It might be useful to reach out to psychological counselling bodies in order to support the learners psychologically.

In summary, chronic diseases such as diabetes, rheumatism, asthma, neurodermatitis, coeliac disease, and heart and blood diseases present significant challenges that extend beyond physical symptoms. The emotional burden associated with managing these conditions can be profound, affecting daily life, social interactions, and mental well-being. Recognizing and addressing these challenges through comprehensive care and support is essential for improving the quality of life for individuals living with chronic diseases.

3.3.4 Progressive diseases

Two common progressive diseases in children and adolescents are cystic fibrosis, muscular dystrophy (Duchenne type) and leukaemia. While leukaemia is comparatively well treatable, cystic fibrosis and Duchenne muscular dystrophy lead irreversibly to a reduction in physical capabilities. Cystic fibrosis causes coughing and shortness of breath in affected children due to a dysfunction of the mucus- and sweat- producing glands. Therefore, they usually have to undergo respiratory therapy and take medication several times a day.

Children affected by Duchenne muscular dystrophy lose their ability to walk by the age of 9-12 and need a wheelchair. Therapies and good medical care can significantly delay the disease (CF), but cannot stop their physical deterioration. Therefore, dealing with death is necessary at an early age for these children, which adds a heavy emotional burden on top of their physical burden. It is therefore important for the students to be able to express their emotions (questions, fears, guilt, anger, sadness) according to their capabilities. As with children and adolescents with chronic diseases, different approaches to express their feelings (language, rationality but also creativity, music, technology) should therefore be made possible. In addition, frequent hospital stays and various therapies during school time require greater flexibility on the part of the teacher in terms of communication and maintaining relationships and access to the learners, as well as organisational and lesson design aspects.

3.3.5 Spina bifida

Spina bifida is a malformation of the neural tube caused by a closure disorder in the third to fourth week of pregnancy. Spina bifida is a malformation of the neural tube caused by a closure disorder in the third to fourth week of pregnancy. This malformation causes a cele (meningocele) on the back filled with cerebrospinal fluid, an additional cele filled with spinal cord or the "open back" with exposed spinal cord. Severe neurophysiological damage is associated with this, such as partial or total paraplegia, paralysis of body parts such as the bladder or intestines with associated incontinence and / or, as the most frequent accompanying symptom in spina bifida, increased accumulation of cerebrospinal fluid (hydrocephalus). The latter can be treated by means of a shunt system, but there is a risk of blockage with an increase in intracranial pressure. Increased intracranial pressure can manifest itself, for example, in the form of headaches, visual disturbances, seizures, nausea, concentration disorders or balance disorders. Hydrocephalus can also occur singly (without spida bifida) and has a negative influence on the learning behaviour and performance of pupils.

Living with spina bifida can present numerous challenges. Individuals may experience a range of physical disabilities, including varying degrees of mobility impairment, which can affect their ability to walk independently. Many require assistive devices such as wheelchairs, braces, or crutches. Additionally, bladder and bowel control issues are common, necessitating ongoing management and sometimes surgical interventions. The emotional and psychological impact of spina bifida can be significant. Children and adults with this condition may face challenges related to self-esteem, social interactions, and mental health. The need for frequent medical appointments, surgeries, and rehabilitation can contribute to feelings of anxiety and frustration. Support from healthcare providers, family, and peer groups is crucial in helping individuals cope with these challenges.

Despite the difficulties associated with spina bifida, many individuals lead fulfilling lives with appropriate medical care, rehabilitation, and support. Advances in treatment, including surgical interventions and therapies, have improved outcomes and quality of life for those affected. Furthermore, with early intervention and a comprehensive care approach that includes physical therapy, occupational therapy, and educational support, individuals with spina bifida can achieve greater independence and participate actively

in their communities. In summary, spina bifida is a complex condition resulting from a failure of the neural tube to close during early fetal development. The impact on life can vary widely depending on the severity of the defect, but with appropriate medical care and support, individuals with spina bifida can lead productive and meaningful lives.

3.3.6 Children with developmental & perceptual disorders

Children with developmental and perceptual disorders are not readily recognisable as such in everyday life. The disorder affects the area of sensorimotor information processing and cannot be described as a physical disability in the narrower sense. Nevertheless, body perception, proprioceptive, vestibular and tactile senses and/or auditory or visual perception are significantly impaired, with a negative impact on concentration, processing of (oral) language, listening and learning.

A discrepancy between action planning and action execution (dyspraxia) is typical (e.g. walking on lines, tying a loop, rhythmic movement sequences such as jumping rope). At school, it is difficult for the affected pupils to meet the performance requirements or to keep up with the performance. Sensory developmental disorder is frequently observed in children with physical disabilities, but children without disabilities are also affected, although these children are often wrongly diagnosed with AD(H)D. A clear delineation and unambiguous diagnosis is difficult because of the complexity of the developmental disorder. If the developmental and perceptual disorders remain untreated, this can lead to permanent excessive demands with corresponding mental stress and /or disruptive behaviour.

3.3.7 Children with severe (complex) disabilities

Children with the most severe (complex) disabilities are affected in all areas of life because several body functions and sensory areas are affected and they need comprehensive help in coping with everyday life. Usually, the children are affected by a severe cerebral movement disorder, the causes of which are diverse and can range from chromosomal anomalies to embryonic malformations to noxae. These children often require comprehensive assistance to navigate everyday activities, as they typically present with severe cerebral movement disorders. The severity of the disorder can vary greatly, leading to a spectrum of functional impairments. Children with severe forms of these disorders may exhibit limited mobility, difficulties with coordination, and challenges in performing daily tasks independently.

In the context of education, establishing an appropriate communication pathway is crucial for these children. Many may have difficulties with verbal communication due to their motor impairments or associated cognitive deficits. Therefore, educators and caregivers must prioritize finding effective alternative communication methods, such as sign language, picture exchange systems, or assistive technology. Building a personal rapport with students is essential, as it fosters trust and encourages engagement in the learning process. This rapport can be further enhanced by employing alternative teaching methods tailored to the individual needs of each child. Academically, children with complex disabilities often face significant hurdles. Research indicates that children with chronic conditions, including severe cerebral movement disorders, are at an increased risk for learning difficulties and academic underachievement. Cognitive challenges associated

with these disabilities can include difficulties with attention, memory, language processing, and problem-solving skills.

The emotional burden on children with severe disabilities is also considerable. They may experience feelings of frustration, isolation, and low self-esteem due to their physical limitations and the challenges they face in social interactions. The need for frequent medical interventions and therapies can further exacerbate these feelings, as children may find it difficult to participate in typical childhood activities. Moreover, the social stigma associated with disabilities can lead to exclusion from peer groups, further impacting their emotional well-being. Support systems play a critical role in helping children with complex disabilities cope with their challenges. A multidisciplinary approach that includes healthcare providers, educators, therapists, and family members is essential for addressing the physical, cognitive, and emotional needs of these children. Interventions may include physical therapy to improve mobility, occupational therapy to enhance daily living skills, and speech therapy to support communication development. Additionally, mental health support can help children and their families navigate the emotional complexities associated with living with severe disabilities. In conclusion, children with severe cerebral movement disorders face a multitude of challenges that affect all areas of their lives. The need for comprehensive support in communication, education, and emotional well-being is paramount. By fostering an inclusive environment that recognizes and addresses these challenges, caregivers and educators can help these children achieve their fullest potential, promoting a better quality of life and enhancing their overall development.

3.4 Preconditions for Learners with Physical Impairments

According to Walter-Klose (2012, p. 72), the following conditions have to be met for learners with physical impairments:

Staff Requirements

- Professionalism of special needs teachers (subject and methodological knowledge in the field of didactics for physical disabilities as well as (inclusive) diagnostic skills; knowledge of aids, care, therapy; conversation and counselling skills; personal competencies such as positive attitudes towards people with physical disabilities and chronic diseases and inclusion, readiness for interdisciplinary cooperation).
- Availability or presence of other professional groups with specific special needs education, psychological, medical, therapeutic, etc. skills, psychological, medical, therapeutic and nursing expertise, who can provide advice and guidance.
- Possibilities for cooperation within the teaching team, with parents and interdisciplinarily (time, resources, opportunities for cooperation; definition of tasks and roles).

Material conditions

- Suitable teaching and learning aids suitable for the disabled.
- Aids for workplace and environmental design.
- Medical aids.

Spatial conditions

- Room equipment (barrier-free access to all classrooms, therapy rooms, break rooms and administrative rooms; orientation-friendly environment with handrails, high-contrast environmental design, clear structuring and stimulus regulation, for example sound-reducing ceilings).
- Room layout (sufficiently large classrooms, differentiation rooms, accessible toilets, therapy rooms, break and recreation rooms, conversation rooms, room for storing aids, nursing rooms).

Organisational conditions

- Class and lesson organisation (small class size; 2-teacher system; flexible teaching; individual opportunities for differentiation; opportunities for peer co-operation, staff support for field trips; support for crises; flexible breaks and recreation times; high performance expectations for all pupils).
- School organisation (positive attitudes and support of the school authority and the teaching staff; networking with other schools; quality assurance, evaluation and self-evaluation; quality assurance, evaluation and self-reflection; standards on supervisory duties; offer and support for specific in-service training).
- Supporting measures and community outreach (transport, leisure time, cooperation with neighbours and extracurricular activities in the city).

3.5 Implications for Learning & (Foreign) Language Education

While the requirements listed above are needed for a general learning and teaching setup, specific implications for (foreign) language education are presented in this section. First of all, the type of disability does not allow any conclusions to be drawn about the performance of the learners. The spectrum of the disabilities with their numerous potential comorbidities and developmental complexities is reflected in their learning performance, which ranges from normal giftedness to cognitive ability (Boenisch, 2016, p. 57).

In general, children with physical disabilities can have various difficulties in their attention and their learning in general. Blume-Werry (2012), in her study with children with hydrocephalus, found that children had deficits in learning and perception problems that impacted negatively on visual-spatial and executive functions. Related to this, problems in grasping geometric shapes, in structuring and planning courses of action are common with many brain damaged learners and learners with developmental and perceptual disorders. In addition, these learners may be distracted easily, they usually lack self-directed learning skills and they require high-frequency revision of subject matter, and their transfer skills of acquired subject matter are likely to be limited. However, since many of the affected children display comparatively advanced communicative skills, they are regularly overburdened and overtaxed (Bergeest *et al*., 2019).

Epilepsy can significantly impact the learning process, particularly when it comes to acquiring foreign languages. Individuals with epilepsy may experience a range of challenges that can hinder their ability to communicate effectively, retain new information, and engage fully in the learning experience. To be more specific, one of the primary challenges faced by individuals with epilepsy is related to communication

barriers. Seizures, which can vary in frequency and intensity, may lead to temporary disruptions in speech and language skills. This can create difficulties in expressing thoughts and understanding others, particularly in a foreign language where nuances and pronunciation are critical. Additionally, cognitive impairments associated with epilepsy, such as issues with memory, attention, and concentration, can further complicate the learning process. These cognitive deficits make it challenging for learners to absorb new vocabulary, grasp grammar rules, and recall previously learned material, all of which are essential components of mastering a foreign language.

The learning environment can also be disrupted by the nature of epilepsy itself. Seizures and the side effects of anti-seizure medications may lead to frequent absences from school or language classes. This interruption in continuity can result in gaps in knowledge and understanding, making it difficult for individuals to keep pace with their peers. Moreover, the psychological impact of living with epilepsy can contribute to feelings of anxiety and low self-esteem. Individuals may feel self-conscious about their condition, which can deter them from participating actively in language classes or engaging in conversations with peers. This lack of confidence can create a cycle of avoidance, further limiting their opportunities to practice and improve their language skills.

Another significant concern is the lack of appropriate accommodations and support within educational settings. Many schools and language programs are not adequately equipped to address the unique needs of students with epilepsy. Without tailored support, such as individualized learning plans, access to specialized teaching methods, or the provision of a supportive learning environment, students with epilepsy may struggle to achieve their language learning goals. In conclusion, the impact of epilepsy on learning, particularly in the context of foreign language acquisition, is multifaceted. The combination of communication difficulties, cognitive impairments, disrupted learning experiences, and psychological factors creates significant challenges for individuals with epilepsy. To help these learners succeed, it is essential for educators and institutions to provide the necessary accommodations, support, and understanding. By fostering an inclusive learning environment, we can enable individuals with epilepsy to overcome these obstacles and reach their full potential in foreign language learning.

Children affected by Duchenne muscular dystrophy less commonly display these learning difficulties. While they are able to experience spatial relations in early childhood and thus are more likely to navigate temporal and spatial dimensions, they are exposed to a high level of mental stress due to their need for early confrontation with death. Therefore signs of learning blocks, refusal to learn, disinterest in school or aggressive behaviour can therefore be the external signs of these difficult psychological processes. We need to bear in mind that the learners affected face additional burdens in school and in their families that are related to schooling, e.g. catching up on homework on a regular basis due to regular therapy sessions and/or frequent hospitalisations. These circumstances can impede successful schooling on a whole and need to be taken into consideration by teachers when planning instructional activities. Children with physical disabilities face difficult conditions in their lives, with schooling only one aspect of them, which might impact on their social-emotional development and mental state in general. Among these are conditions like frequent

hospital stays, temporary separations from parents but also close family and parental ties along with a tendency of parents to overprotect children. They might result in a lack of independence and which, taken together, might facilitate the emergence of abnormal behaviour and limited emotional lifeworlds. Learners do not display socio-emotional peculiarities per se but teachers might want to expect them with some learners due to their difficult conditions, at least temporarily.

It is not just the children themselves who need emotional support, but also their teachers who often support these learners during several years need supervision in order to help them cope with the situation which many teachers perceive as challenging but also as personally enriching for themselves. When selecting the appropriate support measures for the diverse group of learners with physical disabilities, Lelgemann (2016) highlights that a high amount of transparency in the communication of the different stakeholders in education (learners, parents, teachers, medical support, school authorities) is vital, also to deal with fears, consternation and worries in the entire school community. For example, with epileptic children, fellow students and teachers have to be prepared in the event of a seizure with e.g. absences that can be experienced as disturbing if unprepared. This is also the case for more practical aspects like accommodations for assessment situations in order to avoid tensions among staff and learners. Affected learners and their parents should have a say in the way the communication is planned. In general, constant contact with parents is vital.

In addition to questions of accessibility of rooms in the school, the furniture and necessary aids (fine motor aids, double set of books at home and at school, same communicative aids at home and at school), practical or economic aspects of teaching should also be considered. For example, if the pupil needs assistive technology, time should be planned in advance for the response or the pupil can be given some questions or stimuli in advance to which she can then respond using the technology. The writing on the board should be clearly structured, as should the worksheets, because of the perception problems of many students. If necessary, an adjustment of the font size, colored markings and / or an enlargement of the spaces is also necessary. Larger line spacing can be used if graphomotor skills are impaired or the use of a tablet can be helpful here. Instead of copying from the board, it can also be photographed, although the photo must be enlargeable afterwards, for example, for students with visual impairments.

As regards methods and techniques of assessment, flexibility is needed when it comes to the assessment of academic performance and participation in class; this also applies to foreign language teaching. In accordance with the Universal Design for Learning principles (multiple means of action and expression), oral skills, for example, can be emphasized and also assessed. Alternative assessment methods such as differentiated observations can be used. In-class diagnostics should likewise be applied to find ways and means for students to demonstrate their competencies. Weekly schedules or other differentiated forms such as station learning represent a flexible way of learning at school, especially for students with multiple disabilities. For foreign language teaching, an approach suggested by Chilla & Vogt (2017) is to combine task- supported language learning with the inclusive pedagogical approach of learning on the common object (Feuser, 2011). If students are systematically introduced to differentiating methods and these are pre-

structured and didactically reduced, they seem to be quite promising for many students (Moosecker, 2008).

Based on the previous deliberations, the following aspects seem to be fruitful for foreign language teaching to learners with physical impairments, although the instructional decisions need to be taken on the basis of the knowledge and Diverse Learning Needs of the individual learners.

Language learning is fundamentally about participation rather than merely achieving specific performance-oriented objectives. This perspective is especially pertinent for children with cerebrally-induced physical disorders, as approximately 50% of these children experience significant impairments in (oral) articulation and communication. Conditions such as dysarthria, which affects the muscles used for speech, can hinder their ability to express themselves verbally, while some children may face complete inability to speak, a condition known as anarthria. In these cases, alternative forms of communication become essential to facilitate interaction and learning. For children with severe disabilities, the use of augmentative and alternative communication (AAC) systems is crucial.

To be more specific, AAC encompasses a wide range of communication methods that supplement or replace traditional speech. These methods can be categorized into two main types: unaided and aided communication. Unaided AAC includes techniques that do not require any external devices, such as gestures, facial expressions, and sign language. Aided AAC involves the use of tools or devices, which can range from low-tech options like picture boards to high-tech devices that generate speech through computer software. The implementation of AAC is particularly beneficial for children with communication disorders, allowing them to express their thoughts, needs, and emotions effectively. Research indicates that early introduction of AAC can significantly enhance communication and language skills, especially during the critical period of brain development from birth to three years of age. By providing these children with alternative means of communication, AAC not only helps them meet developmental milestones but also fosters social interactions and reduces behavioral challenges that may arise from frustration due to communication barriers. Moreover, AAC can play a vital role in the educational setting. Children using AAC can participate more fully in classroom activities, express their understanding of academic content, and engage with peers and teachers. This participation is essential for building a sense of belonging and enhancing their overall learning experience. Teachers and caregivers must be willing to adapt their teaching methods to accommodate the communication needs of these children, ensuring that they are included in the learning process. The effectiveness of AAC systems varies among individuals, and it is essential to tailor these systems to fit each child's unique abilities and preferences. A speech-language pathologist (SLP) typically conducts assessments to determine the most suitable AAC options, considering factors such as the child's current communication skills, cognitive abilities, and physical capabilities. The assessment process is dynamic and ongoing, allowing for adjustments to be made as the child's needs evolve. It is important to dispel common myths surrounding AAC, such as the belief that using AAC will hinder the development of verbal speech. In fact, research shows that AAC can support and enhance verbal communication skills. Many users of AAC may eventually transition to more verbal communication as they develop their language skills, while others may continue to rely on AAC as their primary mode of communication.

In conclusion, language learning for children with severe disabilities necessitates a shift in focus from performance to participation. By utilizing AAC systems and alternative communication methods, these children can engage meaningfully in their learning environments. The integration of AAC not only facilitates communication but also promotes social interaction, emotional expression, and academic achievement. As educators and caregivers work collaboratively to support these children, they can help create inclusive environments where all learners can thrive, regardless of their communication challenges.

Moreover, in many cases, it is not the proficiency level to be achieved that is important but the fact that participation is made possible in a foreign language, often English as a world language. Communicative skills in the foreign language should be developed without pressure, with a focus on foreign language enjoyment (Dewaele & MacIntyre, 2014; Dewaele & Dewaele, 2018), giving the learners a sense of achievement where possible. In this connection, tolerance of errors is a suitable concept in foreign language teaching in general and in foreign language teaching to learners with physical impairments in particular. An awareness of mistakes should be developed so that mistakes can be considered as a sign of language development. This approach emphasizes the importance of creating a supportive and inclusive learning environment where learners feel comfortable experimenting with language. For children with severe disabilities, the pressure to perform can often lead to anxiety and frustration, which may hinder their willingness to engage in language learning activities. By prioritizing participation over perfection, educators can foster a more positive attitude towards language learning, encouraging students to express themselves freely and explore the language without fear of making mistakes.

Incorporating play and interactive activities into language lessons can further enhance enjoyment and engagement. Games, songs, and storytelling can provide meaningful contexts for language use, allowing learners to practice their skills in a fun and relaxed atmosphere. Such activities can also promote social interactions among peers, helping to build friendships and a sense of community within the classroom. Additionally, the use of technology can play a significant role in facilitating language learning for students with physical impairments. Assistive technology tools, such as speech-generating devices, communication apps, and interactive language software, can provide alternative avenues for practicing language skills. These tools can be tailored to individual needs, allowing learners to engage with the language at their own pace and in ways that are most comfortable for them. Furthermore, fostering a growth mindset is essential in this context. When learners understand that language acquisition is a gradual process that involves making mistakes, they are more likely to embrace challenges and persist in their efforts. Educators can help cultivate this mindset by celebrating small successes and providing constructive feedback that focuses on progress rather than perfection. This approach not only enhances language skills but also builds resilience and confidence in learners. In conclusion, the emphasis on participation and enjoyment in foreign language learning, particularly for learners with physical impairments, is crucial for fostering a positive and effective learning experience. By creating an inclusive environment that tolerates errors and encourages exploration, educators can help students develop their communicative skills in a foreign language while also nurturing their emotional and social well-being. Ultimately, this approach not only enhances language proficiency but

also empowers learners to engage meaningfully with the world around them, enriching their lives through language and communication.

In terms of teaching practices, Universal Design for Learning (UDL) guidelines offer various means of representation of the language content to be taught. These include e.g. multisensory learning by using visualisation of content, deploying auditive channels, providing audio-visual representations in the target language. Depending on the particular learner(s) and their DLN, it might also be helpful to offer various (multimodal, involving multiple intelligences like creative, cognitive) ways of action and expression and offer multiple ways of engaging with the content. Doing this, mastery feedback is important and also peer feedback (if possible) to foster engagement with the content.

More specifically, by incorporating a range of sensory modalities, educators can enhance comprehension and retention of language content. For instance, visual aids such as diagrams and infographics can help learners grasp complex concepts, while auditory elements like songs or spoken narratives can aid in developing listening skills and pronunciation. The integration of technology, such as interactive language apps and online resources, can further enrich the learning experience by providing diverse formats for engagement. Moreover, the emphasis on multimodal learning recognizes that each learner has unique strengths and preferences. For example, some students may excel in creative expression through art, while others may prefer logical reasoning and analytical tasks. By offering various ways to engage with the language, educators can tap into these strengths, fostering a more inclusive classroom environment. This approach not only promotes language acquisition but also encourages critical thinking and problem-solving skills, which are essential for academic success. Incorporating peer feedback into the learning process can also enhance engagement and motivation. When learners have the opportunity to collaborate and provide constructive feedback to one another, they develop a sense of community and shared responsibility for their learning. This collaborative environment can reduce anxiety and foster a positive attitude toward language learning, as students feel supported by their peers. Additionally, peer feedback can provide diverse perspectives on language use and communication styles, enriching the learning experience. Furthermore, it is essential to recognize the role of formative assessment in this context. Mastery feedback, which focuses on specific strengths and areas for improvement, allows learners to understand their progress and set achievable goals. This feedback should be timely and constructive, guiding students in their language development while celebrating their successes. By creating a culture of continuous improvement, educators can empower learners to take ownership of their language learning journey. In conclusion, the application of UDL principles in language teaching provides a comprehensive framework for accommodating the diverse needs of learners. By utilizing multisensory approaches, offering multimodal engagement opportunities, and fostering a collaborative learning environment through peer feedback, educators can create inclusive and effective language learning experiences. This approach not only enhances language proficiency but also promotes the development of critical skills necessary for success in an increasingly interconnected world. Ultimately, the goal is to cultivate a love for language learning that transcends traditional performance metrics, allowing all learners to thrive and communicate effectively in a global context.

Many learners with physical and motor impairment have considerable problems in mustering sufficient energy levels for an extended time. Due to their limited energy and attention levels, teachers would have to plan in frequent pauses on an individual level and, with some learners, do not plan exhausting activities over a longer period of time. Depending on the learners' medical condition, energy levels, attention span, availability of assistive technology etc., learners might focus on e.g. spoken communication, they might avail themselves of assistive technology or other help/helpers in order to achieve their individualised objectives, based on an individual support plan. Due to learners having to miss class because of therapy or hospitalisations, fatigue or limited attention spans and energy levels, teachers would need to offer frequent revision and repetition to make up for missed classes. Buddy systems could be established which group two students, one with physical and motor impairment, one without or with minor impairments, and they would support each other. Buddy or helper systems have also been criticised for depreciating the persons who are helped and have warned against negative sentiments of the helping persons.

3.6 Assessing Learners with Physical Impairments

Regarding assessment, one could employ Assessment for Learning and Assessment as Learning since it is desirable for a student with a motor impairment to not be restricted and enable constant success. In this context, one perceives that the selected assessment method is suitable for the perspective student as it focuses on the actual learning process, rather than just the outcome. For this reason, the selected method helps maintain a positive and inclusive learning environment that enables students to feel invested and interested in their academic experience. The Assessment for Learning would conduct ongoing assessments providing feedback to students on how well they are progressing. This sort of assessment is classified as formative since it is carried out during the learning process rather than at the end. For learners with motor impairments, this approach allows educators to tailor their teaching strategies based on individual needs and abilities. For instance, teachers can use various assessment methods, such as observations, informal quizzes, and interactive activities, to gauge understanding and adjust instruction accordingly. This adaptability is crucial for students who may require different modes of expression or engagement due to their physical challenges. Assessment as Learning, on the other hand, encourages learners to take an active role in their own assessment process. This can involve self-assessment and peer assessment, where students reflect on their own learning and provide feedback to one another. For learners with motor impairments, fostering a sense of agency in their learning can be particularly beneficial. By engaging in self-assessment, these students can develop greater awareness of their strengths and areas for improvement, which can enhance their motivation and self-esteem. Moreover, peer feedback can promote collaboration and social interaction, helping to build a supportive learning community. Incorporating diverse assessment methods is essential for effectively evaluating learners with motor impairments.

Traditional assessment methods, such as standardized tests, may not accurately reflect the abilities of these students, as they can be hindered by their physical limitations. Alternative assessment strategies, such as portfolios, project-based assessments, and performance tasks, can provide a more holistic view of a learner's capabilities. For example, a portfolio can showcase a student's work over time, highlighting their progress

and achievements in various areas, including language skills, creativity, and critical thinking. Additionally, the use of technology can enhance assessment practices for learners with motor impairments. Assistive technology tools, such as speech-to-text software, adaptive keyboards, and communication devices, can facilitate participation in assessments and allow students to demonstrate their knowledge and skills more effectively. By integrating technology into assessment practices, educators can create a more equitable assessment environment that accommodates the diverse needs of all learners. Furthermore, it is essential to cultivate a culture of tolerance for errors within the classroom. Recognizing that mistakes are a natural part of the learning process can help reduce anxiety and encourage risk-taking in language learning. By framing errors as opportunities for growth, educators can help learners with motor impairments develop resilience and a positive attitude towards their language acquisition journey. In conclusion, adopting Assessment for Learning and Assessment as Learning approaches in the context of learners with motor impairments can significantly enhance their educational experience. By focusing on the process of learning, providing ongoing feedback, and incorporating diverse assessment methods, educators can create an inclusive environment that supports the unique needs of these students. This approach not only fosters a sense of achievement but also empowers learners to take an active role in their education, ultimately promoting their overall development and success in language learning.

Adapting assessment methods for learners with motor impairments involves a thoughtful consideration of their unique needs and abilities. These adaptations aim to create an inclusive environment where all students can demonstrate their knowledge and skills effectively, regardless of physical limitations. In the following list we have included several techniques that can be implemented in mainstream classrooms:

1. **Flexible Assessment Formats**: Instead of relying solely on traditional written assessments, educators can offer various formats that allow learners to express their understanding in ways that suit their abilities. For example, assessments can include oral presentations, video submissions, or visual projects. This flexibility enables students to leverage their strengths, whether they excel in verbal communication or creative expression.
2. **Use of Assistive Technology**: Incorporating assistive technology can significantly enhance the assessment process for learners with motor impairments. Tools such as speech recognition software, adaptive keyboards, and touch-screen devices can facilitate participation. For instance, students can use speech-to-text applications to complete written assignments or engage in oral assessments without the physical strain of typing or writing. Similarly, interactive apps can be used for quizzes and games that assess knowledge in an engaging manner, accommodating various learning styles and physical abilities.
3. **Modified Testing Environments**: Creating a comfortable and accessible testing environment is essential. This may involve providing additional time for assessments, allowing breaks, or using ergonomic furniture that accommodates the learner's physical needs. A quiet space free from distractions can also help students focus better during assessments.
4. **Peer Collaboration**: Encouraging collaborative assessments can foster a sense of community and support among learners. Group projects or peer assessments allow students to work together, share

ideas, and provide feedback to one another. This collaborative approach not only enhances learning but also helps students develop social skills and confidence.

5. **Performance-Based Assessments**: Implementing performance-based assessments can provide a more authentic measure of a learner's abilities. These assessments focus on real-world tasks that require the application of knowledge and skills. For example, instead of a written test on a science topic, students might conduct an experiment and present their findings, allowing them to demonstrate their understanding in a practical context.
6. **Interactive Portfolios**: Utilizing digital portfolios can provide a platform for students to showcase their work over time. These portfolios can include a variety of formats, such as videos, audio recordings, and images, allowing students to present their learning in a way that suits their abilities. This method not only highlights their progress but also encourages self-reflection and goal setting.
7. **Game-Based Assessments**: Incorporating game elements into assessments can make learning fun and engaging. Educational games that allow for different modes of participation can assess knowledge while providing a low-pressure environment. For example, students could participate in team-based games that require collaboration and communication, allowing them to demonstrate their understanding in a dynamic setting.
8. **Continuous Feedback**: Providing ongoing feedback throughout the learning process is crucial for learners with motor impairments. Instead of waiting for formal assessments, educators can offer regular, constructive feedback that highlights progress and areas for improvement. This can include verbal feedback during class discussions or written comments on assignments, helping students understand their growth and encouraging them to keep striving for success.
9. **Personalized Learning Goals**: Setting individualized learning goals can help focus assessments on each student's unique abilities and aspirations. By collaborating with learners and their families to establish these goals, educators can ensure that assessments are relevant and meaningful. This personalized approach allows students to take ownership of their learning and feel a sense of accomplishment as they achieve their objectives.
10. **Incorporating Multimodal Methods**: Utilizing a variety of instructional and assessment methods that engage different senses can benefit learners with motor impairments. For example, combining visual aids, auditory materials, and hands-on activities can help reinforce learning and provide multiple avenues for assessment. This strategy caters to diverse learning styles and can enhance overall comprehension.
11. **Utilizing Visual Supports**: Visual aids such as graphic organizers, charts, and diagrams can help students organize their thoughts and express their understanding. These tools can be integrated into assessments to provide a structured way for students to convey their knowledge, making it easier for them to participate actively.
12. **Encouraging Self-Advocacy**: Teaching learners to advocate for their needs in assessment situations can empower them and promote independence. Educators can guide students in communicating their preferences for assessment formats, accommodations, and support, fostering a sense of agency in their learning process.

13. **Involving Families**: Engaging families in the assessment process can provide valuable insights into the learner's strengths and challenges. Parents and caregivers can share information about their child's abilities and preferences, helping educators tailor assessments to better meet individual needs.

Technology can play a significant role in assessing students with severe motor impairments by providing alternative methods for them to demonstrate their knowledge and skills. Some ways technology can be leveraged are the following:

1. **Assistive Communication Devices**: Students with limited speech or motor skills can use speech-generating devices, eye-gaze technology, or augmentative and alternative communication (AAC) systems to participate in assessments. These devices allow them to express their understanding, answer questions, and engage in discussions.
2. **Computer-Based Assessments**: Assessments can be adapted to a computer format, enabling students to respond using alternative input methods, such as touch screens, trackballs, or head pointers. This allows them to complete tests and assignments without relying on fine motor skills required for writing.
3. **Multimedia Presentations**: Students can demonstrate their knowledge through multimedia projects, such as creating videos, digital stories, or presentations using assistive technology. This format enables them to showcase their understanding in a way that accommodates their physical abilities.
4. **Interactive Games and Simulations**: As mentioned above, educational games and interactive simulations can be used for assessment purposes. These tools can adapt to different input methods and provide engaging ways for students to demonstrate their learning.
5. **Virtual Reality (VR) and Augmented Reality (AR)**: VR and AR technologies can create immersive assessment environments that allow students to interact and respond in ways that are tailored to their needs. For example, students can navigate virtual scenarios and make decisions using eye-gaze or voice commands.
6. **Adaptive Software**: Software programs can be customized to provide accommodations for students with motor impairments. This includes features like text-to-speech, word prediction, and customizable interfaces to facilitate their participation in assessments
7. **Cloud-Based Platforms**: Online platforms and applications allow students to access assessments remotely and collaborate with teachers and peers. This flexibility enables students with mobility challenges to participate in assessments from their preferred locations
8. **Assistive Robotics**: Robotic devices, such as powered wheelchairs or exoskeletons, can enhance a student's ability to interact with their environment and participate in assessments. These technologies can provide support for mobility and manipulation tasks

In summary, adapting assessment strategies for learners with motor impairments requires creativity, flexibility, and a commitment to inclusivity. By implementing a variety of assessment formats and technological solutions, providing continuous feedback, and involving families, educators can create an environment where all learners can thrive. These adaptations not only enhance the assessment experience but also support the overall development and success of students with motor impairments.

3.7 Foreign Language Instruction for Learners with Physical Impairments

There is hardly any literature available on teaching foreign or second languages to learners with physical impairments. This fact points to a serious gap in the research. The few studies that have been identified are outlined below. Not all of them have a direct link to language learning or teaching, though.

Bekirogullari *et al*. (2022) investigated the self-perceived learning outcomes and motivation levels of ten university-level wheelchair basketball players using a CLIL approach to learning English as a Foreign Language. The results of the four-month intervention study with interviews as the main data collection instrument indicated an improved self-image of the informants, higher motivation to learn a foreign language, social skills development, and better speaking skills in the target language. A holistic, hands-on and authentic approach to language learning like CLIL seems highly promising for providing opportunities for a sense of achievement in the language learning process.

Zhang *et al*. (2020) researched the use of Open Educational Resources (OER) and Open Educational Practices (OEP) in a review of the literature in the field of the accessibility and functional diversity of OER and OEP. They attempted to gauge the potential effect of OER on twenty-first century teaching and learning for learners with DLN that enable open educational ecosystems for inclusive learning. Relevant core findings of the review included the following: In the study, only nine countries were involved, suggesting the necessity for researchers to become involved in the field of OER to provide accessible education to persons with functional diversity. While studies seemed to focus on the accessibility of OER, their effectiveness in providing accessible learning environments. They identify learning analytics as a developmental field in order to arrive at a more accurate assessment of the accessible learning experience for learners with disabilities, language learners included. Overall, the support that has to be given to teachers and educators in "foundations of functional diversity, develop the skill set to operate learning resources under these terms and are fully aware of the significance of and need for specific actions around the topic" (p. 18) is considered a key issue.

Fast (2016) focused on children with cerebral palsy in the Austrian context. In a mixed-methods study with seven former and current learners with different kinds of and degrees of affectedness by cerebral palsy, their parents, teachers and carers (n=27), she investigated the learners' ability to learn a foreign language in an inclusive language classroom. She also probed into the perceived experience of the learners and their significant others in terms of their integration into the language classroom. Fast (2016) found that all students were academically capable of developing language proficiency and of following mainstream education in general. The learners in the sample mostly received additional support necessary to succeed in the educational environment. The extent to which learners were socially integrated was to be found largely dependent on the age in which they had entered inclusive education; the earlier non-disabled learners start learning with them, the more effective social integration processes will be.

3.8 Assistive technology

Any device or tool that enables a student to participate in learning activities can be called assistive technology, regardless of whether they are digital or not. Their purpose is to help compensate for the effects of disability so that the person affected can increase their capabilities.

Fernandez-Batanero *et al*. (2022), in their metastudy of assistive technology for the inclusion of students with disabilities, have found an increased use of assistive technology in education since 2017. At the same time, the authors note a scarcity of research pertaining to assistive technology. In the research studies available, the authors note an improvement in academic engagement as well as benefits of using assistive technology for learner autonomy and participation. Additionally, a more pronounced development of social skills was found to take place with assistive technology being used for instructional purposes. The most frequently used types of assistive technology relate to Web 2.0 applications as an available and low-cost resource, followed by mobile learning e.g. using an IPad or smartphone. Fernandez-Batanero and colleagues highlight that the use of assistive technology is mainly relevant for learners with physical impairment, visually impaired and deaf and hard of hearing students (p. 1923), increasing their inclusion in educational contexts. The authors also identify barriers to the beneficial use of assistive technology, namely inadequate training in the use of assistive technology by teachers, difficult access to assistive technologies, e.g. due to lacking resources. To address the training issue, the authors suggest Universal Design to be included in teacher training in order to ensure a minimum of expertise in the use of assistive technologies with teachers. This definitely also includes language teachers. In the following sub-sections some examples that help certain students with physical disabilities communicate in a foreign language are presented.

3.8.1 Assistive technology for non-verbal students

One type of assistive technology that suits non-verbal children includes augmentative alternative communication (AAC) devices or systems. Assistive technology options represent important support, as communication in a (foreign) language is vital for developing communicative skills in this language. Even though students might not be verbal they could still communicate by using alternative communication and AAC devices. These devices include the Picture Exchange Communication System (PECS) and Voice Output Communication Aids (VOCAs). They are two types of assistive technology that can help non-verbal children communicate. PECS uses pictures of objects and actions to help children communicate with others. The child recognizes what the picture card represents, exchanges it with a communication partner (teacher or other professional, or parent), and receives the object or action in exchange. VOCAs incorporate some form of pictorial representation on the keys of the hand-held devices – each key contains a pre-recorded message that "speaks" the name of the object or action. Type-to-Talk devices are similar to VOCAs, but are usually appropriate for older children who are able to type on a traditional keyboard. Adaptive computers and keyboards are standard computers (desktops or laptops) and keyboards adapted with special software, touch-screen monitors, and keyboards with pictorial overlays that allow the non-verbal child to communicate and interact with others, also in the foreign language (based on Bright Hub Education, n.d.).

3.8.2 Assistive technology for physically impaired students using a computer

For learners with typing challenges who still need to use a computer, various types of assistive technology exist depending on the types of challenges. Keyguards (plastic covers with holes for each key, attached to the keyboard with velcro) help learners with unsteady fingers or other motor difficulties strike the right key, thus accelerating their typing in the foreign language. They might also help the learner to correctly place their hand. Alternative keyboards can cater to the specific needs of individual learners. For example, an adjustable keyboard has three sections that can be positioned close together or further apart, rotated, and tilted to many angles. With a miniature keyboard, the keys are close together in order to allow children with limited range of motion to access all keys. Programmable keyboards can be customized so that letters, numbers, words, or phrases can be entered by pressing custom keys or shortcuts (based on Bright Hub Education, n.d.).

3.8.3 Digital tools for inclusive education

There are many more examples of assistive technology for learners with physical impairments, depending on the type of support they need. The tools presented below provide an exemplary overview of frequently used digital technologies in general education. In addition to software specifically tailored to the needs of children or young people with special needs, apps and operating aids for tablets are presented that are low-tech and/or easily accessible (based on Aktion Mensch, n.d.).

Multitext: Multitext is a barrier free text processing tool with speech output and computing keyboard. It uses and processes textbook materials in such a way that Multitext can work on them using e.g. a mouse, keyboard or alternative input devices like switches or eye control. It also includes read-aloud help and text input assistance for children with dyslexia. In Germany, Multitext is an assistive device and can be financed by health insurance. www.hindelang-software.de

SnapType Pro: Snap Type Pro is an app for children who struggle with their penmanship, e.g. due to motor dyspraxia, but are able to use a tablet. A worksheet is photographed and a marker is set by tapping and label with on-screen or external keyboard. It also has writing tools for highlighting and marking. https://snaptypeapp.com/

Book Creator: Book creator is used for creating e-books and comics, and it is often used in education e.g. for storytelling and project documentation. Book Creator has many assistive features for barrier-free book production such as read-aloud and speech-into-text functions (for reading and writing difficulties in the foreign language), alternative texts for images (blind and visually impaired learners), automatic subtitling and transcript function (deaf and hard of hearing learners) or enlarging text as you type (visually impaired learners) The app can be operated with keyboard and screen readers (blind and physically impaired learners). https://bookcreator.com

Microsoft Lens: Microsoft Lens can take photos of printed documents and convert them into digital text for integration into Microsoft programs (e.g. Word). Here, they can be edited and processed further.. The digitized texts can be exported to an immersive reader such as Azure, which uses Artificial Intelligence to enhance reading experience, with functions such as a read aloud function that can be adapted to individual requirements. The visual presentation of the text can also be adapted to very different needs (e.g. text size, colors, contrasts, with or without hyphenation, etc.). A translator (for 100 languages) is also integrated. Azure is not free of charge. https://support.microsoft.com/de-de/office/office-lens-f%C3%BCr-windows- 577ec09d-8da2-4029-8bb7-12f8114f472a

Google Lens: The Google app "Lens" features a translator like Microsoft Lens but does not have as many individual adaptation functions to the needs of learners with visual impairments or reading difficulties as Microsoft's immersive reader. However, it is easy to use and has excellent Optical Character Recognition (OCR) text recognition. You take a picture of printed text and have it read out or translated. https://play.google.com/store/apps/details?id=com.google.ar.lens

Audiopen Anybook Reader: Read aloud pen that makes audible any learning material. This is how it works: Put the sticker in the desired place, touch the sticker with the audio pen, switch to recording mode, and make a voice recording. To play back, switch to play mode and hold the pen against the sticker. Voice recordings can also be made on a computer with a microphone via software. The stickers can be replayed as often as you want. For use with blind learners, the placement of the sticker must be made tactile (e.g., using supplementary foam rubber stickers). https://anybookreader.de/

Magnifier and zoom on iPad: Magnifier and zoom are among the iOS operating aids that turn the iPad into assistive technology. The magnifier enables the magnification and visual adaptation of printed documents to visually impaired needs via the tablet camera. The zoom function is a kind of digital magnifying glass: the user "slides" it over desired areas of the screen to display them enlarged. In this way, the entire screen content can be enlarged - and not just the font size, as is the case when zooming with the two-finger pull-up gesture. The size of the digital magnifier - i.e. the zoom window - as well as the color display can be adjusted. How to find Magnifier & Zoom: Settings > Accessibility => Vision

Reading and writing: Speak Screen and Speak Selection on iPad

Speak screen and speak selection are also part of the iOS operating aids. If the functions are activated, you can have digital text (e.g. websites, emails) read aloud. The reading speed can be adjusted. You can also set the content to be visually highlighted when it is read aloud. The target group for "Speak selection" is primarily people with dyslexia: Here you can choose whether individual letters or the entire word are read aloud. How to find "Speak Selection & Read Input": Settings > Accessibility => Vision

Spelling aid: Tap the microphone icon and speak a word or short sentence. The app repeats the spoken words and outputs them as written text. The display of the text can be adapted to individual needs, e.g. in a dyslexia-friendly font. A translation function is also integrated. This app is extremely easy and suitable for

young learners.

Assisted communication: MetaTalk

This app turns the iPad into a so-called talker for learners without (intelligible) spoken language. METACOM symbols are combined to statements. The vocabulary is available on different, interconnected surfaces. The number of symbol fields per surface can be changed, depending on communicative abilities. The symbols can also be customised, e.g. with photos of significant others instead of METACOM symbols. https://www.metacom-symbole.de/apps/metatalk.html

MetaTalk app (https://www.aktion-mensch.de/inklusion/bildung/impulse/digital-inklusive-bildung/barrierefreie-bildung-mit-assistiver-technologie/ueberblick-assistive-technologien)

Predictable: Predicable is a talker app for learners without (intelligible) spoken language who can communicate using written language (available in various languages). They enter text which is spoken via the on-screen keyboard, the adaptive word prediction and ready-made sentences accelerate the learner's communication. Sentence building blocks are arranged in different categories and can be supplemented with your own sentences and categories. Learners can operate the app in a barrier-free way, e.g. by push buttons and head control. Those who do not need so much equipment can use simpler and less expensive apps (e.g. Assistive Express). https://therapy-box.co.uk/predictable

3.9 CEFR & UDL: Creating Inclusive Language Learning Environments for Students with Physical Impairments

The Common European Framework of Reference for Languages (CEFR) is a valuable tool for creating inclusive language learning environments for students with physical impairments. By providing a comprehensive framework for describing language proficiency, the CEFR enables educators to design tailored curricula and assessments that cater to the unique needs and abilities of students with physical disabilities. One of the key advantages of using the CEFR in inclusive language learning is its flexibility. The framework recognizes that language proficiency is not a binary concept but rather a continuum, with learners progressing through different levels of competence. This allows educators to set achievable goals for students with physical impairments, focusing on their individual strengths and areas for improvement. By breaking down language skills into manageable steps, the CEFR can help these students build confidence and motivation, as they can experience success at their own pace. Moreover, the CEFR emphasizes the importance of communicative competence, which is particularly relevant for students with physical disabilities. The framework encourages a focus on real-life language use, enabling learners to develop the skills necessary for effective communication in various contexts. For students with physical impairments, this approach can be particularly empowering, as it helps them navigate social situations and express their needs and preferences independently. Another significant advantage of using the CEFR in inclusive language learning is its emphasis on learner-centered instruction. The framework recognizes that each student brings unique experiences, learning styles, and preferences to the classroom. By incorporating the CEFR into their teaching practices, educators can create learning environments that are responsive to the needs of students with physical impairments. This may involve using assistive technologies, adapting learning materials, or providing alternative assessment methods that allow these students to demonstrate their language proficiency effectively. Furthermore, the CEFR's focus on plurilingualism and intercultural competence can contribute to creating more inclusive language learning environments. By valuing and celebrating the linguistic and cultural diversity within the classroom, the CEFR encourages a sense of belonging and acceptance for all learners, including those with physical impairments. This approach fosters an atmosphere of mutual respect and understanding, where differences are seen as strengths rather than barriers. In conclusion, the CEFR is a powerful tool for creating inclusive language learning environments for students with physical impairments. By providing a flexible and learner-centered framework, the CEFR enables educators to design curricula and assessments that cater to the unique needs and abilities of these students. Moreover, the CEFR's emphasis on communicative competence, plurilingualism, and intercultural competence contributes to creating more inclusive and supportive learning environments that empower students with physical disabilities to achieve their language learning goals.

Nevertheless, the CEFR has some limitations in addressing the specific needs of students with physical impairments. To be more specific, the original CEFR descriptors were not developed with students with physical disabilities in mind, so they may not adequately capture the unique challenges and abilities of this population. There is a lack of CEFR descriptors specifically tailored for assessing the language proficiency of

students with physical impairments. The existing descriptors may not be sensitive enough to measure their progress accurately.The CEFR focuses on general language proficiency, but more specific descriptors are needed to address the particular communication needs of students with physical disabilities in various contexts, such as medical, educational, or social settings. Upgrading the CEFR descriptors to be more inclusive of students with physical impairments requires extensive research, piloting, and validation to ensure the descriptors are reliable, valid, and fair. To address these limitations, the Council of Europe has been working on expanding and updating the descriptors in the 2018 CEFR Companion volume. However, more work is still needed to develop descriptors that are specifically tailored for assessing the language proficiency of students with physical impairments and ensuring that the CEFR can be used as an effective tool for creating inclusive language learning environments for this population. To this end, it might be worthwhile checking with various experts in the field, determining how individual descriptors could be adapted better to learners' immediate language learning needs.

Universal Design for Learning (UDL) is another powerful framework for creating inclusive language learning environments for students with physical impairments. By providing multiple means of engagement, representation, and action and expression, UDL enables educators to design learning experiences that cater to the diverse needs and abilities of all learners, including those with physical disabilities. One of the key principles of UDL is providing multiple means of representation, which is particularly relevant for students with physical impairments. This involves presenting information in a variety of formats, such as visual, auditory, and tactile, to ensure that all learners can access the content. For example, educators can use assistive technologies, such as screen readers or text-to-speech software, to make digital materials accessible to students with visual or physical impairments. Another important aspect of UDL is providing multiple means of action and expression, which allows students to demonstrate their knowledge and skills in various ways. This is crucial for students with physical disabilities who may face challenges with traditional assessment methods. By offering alternative ways for students to respond, such as using voice recognition software, eye-tracking devices, or adapted keyboards, educators can create a more equitable and inclusive learning environment. Moreover, UDL emphasizes the importance of providing multiple means of engagement, which helps to motivate and sustain learners' interest and effort. For students with physical impairments, this may involve offering choices in learning activities, providing opportunities for collaboration and social interaction, and fostering a sense of belonging and community in the classroom. By implementing UDL principles, educators can create language learning environments that are flexible, supportive, and responsive to the needs of students with physical disabilities. This approach not only benefits these students but also enhances the learning experience for all participants, promoting a culture of inclusivity and respect for diversity.

3.10 Conclusion

This chapter outlined the significant challenges faced by students with physical impairments in accessing quality education, particularly in the context of language learning. With an estimated 1.3 billion people globally experiencing some form of disability, the need for inclusive educational practices has never been

more pressing. However, statistics reveal that children with disabilities, particularly those with physical impairments, often face barriers that hinder their educational progress. For instance, in Germany, only 35% of students in special needs schools have access to foreign language education, indicating a substantial gap in educational provision.

In this chapter, physical and motor impairments were categorized into various subgroups, including cerebral movement disorders, epilepsy, chronic diseases, and progressive diseases. Each category presents unique challenges that affect not only the students' physical capabilities but also their emotional and social well-being. For example, learners with cerebral movement disorders may struggle with muscle control and coordination, impacting their ability to participate in language classes. Similarly, students with epilepsy may experience disruptions in their learning due to seizures, while those with chronic conditions often deal with the emotional burden of managing their health alongside their education. The emotional and psychological aspects of living with physical impairments are crucial in understanding the educational experience of these students. Many face anxiety, depression, and social isolation, which can further impede their learning. Thus, emphasis is placed on the importance of creating supportive and empathetic learning environments that address both the academic and emotional needs of students with physical impairments. This includes the integration of therapeutic approaches and creative expression into language learning, allowing students to communicate their feelings and experiences in ways that resonate with them.

In conclusion, this chapter highlights the urgent need for educational systems to adapt and provide inclusive language learning environments for students with physical impairments. By recognizing the diverse challenges these students face and implementing strategies that cater to their unique needs, educators can foster a more equitable and supportive learning atmosphere. Addressing these issues requires a collaborative effort among educators, healthcare professionals, and support systems to ensure that every student has the opportunity to thrive in their language learning journey.

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CHAPTER 4: SUPPORTING LEARNERS WITH VISUAL IMPAIRMENT

Marianthi Karatsiori
University of Macedonia

4.1 Introduction

This chapter examines the worldwide rates of visual impairment, the challenges faced by visually impaired students in learning, particularly in the context of foreign language acquisition, and the practices and technologies that can be employed to create inclusive language learning environments. By exploring recent research insights, this chapter aims to provide an understanding of the current landscape and offer actionable recommendations for educators and policymakers to support students with visual impairments in their language learning journey. To this end, it provides a comprehensive overview of various aspects related to visual impairments and their impact on education, particularly language learning. It begins by highlighting the global prevalence of visual impairments with statistics from the World Health Organization and recent research studies. It also introduces key advocacy organizations supporting visually impaired individuals. The classification of visual impairments according to ICD-11 and common types are explained, followed by strategies for fostering inclusion in mainstream classrooms. This includes attitudinal shifts, classroom adaptations, and collaboration among professionals. The Expanded Core Curriculum (ECC) is introduced, detailing its nine key areas and their implementation in the classroom. The text discusses the impact of visual impairments on learning, especially in foreign language acquisition, and presents challenges faced by these learners. It suggests evidence-based strategies for language learning, such as multisensory approaches, Braille instruction, and auditory input. The importance of assistive technologies and teacher training in using these technologies effectively is emphasized. An academic literature review highlights recent articles on the needs and challenges of visually impaired students in language learning, along with innovative approaches and technologies. The author proposes aligning the Common European Framework of Reference for Languages (CEFR) with Universal Design for Learning (UDL) principles to create inclusive environments. This chapter comes to an end by featuring projects and resources for educators to enhance their inclusive education skills and support visually impaired students.

4.2 Visual Impairment: Research Insights & Key Advocacy Organizations

Globally, at least 2.2 billion people have a near or distance vision impairment (WHO, 2023). The World Health Organization estimated that nearly 285 million people of all ages worldwide are visually impaired (Vishnuprasad *et al*., 2017). Based on the website of the European Blind Union (EBU, 2023), the number of individuals who are blind or have partial sight is estimated to exceed 30 million within Europe. Many studies have focused on different challenges that students with visual impairments might face when learning in all levels of education. Just to name a few, a study conducted in China examined the presenting visual acuity and prevalence of visual impairment among 9,070 college students (Cai *et al*., 2020), another study focused

on the population data for students with visual impairments in the United States (Schles, 2021), while other studies explored the self-esteem levels of students with visual impairments in Tanzania (Kapinga & Aloni, 2021), psychological and social adaptation of students with visual impairment in Jordan (AlTarawneh, 2022), assistive technology competencies of teachers of students with visual impairments (Zhou et al., 2011), challenges of digital literacy among students with visual impairments (Iqbal *et al*., 2022), and the behavioral and emotional profiles of students with visual impairments (Sims *et al*., 2021). These studies provide insights into various aspects related to students with visual impairments and the challenges they face during the learning process.

There are many organisations or associations at both global and European levels that advocate for the rights and well-being of blind and visually impaired individuals. Indicatively, the World Blind Union (WBU) in Toronto, Canada, which is devoted in empowering blind people, raising awareness, and influencing policies on a global scale; the International Council for Education of People with Visual Impairment (ICEVI) in Netherlands, which is a global organization focused on promoting education and rehabilitation for people with visual impairments and the European Blind Union (EBU) in Paris, France, which aims to promote equal opportunities, independence, and full participation in society for visually impaired individuals; It supports professionals working in the field of visual impairment and collaborates with various stakeholders to improve educational opportunities for visually impaired individuals. In addition, there are many national associations. A good example is the Royal National Institute of Blind People (RNIB), which is based in the United Kingdom. However, the RNIB is a leading organization providing support and services to blind and partially sighted individuals. Alike the international associations, the national associations offer practical advice, campaigns for equal rights, and work towards an inclusive society for people with visual impairments.

4.3 Classification of Visual Impairments

The International Classification of Diseases 11 (ICD-11), issued by the World Health Organization (WHO, 2018), classifies vision impairment into two groups: distance and near presenting vision impairment. The ICD, for which WHO has been responsible since 1948, serves as the global standard for health data, clinical documentation, and statistical aggregation. The 11th revision (ICD-11) was adopted by the 72nd World Health Assembly in May 2019 and came into effect on January 1, 2022. This latest revision includes updated classifications for visual impairment, reflecting advancements in the understanding and categorization of vision-related conditions.

Visual acuity is typically measured using a Snellen chart, which consists of rows of letters that decrease in size from top to bottom. The measurement is expressed as a fraction, where the numerator represents the testing distance (usually 6 meters or 20 feet), and the denominator represents the distance at which a person with normal vision can read the same line. Excellent or normal vision is considered to be 6/6 (in meters) or 20/20 (in feet). This means that an individual can clearly see at 6 meters (or 20 feet) what a person with normal vision can see at that distance. For example:

- 6/6 or 20/20: Excellent/normal vision
- 6/12 or 20/40: The individual needs to be at 6 meters to see what a person with normal vision can see at 12 meters

Distance vision impairment:

- Mild – visual acuity worse than 6/12 to 6/18 indicates that an individual can see at 6 meters what a person with normal vision can see at 12 to 18 meters.
- Moderate – visual acuity worse than 6/18 to 6/60 suggests that what an individual perceives at 6 meters, a person with normal vision would see at 18 to 60 meters.
- Severe – visual acuity worse than 6/60 to 3/60 implies significantly limited vision, where an individual's perception at 6 meters equates to normal vision at 60 meters or beyond.
- Blindness – visual acuity worse than 3/60 represents profound vision loss or complete lack of visual perception.

Near vision impairment:

- Near visual acuity worse than N6 or M.08 at 40cm. Impairment is classified as near visual acuity worse than N6 or M.08 at 40cm, indicating difficulty reading standard print at a typical reading distance.

According to the World Health Organization (WHO, 2023): "Vision impairment occurs when an eye condition affects the visual system and one or more of its vision functions. Vision impairment can be categorized as mild, moderate, severe, or blindness. Many people with vision impairment retain some degree of vision". These developments enable them to effectively utilize their remaining sight, leading to enhanced quality of life and improved overall well-being. According to the California Optometric Association (COA), visual impairments can be categorized into several distinct types based on their impact on visual function:

1. **Central Vision Loss**: This condition is characterized by a central blur or scotoma, while peripheral vision remains intact. It significantly impairs reading ability, facial recognition, and distance detail perception. However, mobility is generally preserved due to the retention of side vision.
2. **Peripheral Vision Loss**: Also known as "tunnel vision," this impairment is defined by the inability to perceive visual stimuli in the lateral, superior, or inferior visual fields. While central vision is maintained, allowing for direct forward sight, this condition can adversely affect mobility and, in severe cases, reduce reading speed due to the limited visual field.
3. **Blurred Vision**: This type of impairment results in a lack of focus for both near and distant objects, persisting even with optimal conventional refractive correction.
4. **Generalized Haze**: Individuals with this condition experience a pervasive sensation of film or glare across their entire visual field.
5. **Extreme Light Sensitivity**: This disorder is characterized by an oversensitivity to standard illumination levels, resulting in image washout and/or glare disability. Affected individuals may experience discomfort or pain from exposure to normal light levels.
6. **Night Blindness**: This condition manifests as an inability to see in low-light conditions, such as nighttime environments or dimly lit indoor spaces.

4.4 Inclusive Classrooms: Supporting Visually Impaired Students

Inclusion of students with visual impairments in mainstream classrooms is a multifaceted process that necessitates a commitment to presence, participation and achievement for all students. It is imperative to emphasize that inclusive education does not equate to simplifying the curriculum or lowering expectations. Rather, it is about fostering an environment where every student, including those with visual impairments, can thrive and achieve high standards.

Attitudinal and mindset shift: The first step towards inclusion is an attitudinal shift. Teachers must adopt a growth mindset, recognizing that diversity enriches the educational experience. Understanding that visual impairment exists on a continuum is crucial. Each visually impaired student will have a unique way of perceiving the world, and thus, teachers should prioritize getting to know the individual student over merely understanding the diagnosis. This approach ensures that the educational strategies employed are tailored to the child's specific needs, strengths, and preferences.

Preparing peers and promoting empathy: Preparation and planning are critical for successful inclusion. Before a visually impaired student joins the classroom, it is essential to prepare their peers. Educators should engage students in activities that promote empathy, respect, and cooperation rather than simply preaching these values. Emphasizing equality and mutual support helps prevent the development of learned helplessness among visually impaired students. Teachers could:

- Engage sighted students in activities that promote empathy, respect, and cooperation.
- Emphasize equality and mutual support to prevent the development of learned helplessness among visually impaired students.

Classroom Environment and Adaptations: Preparing the classroom involves thoughtful consideration of seating arrangements and ensuring the physical environment is navigable. Typically, a visually impaired student should be seated in the front to facilitate better auditory access to the teacher's instructions. However, it is important to respect the student's preference and avoid isolating them from their peers. Creating a safe and independent movement environment is also crucial. Consistent furniture arrangement and practicing new routes can significantly enhance the student's confidence and autonomy. Additionally, incorporating tactile materials and multisensory learning aids can make lessons more accessible and engaging for visually impaired students, while also benefiting their sighted peers.

Experiential Understanding and visual efficiency: Teachers can enhance their empathy and understanding by imagining or experiencing their classroom from the perspective of a visually impaired student. This exercise can reveal the extent to which visual information is relied upon and prompt the incorporation of auditory, tactile, and other sensory inputs into teaching. Such an approach not only aids visually impaired students but also enriches the learning experience for all students. Teachers could incorporate tactile materials and multisensory learning aids in lessons. This approach makes the classroom more accessible and engaging for visually impaired students and benefits sighted peers as well.Teachers should enhance the

visual efficiency with visual and technological adjustments:

- Experiment with different font sizes, colors, contrasts, and lighting.
- Provide access to large print or braille textbooks, screen magnifying programs, screen readers, and talking calculators.
- Simplify graphs and maps by removing unnecessary lines and using bold, high-contrast lines for essential information.
- Use tactile versions of graphs and maps, with labeled keys for easier interpretation.

Finally, successful inclusion requires collaboration with colleagues and specialists. A supportive team environment ensures that if challenges arise, there is a collective effort to address and overcome them. Engaging with orientation and mobility specialists, as well as other educational professionals, can provide valuable insights and strategies for effective inclusion. Inclusion of visually impaired students is an ongoing process that involves a combination of positive attitudes, careful planning, and collaborative effort. By adhering to principles of Universal Design educators can create an inclusive environment that promotes the presence, participation, and achievement of all students. This journey, though challenging, is ultimately rewarding and enhances the educational experience for everyone involved.

4.5 The Expanded Core Curriculum (ECC)

The Expanded Core Curriculum (ECC) is a specialized set of skills and knowledge areas designed to support students with visual impairments or blindness in several countries like USA, Canada, Australia. It complements the general education curriculum and addresses unique needs related to vision loss. It's a collection of content areas that teachers infuse in their core curriculum to teach visually impaired learners skills and knowledge that their sighted peers learn through observation.The ECC consists of nine key areas:

1. **<u>Compensatory or functional academic skills could be enhanced via:</u>**

   Teaching Braille and Technology:

   - Ensure proficiency in braille or access to technology such as word processors and screen readersTeach the braille cell structure consisting of six dots, allowing for over 163 combinations representing letters, punctuation, contractions, math symbols, and more.
   - Focus on pre-reading readiness skills, ensuring the development of upper limb and shoulder girdle muscles, which are crucial for correct reading and writing posture.

   Strengthening Muscles:

   - Engage students in activities to strengthen hands and fingers, such as squeezing toys, popping bubble wrap, and using elastic bands. These activities help prepare them for the mechanical strength required to use a braille machine.

   Developing Fine Motor Skills:

   - Improve fine motor skills through activities like sorting objects, stacking blocks, stringing beads, and tying knots. These exercises enhance tactile discrimination necessary for reading braille.

Building Sensory Efficiency:

- Use tactile graphics and tracing exercises to teach shape recognition and spatial awareness. Start with simple shapes and gradually move to more complex pictures.
- Teach students to use the cushion of their index fingers for reading, as this provides better tactile feedback than the fingertip.
- Regularly incorporate these tools into lessons to build familiarity and ease of use.
- Use tactile materials to help students identify objects and textures.
- Create hands-on activities that allow students to explore and understand concepts through touch.

Auditory Learning:

- Incorporate auditory comprehension exercises, such as listening to and summarizing recorded information or practicing mental arithmetic and spelling aloud.

Spatial Understanding:

- Engage students in physical activities involving spatial concepts, such as moving towards a noise stimulus or navigating an obstacle course.
- Use real-life objects and scenarios to teach concepts like distance, direction, height, and size.

Classroom and Personal Organization:

- Teach students to keep their workspace organized and materials easily accessible.
- Provide additional storage space for large braille books and other necessary equipment.
- Implement a classroom rule for neatness and order to help all students maintain an organized learning environment.

2. **Orientation and mobility skills:** To enhance orientation and mobility skills, educators can implement a variety of strategies. First, it is crucial to provide students with consistent and systematic instruction in the use of mobility aids, such as canes or guide dogs. Training should focus on proper techniques for using these aids, as well as understanding the sensory feedback they provide. This hands-on experience is vital for building confidence and competence in navigating different environments, whether in school, at home, or in the community. Additionally, educators should create opportunities for students to practice their orientation and mobility skills in real-world settings. This can include structured outings to familiar and unfamiliar locations, where students can apply their skills in a controlled yet dynamic environment. Such experiences not only reinforce their learning but also help to reduce anxiety associated with navigating new spaces.

3. **Social interaction skills**: To help students with visual impairments develop better social interaction skills, it's crucial to provide deliberate input to compensate for the incidental learning they miss. Educators should focus on teaching the unwritten social rules that sighted children learn passively, such as appropriate physical gestures, facial expressions, and body language in various social contexts. For example, explaining the nuances of shaking hands, which might be confusing for visually impaired students if their handshake is not reciprocated. Additionally, distinguishing between behaviors acceptable in public versus private, such as yawning or changing clothes, is essential. Teachers should foster an

understanding of social cues and contexts through supportive conversations and role-playing scenarios, helping visually impaired students navigate social interactions confidently. Furthermore, it's important to teach them to ask for and accept help when needed and to politely decline assistance when it's not necessary, reinforcing their sense of independence and self-worth. By building these skills thoughtfully and sensitively, educators can support visually impaired students in forming meaningful and fulfilling relationships with their peers.

4. **Independent living skills**: To enhance independent living skills, educators and specialists can adopt a multifaceted approach. Firstly, practical instruction in daily living activities is essential. This includes teaching students how to perform tasks such as cooking, cleaning, personal hygiene, and budgeting. By using tactile and auditory materials, educators can create an engaging learning environment that allows students to practice these skills safely. For instance, using textured labels on kitchen items can help visually impaired students identify ingredients, while auditory timers can assist them in managing cooking times.

5. **Recreation and leisure skills**: To support visually impaired students in enjoying recreation and leisure, it's crucial to incorporate a wide variety of activities into the curriculum. Physical fitness and sports are essential, but the focus should be on fun and social interaction rather than just health benefits. Adapted sports such as goalball, blind cricket, tandem cycling, swimming, and rowing can be included. For example, goalball is specifically designed for visually impaired learners, involving a ball with bells that players aim to throw into the opponents' net. Tandem cycling allows visually impaired students to ride with a sighted guide, promoting both physical fitness and social bonding. Non-sport activities are equally important. Encourage participation in clubs like environmental or gardening clubs, music bands, and drama groups. Adapted games such as braille chess, Scrabble, and card games with braille can be available for classroom use.In addition, introduce visually impaired students to accessible video games via websites like AudioGames and Games for the Blind, providing them with modern, engaging ways to enjoy leisure time.

6. **Career education**: One of the primary ways to enhance career education is through exposure to a wide range of career options. This can involve organizing job shadowing experiences, internships, and mentorship programs that connect students with professionals in various fields. Such experiences allow visually impaired students to gain firsthand knowledge of different occupations, helping them to identify their interests and strengths. Additionally, these opportunities can foster networking skills and build professional relationships that may be beneficial in their future job searches. Incorporating practical skills training into the curriculum is also essential for enhancing career education. This includes teaching students how to create resumes, prepare for job interviews, and develop essential workplace skills such as communication, teamwork, and problem-solving. Role-playing job interviews and providing constructive feedback can help students build confidence in their abilities to present themselves effectively to potential employers. Furthermore, educators should focus on teaching students how to utilize assistive technologies that can enhance their productivity and independence in the workplace,

such as screen readers, braille displays, and other adaptive tools.

7. **Use of assistive technology**: To effectively enhance the use of assistive technology, educators must first ensure that students are familiar with the various tools available to them. This includes providing comprehensive training on the use of devices such as screen readers, magnifiers, braille displays, and audio recording tools. By integrating these technologies into the curriculum from an early age, educators can help students develop proficiency and confidence in using them. For instance, teaching students how to navigate digital platforms with screen readers can significantly enhance their ability to access information and participate in classroom activities. Moreover, the ECC emphasizes the importance of individualized instruction when it comes to assistive technology. Each visually impaired student has unique needs and preferences, and educators should work closely with students to identify the tools that best suit their learning styles. This personalized approach can involve conducting assessments to determine the most effective technologies for each student, ensuring that they receive the support necessary to thrive academically.

8. **Sensory efficiency skills**: One of the primary ways to enhance sensory efficiency skills is through systematic instruction in the use of low vision devices and techniques. Many visually impaired students have some residual vision, and learning how to maximize the use of this vision can significantly improve their ability to access information and participate in daily activities. Educators should provide training on the proper use of magnifiers, telescopes, and other low vision aids, as well as teach strategies for enhancing visual efficiency, such as using high-contrast materials and adjusting lighting conditions. In addition to vision, the ECC also emphasizes the importance of developing auditory skills. Visually impaired students often rely heavily on their sense of hearing to gather information about their surroundings and communicate with others. Educators should provide instruction in sound localization, auditory discrimination, and auditory memory to help students effectively utilize their hearing. This may involve activities such as identifying the direction of sounds, discriminating between different environmental sounds, and remembering auditory sequences. Touch is another critical sense that visually impaired students must learn to use efficiently. The ECC includes instruction in tactile discrimination, texture identification, and object exploration to help students gather information through touch. Educators should provide opportunities for students to explore a variety of materials and objects, encouraging them to use their sense of touch to identify shapes, textures, and spatial relationships. This can be particularly important for students who rely on braille for reading and writing.

9. **Self-determination**: To effectively enhance self-determination skills of their visually impaired students, educators must first create an environment that encourages autonomy and decision-making. This can be achieved by involving students in the planning of their learning experiences and allowing them to express their preferences regarding the methods and materials used in their education. For instance, educators can provide choices in assignments, projects, and even classroom seating arrangements, which helps students feel more in control of their learning process. By fostering a sense of ownership over their education, students are more likely to develop confidence in their abilities to make decisions. Another

important strategy for enhancing self-determination is teaching goal-setting and problem-solving skills. Educators can guide students in identifying their personal and academic goals, breaking them down into manageable steps, and developing action plans to achieve them. This process not only helps students clarify their aspirations but also instills a sense of purpose and motivation. Additionally, educators should encourage students to reflect on their progress and adjust their goals as needed, promoting a growth mindset and resilience in the face of challenges.

Self-advocacy is a crucial aspect of self-determination, and educators should provide explicit instruction on how to advocate for oneself in various situations. This includes teaching students how to communicate their needs effectively, understand their rights, and seek accommodations or support when necessary. Role-playing scenarios can be an effective way to practice these skills, allowing students to gain confidence in expressing their preferences and negotiating for their needs, whether in educational settings or future workplaces. Collaboration with families and community resources is also essential in enhancing self-determination skills. Educators should engage families in discussions about their children's goals and aspirations, helping to create a supportive network that reinforces the importance of self-determination. Furthermore, connecting students with community organizations that provide mentorship, vocational training, or life skills programs can offer valuable resources and experiences that promote independence.

A tenth area that can be added relates to the haptic sense, a key component of the sense of touch, that goes beyond basic physical sensations like heat, cold, or pain. It involves the ability to recognize and interpret qualities and characteristics of objects through touch, such as texture, shape, size, weight, and temperature. This sense is essential for understanding and interacting with the physical world, especially for individuals with visual impairments who rely on it to compensate for the lack of visual information. For visually impaired individuals, a strong haptic sense is crucial for activities like reading braille, navigating, and manipulating objects. It enables them to distinguish between different braille characters by feeling the raised dots and to understand spatial orientation, which is vital for tasks like moving through spaces or using tools. The haptic sense also aids in learning by allowing them to engage with educational materials through tactile graphics and models, thus comprehending concepts typically conveyed visually. To enhance the haptic sense in visually impaired children, activities that encourage tactile exploration and fine motor skills are beneficial. These can include manipulating small objects, using modeling clay, and practicing braille reading and writing. Such activities help develop finger sensitivity and coordination, enabling visually impaired individuals to interact confidently with their environment and perform daily tasks with greater independence.

4.6 Curriculum Differentiation for Visually Impaired Students: Practical Tips

Creating an inclusive learning environment for visually impaired students requires thoughtful curriculum differentiation. This process ensures that all students have equal access to education by adapting various aspects of the classroom and instructional methods. The four key stages of curriculum differentiation, i.e. classroom management, content, teaching methodology, and assessment, provide a comprehensive framework for making the curriculum accessible. The following part provides some tips for teachers for

differentiating the curriculum to students with visual impairments:

1. **Classroom management**:
   - Seating arrangements: Position students where lighting is optimal and glare is minimized. For example, seat them in the front or near windows with proper blinds.
   - Tactile markers: Use tactile markers on desks, chairs, and paths to help students navigate independently.
   - Organization: Maintain a clutter-free classroom, ensure pathways are clear, and use tactile floor mats to indicate safe walking areas.
   - Workspace and storage: Provide additional workspace and storage for braille materials and assistive devices, like a dedicated desk area for a brailler and shelves for large print books.
   - Safety measures: Teach students to keep chairs pushed in and materials off the floor to prevent tripping hazards. Ensure doors are either fully open or closed.
2. **Content differentiation:**
   - Tactile and sensory experiences: Use real-life objects to teach abstract concepts, such as using physical models for geometry or textured maps for geography. For instance, use a tactile globe for geography lessons.
   - Simplified visual content: Convert visual materials like graphs and pictures into tactile versions. For example, use raised line drawings to depict graphs and charts.
   - Expanded core curriculum: Integrate skills like orientation and mobility by having students practice moving around the classroom or school using a cane. Teach independent living skills such as organizing their workspace or using adaptive technology.
   - Braille and large print: Provide braille versions of texts and large print materials tailored to individual needs. For example, convert lesson handouts into braille or enlarge text on worksheets.
3. **Teaching methodology:**
   - Extended time: Allow more time for tasks that require tactile exploration or braille reading. For instance, give students extra time to complete reading assignments or exams.
   - Accessible formats: Use braille, large print, and audio materials. Provide textbooks in braille or digital formats accessible via screen readers.
   - Varied presentation methods: Simplify diagrams, use real objects instead of pictures, and offer written descriptions. For example, replace a visual chart with a tactile version and provide an audio description.
   - Multisensory learning: Incorporate activities that engage multiple senses, such as using textured art materials for art projects or playing audio recordings for language lessons.
   - Lesson organization: Organize lessons to include tactile and auditory elements. For example, use a tactile calendar to teach days of the week or a braille clock for learning to tell time.
4. **Assessment:**
   - Extended time: Provide additional time for tests and assignments to accommodate the slower pace of braille reading or tactile exploration.
   - Braille and enlarged print exam papers: Offer exam papers in braille or enlarged print formats. For

example, provide a math test in both braille and large print

- Oral exams and assistive technology: Use oral exams or allow the use of screen readers and other assistive technologies. For instance, students can use a digital recorder to answer essay questions verbally.
- Alternative assessments: Design assessments that allow for different modes of response, such as written, oral, or tactile. For example, accept a recorded presentation or a tactile model as an alternative to a written report.

By adopting these methods of classroom organisation and instruction, i.e. seating arrangements, tactile markers, organization, extended time, accessible formats, varied presentation methods, multisensory learning, and alternative assessment, teachers can effectively differentiate the curriculum and create an inclusive learning environment for visually impaired students.

4.7 Visually Impaired Students & Learning

Visual impairments can significantly impact the learning process for students in several key ways:

1. **Reduced incidental learning**: Students with visual impairments miss out on much of the incidental learning that sighted students acquire simply by observing their environment. This requires more direct instruction for students with visual disabilities (Corn & Erin, 2010; D'Andrea & Siu, 2015).
2. **Challenges with part-to-whole learning**: While sighted students can quickly grasp the whole picture, students with visual impairments often have to learn about individual parts before putting them together, which is a slower process (Hatlen, 1996; D'Andrea & Siu, 2015). In addition, visual impairments can hinder learning by limiting concept development when interacting with educational materials. Students with visual impairments may face challenges in grasping information presented visually, impacting their overall learning process. The inability to access visual content can impede their understanding and engagement with learning materials that heavily rely on images and visual aids. Therefore, visual impairments can significantly affect a student's ability to learn effectively, highlighting the importance of alternative learning approaches such as comic-based learning to cater to the unique needs of students with visual impairments (Chamath et al, 2021).
3. **Difficulty accessing educational materials**: Textbooks, handouts, and other standard educational materials are often inaccessible for students with visual impairments, requiring alternative formats like Braille, audio, or enlarged print (Corn & Erin, 2010; D'Andrea & Siu, 2015).
4. **Impact on developmental areas**: Visual impairments can negatively affect social, motor, language, and cognitive development if not properly addressed through specialized instruction and accommodations (Hatlen, 1996; D'Andrea & Siu, 2015).
5. **Increased time requirements**: Tasks like reading, note-taking, and navigating the school environment often take significantly longer for students with visual disabilities, causing them to fall behind their peers (Corn & Erin, 2010; D'Andrea & Siu, 2015).

4.8 Visually Impaired Students & Foreign Language Learning

This section presents five articles that put a spotlight on the needs and challenges faced by visually impaired students in language learning. The first article by Cárdenas and Inga (2021) explores inclusive practices for visually impaired students in learning English in a polytechnic school at the University of Ecuador, highlighting the use of information and communication technology (ICT) and typhlo-technical tools. The second article by Ahmetovic *et al*. (2021) presents the development of WordMelodies, a mobile app designed to support literacy skills in English and Italian for visually impaired children. Efstathiou and Polichronopoulou (2015) investigate the materials and technological support used by EFL teachers in Greece working with visually impaired students across grades and CEFR levels, emphasizing the need for specialized teaching materials and targeted training. Al Siyabi *et al*. (2022) discuss the impact of assistive technology on English language teaching practices for visually impaired students, emphasizing the importance of professional development and management in integrating technology effectively. Lastly, Pintado Gutiérrez and Torralba examined the use of audio description tasks in foreign language teaching to develop mediation skills and raise accessibility awareness. It involved 21 university language students in Ireland completing a series of 5 audio description-related activities. Students alternated roles as "blind" and "non-blind" participants, practising creating and assessing audio descriptions in both their native language and Spanish. Together, these articles shed light on the challenges and innovative approaches in providing better and more inclusive learning strategies for visually impaired students in language learning contexts. All these articles relate to assistive technology or digitally enhanced practices. It should be noted that these articles are not exhaustive in the field, and they were chosen in an attempt to provide different perspectives and thematic fields in language learning to students with visual impairments.

To begin with, the article by Cárdenas, J. & Inga, E. (2021) addresses the challenges faced by visually impaired students in learning English and emphasizes the necessity of implementing new methodological approaches in learning English as a foreign language. The study presents a detailed account of a methodological experience conducted at the Salesian Polytechnic University of Ecuador, focusing on inclusive practices based on the utilization of information and communication technology (ICT) and typhlo- technical tools for students with visual impairments. The research employs a combination of bibliometric analysis and qualitative assessments to evaluate the effectiveness of technological strategies employed by teachers and their impact on the educational inclusion of visually impaired students. Figure 1 below summarizes the concept of educational inclusion for visually impaired students (VISs) in traditional classrooms, emphasizing the direct teacher-Visually Impaired Students (VIS) relationship and the practical nature of the inclusion process.

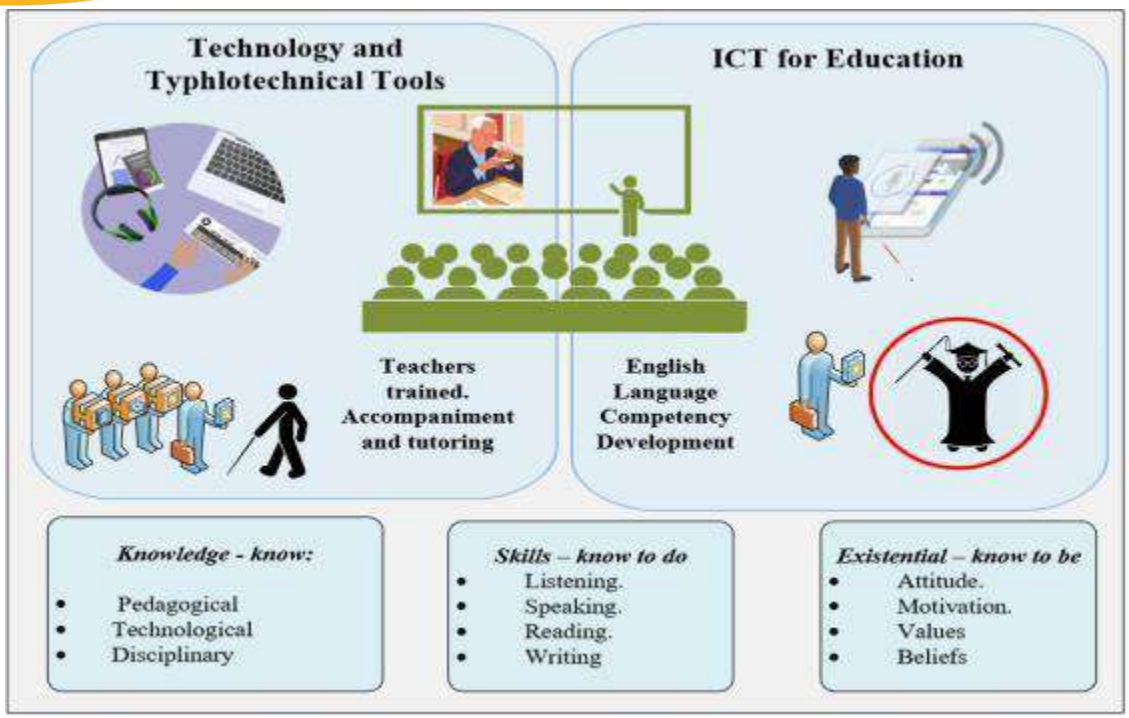

Figure 1: Concept of inclusive education for VIS in English Language Learning. Source: Cárdenas, J. & Inga, E. (2021)

The findings underscore the crucial role of technology integration and the adaptation of learning materials to cater to the unique needs of visually impaired students. Various technological tools, including JAWS software, NVDA, and OrCam MyEye, are discussed as means to enhance accessibility and reduce barriers encountered during the process of learning the English language for visually impaired students. Figure 2 below presents a roadmap for developing an inclusive environment in the English language classroom for inclusion of students with visual impairments. This diagram outlines a step-by-step process for teachers and students, integrating various technologies and strategies to create an inclusive learning environment. The description of the steps:

1. **Diagnosis**: The process begins with an assessment, pre-evaluation of the student's current English proficiency level and specific visual impairment needs.
2. **Adaptation**: Based on the diagnosis, learning materials and methods are adapted to suit the student's needs and the learning environment (face to face or online).
3. **Implementation**: The adapted materials and methods are implemented.
4. **Use of ICT**: Information and Communication Technologies are integrated into the learning process. This includes:
   - JAWS (Job Access With Speech): A screen reader for Windows
   - NVDA (NonVisual Desktop Access): A free, open-source screen reader
   - OrCam MyEye: A wearable device that assists visually impaired people by vocally relaying visual information
   - AMS (Audio Management System): A tool for managing and delivering audio content
5. **Practice**: Students engage in various exercises and activities to practice their English skills.

6. **Evaluation**: Regular assessments are conducted to monitor progress and identify areas for improvement.
7. **Feedback**: Based on the evaluation, constructive feedback is provided to the student.
8. **Reinforcement**: Additional support and practice are provided in areas where the student needs improvement.

This roadmap creates a cyclical process, with each step informing the next. The use of assistive technologies is emphasized throughout, particularly in the 'Use of ICT' step, showcasing how these tools can be integrated to support SwVI in their English language learning journey.

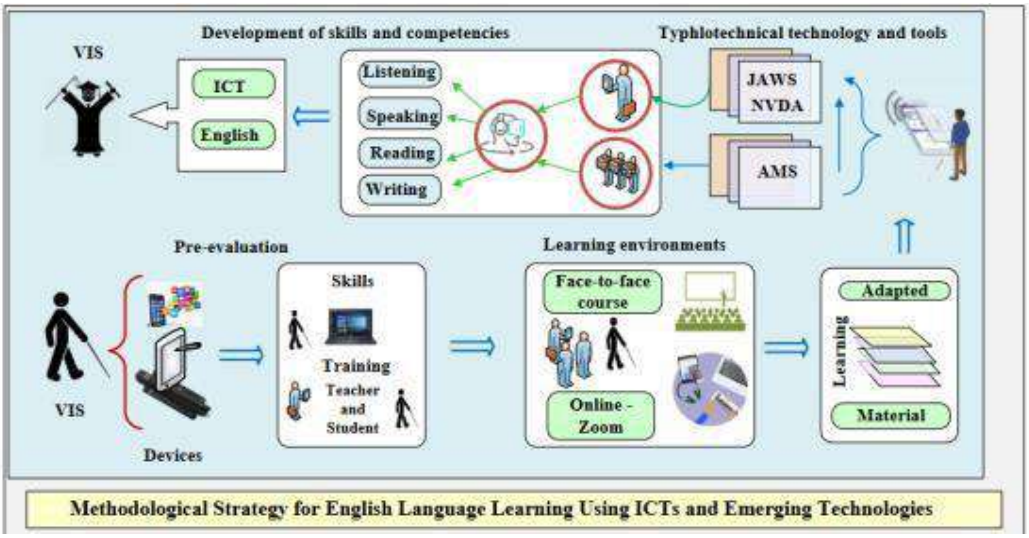

Figure 2: Outline of the roadmap for learning English for VIS. Source: Cárdenas, J. & Inga, E. (2021)

Figure 3 below illustrates a methodological strategy in English language learning that aims to foster meaningful learning by incorporating adapted didactic materials tailored to the needs of visually impaired students (VISs), in conjunction with the use of ICT tools. The diagram presents a circular flow of interconnected elements, guiding teachers through an inclusive approach to English language instruction. At the center of the circle is "Meaningful Learning," emphasizing that all strategies should converge on this goal. Surrounding this core are six key components:

1. **Didactic Material**: This involves adapting learning materials to be accessible for VIS, such as using braille, large print, or tactile graphics.
2. **Activities**: Suggests implementing a variety of engaging, multi-sensory activities that cater to different learning styles and abilities.
3. **Methodology**: Emphasizes using appropriate teaching methods tailored for VIS, potentially including auditory-based approaches or hands-on learning experiences.
4. **ICT Tools**: Highlights the importance of incorporating assistive technologies and digital tools that can aid VIS in accessing and interacting with learning content.
5. **Evaluation**: Stresses the need for appropriate assessment methods that fairly evaluate the progress of VIS without being hindered by their visual impairment.
6. **Feedback**: Underscores the importance of providing regular, constructive feedback to support student learning and improvement.

These components are interconnected by arrows, indicating that they should be implemented in a holistic, cyclical manner. The outer ring of the circle contains various English language skills and areas (Listening, Speaking, Reading, Writing, Grammar, and Vocabulary), suggesting that this methodological approach can be applied across all aspects of English language learning.

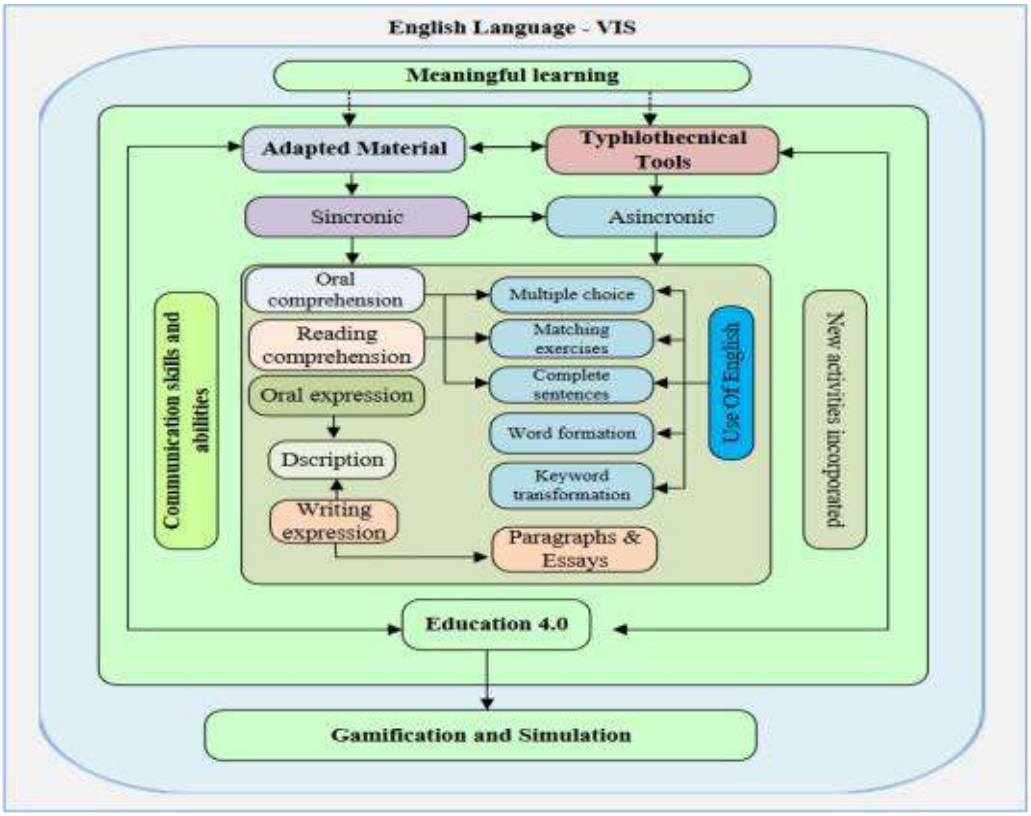

Figure 3: Methodological strategy for teaching English to VIS. Source: Cárdenas, J. & Inga, E. (2021)

In conclusion, the article underscores the necessity for teachers to possess a solid understanding of emerging technologies, adapt learning materials to suit the needs of SwVI, and establish an inclusive learning environment that fosters their educational inclusion and empowerment in the language classroom.

The second article written by Ahmetovic *et al*. (2021) discusses the development of WordMelodies, a mobile application designed to support children with visual impairments or blindness (VIB) in developing literacy skills in English and in Italian. The application aims to address the lack of accessible digital teaching materials for children with VIB, especially in remote learning situations. The first iteration of the application included nine exercise types based on feedback from experts in accessibility and education. The application used audio-icons and interactive elements accessible by both hearing and sight to ensure inclusiveness. The second iteration focused on increasing exercise variety, supporting application localization, providing in- application tutorials, and implementing remote logging. The application was evaluated by domain experts and adult participants with VIB, leading to improvements in interface design, color contrast, and translations. Usage data showed the application's popularity among both English and Italian-speaking users, and the inclusion of tutorials and exercises for complex touchscreen interactions was found to be valuable.

Based on their article, WorldMelodies provides the following features to language learning for students who are visually impaired:

1. **Audio-Icons for Vocabulary Learning**: WorldMelodies uses audio-icons to represent vocabulary words. This feature allows visually impaired students to identify and learn new words through sound. Each word is associated with a unique and memorable audio-icon, making it easier for students to recall and understand the vocabulary.
2. **Interactive Exercises**: The app offers interactive exercises that focus on various language learning skills such as word association, sentence formation, and grammar. The exercises are designed to be accessible to visually impaired students, and they can engage with the content through audio feedback and touch-based interactions.
3. **Screen Reader Compatibility**: WorldMelodies is designed to be compatible with screen readers commonly used by visually impaired individuals. This compatibility ensures that students can access the app's content and interface effectively, providing them with an equal learning experience.
4. **Localization in Different Languages**: The app supports multiple languages, allowing students to learn languages beyond their native tongue.
5. **Inclusive Learning Environment**: WorldMelodies fosters an inclusive learning environment by enabling visually impaired students to learn alongside their sighted peers. This integration promotes social inclusion and helps in breaking down barriers between students with and without visual impairments.
6. **Engaging Edutainment Approach**: The app incorporates an edutainment approach, combining education with entertainment.
7. **Customizability and Scalability**: Educators and instructors can customize the app's exercises to cater to the specific needs and learning goals of their visually impaired students. The platform also allows for the addition of new exercises, ensuring scalability and adaptability to different teaching requirements.
8. **Progress Tracking and Feedback**: WorldMelodies tracks students' progress in language learning and provides constructive feedback. This feature helps visually impaired students monitor their improvements and areas that require further attention.

In addition, WordMelodies was engineered with a universal design approach, which means it improves learning outcomes for all students, regardless of their abilities or disabilities. By considering the needs of diverse learners from the beginning, WordMelodies claims that it can benefit a wide range of users, promoting inclusive education. Overall, WorldMelodies claims to provide visually impaired students with a comprehensive and inclusive language learning experience. Through its audio-based approach, interactive exercises, and accessibility features, the app claims to empower students with visual impairments to develop their language skills effectively and enjoyably.

In their article *Teaching English as a foreign language to visually impaired students: Teaching materials used by teachers of English* (2015), Efstathiou & Polichronopoulou investigate the materials and technological support used by English teachers working with visually impaired students. The study also examined how the teachers' qualifications and experience influenced their choice of teaching materials and technological support. The research involved 80 English as a Foreign Language (EFL) teachers who were currently working

with visually impaired students in Greece, and 10 of them were selected for semi-structured interviews. The findings revealed that many teachers lacked knowledge about various teaching materials specifically designed for visually impaired students. The survey indicated that the majority of EFL teachers were unfamiliar with materials such as PIAF images, Thermoform images, magnification software, software adapted for visually impaired students, telescopic aids, and tactile construction sets, among others. Most teachers rely heavily on audio materials and CD players, with limited use of Braille or tactile resources. The teachers also faced difficulties in developing or obtaining these materials. The interview data supported the survey results, showing that most teachers did not use specialized materials but relied on recorded audio material, large print material, and Braille material. The teachers who used more varied materials typically worked in smaller groups or on a one-on-one basis and had more educational experience and training. The discussion highlighted the need for specialized teaching materials, the challenges faced by teachers in obtaining or adapting materials, and the lack of awareness and training. The findings emphasized the passive role of visually impaired students in accessing materials and the importance of involving the sense of touch in the learning process. The results aligned with previous research that identified difficulties in modifying and adapting materials for visually impaired students and emphasized the need for accessible materials. The study highlights a significant gap in teacher training and support for adapting materials to meet the needs of visually impaired learners. It also points out the difficulties teachers face in implementing modern, visual- based language teaching approaches with these students. The researchers conclude that there is a pressing need for better accessibility to teaching materials, more specialized training for teachers, and greater support in adapting resources for visually impaired students in EFL contexts.

In their article *Assistive Technology in the English Language Classroom: Reality and Perspectives*, Al Siyabi *et al*. (2022) investigate the impact of assistive technology on English language teaching practices and inclusive education at Sultan Qaboos University's Centre for Preparatory Studies in Oman. The research team conducted semi-structured interviews with various participants, including decision makers, special needs coordinators, English language teachers, and lab technicians. The interviews sought to gather insights into the participants' experiences, practices, and perceptions regarding the integration of assistive technology for visually impaired students in the English language classroom. Thematic analysis was employed to analyze the qualitative data obtained from the interviews. The main themes identified are technology, professional development, management, and teaching and learning. Based on the findings, assistive technology helps students integrate into the classroom, become more independent, and improve their functional ability. Different types of technology, such as magnifiers, audio materials, and screen readers are provided to visually impaired students. However, there are limitations in terms of the fear of the unknown and financial resources. It was revealed that professional development is crucial as for teachers and technical staff to familiarize themselves with the support and accommodations for visually impaired students. The importance of Management was pointed out. Integrating technology and managing its use in the English language teaching context can be time-consuming. Clarity of the process, strategic planning, leadership qualities, effective communication, and a supportive physical environment are essential. Finally, the teaching and learning aspect was pointed out. Students with visual impairments have individual differences in language

proficiency, reading Braille, and attitudes towards learning. Access to course materials and copyright considerations are crucial. Availability of laptops with installed screen readers and textbooks in Braille is important. The study concludes with the assertion that foreign language learning process is complex, involving the development of auditory, visual, and mechanical skills. Difficulties in any of these areas can pose challenges for students in acquiring the language. Obstacles in creating inclusive learning environments that address students' disabilities can impede their learning experience, leading to inefficiencies and discouragement. The perceptions of decision makers, teachers, and technicians regarding inclusive pedagogy for visually impaired students also impact the quality of the learning and teaching experience. Integrating assistive technology is an essential aspect of creating an inclusive environment that meets students' needs, provides support, engagement, and fosters academic success.

The fifth article *New landscapes in higher education: audio description as a multilayered task in FL teaching* was written by Gutiérrez and Torralba (2022). The study explores the concept of mediation and its role in language education, particularly in the context of foreign language teaching and learning. Mediation is defined as a communication process that enables individuals who are unable to directly communicate with each other to understand and convey meaning. The Common European Framework of Reference for Languages (CEFR, Council of Europe 2001) recognizes mediation as one of the four language activities alongside reception, production, and interaction. The CEFR Companion Volume (2020) provides detailed descriptors of mediation and its importance in developing learners' communicative competence. The study also explores the connection between foreign language teaching, translation, and mediation. It suggests that mediation provides a space for maximizing the pedagogical value of translation in the language learning curriculum. Translation competence, which involves transfer skills necessary for effective meaning transfer, plays a crucial role in mediation and can be integrated into language education. The study specifically focuses on Audio Description (AD) as a form of audio-visual translation that can enhance mediation skills in foreign language learning. The pedagogic intervention involves engaging students in hands-on experience with multimedia translation and encouraging them to reflect on the barriers and accessibility challenges faced by individuals who are blind or visually impaired. This study explored the use of audio description (AD) tasks as a mediating activity in foreign language teaching and learning. It involved 21 final-year university students in Ireland studying languages and translation, with 3-7 years of formal Spanish education. The research employed a qualitative case study methodology, featuring a sequence of 5 pedagogical tasks related to AD. Data was collected through student reflections in booklets and analyzed using N-Vivo software to identify themes. The module focused on advanced oral skills in Spanish at CEFR B2 level. While one blind person from the National Council for the Blind in Ireland participated in an introductory hands-on task to help students understand AD needs, there were no blind students among the regular participants. Instead, sighted students alternated roles as "blind" (BR) and "non-blind" (NBR) participants in various tasks, with BR students assessing AD provided by NBR peers, and NBR students practicing creating AD for BR peers. The study aimed to develop mediation skills and raise awareness about accessibility among sighted language students, rather than specifically supporting foreign language learning for blind students. However, the authors suggest that their framework and tasks could potentially be adapted for various learning contexts,

including those involving visually impaired learners.

To conclude, there is limited information available regarding the specific percentages of students with visual impairments learning foreign languages. Research using psychometric tests has shown that the mental development of visually impaired children is identical to that of sighted children, as long as they receive appropriate education concurrently (Claudine, 1976 cited in Nikolic, 1987: 63). This suggests that blindness does not hinder linguistic and verbal development. The primary factor contributing to the lack of success in foreign language learning for visually impaired individuals may be the insufficient support and encouragement provided by their environment (Pawlak & Jedynak, 2011). Research suggests that students with visual impairments (VI) do face unique challenges in learning foreign languages. These challenges include the need for accessible teaching strategies, techniques, and resources (Belova, 2017), as well as the influence of external factors on the learning experience (Nagar & Krisi, 2022). Teachers who work with visually impaired students and English language learners may also feel unqualified (Topor & Rosenblum, 2013). Additionally, there is evidence that learning a foreign language as a second language poses a greater challenge for visually impaired students (Cárdenas & Inga, 2021). Learners with visual impairments encounter various obstacles when acquiring foreign languages. A significant hurdle arises from the difficulty in accessing and utilizing visual learning materials, including textbooks, maps, and charts, which are commonly employed in language instruction (Belova, 2017; Cárdenas & Inga, 2021). Visualizing abstract concepts and acquiring visual vocabulary also pose considerable challenges (Belova, 2017; Zahra *et al*., 2022). While there is a general understanding of the difficulties faced by visually impaired students in learning foreign languages, specific percentages are not mentioned in the available references. Further research may be necessary to determine the exact percentages of visually impaired students engaged in foreign language learning.

Conventional wisdom suggests that blind individuals or individuals with severe visual impairment develop their other senses to compensate for their lack of vision, and research has explored the extent and nature of this phenomenon. One crucial variable in these studies is the age at which individuals became blind. Those who are congenitally blind or lost their sight early in life tend to exhibit a greater degree of enhanced sensory abilities compared to those who became blind later in life (Cattaneo & Vecchi, 2011). Regardless of the degree of enhancement, research indicates that vision plays a facilitative role in integrating information from other senses to form mental representations that contribute to our understanding (Röder et al., 2008). In the absence of vision, early-blind individuals demonstrate enhanced aural semantic processing, including the ability to comprehend rapid synthetic speech (Röder *et al*., 2010). Furthermore, studies have shown an enhanced sense of touch or tactile acuity among individuals who are blind from an early age (Forster *et al*., 2007).

Students with visual impairments face specific challenges in learning foreign languages. One challenge is the inadequate modifications of instruction, which can hinder their learning progress (Susanto & Nanda, 2020). Lack of information access opportunities and difficulties in comprehending pronunciation and spelling are also common problems for visually impaired individuals learning a foreign language. Furthermore, the

teaching of foreign languages to students with visual impairments may require adaptations and inclusive strategies to ensure accessibility and effective learning (Belova, 2017). Access to appropriate teaching materials and resources is also crucial for visually impaired students (Cárdenas & Inga, 2021). Additionally, teachers may face difficulties in addressing behavioral issues, maintaining attention, and providing sufficient motivation for visually impaired students (Zahra et *al*., 2022). The challenges faced by learners with visual impairments in language learning can be summarized as follows:

1. **Integration and inclusion challenges**: The integration of learners with visual impairments into mainstream schools is often met with diverse opinions and obstacles (Ralejoe, 2021). Inclusive efforts must address the specific needs of visually impaired students and ensure adequate support, acceptance and empowerment within the learning environment (Cain and Fanshawe 2019a, 2019b).

2. **Limited Availability of learning resources**: Students who are blind or visually impaired encounter challenges throughout their language learning journey, such as accessing and utilizing visual materials, visualizing concepts, and acquiring vocabulary with visual references (Belova, 2017). Visually impaired learners often face hurdles due to the scarcity of suitable learning materials and resources. The provision of accessible formats, such as braille or audio materials, can significantly enhance their language learning experience. Language instructors should employ inclusive teaching strategies and activities that benefit all students, including those with visual impairments (Belova, 2017).

3. **Inadequate expertise of foreign language teachers in assisting visually impaired students:** In order to support foreign language acquisition of individuals with visual impairments (VISs), it is necessary to integrate new instructional approaches into the language teaching and learning process (Kocyigit, et Artar, 2015). This circumstance presents novel obstacles and demands for educators, as they must find ways to motivate and engage students who do not have visual disabilities, along with those that have in order to make their language classroom inclusive. Özer & Cabaroglu (2018) conducted a qualitative study that explores the challenges faced by foreign language teachers in teaching vocabulary to visually impaired English as a foreign language (EFL) learners. The study focuses on two EFL teachers working with visually impaired students in Turkey. The findings shed light on the inadequate expertise of foreign language teachers in effectively assisting visually impaired students in learning a foreign language.

4. Adapting to new learning modalities: The COVID-19 pandemic has introduced additional challenges for visually impaired learners in adapting to novel learning modalities, while also navigating personal struggles and insufficient resources. Online learning is much more difficult for students with visual impairments. Here are some reasons why it was more difficult for them:

i. **Accessible materials**: Online learning heavily relies on digital materials, such as text, images, videos, and interactive content. However, students with visual impairments faced difficulties accessing these materials in an accessible format. The lack of proper accommodations, such as alternative text descriptions for images or closed captions for videos, made it challenging for visually impaired students to comprehend the content.
ii. **Visual engagement**: Many online learning platforms and tools heavily rely on visual interfaces, which

can present obstacles for students with visual impairments. Navigating complex user interfaces, accessing menus, buttons, and interactive elements, and following visual cues or instructions became more challenging for visually impaired students.

iii. **Limited interaction and feedback**: Online learning often reduces opportunities for direct and immediate interaction with teachers and peers. For students with visual impairments, the absence of visual cues, nonverbal communication, and real-time feedback made it more difficult to engage in discussions, ask questions, and receive immediate assistance or clarification.

iv. **Physical and technical support**: Students with visual impairments may require additional physical and technical support to access and utilize online learning platforms. They might need assistive technologies, such as screen readers or magnification software, along with appropriate devices and internet connectivity. The lack of access to these resources or inadequate technical support further exacerbated the challenges faced by visually impaired students.

v. **Collaborative learning**: Online learning environments sometimes provide limited collaborative activities and group work, which are beneficial for language learning and skill development. Students with visual impairments may have encountered difficulties in participating effectively in group discussions, collaborative projects, or shared documents due to the nature of online platforms (Cain & Fanshawe, 2021).

vi. **Lack of personalized instruction**: Individualized instruction and support are crucial for students with visual impairments. However, online learning often presented challenges in providing personalized instruction tailored to the specific needs of visually impaired students (Cain & Fanshawe, 2021). The absence of in-person support and the difficulty in replicating certain tactile or hands-on learning experiences online made it more challenging to meet their unique learning requirements.

4.9 Language Instruction Practices for Visually Impaired Students

Differentiated instruction is required for all four macro-skills in language learning: listening, speaking, reading, and writing. According to Lewin-Jones and Hodgson (2004), even speaking activities require specific instruction for blind students, as they may not naturally understand how to position themselves in relation to their classmates during speaking tasks. It is also important to educate sighted classmates on how to support their visually impaired peers (Lewin-Jones & Hodgson, 2004). Additionally, Conroy (1999) suggests that connecting vocabulary and grammar concepts with movement can be beneficial for blind students. The use of audio and visual aids, such as authentic English videos, has been found to have positive effects on enhancing listening and speaking skills in English as a foreign language learners (Wang, 2014). Guinan (1997) argues that braille literacy in the student's first language (L1) is crucial for learning a second language (L2), along with the use of text-reading software and email communication for visually impaired students who struggle with braille reading (Malinovská & Ludíková, 2017). According to Guinan (1997), a combination of strong L1 communication skills, braille literacy, and access to assistive technologies lays the groundwork for L2 language learning for visually impaired individuals. Below some research-based instruction practices to engage students with visual impairments in language learning are presented. In particular:

1. **Multisensory approach**: Literature evidences that blind students and students with visual impairments learn through touch (Hilton *et al*., 2012; Pritchard & Lamb, 2012) Multiple senses, such as touch, hearing, and kinesthetic could be introduced to the language classroom as to facilitate language learning. Tactile materials, manipulatives, and real-life objects can provide a tactile experience of vocabulary and language structures to learners.

2. **Braille Instruction**: For learners who read Braille, Braille materials and instruction are essential (Guinan, 1997). The language teacher should offer opportunities for practicing reading, writing, and comprehending Braille texts related to language learning. Ideally, the language teacher should have a good knowledge in braille, so if a student faces a challenge, the teacher could offer his/her support.

3. **Auditory input**: Recordings, audio materials, and spoken language could help learners with visual impairments to learn a foreign language. Clear and descriptive verbal explanations of concepts, vocabulary, and grammar rules can empower their language learning trajectory (Cain & Fanshawe 2019a).

4. **Assistive technology**: Assistive technologies, such as screen readers, speech-to-text software, and magnification tools, can enhance accessibility and support language learning for visually impaired students.

5. **Adapted materials**: Adaptation of learning materials to make them accessible for visually impaired learners. This includes providing alternative formats, such as digital texts with proper accessibility features, large print materials, tactile graphics, or audio descriptions.

6. **Collaborative learning**: Encouragement of collaborative activities that promote interaction and communication among learners. Group discussions, pair work, and cooperative projects can enhance language skills while fostering social interaction and peer support. Cooperative learning models, such as the talking chips technique, have also been successful in improving oral language skills for students with visual impairments (Samathayakul & Thamaduangsri, 2022).

7. **Inclusive instructional techniques**: Implementation of inclusive instructional techniques that benefit all learners, including those with visual impairments (Cain & Fanshawe, 2019b). These strategies may include explicit instruction, modeling, scaffolding, and differentiated activities that cater to individual learning needs.

8. **Clear structure and organization**: Clear structure and organization in lessons, assignments, and materials is important for students with visual impairments. Clear and concrete objectives, steps, and expectations help visually impaired learners navigate the learning content effectively.

9. **Sensory contextualization**: Making connections among language learning and real-life contexts and experiences. The use of sensory cues, descriptive language, and vivid examples help visually impaired learners to form meaningful associations and understand language concepts.

10. **Individualized support**: Recognition of the unique learning needs of each visually impaired learner and provision of individualized support. It is essential to provide instruction to normally sighted

classmates on how to offer support to their visually impaired peers (Lewin-Jones & Hodgson, 2004). Tailoring instruction, accommodations, and assessment methods to address their specific requirements and foster their language learning progress (Al Siyabi *et al*., 2022).

4.10 Assistive Technology

Guinan (1997) observed that vision teachers and language teachers undergo distinct training, each with its unique skill sets. Traditionally, language teachers do not receive any targeted training neither know how to utilize multi-modal sensory information or assistive technology (Efstathiou & Polichronopoulou, 2015). The training of teachers is essential for effectively incorporating the diverse range of new instructional technology methods when teaching visually impaired students (Kamei-Hannan *et al*., 2012; Zhou *et al*., 2012, Argyropoulos *et al*., 2008). Practical tips for teachers include following specific teaching methods and utilizing assistive technology to maximize the performance of visually impaired students in the language classroom (Khan & Mahmood, 2022; Cárdenas & Inga, 2021). Insufficient awareness and understanding of assistive technology among both students with visual impairments and their families are significant concerns. This lack of knowledge limits educational options and results in the limited utilization of technological tools in education. Persons with visual impairments use various assistive technologies to enhance their educational experience. Some of the common types of assistive technology used in education include:

1. **Screen Readers**: Screen readers are software applications designed to aid individuals with visual impairments in accessing digital content and navigating computer interfaces. They convert on-screen text, including documents, web pages, and user interface elements, into synthesized speech or Braille output. This allows visually impaired students to access digital content, websites, and documents effectively, enabling them to listen to the information presented on the screen independently. Some of the most common types of screen readers include:

i. JAWS (Job Access With Speech): JAWS is one of the most popular and widely used screen readers for Windows-based computers. It provides support for a wide range of applications and offers various customizable settings.

ii. NVDA (NonVisual Desktop Access): NVDA is a free and open-source screen reader available for Windows. It has gained popularity for its accessibility features and regular updates driven by a community of developers.

iii. VoiceOver: VoiceOver is a built-in screen reader that comes pre-installed on Apple devices, including macOS, iOS, iPadOS, and watchOS. It provides accessibility support across a wide range of Apple applications and services.

iv. TalkBack: TalkBack is the screen reader included with Android devices. It allows visually impaired users to navigate and interact with Android smartphones and tablets, providing text-to-speech feedback and other accessibility features.

v. Narrator: Narrator is a screen reader built into Windows operating systems. While it may not be as feature-rich as some third-party screen readers, it still offers basic accessibility support for Windows users.

vi. ChromeVox: ChromeVox is a screen reader designed specifically for the Google Chrome web browser. It allows visually impaired users to access web content and navigate websites efficiently.

vii. Orca: Orca is a popular screen reader for Linux-based operating systems, such as Ubuntu. It provides text-to-speech output and Braille display support for a range of applications.

2. **Braille and Braille Displays**: Invented by Louis Braille in 1824, Braille is a distinctive system of raised dots that blind individuals can touch to read. Its applications have expanded beyond books and documents, now commonly found in labels on objects, receipts, pharmaceutical packaging, tactile graphics, and numerous other uses. Braille displays are tactile devices that convert digital text into Braille characters, allowing blind students to read and navigate using their sense of touch with their fingers. With the braille sense machine, students have the ability to upload diverse file formats, which are then converted into braille text. This text can be read by using the raised bumps on the trackpad. According to Guinan (1997), there is a strong argument for the necessity of braille literacy in one's first language (L1) in order to facilitate the learning of a second language (L2).

3. **Optical Character Recognition (OCR) Software**: OCR software converts printed text into digital text, which can then be read by screen readers or displayed on a Braille device. This technology enables visually impaired students to access printed materials, such as textbooks and handouts.

4. **Electronic Magnifiers**: Electronic magnifiers, also known as video magnifiers or CCTV systems, enlarge printed materials and display them on a screen. These devices assist individuals with low vision in reading books, worksheets, and other printed materials.

5. **Voice Recognition Software**: Voice recognition software allows visually impaired students to control their computers and dictate text using their voice. This technology is helpful for tasks such as writing essays, composing emails, and navigating through computer applications.

6. **Tactile Graphics Software**: Tactile graphics software helps in creating tactile representations of images, graphs, and diagrams. It allows visually impaired students to explore and understand visual information through touch.

7. **Accessible Learning Platforms**: Educational platforms that are designed with accessibility in mind, providing features such as compatibility with screen readers, alternative text for images, and keyboard navigation, ensuring that visually impaired students can access course materials and participate in online learning.

8. **Audio Books and Podcasts**: Access to audiobooks and educational podcasts provides visually impaired students with an alternative way to consume information and engage with educational content.

9. **Electronic Note-Taking Devices**: Electronic note-takers allow students to record lectures, take notes, and organize information for study purposes. Some note-takers have Braille keyboards or speech-to-text capabilities.

These assistive technologies play a crucial role in creating a more inclusive learning environment for students with visual impairments, empowering them to actively participate in their education and achieve their academic goals. Assistive technologies enable those without vision to independently use computers, cell phones, smartphones, and other electronic devices. Self-service features, adherence to WCAG (web content

accessibility guidelines), and the utilization of add-ons empower people with visual impairments, granting them greater independence and accessibility.

4.11 CEFR and UDL: Creating Inclusive Language Learning Environments for Visually Impaired Students

One of the main objectives of SPLENDID is to create an inclusive language learning environment for students with visual impairments (VI) by merging the principles of the Common European Framework of Reference for Languages (CEFR) and the Universal Design for Learning (UDL). The CEFR provides a comprehensive framework for assessing language proficiency, encouraging educators to adapt and innovate their language teaching methodologies via action research and based on student needs and context. The UDL model emphasizes flexibility and adaptability in instructional design to accommodate diverse learners' needs. It ensures all learners have access to content, opportunities for active engagement, and varied ways to showcase their language proficiency. Both models strive to promote inclusive practices that value learners' diverse backgrounds and experiences.

Merging the principles of the Common European Framework of Reference for Languages (CEFR) with the educational needs of visually impaired students is crucial for fostering inclusive and effective language instruction. The CEFR provides a comprehensive framework for language learning, assessment, and teaching, emphasizing communicative competence and the ability to use language in real-life contexts. By aligning CEFR principles with the specific requirements of visually impaired learners, educators can create a more equitable and supportive learning environment that enhances language acquisition and promotes independence. The CEFR's focus on learner-centered approaches is particularly beneficial for visually impaired students. This demographic often faces unique challenges in accessing educational materials and participating in classroom activities. By integrating CEFR principles, educators can tailor their teaching methods to accommodate these challenges, ensuring that visually impaired students receive instruction that is relevant to their individual needs and learning styles. For instance, the CEFR encourages the use of diverse teaching materials and methods, which can include tactile resources, audio recordings, and assistive technologies. This variety not only supports different learning preferences but also enhances engagement and motivation among visually impaired learners.

Furthermore, the CEFR puts emphasis on setting clear learning objectives and outcomes aligns well with the goals of inclusive education. By establishing specific language competencies that visually impaired students should aim to achieve, educators can provide a structured framework for assessment and progress tracking. This clarity helps students understand their learning goals and fosters a sense of accomplishment as they reach each milestone. Additionally, incorporating formative assessments allows educators to monitor students' progress continually and adjust their teaching strategies accordingly, ensuring that all learners can succeed. The CEFR also promotes the development of intercultural competence, which is essential for language learning in a globalized world. For visually impaired students, understanding cultural contexts and nuances is vital for effective communication. By merging CEFR principles with culturally relevant content,

educators can help visually impaired learners develop the skills necessary to navigate diverse social situations and engage with peers from different backgrounds. This approach not only enriches their language learning experience but also fosters social inclusion and empathy. Moreover, the CEFR's focus on communicative language ability encourages the use of authentic materials and real-life scenarios in language instruction. For visually impaired students, this means creating opportunities for meaningful interactions that simulate real-world communication. Activities such as role-playing, group discussions, and collaborative projects can enhance language skills while promoting social interaction and teamwork. By providing these opportunities, educators can help visually impaired learners build confidence in their language abilities and prepare them for future social and professional interactions. In conclusion, merging the principles of the Common European Framework of Reference for Languages (CEFR) with the instruction of visually impaired students is essential for creating inclusive and effective language learning environments. By tailoring teaching methods to meet the unique needs of visually impaired learners, setting clear learning objectives, promoting intercultural competence, and utilizing authentic materials, educators can significantly enhance the language acquisition process for these students. This integrative approach not only supports their academic success but also fosters independence and confidence, empowering visually impaired students to engage fully in their educational journeys and beyond.

At the same time, pplying Universal Design for Learning (UDL) principles to English as a Foreign Language (EFL) instruction for visually impaired students is essential for creating inclusive and effective learning environments. UDL emphasizes flexibility in teaching methods, materials, and assessments to accommodate diverse learners, including those with visual impairments. By integrating UDL principles, educators can enhance engagement, accessibility, and learning outcomes for visually impaired students in EFL contexts. One of the core UDL principles is providing multiple means of engagement. For visually impaired students, this can involve using varied instructional strategies that cater to their unique learning preferences. For example, incorporating auditory materials, tactile resources, and interactive activities can help maintain students' interest and motivation. Engaging students in collaborative projects, where they can work with peers to practice language skills, fosters a sense of belonging and encourages social interaction. Additionally, allowing students to choose topics or themes that resonate with their interests can further increase their motivation to learn.

Another critical aspect of UDL is providing multiple means of representation. This principle is particularly relevant for visually impaired students, who may struggle with traditional text-based materials. Educators should utilize a range of formats, such as audio recordings, braille texts, and digital content that is compatible with screen readers. By offering diverse representations of language concepts, educators can ensure that visually impaired students can access and comprehend the material effectively. Moreover, using visual aids with high contrast and large print can benefit students with residual vision, allowing them to engage more fully with the content. The UDL principle of providing multiple means of action and expression is also vital in EFL instruction for visually impaired students. This involves allowing students to demonstrate their language proficiency in various ways, rather than relying solely on traditional assessments. For

instance, students can use audio recordings, presentations, or collaborative projects to showcase their understanding of language concepts. Providing options for how students can respond to prompts—whether through spoken language, written assignments, or multimedia presentations—ensures that all learners have the opportunity to express their knowledge and skills in ways that suit them best.

Additionally, UDL encourages the use of assistive technologies to support visually impaired students in their language learning. Tools such as screen readers, speech-to-text software, and braille displays can enhance accessibility and facilitate communication. Educators should ensure that students are trained in using these technologies effectively, as they can significantly impact their ability to engage with EFL materials and participate in classroom activities. By integrating assistive technologies into the curriculum, educators can create a more inclusive learning environment that empowers visually impaired students to take ownership of their language learning. Furthermore, fostering a supportive classroom culture is essential for implementing UDL principles effectively. Educators should promote empathy and understanding among all students, encouraging them to support their peers with visual impairments. This can involve raising awareness about the challenges faced by visually impaired learners and fostering an inclusive atmosphere where all students feel valued and respected. Encouraging collaboration and peer support can enhance the learning experience for visually impaired students and contribute to a positive classroom environment. In conclusion, applying UDL principles to EFL instruction for visually impaired students is crucial for creating an inclusive and effective learning environment. By providing multiple means of engagement, representation, and action and expression, educators can accommodate the diverse needs of visually impaired learners and enhance their language acquisition. Integrating assistive technologies and fostering a supportive classroom culture further contribute to the success of visually impaired students in EFL contexts. This holistic approach not only improves language learning outcomes but also promotes independence and self-confidence, empowering visually impaired students to thrive in their educational journeys.

4.12 Projects & Resources for Future Research

ADCET (Australian Disability Clearinghouse on Education and Training) is an online resource funded by the Australian Government Department of Education and hosted by the University of Tasmania. It provides information and resources to support the participation of students with disabilities in post-secondary education and training. Key features of ADCET include:

1. Extensive information on various disabilities, including vision impairment and blindness
2. Guidelines for inclusive teaching and assessment strategies
3. Resources on assistive technologies and their applications in education
4. Webinars and recordings on topics related to disability support in education
5. Links to other relevant organizations and resources

ADCET serves as a valuable hub for students, educators, disability support professionals, and anyone interested in inclusive education practices in Australia. Its website (www.adcet.edu.au) offers a wealth of information on supporting students with various disabilities, including those with vision impairments, in

higher education and training settings.

The Project IDEAL

The Project IDEAL (Informing and Designing Education For All Learners) is an online teacher preparation program developed in Texas, USA. Funded by the Texas Council for Developmental Disabilities, it aims to better equip teachers for working with students with disabilities. The website offers various modules covering different disability categories, each providing key concepts, activities, presentations, tests, and media. A companion site, "IDEAL In Action," showcases real-world classroom applications. The resource is structured for self-paced learning, starting with an introductory video and encouraging exploration of disability categories before delving into specific teaching strategies. It offers practical ideas for classroom implementation and is supported by federal funds from the U.S. Department of Health and Human Services. Developed by a dedicated team of education professionals, Project IDEAL serves as a valuable tool for educators seeking to enhance their skills in special education and inclusive teaching practices.

Iris.peabody

The IRIS Center, located at Vanderbilt University's Peabody College, is a comprehensive resource for evidence-based instructional and behavioral practices in education. Supported by the U.S. Department of Education's Office of Special Education Programs, it provides free online resources to bridge the research- practice gap. These materials include modules, case studies, and professional development activities, covering topics like classroom management, secondary transition, and Universal Design for Learning. Among its comprehensive materials is a specific module titled "Instructional Accommodations: Making the Learning Environment Accessible to Students with Visual Disabilities." This module, which takes approximately 1.5 hours to complete, provides valuable tips for modifying lessons and making them accessible for students with visual impairments.

4.13 Conclusion

Based on the review provided in this chapter, several key conclusions can be drawn about supporting foreign language learning for students with visual impairments (SwVI). There is a significant need for more research and data on foreign language learning approaches specifically tailored for SwVI. The limited existing research suggests that SwVI can successfully learn foreign languages when provided appropriate accommodations and support. Major challenges faced by SwVI in language learning include accessing visual learning materials, visualizing abstract concepts, limited specialized teaching materials, and inadequate teacher training on inclusive practices. Assistive technologies play a crucial role in supporting SwVI, including screen readers, braille displays, audio description services, and specialized software/apps. However, there is often a lack of awareness and training on using these tools effectively. Successful strategies for teaching foreign languages to SwVI include multisensory approaches, collaborative learning, adapting materials into accessible formats, using authentic audio materials, and implementing universal design for learning principles.

Teacher training and professional development on inclusive language teaching practices for SwVI is critically important but often insufficient. A comprehensive approach integrating the Common European Framework of Reference for Languages (CEFR) with Universal Design for Learning (UDL) principles shows promise for creating more inclusive language learning environments. There is a need for more accessible, digitally- enhanced learning materials and tools specifically designed for language acquisition by SwVI across all proficiency levels.Co llaboration between language teachers, special educators, assistive technology specialists, and SwVI themselves is crucial for developing effective inclusive language education practices. Further research is needed on assessment methods, curriculum design, and pedagogical approaches to optimize foreign language learning outcomes for SwVI.

In conclusion, while progress has been made, there remains significant work to be done to ensure equitable access to quality foreign language education for students with visual impairments. Continued research, resource development, and teacher training will be essential to advancing this important area of inclusive education.

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CHAPTER 5: SUPPORTING LEARNERS WITH HEARING IMPAIRMENT

Ewa Domagala-Zyśk
Katolicki Uniwersytet Lubelski Jana Pawla II

5.1 The Impact of Deafness on Learning Foreign Languages

Deaf and hard of hearing students do not form one homogeneous group, as the level of hearing loss and other factors (e.g. their family social capital, rehabilitation paths and effects of speech and language classes therapy) influence their level of national language acquisition and thus – possibilities, methods and strategies for foreign language learning.

In Poland and Western European countries the classification of hearing impairment proposed by BIAP (International Bureau for Audiophonology) is commonly used. The classification divides hearing impairment into 5 categories according to the degree of hearing sensitivity loss: people with mild hearing impairment (21-40 dB), moderate impairment (41-70 dB, including first degree - 41-55 dB, second degree - 56-70 dB), severe impairment (71-90 dB, including first degree - 71-80, second degree - 81-90) and profound impairment (above 91 dB, including first degree - 91-100, second degree - 101-110, third degree - 111-119 dB). People with hearing impairment above 120 dB are referred to as totally deaf.

Level of hearing loss in decibels	Description
21-40 dB	Mild hearing loss
41-70 dB	Moderate hearing loss
71-90 dB	Severe hearing loss
91-119 dB	Profound hearing loss
More than 120 dB	Total hearing loss

Table 5.1: Types of hearing impairment

Another classification of hearing impairment was proposed by the World Health Organization (WHO Report, 1991). It differs from the BIAP classification, since it assumes that we speak of hearing damage in the case of a disorder greater than 26 dB (in the BIAP classification it is 21 dB), while for severe and profound damage it is proposed to adopt lower values: severe damage applies to people with auditory sensitivity of 61-80 dB, while profound damage is diagnosed in people with auditory sensitivity of 81 decibels and more, which means differences from the BIAP classification of up to 10 decibels (Table 5.2).

Level of hearing loss in decibels	Description
26-40 dB	Slight hearing loss
41-60 dB	Moderate hearing loss
61-80 dB	Severe *hearing loss*
81 dB	Profound hearing loss

Table 5.2: Classification of hearing loss, *WHO Report on Deafness* 1991

A separate issue is also the question of the identity of people with hearing impairment. In recent years, a very clear division has been made within this group between:

- Deaf people (written in capital “D”), who consider deafness to be a cultural fact that signifies for them membership in an ethnic Deaf group,
- deaf and hard of hearing people (using the descriptions: deaf, hard of hearing), who consider the fact of deafness to be a manifestation of a disability, to some extent to be compensated through therapy and the use of technological aids, while they identify ethnically, culturally and linguistically with their nation.

Belonging to the Deaf Culture is most often associated with the use of sign language as the primary means of communication and a reluctance to use any phonic language, while identifying oneself as deaf or hard of hearing is associated with using primarily or exclusively phonic language in communication. These people usually enter education in inclusive and mainstream schools and often have no knowledge of any sign language. Thus, English as a Foreign Language students with hearing impairment can be divided into two separate groups:

Deaf EFL learners are those who use sign language as their primary means of communication and their abilities to use auditory channels of language perception is limited. Usually they do not speak their national language – or use speech in a very limited way. Because of that they do not participate in listening or speaking activities and learn a foreign language mainly in its written form.

Hard of hearing EFL learners – they have difficulties in perceiving speech sounds but thanks to hearing aids, cochlear implants, lip-reading and good speech and language rehabilitation results they can hear the speech sounds and speak their national language. Consequently, they are able to learn not only to read and write, but also to speak and listen to a foreign language, though they need special accommodation in that.

5.2 Inclusive Foreign Language Learning for People with Disabilities

The Polish education system consists of three main levels: pre-primary (kindergarten), primary (grades 1 to 8) and secondary (grades 9 - 12). Pre-primary education is available but not obligatory for children from age 3; it depends on the parental decision if the child uses it or not. Only one year before the school entry age kindergarten education is obligatory and provided to every child by the state. Foreign language classes are not obligatory at this stage but they are strongly recommended. Teachers are encouraged to include English songs and vocabulary into everyday routine and additional English classes are offered at majority Polish kindergartens (once or twice a week, paid by the parents). Children start school at the age of 7 or, with their parents’ consent, at the age of 6. There are three main types of schools in the country: special, integration and mainstream (inclusive).

- **Special schools** in Poland have been usually designed for three groups of children: 1. With intellectual disabilities, 2. With vision impairment, 3. Deaf and hard of hearing. They are segregated schools and children have fewer opportunities for socializing with their non-disabled peers, but at the same time qualified instructors and teachers very often make it a place where children in a safe environment

develop their life skills and learn independence.

- **Integration schools** are specially designed mainstream schools where children learn in smaller groups. In each group there are about 75% of non-disabled students and 25% students with different disabilities. Lessons are given by two teachers, i.e. the main teacher and the supportive one.
- **Mainstream schools** (lately often named as inclusive) provide education for every child who lives in a given district. It is advised that children with special educational needs could enter these schools, which are the closest to their place of living and to which they would sign if it was not for their disability/special needs.

In Poland, as in many other European countries, deaf and hard of hearing children often attend mainstream schools. The numbers for Poland (2020) are as follows: more than 90% are hard of hearing and more than 50% of children diagnosed as deaf attend mainstream integrated education. Deaf and hard of hearing students, if they do not have additional intellectual deficits, are obliged to follow the national Curriculum (Podstawa Programowa 2017). When attending integration or mainstream schools, deaf and hard of hearing students participate in foreign language classes together with their hearing peers, rarely using any form of sign language. In special schools while the standards of the National Curriculum have to be met, the methods and strategies for teaching and learning more often include sign language (mainly Polish Sign language; in none of schools there are professionals using International Sign, BSL or ASL).

	Special schools	Integration schools	Mainstream schools
Deaf	719	25	792
Hard of hearing	736	103	8 126

Table 5.3: Deaf and hard of hearing students in Poland

5.3 Foreign Language Learning: Challenges for Deaf & Hard of Hearing Learners

Hearing impairments, as prof. R.O.Cornett said once it is not a matter of voice which can be or cannot be heard but of word, i.e. the concept of vocabulary which has been created or has not been created in a person's mind. Thus, hearing impairment forms a crucial barrier to language acquisition, both as regards the native language acquisition and, consequently, foreign language acquisition. Challenges appear in acquiring not only listening and speaking skills but also reading competencies and writing skills.

When it comes to the skill of **reading** teachers should not take it for granted that, as DHH persons see usually correctly, they can use written materials for reading and mastering language competencies without any barriers. As it was mentioned above, hearing loss means obstructions in spontaneous language acquisition and usually results in poorer vocabulary and lower linguistic skills. This is not to say that DHH persons cannot master languages; they can, but it needs extra effort and much more time to achieve. Basic challenges in mastering reading skills are:

- limited vocabulary that hinders reading comprehension,
- difficulties in understanding instructions (they are often issued by the teachers quickly and with the use of difficult vocabulary),
- texts typical for a peer group might be too difficult for DHH students; they often need texts that are

written in simpler language and/or accompanied with glossaries,
- texts might contain vocabulary and language structures not known and not used by DHH students even in their national language,
- for sign language users – texts of phonic languages do not match the structure of sign languages and this creates traditional obstacle to understand them,
- these challenges usually results in low motivation for reading and, in a vicious circle manner, low reading comprehension skills.

Writing skills are also acquired by DHH students differently from their hearing peers. Limited vocabulary knowledge and limited speaking practice make it difficult to create comprehensive and rich writing works. For sign language users an additional challenge is connected with differences in language modality as sign languages do not have their written form, sign language users are not using writing in communication. Creating written texts while learning a foreign language is a challenge, both at the level of semiotics and syntax.

As regards **listening skills** it is a kind of a myth that DHH persons do not hear at all. In this group there are persons with different levels of hearing loss and the majority of them, especially with the help of HA, CI and other technological devices, can hear quite well. Thus, in the process of language learning, listening activities can be and should be used. It is very important to decide at the beginning of the course what are the students' needs and preferences: To what extent can they benefit from listening to other people's speech? Do they lip-read? Do they always use subtitles or do they prefer to master their listening skills without this technique? Do they benefit from listening to a pre-recorded speech ("listening activities")? Do they need any special technique while listening, e.g. listening at a slower pace, louder than the rest of the class, with special headphones etc.

The majority of DHH students use speech in their national language, though to a different extent. Consequently, they want and can speak foreign languages. Challenges that appear while mastering the **speaking skill** are typical to all DHH persons (eg. they usually do not speak their national language as often as their peers thus lack some conversation strategies). However, some of the challenges might be connected with the specificity of their national language. For Polish DHH students the main challenges for Learning English as a Foreign language are the following (Domagała-Zyśk 2013b):

- adding unnecessary sounds where a consonant cluster appears (like in the word *table*),
- not pronouncing /s/ at the end of words in the plural or 3rd person singular forms,
- pronouncing the past tense ending /-ed/ in the same way for all words, without differentiating it into its three different pronunciations,
- using incorrect stress, rhythm, and intonation patterns,
- pronouncing letters and words as they are written, without applying pronunciation rules and habits.
- using sounds from their national spoken language instead of English sounds, e.g. using /s/ or /f/ instead of English /th/.

5.4 Language Learning Practices for Deaf & Hard of Hearing Learners

On the one hand, as in case of people with any other disability or special /additional needs, language learning techniques used in foreign language classes for DHH students are the same techniques as used for the general population. Especially when in inclusive classes or groups, DHH students benefit most from participating in activities involving latest methodological achievements in methodology of foreign language learning. On the other hand some specific instructional techniques can be enlisted that have been checked as beneficial and suit best this group of students by many experiments and teaching practice of the participants of the International Research Group on English as a Foreign Language for DHH. These techniques are usually named as following:

- **individualization in age**: appropriate and factual skills appropriate vocabulary and grammar teaching and learning materials,
- **emotionalisation**: in the learning process the emotional component of being interested /motivated to learn is important,
- **lexical analysis**: as DHH students usually have the experience of participation in speech therapy classes, they are used to vocabulary analyses – language teachers can build on this habit,
- **multisensory memorization**: new vocabulary might be associated with visuals, smells, emotional experiences,
- **structuralisation**: as English is a highly structured language, it helps students learn it as a predictable structure; for example, this may appeal to some grammar rules for tenses,
- **experiential learning**: while learning a language we talk about our life experiences; thus any type of learning should be connected with a real experience, which might be then contextualized, named and repeated (cf. also https://experientiallearninginstitute.org/resources/what-is-experiential- learning/),
- **using sign language as a language of instruction** for these DHH student for whom this is a first and main language of communication,
- **using the Cued Speech System** for these who mastered is for their national language (cf. https://cuedspeech.eu/en/),
- **using International Phonetic Alphabet** while practicing pronunciation and explaining the pronunciation rules,
- **using techniques of Visual Supported Listening**, including lipreading, clear speech principles such as the speakers' faces should be well lit; the speaker should have his/her face directed towards the lip-reader and be close to him/her (but without encroaching on his or her personal space); the speaker should not speak too fast or too slowly; the pronunciation should be natural, not exaggerated and, if necessary, the speaker should be ready to repeat things and/or use different language (e.g. a synonym which might be easier to understand).

5.5 Research: Foreign Language Learning by Deaf and Hard of Hearing Students

Academic literature on learning foreign languages by DHH learner and how to support this process has been collected on the website of the International Research Group on English as a Foreign Language for deaf and Hard of Hearing (https://www.kul.pl/english-for-deaf-and-hard-of-hearing,art_74431.html) It consists of books, papers and chapters published in the years 1990-2023 mainly in English, but also in French (Karpińska-Szaj 2005, 2008), Norwegian (Pritchard 1997), Polish (Domagała-Zyśk 2001, 2003, 2013, 2021 et others, Podlewska 2013, Karpińska-Szaj 2010, Harań 2013, Nabiałek 2013), Serbian (Urdarevic 2007), Hungarian (Kontra 2017) , Czech (Sedlackova 2013, 2014, 2017), Spanish (Domagała-Zyśk 2010) and German (Urbann 2020). Milestones in research and practice on learning English as a foreign language for DHH students are the following publications:

1. First paper on surdoglottodidacitcs by Domagała–Zyśk E. (2003). Czy istnieje już surdoglottodydaktyka? *Języki Obce w Szkole*, 4, 3-6. The paper explores the concept of surdoglottodidactics, which refers to the teaching of foreign languages to deaf and hard-of-hearing students. Domagała–Zyśk examines whether surdoglottodidactics can be considered an established field of study and practice. The author begins by discussing the challenges deaf and hard-of-hearing students face in learning foreign languages, such as difficulties with pronunciation, listening comprehension, and understanding grammar rules. These challenges stem from the students' limited access to auditory input and the lack of appropriate teaching methods tailored to their needs. Domagała–Zyśk then reviews the limited research available on teaching foreign languages to deaf and hard-of-hearing learners. She highlights the work of scholars like Komorowska, who emphasizes the importance of using visual aids, gestures, and written materials to support language learning for this population. The paper also examines the role of sign language in foreign language instruction for deaf students. Domagała–Zyśk argues that sign language can serve as a bridge to learning written and spoken languages, as it helps students understand vocabulary and grammar concepts. Furthermore, the author discusses the need for specialized teacher training in surdoglottodidactics. She suggests that teachers working with deaf and hard-of-hearing students should be proficient in sign language and have a deep understanding of the unique needs and learning styles of this population. In conclusion, Domagała–Zyśk asserts that while surdoglottodidactics is still an emerging field, it is essential for addressing the educational needs of deaf and hard-of-hearing students learning foreign languages. She calls for increased research, teacher training, and the development of specialized teaching materials to support the growth and recognition of surdoglottodidactics as a distinct area of study.

2. First book presenting results of a 10-year teaching and action research practice in surdoglottodidactics by Domagała-Zyśk E. (2013). This book provides a comprehensive exploration of the unique challenges and strategies involved in teaching foreign languages to deaf and hard-of-hearing students. The author emphasizes the importance of understanding the specific needs of these learners in order to create effective educational practices that promote language acquisition and communication skills. Domagała-Zyśk begins by examining the demographic context of deaf and hard-of-hearing students, highlighting the significant barriers they face in accessing language education. She discusses the impact of hearing loss on language

development and the subsequent implications for learning foreign languages. The book outlines the cognitive and linguistic challenges that arise from limited auditory input, which can affect vocabulary acquisition, grammar comprehension, and overall communication abilities. The author advocates for the implementation of tailored teaching methodologies that consider the unique learning styles of deaf and hard-of-hearing students. She emphasizes the necessity of integrating visual aids, tactile resources, and interactive activities into the language curriculum to enhance comprehension and engagement. Domagała- Zyśk also highlights the role of sign language as a vital tool in the language learning process, suggesting that it can serve as a bridge to understanding both spoken and written languages.

Furthermore, the book discusses the significance of fostering an inclusive classroom environment that encourages collaboration and peer support. Domagała-Zyśk argues that creating a sense of community among students can enhance motivation and facilitate language learning. She emphasizes the need for teacher training that equips educators with the skills to effectively support deaf and hard-of-hearing learners in their language studies. The author also addresses the importance of self-advocacy and empowerment for deaf and hard-of-hearing students. She encourages educators to teach students how to communicate their needs and preferences effectively, enabling them to take an active role in their learning process. This focus on self-determination is crucial for fostering independence and confidence in language use. In conclusion, Domagała-Zyśk's book serves as a significant contribution to the field of language education for deaf and hard-of-hearing students. By highlighting the specific challenges these learners face and proposing effective strategies for instruction, she advocates for a more inclusive and supportive approach to foreign language teaching. The insights presented in this work underscore the importance of understanding the diverse needs of visually impaired students and adapting educational practices to promote their success in language acquisition.

3. Three volumes presenting international research and teaching experiences form several countries: a) Domagała-Zyśk E. (ed.), (2013). *English as a foreign language for deaf and hard of hearing persons in Europe*. Lublin: Wydawnictwo KUL. pp. 220. b) Domagała-Zyśk E. Kontra E.H. (ed.) (2016). *English as a foreign language for deaf and hard-of-hearing persons. Challenges and strategies*. Newcastle upon Tyne: Cambridge Scholars Publishing, ss. 200, and c) Domagała-Zyśk E., Moritz N., Podlewska A. (ed.) (2021). English as a Foreign Language for Deaf and Hard of Hearing Learners Teaching Strategies and Interventions. London: Routledge, ss. 156. These three volumes edited by Domagała-Zyśk provide a comprehensive exploration of teaching English as a foreign language (EFL) to deaf and hard-of-hearing students, drawing on international research and experiences from several countries. These books serve as valuable resources for educators, researchers, and policymakers working to create inclusive and effective language learning environments for this population.

The first volume, "English as a foreign language for deaf and hard of hearing persons in Europe" (2013), offers a broad overview of the challenges and strategies involved in teaching EFL to deaf and hard-of-hearing students in various European contexts. The book emphasizes the importance of understanding the unique needs and learning styles of these learners, and it presents a range of teaching methodologies and resources

that can be adapted to different educational settings. The second volume, "English as a foreign language for deaf and hard-of-hearing persons. Challenges and strategies" (2016), delves deeper into the specific challenges faced by deaf and hard-of-hearing students in learning EFL. The book explores the cognitive, linguistic, and emotional factors that can impact language acquisition and proposes strategies for overcoming these challenges. It also highlights the role of sign language in supporting EFL learning and the importance of fostering an inclusive classroom environment. The most recent volume, "English as a Foreign Language for Deaf and Hard of Hearing Learners: Teaching Strategies and Interventions" (2021), presents cutting-edge research and best practices in teaching EFL to deaf and hard-of-hearing students. The book covers a wide range of topics, including the use of assistive technologies, the integration of visual and tactile resources, and the development of self-advocacy skills. It also emphasizes the importance of teacher training and professional development in supporting the success of deaf and hard-of-hearing students in EFL learning.

Together, these three volumes make a significant contribution to the field of EFL education for deaf and hard-of-hearing students. By bringing together international perspectives and evidence-based practices, they provide a comprehensive resource for educators and researchers working to create more inclusive and effective language learning environments. The books also highlight the importance of recognizing the unique needs and abilities of deaf and hard-of-hearing students and adapting educational practices accordingly.

It is worth pointing out at this point that the first publications on this topic come from Israel (Epstein 1990, 1993) and Norway (Pritchard 1997, 2000, 2001, 2004). In both these countries English is a must for every student and in both countries inclusive education was introduced a long time ago. Approaching the issue of accommodating DHH students in inclusive settings with their hearing peers, both authors advocate for including sign language as a language of instruction for DHH learners. Thanks to some pragmatic issues in Norway students had the chance to learn and use British Sign Language instead of phonic English as a foreign language.

The majority of publications on EFL for DHH learners contain meaningful descriptions of teaching practices in surdoglottodidactics (the term coined by Domagała-Zyśk in 2003). In the first years the research was devoted mainly to recognizing the students' needs. It was established that:

- the majority of students who are deaf and hard of hearing speak in their national language to some extent and that depend on diverse personal and educational factors; they want and might learn foreign phonic languages, though with specific reasonable adjustment (Domagała-Zysk 2001, 2003, 2009; Karpińska-Szaj 2006, 2007),
- national sign language or British Sign Language or American Sign Language might be a supportive tool for instruction for D/deaf learners (Ochse, 2001; Pritchard, 2004; Janakova, 2005; Harań, 2005; Bajko, Kontra, 2008; Kontra, Csizer, 2013),
- both general technology tools and services (like computers, tablets, smartphones, Bluetooth) and assistive technology typical for hearing disability, like FM systems, Cochlear Implants, hearing aids, etc. can support students immensely during language learning process (Podlewska, 2010; Nabiałek,

2013; Domagała-Zyśk,2013),

- writing in a foreign language plays a special role in language expression activities: even if a student cannot speak with a proper intelligibility, they can use writing for language expression (Karpińska- Szaj, 2006; Domagała-Zyśk 2011, 2012, 2013),
- DHH students who use their national phonic language are able to master a phonic foreign language so as their speech is intelligible enough to enable effective communication (Domagała-Zyśk, Podlewska 2012),
- Cued Speech System, a manual system of speech support developed for American English and adapted to many languages cab serve as a tool for enhancing language acquisition of DHH learners (Podlewska 2013, 2016),
- DHH students do not only need general English classes but they also need to master English for work and business. Thus, there is a need for English for Specific Purposed classes adjusted to DHH students' needs and learning styles. Elana Ochse from Torino University Italy shares her experience on leading such a class in English for Media and Communication classes (Ochse, 2013),
- online and e-learning classes (Gulati, 2020) can be also of great support for DHH learners as additional and other international experience,
- motivation to learn a foreign language of DHH learners in central Europe is sometimes stronger than their hearing peers since they perceive foreign language competence as opening doors to international experience, work possibilities and achieving their life goals (Lewandowska, 2021),
- DHH students' beliefs about foreign language learning are typical to these of their peers (Domagała-Zyśk, 2015). Contrary to the popular beliefs, they perceive themselves as being able to master a foreign language and they have a high level of willingness to communicate with others (Domagała- Zyśk, 2013) and motivation to work hard (Domagała-Zyśk 2013, Kontra, Csizer 2013, Csizer, Kontra, Pinel 2015).

To conclude, in the worldwide literature there are some other authors who tackle this issue and their publications describe challenges and teaching and learning techniques implemented in France (Bedoin 2011), Canada (Darroch, 2013), Finland (Kelly, Dufva & Tapio, 2015) and Japan (Quay, 2005). To be more specific, In France, Bedoin (2011) addresses the specific difficulties faced by deaf learners in acquiring a foreign language. The study emphasizes the need for tailored pedagogical approaches that consider the unique cognitive and linguistic profiles of deaf students. Bedoin advocates for the use of visual aids and interactive methods to enhance comprehension and engagement in language learning. Darroch (2013) explores the Canadian context, focusing on the integration of deaf and hard-of-hearing students into mainstream classrooms. The research highlights the importance of inclusive teaching practices and the necessity of training educators to effectively support these learners. Darroch emphasizes collaborative learning environments that foster peer interaction and social skills development, which are crucial for language acquisition. In Finland, Kelly, Dufva & Tapio (2015) investigate the role of technology in supporting EFL instruction for deaf students. Their research shows that assistive technologies, such as speech-to-text software and interactive applications, can significantly enhance language learning experiences. The authors

argue that integrating technology into the curriculum not only improves accessibility but also motivates students by making learning more engaging and interactive. Quay (2005) presents findings from Japan, where the focus is on the cultural and linguistic adaptations necessary for teaching EFL to deaf learners. The study highlights the importance of incorporating cultural context into language instruction, as understanding cultural nuances can enhance communication skills. Quay also discusses the role of sign language as a bridge to learning foreign languages, emphasizing its significance in providing a comprehensive language education. Together, these publications underscore the necessity of adapting teaching methodologies to meet the diverse needs of deaf and hard-of-hearing learners in EFL contexts. They advocate for inclusive practices, the integration of technology, and the importance of cultural relevance in language education. By addressing the unique challenges faced by these students, educators can create more effective and supportive learning environments that promote successful language acquisition

5. 6 Assistive Technology

Basic technology used by DHH persons are hearing aids 9HA) and/or cochlear implants (CI) that are medical prostheses helping DHH individuals hear better. They are often used together with induction loops, i.e. a kind of a cable that transmits the sound signal in the form of a magnetic field which can be picked up by HA or CI.

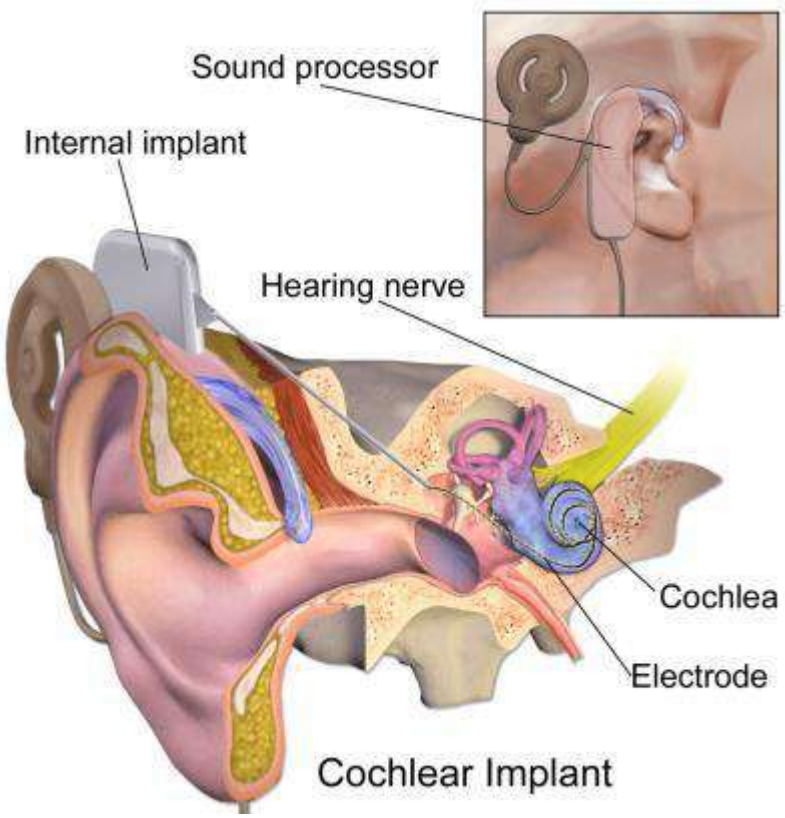

Photo 1: What does a cochlear implant look like? (https://en.wikipedia.org/wiki/Cochlear_implant)

To be more specific, there is a wide range of technological devices and services that assist deaf and hard-of-hearing (DHH) individuals in their everyday lives, and these tools can also be effectively utilized in language instruction to enhance language skills. The integration of such technologies in educational settings is crucial for promoting accessibility and engagement among DHH learners. One of the primary technologies used by DHH individuals is hearing aids, which amplify sound and improve auditory access to spoken language. These devices can significantly enhance classroom participation, allowing students to engage more fully in discussions and interactions. Additionally, cochlear implants serve as another important tool for some DHH learners, providing direct stimulation to the auditory nerve and facilitating better access to sound. Assistive listening devices, such as FM systems, are also valuable in educational settings. These systems transmit the teacher's voice directly to the student's hearing aid or cochlear implant, minimizing background noise and improving clarity. This technology is particularly beneficial in noisy classroom environments, ensuring that DHH students can hear instructions and participate actively in language learning activities. Visual technologies play a significant role in supporting DHH learners as well. For instance, video conferencing tools enable real-time communication through sign language, facilitating interaction between students and teachers or peers. This is especially important for language instruction, as it allows for the modeling of language use and the practice of conversational skills in a visually accessible format.

Moreover, captioning services and speech-to-text applications provide written transcripts of spoken language, making it easier for DHH students to follow along during lectures or discussions. These tools not only support comprehension but also allow students to engage with the material in a way that aligns with their learning preferences. In addition to these technologies, educational apps and software designed specifically for language learning can enhance the language acquisition process for DHH students. Many of these applications incorporate visual and interactive elements that cater to diverse learning styles, making language practice more engaging and effective. Furthermore, the use of multimedia resources, such as videos and animations, can provide contextualized language instruction that is visually stimulating. These resources can help DHH learners understand vocabulary and grammar concepts through visual cues, supporting their overall comprehension and retention of the language. Additionally, instant messaging, i.e. real time communication based on typed text-to-speech, internet captioned telephone services which make it possible to make a phone call with real time captions displayed and videophone chatting enabling real time video and audio communication, often with real-time captioning, could be of great help to DHH students. In conclusion, the integration of various technological devices and services is essential for supporting the everyday lives of deaf and hard-of-hearing individuals, particularly in the context of language instruction. By utilizing hearing aids, assistive listening devices, visual communication tools, captioning services, and specialized educational software, educators can create an inclusive and accessible learning environment that enhances language acquisition for DHH students. These technologies not only facilitate communication but also empower DHH learners to engage with language in meaningful ways, ultimately promoting their success in language learning and beyond.

5.7 Supportive materials

1. Additional materials for textbooks

Some textbooks have additional materials which are designed especially for students with special needs. An example of this is a series of reading and listening materials by Oxford University Press. The reading material has been presented in a comfortable font of a bigger size and sans serif style, with pastel background, clear illustrations and plenty of space for individual work. These materials are helpful for D/deaf and hard of hearing students too (https://elt.oup.com/student/englishfile/dyslexicfriendly?cc=pl&selLanguage=pl). The difference is visible: Photo 2 below shows a typical page from a textbook whereas Photo 3 depicts a modified version of the same text.

Starbucks, summer, and other things I ♥ love about Britain

Mark Vanhoenacker, an American journalist who lives in London, says the UK is not just OK – it's paradise. These are some of his reasons...

Walking
Britain isn't a good place for cyclists. But for pedestrians it is wonderful. When you walk on a zebra crossing, all the drivers stop.

Banks
British banks are great – you do everything online, and you don't pay when you take money out of an ATM. And if you want to change banks, the banks do all the work, not you.

Drivers
The British are very polite when they drive. They don't hoot, and they are patient with other drivers. They always say thank you when you let them pass.

Boots the Chemist
Chemists in the UK are wonderful, friendly shops and completely different from US pharmacies. Boots sells everything you want, not just medicine, and the shop assistants give you good advice.

No ID Cards
Britain is one of the only places in the world where people don't have ID cards. In the US you need ID when you buy a drink, go to a club, use a credit card, or take an intercity train.

Summers
I love British summers! A good summer day in Britain is dry and warm, but not very hot.

Starbucks
Starbucks isn't British, of course, but I prefer the Starbucks in Britain. They are nice, friendly places where people read the newspaper and drink good coffee. And the waiters don't write your name on the cups – I feel stupid in America when the waiter calls 'Mark, your tall cappuccino with extra chocolate!'

Photo 2: A typical text in an EFL coursebook

Read and listen.

Starbucks, summer, and other things I love about Britain

Mark Vanhoenacker, an American journalist who lives in London, says the UK's not just OK – it's paradise. **These are some of his reasons...**

Walking

Britain isn't a good place for cyclists. But for pedestrians it is wonderful. When you walk on a zebra crossing, all the drivers stop.

Banks

British banks are great – you do everything online, and you don't pay when you take money out of an ATM. And if you want to change banks, the banks do all the work, not you.

Drivers

The British are very polite when they drive. They don't hoot, and they are patient with other drivers. They always say thank you when you let them pass.

Photo 3: A modified text

2. Subtitled films

There are plenty of materials with subtitles pre-prepared. It is enough to click a button to have them or use films without them, just to practice sheer listening. Photos 8 and 9 show an example of that.

Photo 4: A scan of a film without subtitles.

Photo 5: The very same film snapshot after clicking the button “show subtitles”.

5.8 CEFR and UDL: Creating Inclusive Language Learning Environments for Hearing Impaired Students

As it was concluded above, deaf and hard of hearing students might follow the national curricula for foreign language learning and effectively learn different languages. Some of them might need a wider support from sign languages and some would prefer to use foreign languages in oral form, benefiting also from their listening skills via cochlear implants or hearing aids. Supported by them and proper teaching techniques and class design they can achieve the CEFR levels. Adjusting the Common European Framework of Reference for Languages (CEFR) to create inclusive language learning environments for hearing-impaired students involves several strategies that align with the principles of accessibility, differentiation, and support for diverse learning needs. The CEFR provides a structured framework for language proficiency that can be adapted to accommodate the specific challenges faced by hearing-impaired learners.

1. Alternative Assessment Methods: One of the primary adjustments to the CEFR is the incorporation of alternative assessment methods that account for the unique abilities and needs of hearing-impaired students. Traditional assessments may not accurately reflect these learners' language proficiency, as they often rely heavily on auditory input. Therefore, educators should develop assessments that utilize visual, tactile, and interactive elements. For example, oral assessments can be complemented with visual presentations or projects that allow for creative expression, providing a more comprehensive evaluation of a student's language skills.

2. Accessible Learning Materials: Another important adjustment involves modifying the learning materials used in language instruction. The CEFR emphasizes the use of authentic materials to enhance language learning; however, these materials must be accessible to hearing-impaired students. This can include providing texts with clear visuals, captions for videos, and using sign language interpreters or subtitles during multimedia presentations. By ensuring that all learning materials are accessible, educators can facilitate a more inclusive learning environment that allows hearing-impaired students to engage fully with the content.

3. Focus on Visual and Kinesthetic Learning: The CEFR can be adjusted to emphasize the development of specific skills that are particularly relevant for hearing-impaired learners. For instance, the framework can highlight the importance of visual comprehension and non-verbal communication skills, which are essential for effective language use. Educators can incorporate activities that focus on visual learning, such as using gestures, facial expressions, and body language to convey meaning. This approach not only aids comprehension but also helps students develop their expressive skills in a language context.

4. Expanded Competencies: The CEFR's descriptors can be expanded to include competencies that reflect the unique experiences of hearing-impaired learners. This may involve creating new descriptors that address the use of assistive technologies, such as captioning services and visual aids, as well as the ability to navigate digital environments effectively. By recognizing these competencies, the CEFR can better serve the needs of hearing-impaired students and provide a more accurate representation of their language abilities.

5. Professional Development for Educators: Collaboration and training for educators are also crucial in implementing these adjustments. Teachers must be equipped with the knowledge and skills to adapt their teaching practices and materials to meet the needs of hearing-impaired students. Professional development opportunities focused on inclusive teaching strategies, assistive technologies, and differentiated instruction can empower educators to create more effective and supportive learning environments.

6. Fostering an Inclusive Classroom Culture: Finally, fostering a culture of inclusion within the classroom is essential for the successful implementation of CEFR adjustments. Educators should promote awareness and understanding among all students about the challenges faced by their hearing-impaired peers. Encouraging collaboration, peer support, and empathy can enhance the overall learning experience and create a positive atmosphere where all students feel valued and respected.

At the same time, applying the principles of Universal Design for Learning (UDL) is crucial for creating inclusive language learning environments for hearing-impaired students. UDL emphasizes flexibility in teaching methods, materials, and assessments to accommodate diverse learners, including those with hearing impairments. To this end, educators could consider the following practices:

1. **Multiple Means of Representation:** One key UDL principle is providing multiple means of representation, which is particularly relevant for hearing-impaired students. This involves presenting information in a variety of formats, such as visual, tactile, and interactive, to ensure that all learners can access the content. For example, educators can utilize clear visuals, sign language interpreters, and captions for videos to make language instruction accessible.

2. Multiple Means of Action and Expression: Another important aspect of UDL is providing multiple means of action and expression, allowing students to demonstrate their knowledge and skills in various ways. This is crucial for hearing-impaired learners who may face challenges with traditional assessment methods. By offering alternative ways for students to respond, such as visual presentations, written assignments, and projects that allow for creative expression, educators can create a more equitable and inclusive learning environment.

3. Multiple Means of Engagement: Furthermore, UDL emphasizes the importance of providing multiple means of engagement, which helps to motivate and sustain learners' interest and effort. For hearing-impaired students, this may involve offering choices in learning activities, providing opportunities for collaboration and social interaction, and fostering a sense of belonging and community in the classroom.

4. Assistive Technologies: Integrating assistive technologies is another crucial aspect of applying UDL principles to create inclusive language learning environments for hearing-impaired students. Tools such as captioning services, visual aids, and digital platforms can significantly enhance accessibility and facilitate communication. Educators should ensure that students are trained in using these technologies effectively, as they can contribute to their engagement and success in language learning.

5. **Educator Training and Collaboration**: Collaboration and training for educators are also essential in implementing UDL principles. Teachers must be equipped with the knowledge and skills to adapt their teaching practices and materials to meet the needs of hearing-impaired students. Professional development opportunities focused on inclusive teaching strategies, assistive technologies, and

differentiated instruction can empower educators to create more effective and supportive learning environments.

6. Fostering an Inclusive Classroom Culture: Finally, fostering a culture of inclusion within the classroom is crucial for the successful implementation of UDL principles. Educators should promote awareness and understanding among all students about the challenges faced by their hearing-impaired peers. Encouraging collaboration, peer support, and empathy can enhance the overall learning experience and create a positive atmosphere where all students feel valued and respected.

In summary, adjusting the CEFR to create inclusive language learning environments for hearing-impaired students requires a multifaceted approach that includes alternative assessment methods, accessible learning materials, a focus on relevant skills, expanded descriptors, educator training, and a culture of inclusion. By implementing these practices, educators can ensure that hearing-impaired learners have equitable access to language education and the opportunity to reach their full potential in language proficiency. In a similar vein, applying UDL principles is essential for creating inclusive language learning environments for hearing- impaired students. By providing multiple means of representation, action and expression, and engagement, integrating assistive technologies, and fostering a supportive classroom culture, educators can ensure that all learners have equal access to language education and the opportunity to reach their full potential.

5.9 Conclusion

Research and practice sharing in the methodology of teaching English as a foreign language, particularly in the context of surdoglottodidactics, has established a significant foundation. This advancement is largely attributed to collaborative efforts across various countries, which have enabled educators to gain a deeper understanding of the unique needs of deaf and hard-of-hearing (DHH) students. As a result, teachers are better equipped to adapt their instructional methods to meet the diverse requirements of these learners. Recent advancements in medical and technological support for individuals with hearing impairments have accelerated rapidly, particularly concerning early medical interventions and cochlear implantation. These developments have transformed the landscape of language learning for DHH individuals, allowing them to achieve auditory capabilities that were previously thought unattainable. When coupled with early intervention practices, these technologies enable many DHH students to participate effectively in mainstream or inclusive classrooms with only minor adjustments needed to facilitate their learning. Despite these advancements, contemporary challenges remain. One of the primary concerns is the need for functional assessments to identify the specific nature and scope of additional needs that DHH students may have. This involves evaluating their unique learning profiles and determining how best to adjust the classroom environment and teaching strategies to support their mastery of foreign language skills. Effective assessment is crucial for ensuring that DHH students can reach their full potential in language acquisition.

The integration of assistive technologies, such as hearing aids and speech-to-text applications, plays a vital role in supporting DHH learners. These tools not only enhance accessibility but also promote engagement in language learning activities. Educators are encouraged to utilize a variety of instructional strategies that

incorporate visual, auditory, and tactile elements, catering to the diverse learning preferences of DHH students. Furthermore, the importance of fostering an inclusive classroom environment cannot be overstated. Creating a supportive atmosphere where DHH students feel valued and understood is essential for their emotional and social development. Encouraging collaboration among peers and promoting self- advocacy skills can further empower DHH learners, enabling them to take an active role in their education. In summary, the ongoing research and collaboration in the field of surdoglottodidactics have significantly enhanced the understanding of teaching English as a foreign language to DHH students. With the rapid advancements in medical and technological support, along with the emphasis on functional assessment and inclusive practices, educators are better positioned to address the unique needs of DHH learners. By continuing to adapt teaching methodologies and fostering supportive learning environments, it is possible to help DHH students achieve their language learning goals and reach their full potential.

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