

TEACHING FOREIGN LANGUAGES IN LIFE SCIENCES UNIVERSITIES USING MODERN METHODS AND TECHNOLOGIES

R. PAȘCALĂU¹, Laura ȘMULEAC¹, S. M. STANCIU¹, A. ȘMULEAC¹, L.R. STIEGELBAUER², S. LAZA DIMA², G.D. SABĂU², A. PĂDUREAN³, G. KNAP³

¹University of Life Sciences “King Mihai I” from Timișoara

²“Vasile Goldiș” Western University of Arad

³“Aurel Vlaicu” University from Arad

Corresponding author: laurasmuleac@usvt.ro

Abstract. Teaching foreign languages using modern methods involves incorporating technology and other interactive techniques to enhance the learning experience. Some popular methods include: Task-based language teaching (TBLT): This approach focuses on real-life situations and language usage in context. Gamification: Incorporating game-like elements into language lessons to make them more engaging and fun. Blended learning: Combining traditional classroom instruction with online activities and resources. Mobile learning: Using mobile devices such as smartphones and tablets to provide students with language practice and feedback on the go. Video conferencing: Using platforms like Zoom or Skype to connect students with native-speaking tutors or to facilitate virtual language exchanges. Augmented Reality (AR) and Virtual Reality (VR) technologies: Providing students with immersive language learning experiences. Personalized learning: Adapting language lessons to the individual needs, interests, and learning styles of students. By incorporating these modern methods, language teachers can create dynamic and engaging learning environments that promote student success. Collaborative learning: Encouraging students to work together in small groups or pairs to practice their language skills and learn from each other. Digital flashcards and quizzes: Using digital tools to help students memorize vocabulary and test their language knowledge. Online language communities: Connecting students with other language learners and native speakers through online forums, social media, or language exchange websites. Content-based instruction: Integrating language learning with content from subjects such as history, science, or geography to make language lessons more relevant and interesting. Adaptive learning: Using artificial intelligence and machine learning algorithms to customize language lessons based on the student's performance and progress. Authentic materials: Incorporating real-life texts, videos, and audio recordings into language lessons to provide students with authentic language exposure.

Keywords: teaching, foreign languages, education, students, life sciences, technologies

INTRODUCTION

In today's interconnected world, the ability to communicate effectively in multiple languages has become an essential skill, especially in the field of life sciences. Life sciences universities, which focus on disciplines such as biology, biochemistry, biotechnology, and related areas, recognize the importance of foreign language proficiency for their students. To meet the growing demand for language skills, educators in these institutions are embracing modern methods and technologies to enhance the teaching and learning experience (LOPEZ, 1998, P. 132).

This paper aims to explore the integration of modern methods and technologies in teaching foreign languages in life sciences universities. By leveraging innovative approaches, educators can create engaging and immersive language learning environments that cater specifically to the needs of life sciences students (ROMM, J.J., 2007).

Teaching foreign languages in life sciences universities using modern methods and technologies equips students with the language proficiency, communication skills, cultural

awareness, and global mindset necessary for success in their academic and professional endeavours.

Benefits of Modern Methods and Technologies:

Interactive Learning: Modern methods promote interactive and student-centered learning environments. Through group discussions, role plays, and collaborative activities, students actively participate in language acquisition, improving their fluency and communication skills.

Authentic Content: Technology allows educators to incorporate authentic content from the field of life sciences into language lessons. Students can access scientific articles, research papers, and other relevant resources in their target language, enabling them to develop domain-specific vocabulary and comprehension skills.

Multimodal Learning: Modern technologies facilitate multimodal learning experiences by combining different forms of media, such as videos, audio recordings, and interactive simulations. This approach appeals to various learning styles and enhances students' understanding of complex scientific concepts.

Personalized Instruction: Technology-assisted language learning platforms can provide individualized feedback and adaptive learning paths based on students' performance and progress. This personalized approach allows students to focus on areas where they need improvement, optimizing their language learning experience.

Global Connectivity: Modern methods and technologies enable students to connect with language learners and speakers worldwide. Through virtual exchanges, online language communities, and video conferencing, students can engage in real-time conversations with native speakers, gaining cultural insights and improving their language skills.

Implementation Challenges:

While the integration of modern methods and technologies in language teaching offers numerous benefits, there are certain challenges that need to be addressed. These challenges include:

Technical Infrastructure: Ensuring access to reliable technology and internet connectivity for all students can be a logistical challenge, particularly in resource-constrained environments.

Teacher Training: Educators need to receive adequate training and professional development to effectively integrate modern methods and technologies into their language teaching practices. Ongoing support and resources should be provided to assist teachers in adapting to new pedagogical approaches.

Assessment Methods: Assessing language proficiency in the life sciences context requires innovative assessment methods that evaluate both language skills and domain-specific knowledge. Developing appropriate assessment tools and criteria is crucial to accurately measure students' language competence (PAȘCALĂU and all., 2020).

Teaching foreign languages in life sciences universities using modern methods and technologies presents exciting opportunities for both educators and students. By embracing interactive, authentic, and personalized learning experiences, language learning becomes more engaging and relevant to the field of life sciences. However, addressing challenges related to technical infrastructure, teacher training, and assessment methods is crucial to ensure the successful implementation of these approaches. As language skills continue to be an essential asset in the globalized scientific community, integrating modern methods and technologies becomes an imperative for life sciences universities to equip their students with the necessary language proficiency for success in their future careers.

MATERIAL AND METHODS

By using a combination of modern methods, language teachers can create engaging and effective language learning experiences that cater to the diverse needs and interests of their students. Practice is a critical component of effective language learning. Some ways to encourage practice include:

Oral practice: Encouraging students to speak the target language as much as possible, either in class or through language exchanges with native speakers.

Writing practice: Assigning writing tasks, such as journal entries or essays, to help students develop their writing skills.

Listening practice: Providing students with opportunities to listen to native speakers through audio recordings, videos, or live events.

Reading practice: Encouraging students to read authentic materials in the target language, such as news articles, books, or websites.

Regular homework assignments: Assigning regular language practice exercises, such as vocabulary drills or grammar exercises, to reinforce what students have learned in class.

Immediate feedback: Providing students with timely and constructive feedback on their language practice, both in class and through online tools.

Self-reflection: Encouraging students to reflect on their language learning progress and identify areas where they need to improve.

By offering a variety of practice opportunities and providing support and feedback, language teachers can help students develop the skills and confidence they need to use the target language effectively.

Working in pairs or small groups is a valuable language learning strategy that can provide students with opportunities to practice their language skills and interact with their peers. Some benefits of working in pairs or small groups include:

Encourages interaction: Working in pairs or small groups encourages students to interact with each other, which is essential for developing their oral communication skills.

Provides support: When students work in pairs or small groups, they can support each other and help each other understand new language concepts.

Fosters creativity: Working in pairs or small groups allows students to explore new ideas, perspectives, and solutions to language-related tasks and challenges.

Increases engagement: Working in pairs or small groups can be more engaging and enjoyable than working alone, which can increase student motivation and participation.

Promotes peer learning: When students work in pairs or small groups, they can learn from each other and help each other develop their language skills.

To maximize the benefits of working in pairs or small groups, language teachers should provide clear instructions and guidelines, facilitate effective communication and collaboration, and offer guidance and feedback as needed.

Role-play exercises are a popular teaching method in language classes as they provide students with opportunities to practice their language skills in real-life scenarios. Some benefits of role-play exercises include:

Encourages interaction: Role-play exercises encourage students to interact with each other, which helps to develop their oral communication skills.

Promotes language immersion: Role-play exercises simulate real-life situations and create a language immersion experience for students, which can increase their motivation and engagement (PAȘCALĂU AND ALL., 2022).

Develops interpersonal skills: Role-play exercises help students develop their interpersonal skills, such as listening, negotiation, and problem-solving, which are transferable to real-life situations.

Fosters creativity: Role-play exercises allow students to be creative and use their imagination, which can be fun and engaging.

Reinforces language structures: Role-play exercises provide opportunities to practice and reinforce language structures, such as grammar and vocabulary, in a meaningful context.

To raise the importance of the benefits of role-play exercises, language teachers should provide clear instructions and guidelines, create realistic scenarios, and offer feedback and guidance to help students improve their language skills.

Dialogues are an important teaching tool in language classes as they provide students with opportunities to practice their language skills in a conversational setting. Some benefits of dialogues in language classes include:

Encourages interaction: Dialogues encourage students to interact with each other, which helps to develop their oral communication skills.

Promotes language immersion: Dialogues create a language immersion experience for students as they must communicate in the target language to participate effectively.

Reinforces language structures: Dialogues provide opportunities to practice and reinforce language structures, such as grammar and vocabulary, in a meaningful context.

Develops listening and speaking skills: Dialogues require students to listen actively and speak clearly, which can help to develop their listening and speaking skills.

Increases motivation and engagement: Dialogues can be engaging and enjoyable for students, which can increase their motivation and participation.

To increase the benefits of dialogues, language teachers should provide clear instructions and guidelines, create meaningful and relevant dialogue topics, and offer feedback and guidance to help students improve their language skills. Additionally, they can also encourage students to use the target language as much as possible during class and provide opportunities for them to engage in authentic conversations with native speakers (PAȘCALĂU AND ALL., 2022).

Interacting with native speakers or incoming students from abroad can be a valuable experience for language students as it provides them with opportunities to practice their language skills in a real-life setting and learn about the culture and customs of the target language, especially when actions in environmental backgrounds are involved. All environmental and climate change activities connected to life sciences area, involve a communication between the local students and the incoming ones, highlighting the major aspects and concerns within the area of climate changes (ȘMULEAC AND ALL., 2020). Here one may include the Erasmus+ Programs, Ceepus programmes, or other types of mobility programmes. Some benefits of interacting with native speakers or incoming students from abroad include:

Improves language proficiency: Interacting with native speakers or incoming students from abroad can help students improve their language proficiency by providing them with opportunities to practice their speaking, listening, and comprehension skills (GUYVENCHY AND ALL., 2022).

Increases cultural awareness: Interacting with native speakers or incoming students from abroad can increase students' cultural awareness and understanding of the target language culture and customs.

Fosters cross-cultural communication: Interacting with native speakers or incoming students from abroad can help students develop their cross-cultural communication skills and learn how to communicate effectively with people from different backgrounds.

Enhances motivation and engagement: Interacting with native speakers or incoming students from abroad can be engaging and enjoyable for students, which can increase their motivation and participation in language classes.

To maximize the benefits of interacting with native speakers or incoming students from abroad, language teachers can arrange language exchanges, host cultural events, and organize field trips to areas where the target language is widely spoken (ŞMULEAC AND ALL., 2013). Additionally, they can encourage students to engage in meaningful conversations with native speakers or incoming students from abroad and provide opportunities for them to participate in cultural activities and events. The Erasmus+ incoming students are a perfect resource in every university, for one or two semesters while they are hosted there, being able to have dialogues, mutual presentations, and other types of communication activities.

RESULTS AND DISCUSSIONS

Marks and evaluations are an important part of language classes as they provide students with feedback on their language skills and progress, and help teachers to assess their students' strengths and weaknesses. Some benefits of marks and evaluations in language classes include:

Provides motivation: Marks and evaluations can provide students with motivation to work harder and improve their language skills, as they have clear goals to strive towards.

Encourages self-reflection: Marks and evaluations provide students with an opportunity to reflect on their own language skills and identify areas for improvement.

Helps to monitor progress: Marks and evaluations provide teachers and students with a clear picture of their language progress, which can help them to monitor their learning and adjust their study strategies as needed.

Supports formative assessment: Marks and evaluations can support formative assessment, which is an ongoing process of assessing student learning and providing feedback to support their development.

To maximize the benefits of marks and evaluations in language classes, language teachers should provide clear and consistent guidelines, establish fair and objective evaluation criteria, and offer constructive feedback to help students improve their language skills. Additionally, they can involve students in the evaluation process by setting goals, monitoring progress, and reflecting on their own language skills.

Incorporating culture and civilization into language classes can be an effective way to enhance language learning and deepen students' understanding of the target language culture (PAŞCALĂU, 2021). Some benefits of incorporating culture and civilization into language classes include:

Develops cultural competence: Incorporating culture and civilization into language classes can help students develop their cultural competence, which is the ability to understand, appreciate, and effectively interact with people from different cultural backgrounds.

Enhances language proficiency: Incorporating culture and civilization into language classes can help students enhance their language proficiency by providing them with opportunities to practice their language skills in a cultural context.

Increases motivation and engagement: Incorporating culture and civilization into language classes can be engaging and enjoyable for students, which can increase their motivation and participation in language classes.

Supports intercultural communication: Incorporating culture and civilization into language classes can help students understand the cultural norms and values of the target language which can support intercultural communication and improve their ability to communicate effectively with people from different backgrounds.

Promotes language-cultural connection: Incorporating culture and civilization into language classes can help students see the connection between language and culture, which can deepen their understanding and appreciation of both.

To incorporate culture and civilization into language classes, language teachers can incorporate cultural topics and activities into their lessons, such as discussions, debates, and presentations, as well as including cultural elements, such as art, music, literature, and historical events, into their lessons. Additionally, they can organize cultural field trips, invite guest speakers from the target language culture, and encourage students to participate in cultural events and activities outside of class.

The impact of teaching foreign languages with modern methods can be far-reaching and long-lasting. Some of the key impacts include:

Improved language proficiency: Modern methods can lead to a deeper understanding of the language and improved language proficiency, which can benefit students in their personal and professional lives.

Enhanced cross-cultural communication: By gaining a deeper understanding of other cultures through language learning, students can develop more effective communication skills and better relationships with people from different backgrounds.

Increased job opportunities: Being able to speak multiple languages is becoming increasingly valuable in today's globalized job market, and modern methods can help prepare students for these opportunities (KAGAWA, F. & SELBY, D., 2010).

Better cognitive development: The cognitive and critical thinking skills developed through modern language teaching methods can have a positive impact on students' overall academic performance and future success.

Fostering global citizenship: Modern methods can foster a sense of global citizenship by exposing students to different cultures and promoting understanding and respect for diversity.

The results of teaching foreign languages with modern methods can be significant and far-reaching. Some of the benefits include:

Improved language proficiency: By using technology and multimedia resources, students can reinforce their language skills and improve their proficiency in listening, speaking, reading, and writing.

Increased motivation and engagement: Modern methods can make language learning more fun and interactive, leading to increased motivation and engagement among students (PAȘCALĂU AND ALL., 2021).

Enhanced cultural understanding: By using resources that expose students to authentic cultural experiences, they can gain a deeper understanding and appreciation of the culture associated with the language they are learning.

Personalized learning: Modern methods allow for individualized and personalized learning experiences, which can help students achieve their unique language learning goals.

Better preparation for real-world use: By incorporating technology and multimedia resources, students can have a more realistic and practical experience, which better prepares them for using the language in real-world situations.

In summary, the use of modern methods in foreign language teaching can lead to a more effective and enjoyable learning experience, with improved language proficiency,

increased motivation, enhanced cultural understanding, personalized learning and better real-world preparation (ŞMULEAC AND ALL., 2022).

While there are many benefits to teaching foreign languages with modern methods, there are also some potential disadvantages to consider:

Limited accessibility: Technology-based resources and tools may not be accessible to all students, particularly those from low-income backgrounds or those in rural or remote areas.

Dependence on technology: Overreliance on technology in language learning can limit students' exposure to authentic language experiences and interactions with native speakers.




Cost: Implementing modern methods in language teaching can be costly, and may not be feasible for schools and teachers with limited resources.


Skill-set limitations for teachers: Teachers may need to develop new skills and knowledge in using technology and multimedia resources effectively in the classroom.

Potential for distraction: Technology can also be a source of distraction for students, particularly if not used effectively or managed appropriately in the classroom.

Thus, while modern methods in foreign language teaching have many benefits, it is important to be aware of the potential disadvantages and to approach their integration thoughtfully and effectively.

A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis can be a useful tool for evaluating the use of modern methods in foreign language teaching.

<p style="text-align: center;">Strengths</p> <ul style="list-style-type: none"> ❖ Improved language proficiency through use of technology and multimedia resources ❖ Increased motivation and engagement among students ❖ Enhanced cultural understanding through exposure to authentic cultural experiences ❖ Personalized learning experiences ❖ Better preparation for real-world use of the language 	
	<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> ❖ Limited accessibility to technology-based resources, particularly for low-income students or those in rural or remote areas ❖ Overreliance on technology, which can limit exposure to authentic language experiences ❖ Cost and resource constraints for schools and teachers ❖ Need for teachers to develop new skills and knowledge in using technology effectively
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> ❖ Integration of technology and multimedia resources in language teaching can lead to more effective and enjoyable learning experiences ❖ Increased demand for multilingual individuals in today's globalized job market ❖ Potential to foster global citizenship through exposure to different cultures ❖ Improved cognitive and critical thinking skills through the use of modern method 	

	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none">❖ Competition from online language learning platforms and resources❖ Potential for technology to be used inappropriately or for learning to become too focused on technology and not enough on language learning❖ Concerns about privacy and security when using technology in education❖ Need to effectively manage technology in the classroom to prevent distractions and ensure optimal learning experiences
---	---

In conclusion, a SWOT analysis of modern methods in foreign language teaching highlights both the benefits and challenges of incorporating technology and multimedia resources into language education. By understanding these strengths, weaknesses, opportunities, and threats, schools and teachers can make informed decisions and effectively integrate modern methods into their language teaching programs.

CONCLUSIONS

In conclusion, teaching foreign languages with modern methods can have a significant impact on individuals and society. It can improve language proficiency, enhance cross-cultural communication, increase job opportunities, foster cognitive development, and promote global citizenship. It is a multi-faceted and dynamic process that requires a combination of effective teaching strategies and resources to support students' language learning. Incorporating activities such as pair work, role-play exercises, debates, dialogues, and cultural immersion can enhance students' language proficiency, cultural competence, and motivation. Assessing students' language skills through marks and evaluations is also important, as it provides students with feedback and helps teachers to monitor their progress. To be successful, language teachers should design their lessons with clear learning objectives, select teaching materials that meet the needs of their students, and provide a supportive learning environment that fosters student engagement and creativity (PIKE & SELBY, 1988, P. 35, ŞMULEAC, 2020, IMBREA 2011).

There are several careers related to teaching foreign languages with modern methods. Some of these include:

Language teacher: Language teachers use modern methods to teach students a foreign language, including the use of technology and multimedia resources to enhance learning.

Instructional designer: Instructional designers develop and design technology-based resources and tools for foreign language teaching, such as online language courses or mobile apps.

Education technology specialist: Education technology specialists help schools and teachers integrate technology into their language teaching programs, providing training and support in the use of technology-based resources and tools.

Multimedia designer: Multimedia designers create digital resources, such as videos, animations, and interactive simulations, for use in foreign language teaching.

Language education researcher: Language education researchers study the effectiveness of modern methods in foreign language teaching and make recommendations for best practices.

There are many careers related to teaching foreign languages with modern methods, including language teaching, instructional design, education technology, multimedia design, and language education research. These careers offer opportunities to use technology and multimedia resources to enhance language learning and improve education.

Teaching foreign languages with modern methods can lead to more effective and engaging learning experiences for students. By utilizing technology, multimedia resources, and student-centered teaching approaches, students can improve their language proficiency and gain a deeper understanding of the language and culture. It is important for language teachers to stay updated with new teaching techniques and technology to provide their students with the best possible education.

The integration of modern methods in foreign language teaching has the potential to revolutionize the way students learn and engage with the language. By breaking away from traditional teaching methods and embracing technology and student-centered approaches, teachers can create dynamic, interactive and personalized learning experiences. As the world becomes increasingly globalized and connected, the ability to speak multiple languages is becoming more important than ever, and modern methods can help equip students with the skills and knowledge they need to succeed in today's world.

BIBLIOGRAPHY

- BENAYAS JMR, NEWTON AC, DIAZ A, BULLOCK JM. 2009. Enhancement of biodiversity and ecosystem services by ecological restoration: a meta-analysis.
- FRASER DJ, BERNATCHEZ L. 2001, Adaptive evolutionary conservation: towards a unified concept for defining conservation units. *Molecular Ecology* 10:2741–2752.
- GUYVENCHY F., LAURA ŞMULEAC, R. PAŞCALĂU, 2022, The Importance Of Education And Internationalization In Haiti And The Carribean Area, *Research Journal of Agricultural Science*, 54 (4).; ISSN: 2668-926X
- HAMILTON, C., 2010, *Requiem for a Species: Why We Resist the Truth About Climate Change*. Londres: Earthscan.
- HILL R, et al. 2017, Weaving knowledge systems in IPBES, CBD and beyond—lessons learned for sustainability. *Current Opinion in Environmental Sustainability*.
- HILLMAN, M., FAWCETT, T & RAJAN, S.C., 2007, *The Suicidal Planet: How to Prevent Global Climate Catastrophe*. New York: Thomas Dunne
- IMBREA FLORIN, STEFANA JURCOANE, POP GEORGETA, M IMBREA ILINCA, LUCIAN BOTOS, FLORIN CRISTA, LAURA SMULEAC, 2017, Valorising municipal sludge as fertiliser in *Camelina sativa* (L.) Crantz, *Romanian Biotechnological Letters* 22 (4), 12762
- IMBREA FLORIN, 2011, Proiectele de cercetare în domeniul agriculturii în parteneriat public-privat—provocări privind managementul și finanțarea, *Agrobuletin Agir An III*
- IMBREA I, M PRODAN, A NICOLIN, M BUTNARIU, F IMBREA, Valorising *Thymus glabrescens* Willd. From the Aninei mountains, *Research Journal of Agricultural Science* 42 (2), 260-263 9
- KAGAWA, F. & SELBY, D. (EDS), 2010, *Education and Climate Change: Living and Learning in Interesting Times*. New York: Routledge.
- LÆSSØE, J. SCHNACK, K., BREITING, S. & ROLLS, S., 2009, *Climate Change and Sustainable Development: The Response from Education*. IALEI.
- LOPEZ, B., 1998, *About this Life: Journeys on the Threshold of Memory*. New York: Knopf.
- LOTZ-SISITKA, H., 2010, *Climate Injustice: How Should Education Respond?* Dans Kagawa, F. & Selby, D. *Education and Climate Change: Living and Learning in Interesting Times*. New York: Routledge.
- OXFAM INTERNATIONAL, 2009, *Suffering the Science: Climate Change, People and Poverty*. Londres: Oxfam Briefing Paper.
- PAŞCALĂU R., STANCIU S., ŞMULEAC A., A. ŞMULEAC, SĂLĂŞAN C., URLICĂ A.A., 2021, Protecting nature through languages, *Research Journal of Agricultural Science*, 53 (2)

- PAȘCALĂU R., ȘMULEAC L., STANCIU S. M, IMBREA F., ȘMULEAC A., BAKLI M., AMARA, M., 2022, Non-formal education in teaching foreign languages for agriculturists, Research Journal of Agricultural Science, 54 (2)
- PIKE, G. & SELBY, D., 1988, Global Teacher, Global Learner. Londres: Hodder & Stoughton.
- ROMM, J.J., 2007. Hell and High Water: Global warming – The Solution and the Politics – and What We Should Do. New York: William Morrow.
- SELBY, D., 2007. Von der Notwendigkeit eines Klimawandels im Bildungswesen (The need for climate change in education), Portail Internet : Bildung für nachhaltige Entwicklung (Education en vue du développement durable), Portail URL: www.bne-portal.de
- ȘMULEAC A, C POPESCU, F IMBREA, G POPESCU, L ȘMULEAC, 2016 Topographic and cadastre works for the establishment of an animal farm with NPRD funds, measure 121, Vărădia, Caraș-Severin county, Romania, International Multidisciplinary Scientific GeoConference: SGEM 3, 685-692
- ȘMULEAC L., SIMONA N., IENCIU A. ȘMULEAC A., DANIEL D., 2016, Topographic survey for the monitoring of the impact of the BRUA/ROHUAT pipe on water flow in the irrigation system at Fântânele, Arad County, Romania, International Multidisciplinary Scientific GeoConference: SGEM, Vol 3, 333-340
- ȘMULEAC L., SILVICA O., IENCIU A., BERTICI R., ȘMULEAC A., MIHĂIESC C., 2014, Influence of anthropic activities on ground water in Boldur, Timis County, Romania, Research Journal of Agricultural Science, Vol. 46
- UNESCO, 2005. Décennie des Nations Unies pour l'éducation en vue du développement durable des Nations Unies (2005-2014) : Plan international de mise en oeuvre. Paris : UNESCO.
- UNESCO, 2010. Education au changement climatique en vue du développement durable. Paris: UNESCO
- WALS A., 2009 Review of contexts and structures for Education for Sustainable Development 2009. Paris: UNESCO