

Enhancing Environmental Literacy through English Language Education in Maritime Institutions

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Abstract. This research study addresses the critical imperative of integrating environmental perspectives into maritime education, with a primary focus on enhancing reading competencies and instilling environmental literacy among maritime cadets. Recognising the profound impact of the maritime sector on global trade and the environment, this study explores the role of language education, specifically English language instruction, as a conduit for environmental education. Through a comprehensive literature analysis, the research highlights the importance of developing curricula that seamlessly weave environmental content into the fabric of maritime education. The findings underscore the synergistic relationship between language proficiency and environmental literacy, emphasising that language instruction can serve as a powerful vehicle for environmental awareness. The research illuminates the challenges and opportunities in language-integrated environmental education, proposing tailored language instruction, interdisciplinary collaboration, and the use of real-world materials as effective strategies. It further elucidates the profound implications of environmental literacy for the maritime industry, advocating for proactive policy changes, professional development, and industry partnerships. The recommendations emanating from this research encompass curriculum enhancement, awareness campaigns, international collaboration, and the advocacy of environmental literacy in maritime education. By following these recommendations, maritime education can evolve to produce professionals who are proficient in English, environmentally literate, and fully prepared to navigate the complex environmental challenges and responsibilities inherent to the maritime sector.

1 Introduction

Environmental issues have become a global concern in recent decades, as the consequences of climate change and ecosystem degradation have become increasingly apparent. The maritime industry, being an integral part of international trade and transportation, plays a pivotal role in environmental conservation and sustainable development [1,2]. As the world continues to grapple with the ecological challenges posed by climate change, marine biodiversity loss, and the protection of delicate marine ecosystems, it is crucial to equip future maritime professionals with the knowledge, skills, and literacy necessary to address these challenges. This research study delves into the integration of environmental perspectives into the Standard Campus Communication Phrase (SCCP) program at Sekolah Tinggi Ilmu Pelayaran - Jakarta, an institution at the forefront of maritime education in Indonesia. The overarching theme of this research centers on Environmental Perspectives in Maritime Education. It is composed of several interconnected sub-themes, each addressing a specific aspect of environmental awareness and literacy [1,3]. The first sub-theme is dedicated to educating maritime students on marine biodiversity and the conservation of fragile marine ecosystems. The second sub-theme underscores the importance of fostering awareness regarding the maritime sector's role in climate change mitigation. The third sub-theme focuses on addressing legal and ethical issues related to environmental protection in maritime activities. By exploring these sub-themes, this research aims to create a holistic framework for environmental education within maritime institutions.

The importance of this research is underscored by the recognition that the maritime industry, while essential for global trade and transportation, is also a significant contributor to environmental challenges. Shipping emissions, for instance, are a substantial source of greenhouse gases, and maritime activities can have adverse effects on marine ecosystems [4,5]. Thus, it is imperative to instill a sense of environmental responsibility in future maritime professionals, ensuring that they are not only proficient in their field but also well-versed in ecological challenges and their responsibilities. This research is situated within a multidisciplinary framework that draws from the fields of culture, literature, English for Specific Purpose (ESP), English as a Second Language (ESL), and Maritime English [6]. These areas of study provide a solid foundation for understanding the intricate relationship between language education and environmental literacy. The

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integration of environmental perspectives into the SCCP program reflects a fusion of language instruction and ecological awareness, aiming to enhance reading competencies while instilling environmental literacy among maritime cadets.

The potential outcomes of this research are expected to make a substantial contribution to the field of maritime education. By highlighting the role of English language instruction in promoting environmental awareness and literacy, this study has the potential to reshape pedagogical practices in maritime institutions [7]. The research findings can provide valuable insights for educators, curriculum developers, and policymakers involved in maritime education, informing the development of more effective and environmentally-conscious programs. This research endeavors to produce maritime professionals who are not only proficient in English, a crucial skill in the international maritime industry, but also well-prepared to address the ecological challenges and responsibilities associated with the sector. The integration of environmental perspectives into the SCCP program represents a pioneering step towards creating environmentally responsible maritime professionals, and the findings of this study are poised to have a significant and lasting impact in this field.

1.1 Literature review

The intersection of environmental education, language instruction, and maritime studies forms the crux of this literature review. It seeks to provide a comprehensive understanding of the key concepts that underpin the integration of environmental perspectives into language education within maritime institutions. This review draws upon relevant scholarship from the fields of environmental literacy, language education, and maritime education.

1.1.1 Environmental Literacy in Education

Environmental literacy has gained prominence as a fundamental component of education in response to the increasing environmental challenges facing the world. The concept of environmental literacy involves not only a basic understanding of environmental issues but also the ability to critically analyze and engage with these issues. Environmental literacy as the capacity to perceive and interpret the relative health of environmental systems and take appropriate action to maintain, restore, or improve the health of those systems. Environmental literacy encompasses various dimensions, including knowledge about ecological systems, understanding the impact of human activities on the environment, and the ability to make informed decisions that promote sustainability [8,9]. In the context of maritime education, environmental literacy is particularly pertinent given the sector's substantial environmental footprint and its potential to affect marine ecosystems. Therefore, equipping maritime professionals with environmental literacy is essential for responsible and sustainable practices in the field.

1.1.2 The Role of Language Education in Environmental Literacy

The incorporation of language education, particularly English language instruction, into the framework of environmental literacy is a novel but crucial development. Language is the primary medium through which knowledge is conveyed, and as such, it plays a pivotal role in shaping individuals' understanding of environmental issues [10,11]. In the context of maritime education, where English is the lingua franca for international communication, language instruction offers a unique avenue for promoting environmental literacy.

Research in English for Specific Purpose (ESP) and English as a Second Language (ESL) has highlighted the potential for language education to foster environmental awareness. ESP, which tailors language instruction to specific professional contexts, can be adapted to address the language needs of maritime cadets while incorporating environmental content [12]. By integrating environmental terminology and concepts into language lessons, students can develop the language skills required for effective communication in the maritime industry while concurrently acquiring knowledge about environmental issues.

Furthermore, ESL programs can serve as platforms for immersing students in environmental discussions. Utilizing real-world materials such as environmental reports, treaties, and maritime sustainability guidelines can engage students in meaningful language practice while exposing them to relevant environmental information [9,13]. This integration of language instruction with environmental content is pivotal in cultivating environmentally literate maritime professionals.

1.1.3 The Maritime Sector and Environmental Challenges

The maritime industry, encompassing shipping, port operations, and offshore activities, has a significant impact on the environment. One of the primary environmental concerns in this sector is greenhouse gas emissions. The shipping industry alone is responsible for a substantial portion of global carbon emissions [14]. As international regulations and societal pressures increasingly focus on reducing emissions and transitioning to more sustainable practices, the need for environmentally conscious maritime professionals becomes evident. The maritime industry's impact on marine ecosystems is another pressing concern [15]. Activities such as ballast water discharge, oil spills, and the release of pollutants pose direct threats to marine biodiversity and ecosystems. Maritime education institutions must address these

concerns by educating future professionals about the potential environmental consequences of their actions and instilling practices that mitigate harm to marine ecosystems.

1.1.4 Environmental Education Initiatives in Maritime Institutions

Several maritime institutions have recognized the significance of integrating environmental education into their programs. For instance, the World Maritime University (WMU) in Sweden offers a Master's program in Maritime Affairs with a specialization in Maritime Energy Management and the Marine Environment. This program combines the study of maritime management and environmental sustainability, emphasizing the need for environmentally conscious practices in the maritime industry [5,16]. Similarly, the International Maritime Organization (IMO), the United Nations agency responsible for regulating the shipping industry, has adopted environmental regulations, including the International Convention for the Prevention of Pollution from Ships (MARPOL). These regulations underscore the industry's commitment to environmental protection and require maritime professionals to be well-versed in environmental compliance and best practices.

1.1.5 Challenges in Integrating Environmental Perspectives

The integration of environmental perspectives into maritime education is not without challenges. Language barriers, especially for non-native English speakers, can hinder the effective transfer of environmental knowledge [1]. To address this, language instruction must be designed to cater to the specific linguistic needs of maritime students, with a focus on maritime terminology and context-specific environmental concepts [17]. Furthermore, maritime institutions often face constraints in terms of resources and curriculum flexibility. The incorporation of additional environmental content may be perceived as burdensome. Overcoming these challenges requires a well-planned curriculum that integrates environmental education seamlessly and emphasizes the relevance of environmental literacy to students' future careers.

1.1.6 Significance of Environmental Literacy in Maritime Education

The significance of environmental literacy within maritime education cannot be overstated. In addition to fulfilling regulatory requirements and societal expectations, environmentally literate maritime professionals are better equipped to make informed decisions that contribute to the sustainability of the industry. These decisions may involve adopting cleaner technologies, implementing sustainable practices, and complying with international environmental regulations [5,18].

Moreover, environmental literacy can enhance the reputation of maritime institutions and their graduates. In an era where corporate social responsibility and sustainability are valued by employers and clients, maritime professionals with a strong foundation in environmental literacy may have a competitive edge in the job market [15,19]. The integration of environmental perspectives into language education in maritime institutions is a crucial step in equipping future maritime professionals with the knowledge, skills, and literacy necessary to address environmental challenges in the industry. Environmental literacy, encompassing an understanding of ecological systems, the impact of human activities on the environment, and the ability to make informed decisions that promote sustainability, is essential for responsible and sustainable maritime practices.

Language education, particularly English language instruction, can serve as a potent tool for fostering environmental awareness among maritime cadets [6]. Research in ESP and ESL highlights the potential for language instruction to simultaneously develop language skills and environmental knowledge. The maritime industry's impact on the environment, including emissions and threats to marine ecosystems, underscores the urgency of this integration. While challenges exist, including language barriers and resource constraints, the benefits of environmental literacy within maritime education are substantial. Environmentally literate maritime professionals are better positioned to contribute to the sustainability of the industry and may enjoy a competitive advantage in the job market. This literature review establishes the foundation for the subsequent sections of this research, which will investigate the integration of environmental perspectives into the Standard Campus Communication Phrase (SCCP) program at Sekolah Tinggi Ilmu Pelayaran - Jakarta. It seeks to contribute to the growing body of knowledge on the intersection of language education and environmental literacy in the maritime context.

2 Methods

The research focuses on exploring the integration of environmental perspectives into the Standard Campus Communication Phrase (SCCP) program at Sekolah Tinggi Ilmu Pelayaran - Jakarta, with the aim of enhancing reading competencies and instilling environmental literacy among maritime cadets [20,21]. The research adopts a descriptive qualitative method that emphasizes the in-depth examination of existing literature and related materials. This method is characterized by the systematic analysis of textual and conceptual content, enabling a comprehensive understanding of the research subject. In this case, the research leverages the qualitative approach to gain insights into the integration of environmental perspectives into maritime education and its potential impact on students' reading competencies and environmental literacy [22]. The primary data source in this research is the body of literature relevant to environmental

perspectives in maritime education, language instruction, and environmental literacy. The researcher collects and reviews scholarly articles, books, reports, and documents that pertain to the research themes. This encompassing review allows for the synthesis of existing knowledge and positions the study within the broader academic discourse. The research method employed in this study, a descriptive qualitative approach based on reading, analyzing, and comparing relevant literature, is well-suited to the research objectives [21,23]. It enables a deep exploration of the integration of environmental perspectives into maritime education, focusing on the enhancement of reading competencies and the cultivation of environmental literacy among maritime cadets. By systematically examining and synthesizing existing literature, this research method provides a solid foundation for understanding the research area and positioning it within the academic discourse.

3 Findings

The research explored the enhancement of reading competencies and the instillation of environmental literacy among maritime cadets through a qualitative analysis of relevant literature. The findings are organized into key thematic areas that emerged during the analysis.

3.1 Integration of Environmental Perspectives in Maritime Education

The analysis of the literature revealed a growing recognition of the importance of integrating environmental perspectives into maritime education. Several studies highlighted that maritime institutions, including Sekolah Tinggi Ilmu Pelayaran - Jakarta, have been taking proactive measures to incorporate environmental content into their curricula. This integration serves multiple purposes, including raising cadets' awareness of environmental issues and fostering a sense of environmental responsibility.

Moreover, the literature emphasized that the maritime industry's significant environmental footprint, particularly in terms of greenhouse gas emissions and potential harm to marine ecosystems, necessitates a comprehensive approach to environmental education. Curriculum adjustments, the development of specialized courses, and the inclusion of environmental modules have been common strategies adopted by maritime institutions to address these concerns. As maritime professionals play a pivotal role in environmental protection and sustainability, there is a consensus in the literature regarding the urgency of providing cadets with the knowledge and skills to navigate the industry's environmental challenges.

3.2 Language Instruction as a Vehicle for Environmental Literacy

A prominent theme that emerged from the analysis is the role of language instruction, specifically English language instruction, as a vehicle for imparting environmental literacy to maritime cadets. English is the lingua franca of the international maritime industry, and proficiency in English is a fundamental requirement for effective communication. The literature highlighted that this presents a unique opportunity to infuse environmental content into language education.

Studies in English for Specific Purpose (ESP) and English as a Second Language (ESL) underscored the potential for language education to promote environmental awareness. By incorporating environmental terminology and concepts into language instruction, maritime students can develop the language skills required for communication in their professional context while simultaneously gaining knowledge about environmental issues. The literature emphasized that this dual-purpose approach not only enhances language proficiency but also contributes to cadets' environmental literacy.

3.3 Challenges and Opportunities in Language-Integrated Environmental Education

The literature analysis also illuminated the challenges and opportunities associated with language-integrated environmental education in maritime contexts. Several studies highlighted language barriers, especially for non-native English speakers, as a potential impediment to the effective transfer of environmental knowledge. To address this challenge, the literature suggested that language instruction should be tailored to the specific linguistic needs of maritime students, emphasizing maritime terminology and context-specific environmental concepts. Additionally, the integration of real-world materials, such as environmental reports and maritime sustainability guidelines, can enhance language practice while exposing students to pertinent environmental information.

The literature emphasized that the integration of environmental content can be met with logistical challenges, including resource constraints and curriculum flexibility. Maritime institutions often face limitations in terms of available resources and resistance to altering established curricula. Nevertheless, the literature acknowledged that overcoming these challenges requires well-designed curricula that seamlessly integrate environmental education and emphasize the relevance of environmental literacy to cadets' future careers.

3.4 Environmental Literacy and the Maritime Sector

The analysis revealed that environmental literacy holds significant implications for the maritime sector. As the industry continues to face increased scrutiny and regulation related to its environmental impact, environmentally literate maritime professionals are better equipped to navigate these changes. They can make informed decisions that contribute to the industry's sustainability, including adopting cleaner technologies, implementing sustainable practices, and ensuring compliance with international environmental regulations. Moreover, the literature suggested that environmentally literate professionals may be more appealing to employers and clients in an era where corporate social responsibility and sustainability are highly valued.

3.5 Key Takeaways from the Literature Analysis

Maritime institutions, including Sekolah Tinggi Ilmu Pelayaran - Jakarta, have recognized the importance of integrating environmental perspectives into their curricula to address the sector's significant environmental footprint. Language instruction, particularly English language instruction, serves as a valuable medium for infusing environmental content into maritime education, contributing to cadets' environmental literacy.

Challenges in language-integrated environmental education include language barriers, resource constraints, and curriculum flexibility. These challenges necessitate tailored language instruction and well-planned curricula. Environmental literacy among maritime professionals is vital for making informed decisions that contribute to the industry's sustainability and aligning with the growing emphasis on corporate social responsibility and sustainability.

The findings of this study, derived from a qualitative analysis of literature, underscore the critical importance of integrating environmental perspectives into maritime education. The integration not only enhances the environmental literacy of maritime cadets but also equips them with the knowledge and skills to address the environmental challenges associated with the maritime sector. The role of language instruction, particularly English language instruction, in fostering environmental awareness and literacy is pivotal. By tailoring language education to maritime students' specific linguistic needs and incorporating environmental terminology and concepts, maritime institutions can produce professionals who are not only proficient in English but also well-versed in ecological challenges and responsibilities.

The challenges and opportunities associated with this integration are complex, but the literature analysis emphasizes the need for innovative curriculum design and a firm commitment to the cause of environmental literacy. As the maritime industry continues to adapt to environmental regulations and the expectations of environmentally conscious consumers, the findings of this research have the potential to inform educational practices that produce professionals better prepared to address ecological challenges and responsibilities. Furthermore, the findings emphasize the relevance and significance of environmental literacy in the maritime sector, which extends to enhancing the industry's environmental practices and contributing to its long-term sustainability.

4 Discussion and Implication

The research explored the enhancement of reading competencies and the instillation of environmental literacy among maritime cadets through a qualitative analysis of relevant literature. The findings are organized into key thematic areas that emerged during the analysis.

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5 Recommendation

Based on the findings and discussions presented in this research, several recommendations are proposed to further the integration of environmental perspectives into maritime education and foster environmental literacy among maritime cadets. These recommendations address educators, curriculum developers, policymakers, and industry stakeholders, all of whom play a crucial role in shaping the direction of maritime education and its impact on the industry's environmental practices.

1. **Comprehensive Curriculum Integration:** Maritime education institutions should embark on a comprehensive integration of environmental content into their curricula. This should extend beyond standalone environmental courses and encompass all relevant subjects, with a focus on the practical application of environmental concepts. Curricular adjustments should ensure that environmental perspectives are seamlessly woven into the fabric of maritime education.
2. **Tailored Language Instruction:** Language instruction programmes should be tailored to the specific linguistic needs of maritime students, particularly non-native English speakers. Customised language courses that emphasise maritime terminology and context-specific environmental concepts should be developed. Additionally, language instructors should receive training to effectively deliver this tailored instruction.
3. **Interdisciplinary Collaboration:** Maritime education institutions should promote interdisciplinary collaboration among faculty members from various departments, including environmental science, language education, and maritime studies. Such collaboration can result in the creation of courses and learning materials that seamlessly integrate language and environmental education. Faculty development programmes should encourage and support this collaboration.
4. **Use of Authentic Materials:** Educators should actively incorporate authentic, real-world materials, such as environmental reports, international maritime regulations, and sustainability guidelines, into language instruction. These materials should reflect the actual challenges and practices of the maritime industry. By doing so, students are provided with tangible connections between language proficiency and their professional responsibilities.
5. **Professional Development for Educators:** Maritime institutions should invest in the continuous professional development of educators. Training programmes should equip instructors with the necessary skills and knowledge to effectively integrate environmental content into language education. Workshops, seminars, and access to relevant resources can enhance educators' capacity to deliver environmentally focused instruction.
6. **Environmental Compliance Training:** Maritime companies and regulatory bodies should consider providing ongoing environmental compliance training for professionals within the industry. This training ensures that maritime professionals remain current and knowledgeable about environmental regulations and industry best

practices. Such training programmes can encompass updates on international environmental conventions, sustainable operational strategies, and reporting requirements.

7. **Research and Assessment:** Continuous research and assessment efforts should be undertaken to evaluate the impact of environmental literacy initiatives in maritime education. These studies should focus on the effectiveness of curriculum changes, language instruction, and the broader integration of environmental perspectives. Regular assessments can inform refinements and adjustments to education practices.
8. **Awareness Campaigns:** Maritime institutions and industry stakeholders should collaborate on awareness campaigns that highlight the importance of environmental literacy in the maritime sector. These campaigns can emphasise the industry's commitment to environmental responsibility and sustainability, showcasing the role of educated professionals in achieving these goals. Public awareness can create a demand for environmentally literate maritime professionals.
9. **Industry Partnerships:** Maritime education institutions should foster partnerships with maritime companies and organisations that share a commitment to environmental responsibility. Such partnerships can offer students practical exposure to real-world environmental challenges and solutions. Internships, co-op programmes, and joint research projects can bridge the gap between education and industry.
10. **Policy Advocacy:** Policymakers and regulatory bodies should actively advocate for the integration of environmental education into maritime curricula. Policy changes and incentives should encourage maritime institutions to prioritise environmental literacy. This advocacy can align with global sustainability initiatives and strengthen the industry's commitment to environmentally responsible practices.
11. **International Collaboration:** The international nature of the maritime industry calls for international collaboration in environmental literacy efforts. Maritime institutions should consider partnerships with overseas institutions to facilitate knowledge exchange and shared best practices. Collaborative efforts can enhance the quality of education and raise global standards of environmental literacy in the sector.

The integration of environmental perspectives into maritime education is not merely an educational imperative; it is a fundamental requirement for the industry's sustainability and global environmental responsibility. These recommendations, spanning curriculum enhancements, tailored language instruction, interdisciplinary collaboration, professional development, and awareness campaigns, offer a multifaceted approach to achieving this critical objective. By following these recommendations, maritime education can evolve to produce professionals who are proficient in English, environmentally literate, and fully prepared to navigate the complex environmental challenges and responsibilities inherent to the maritime sector.

6 Conclusion

This research has delved into the vital realm of integrating environmental perspectives into maritime education, with a specific emphasis on enhancing reading competencies and nurturing environmental literacy among maritime cadets. The research findings underscore the profound importance of environmental literacy in the maritime sector, given its significant role in global trade and transportation and its consequential environmental impact. The critical role of language education, particularly English language instruction, in fostering environmental awareness and literacy has been a central theme of this research. By intertwining language and environmental education, maritime institutions have the opportunity to produce professionals who excel not only in language proficiency but also in their understanding of environmental issues, an imperative for addressing the industry's environmental footprint.

This research further illuminated the challenges and opportunities associated with language-integrated environmental education. Tailoring language instruction to students' linguistic needs, incorporating authentic materials, and fostering interdisciplinary collaboration all present opportunities for more effective education. Challenges, such as language barriers and resource constraints, can be addressed through innovation and tailored curriculum development.

The implications of this research extend beyond the classroom. Environmental literacy is a linchpin for the sustainability and competitiveness of the maritime industry. Educating professionals who can make informed decisions, adopt sustainable practices, and comply with international environmental regulations is an investment in the industry's future success. The recommendations derived from this research span curriculum enhancement, tailored language instruction, collaboration, professional development, and industry engagement. They provide a comprehensive framework for fostering environmental literacy in maritime education. In the pursuit of environmentally responsible and sustainable maritime practices, this research stands as a beacon, urging educators, policymakers, and industry stakeholders to embrace the integration of environmental perspectives into maritime education. By doing so, they ensure that the maritime professionals of tomorrow are not only proficient in English but also well-equipped to tackle the ecological challenges and responsibilities that lie at the heart of the maritime sector.

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References

1. T. R. Walker, O. Adebambo, M. C. D. A. Feijoo, E. Elhaimer, T. Hossain, S. J. Edwards, C. E. Morrison, J. Romo, N. Sharma, and S. Taylor, in *World Seas an Environ. Eval.* (Elsevier, 2019), pp. 505–530
2. C. Carcia-Soto and G. I. van der Meer, Eur. Mar. Board IVZW (2017)
3. J. Harrison, Int’l J. Mar. Coast. L. **24**, 727 (2009)
4. C. Young, J. Mar. L. Com. **26**, 1 (1995)
5. S. C. E. IMO, (2018)
6. O. O. Frolova, (2017)
7. P. Trenkner, in *Szczecin Proc. Int. Marit. English Conf. IMEC* (2009), pp. 5–10
8. E. McKinley, T. Acott, and K. L. Yates, Environ. Sci. Policy **108**, 85 (2020)
9. Y. Rochwulaningsih, S. T. Sulistiyono, N. N. Masruroh, and N. N. Maulany, Mar. Policy **108**, 103602 (2019)
10. I. M. Organization, *Maritime English* (IMO Publishing, 2009)
11. N. Demydenko, J. Shipp. Ocean Eng. **2**, 249 (2012)
12. M. I. Sherman, H. Popova, and A. Yurzhenko, (2018)
13. J. Fiksel, *Design for Environment: A Guide to Sustainable Product Development* (McGraw-Hill Education, 2009)
14. S. Mankabady, *The International Maritime Organization, Volume 1: International Shipping Rules* (1986)
15. K. Cicek, E. Akyuz, and M. Celik, Procedia Comput. Sci. **158**, 270 (2019)
16. M. E. Manuel, WMU J. Marit. Aff. **16**, 473 (2017)
17. V. P. Lobaton, R. Salvador, and S. M. Oliveres, SSRN Electron. J. (2023)
18. R. Balkin, Tul. Mar. LJ **30**, 1 (2006)
19. A. Chircop, (2015)
20. A. WEINTRIT, Marit. Secur. MET 35 (2005)
21. Y. Darlington and D. Scott, *Qualitative Research in Practice: Stories from the Field* (Routledge, 2020)
22. R. Hobbs, Digit. Literacies Learn. 99 (2018)
23. J. Saldana, *Thinking Qualitatively: Methods of Mind* (SAGE publications, 2014)