

Fostering Blue Sustainability and Innovation

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The aim of this paper is to present a theoretical blue economy innovation model and, based on recent project data and previous research, to identify the key educational success factors underpinning sustainable blue economy entrepreneurship and innovation training. Based on previous studies concerning factors that increase the willingness to become an entrepreneur, we apply a qualitative research approach to develop the theoretical foundations relating to factors that influence both business managers and students to co-create and innovate within the blue economy. Our observations are based on both successful and less successful EU projects carried out in the Baltic Sea region. The issue of innovation and educational factors affecting positive outcomes in practice is highly complex. Based on our observations, we have developed a blue economy innovation model, which we utilise to analyse blue economy projects. The results indicate that the common factors underpinning the most resilient blue economy projects are: (1) access to financing, (2) a motivated team leader, and (3) knowledge of resilient and sustainable solutions. We identify a need for further research into how to foster both students and managers who are aware of sustainable development. One possible way forward is to incorporate some of the 17 UN Sustainable Development Goals (SDG) into every university course. The novelty of this paper lies in the theoretical framework relating to factors that influence individual choices concerning sustainable blue entrepreneurship and potential blue economy innovations.

Key Words: blue economy, higher education, innovation, key elements of success

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INTRODUCTION

The blue economy, encompassing all economic activities related to oceans, seas, coasts, and lakes, presents significant opportunities for

sustainable growth and innovation (European Commission 2021). However, realising this potential requires a workforce equipped with the knowledge, skills, and mindset needed to navigate the complexities of sustainability and to drive innovation within this unique context.

- [8] This paper seeks to contribute to the understanding of how education can effectively foster the blue economy, sustainable entrepreneurship, and innovation. Drawing upon our observations from EU projects in the Baltic Sea region, as well as existing literature on entrepreneurial intention and innovation, we aim to identify key and practical educational success factors and to propose a theoretical framework to guide future educational initiatives. The aim is to present a theoretical blue economy innovation model and, based on recent project data and previous research, to identify the key educational success factors underpinning sustainable blue economy entrepreneurship and innovation training.

Our data is collected from projects in the Baltic Sea region, which faces significant environmental challenges, including pollution and the impacts of climate change. The Baltic Sea is considered one of the most polluted seas in the world and therefore serves as a critical case for exploring both the urgent need for, and the factors influencing, the development of an innovative and sustainable blue economy.

How can we foster blue economy, sustainability, and innovation? This was one of the first questions we asked when we, like many others, began to consider different approaches to coastal place development. How can we motivate students to innovate and to become interested in blue entrepreneurship and economic development? AlQudah et al. (2022) argue that self-efficacy and knowledge sharing have a direct positive influence on managers' innovation capacity. Mittal and Kaur (2023) argue that Human Resource Management (HRM) systems need to evolve into Green Human Resource Management (GHRM), with embedded green values, culture, and attitudes throughout the organization. Renwick et al. (2013) expand the Ability-Motivation-Opportunity (AMO) theory by stressing the role that Green Human Resource Management (GHRM) processes play in people management practices. Sundnäs et al. (2006) and Kjellman (2014) argue that factors affecting the willingness to become an innovator or entrepreneur depend not only on individuals' self-efficacy, but also on the surrounding culture and environment. Other important factors include family entrepreneurship, gender, and expectations (Vadnjal 2008). In fact, we



find it difficult to draw a clear distinction between blue economy entrepreneurship and innovation.

We soon became puzzled by the theoretical approaches to entrepreneurship, innovation, and blue economy development. Within the academic field, beginning with the ‘Father of Entrepreneurship,’ Schumpeter (1911), as well as in the recent sustainability literature concerning cooperation among the Nordic countries, it is difficult to draw a clear line between what constitutes sustainable entrepreneurship and what may instead be regarded as innovation directed towards sustainability (Nordic Council of Ministers 2025; RISE 2025; Norwegian Ministry of Foreign Affairs 2025). Therefore, we also choose to maintain a blurred distinction between entrepreneurship and innovation within the blue economy. [9]

We apply a qualitative research approach to develop the theoretical foundations relating to the factors that influence both business managers and students to co-create and innovate within the blue economy. Our observations are based on both successful and less successful EU projects carried out in the Baltic Sea region. As a starting point, we present a holistic, socio-cultural, and constructivist model of blue entrepreneurship and innovation behaviour. The model is founded on field theory and the conception of human behaviour developed by Kurt Lewin. However, the model is expanded to incorporate modern systems theory. Our findings include a proposal to integrate the 17 UN Sustainable Development Goals (SDGs) across all university courses and curricula, thereby offering a concrete direction for future educational development. In this way, both teachers and students, as well as managers of SMES and other cooperating partners, are encouraged to reflect upon sustainability.

THEORETICAL FRAMEWORK

Individual Psychological Life Space and Blue Economy Choices

To understand the factors influencing an individual’s decision to engage in sustainable blue entrepreneurship and innovation, we draw upon the concept of the ‘individual psychological life space’ introduced by Kurt Lewin and later extended by Kjellman and Ehrsten (2005) to include cultural and environmental factors. This theoretical approach argues that an individual’s choices, including engagement in the blue economy, are shaped by a complex interplay of internal and external factors that evolve over time.

TABLE 1 An Overview of the Main Contributions to Entrepreneurship Theories

Role of the entrepreneur	Example of researchers
Risk-taker	Bernard F. de Belidor, <i>La science des ingénieurs</i> (1729) Richard Cantillon, <i>Essai sur la nature du commerce en général</i> (1755) Jean Baptiste Say, <i>Cours complet d'économie politique pratique</i> (1828) Frank Knight, <i>Risk, Uncertainty and Profit</i> (1921)
Capitalist	Adam Smith, <i>Inquiry into the Nature and Causes of the Wealth of Nations</i> (1776) David Richardo, <i>On the Principles of Political Economy and Taxation</i> (1821) Alfred Marshall, <i>Principles of Economics</i> (1920)
Innovator	Nicholas Baudeau, <i>Premiere introduction à la philosophie economique</i> (1910) Joseph Schumpeter, <i>The Theory of Economic Development</i> (1911) William Baumol, <i>Entrepreneurship, Management and the Structure of Payoffs</i> (1993)
Alert opportunity seeker	Friedrich A. Hayek, <i>The Use of Knowledge in Society</i> (1945) Ludwig von Mises, <i>Human-Action: A Treaties on Economics</i> (1949) Israel Kirzner, <i>Competition and Entrepreneurship</i> (1973)
Coordinator of scarce resources	Jean Baptiste Say, <i>Traité d'économie politique</i> (1814) Mark Casson, <i>The Entrepreneur: An Economic Theory</i> (1982)
Place developer, economic developer, team leader, and innovator	All of the above, and many others

From a theoretical perspective, one should not overlook the influential thinkers of the past who studied entrepreneurship, innovation, and economic development. Schumpeter (1911) is often regarded as the father of entrepreneurship, and he emphasised the role of the innovator in economic development.

The findings of AlQudah et al. (2022) underline that self-efficacy and knowledge sharing positively influence managers' capacity for innovation. The concept of self-efficacy, established by Bandura (1977; 1997; 2001), refers to an individual's belief in his or her ability to execute behaviours necessary to achieve specific performance outcomes. Within the context of blue economy innovation, confidence in one's own ability to create and manage new combinations of products and services is crucial. We argue that strengthening and developing the confidence



of students and managers to exert control over their own motivation, behaviour, and social environment is one important way forward. Improving knowledge of blue economy opportunities further accelerates the innovation process. Cognitive self-evaluations influence many aspects of human experience, including the goals individuals pursue, the amount of energy devoted to achieving those goals, and the likelihood of attaining behavioural performance in relation to blue economy activities and innovation. [11]

Kjellman (2014) notes that the constructs of field theory, complexity theory, and autopoiesis theory have long been associated with social systems in general (Coleman 1999; Burnes 2004; Manuel-Navarette 2015). There is only a short conceptual step from social systems theory to organisational and management theories, including theories of organisational learning and learning organisations. In this context, we highlight Chris Argyris's (1993) theory of 'single-loop' and 'double-loop' learning (Argyris and Schön 1996). When considering human learning, we may conclude that both forms of learning exist. Simpler learning processes, such as conditioning and social modelling, may be understood as forms of single-loop learning, whereas more advanced or higher-level cognitive behaviour clearly follows the principles of double-loop learning.

*Towards a Blue Economy Entrepreneurial and Innovation Model
Based on Field Theory*

Field theory encompasses – or at least touches upon – several different scientific disciplines. The Swiss scholar Alfred Lang (1979; 1981) for instance, suggests that field theory may be regarded as a forerunner of general systems theory, developed by Ludwig von Bertalanffy in the late 1950s. Lang also notes that similarities can be identified between field theory and Bronfenbrenner's theory of ecological psychology (Kjellman and Ehrsten 2005).

It is important to broaden our perspective considerably if we are to understand field theory itself and its implications for entrepreneurship and innovation research. It is necessary to include elements of both modern and postmodern sociology and philosophy in the discussion. These perspectives are needed in order to understand the processes underlying entrepreneurship, innovation, and the formation of the blue economy; that is, how an individual becomes, chooses or develops into a blue economy entrepreneur or even a regional developer, and how to

[12] education may be used to influence this process. It is also essential to emphasise that Lewin's field theory serves only as a starting point and functions primarily as an instrument and a method for analysing and understanding causal relationships. The field theory is, as Kurt Lewin himself pointed out (Cartwright 1951, 43–5), not a theory in the conventional sense of the term. Rather, it is best characterised as a method: namely, a method for analysing causal relationships and constructing scientific concepts. This method of analysing causal relationships may be expressed in the form of general statements concerning the 'nature' of the conditions of change.

The central concept in Lewin's field theory is the construct of the psychological life space. Lewin defined the 'psychological life space' as 'the totality of coexisting facts, which are conceived of as mutually interdependent' (Cartwright 1951, 240). For Lewin, learning was synonymous with the expansion of the life space. He regarded the life space as a field of forces in which the individual constitutes the focal point, surrounded by both proximate and distant areas, as well as barriers and boundaries that influence behaviour. Depending on the situation at hand, the individual's movements vary, and the life space itself is never static (Sundnäs et al. 2006).

We argue that the life space of key individuals is one of the principal factors influencing the decisions and actions taken by the management of a firm. Consequently, it is important to influence the students, i.e. the future managers of organisations, at an early stage so that they become aware of sustainability issues alongside other internal and external organisational factors. The life space concept may assist our understanding of how and why choices are made within firms. More specifically, we argue that the life space of the central actor also influences the selected degree of, for example, sustainability awareness, local development capability, and innovative entrepreneurship.

Kjellman and Ehrsten (2005), Sundnäs et al. (2006), and Kjellman (2014) expanded Lewin's concept of the psychological life space (see figure 1) by incorporating two additional peripheral fields: environmental and cultural aspects. At the centre of the model remains what Lewin referred to as the temporal dimension of the individual life space. This temporal dimension can be divided into three principal components: the past (experience), the present (real time), and the future (aspirations). All actions and changes occur in the present, although they are influenced by past experiences and future aspirations. Consequently,



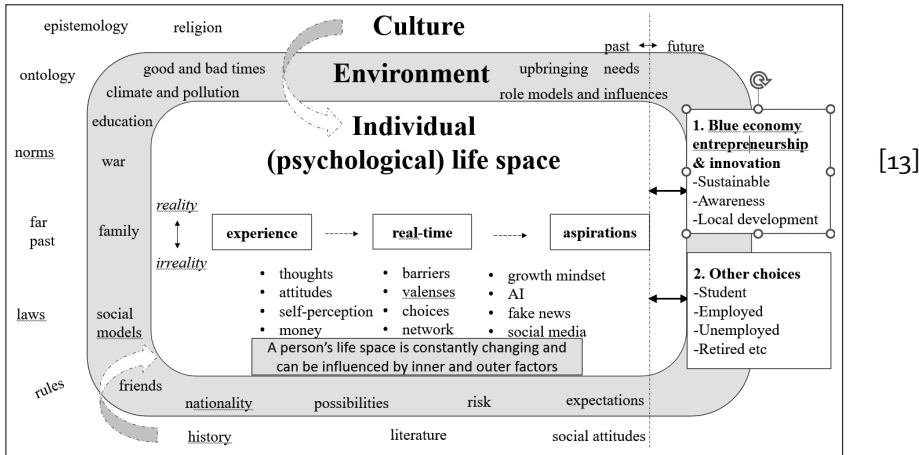


FIGURE 1 Factors Influencing Individual Choices in the Blue Economy Context

these three dimensions continually shape the individual's decision-making processes. In other words, the life space is never static, but is instead constantly evolving over time.

As illustrated in figure 1, an individual's life space is influenced by past experiences, present perceptions, and future aspirations. These are mediated by a range of psychological factors, including thoughts, attitudes, values, self-perception, growth mindset, and exposure to information, including misinformation such as 'fake news' and the influence of social media. Furthermore, external factors embedded within the broader domains of culture and environment significantly influence this life space. These include three principal areas of consideration: culture, environment, and individual aspirations and motivations to act in an innovative manner within the blue economy innovative.

Cultural influences such as epistemology, religion, norms, laws, rules, social models, family, friends, nationality, history, literature, and broader social attitudes shape an individual's worldview and values, including perceptions of environmental responsibility and economic opportunity.

Environmental factors, including climate change and pollution, education, war (as a disruptive force), upbringing, personal needs, and the influence of role models, also contribute to the individual's understanding of both the challenges and opportunities associated with the blue economy. The model and associated projects highlight how global environmental challenges, such as climate change and digital transfor-

mation, intersect with local realities, including seasonal tourism and the vulnerabilities of island communities.

[14] The framework further highlights that an individual's 'reality' is continuously shaped by experiences and perceptions, which may at times diverge from objective reality due to misinformation or distorted interpretations. This dynamic interplay ultimately influences aspirations and the choices individuals make, such as pursuing blue economy entrepreneurship and innovation characterised by sustainability, awareness, and local development, as opposed to alternative pathways such as remaining a student, working in other sectors, unemployment, or retirement.

This model underscores the importance of education in shaping an individual's life space in ways that foster sustainable and innovative thinking within the blue economy. By influencing knowledge, attitudes, values, and perceptions, education can empower individuals to recognise opportunities within the blue economy and equip them with the tools needed to pursue sustainable and innovative solutions.

METHODOLOGY AND DATA

A Qualitative Approach Based on Project Observations

This paper employs a qualitative research approach, drawing upon our observations from several EU-funded projects within the Baltic Sea region focused on blue economy development. This methodology allows for an in-depth understanding of the complex interplay of factors influencing both the successes and challenges associated with fostering sustainable entrepreneurship and innovation within the blue economy.

Our analysis is based on previous research concerning entrepreneurial intention, innovation, and success factors (Kjellman 2014; Kjellman et al. 2019; 2021). We have examined both successful and less successful project outcomes in order to identify recurring patterns and key determinants of success. This comparative approach enables us to discern the factors that appear to be critical in translating educational efforts into tangible and positive outcomes in practice.

The data is based on projects conducted since 2000, although the analysis primarily focuses on four EU-funded projects in which we have participated: Light in the Dark project (LITD), Recovery and Resilience Facility project (P3-C2.R3), Digivision, and Opin.fi. These four projects all include elements relating to sustainable innovation within the blue economy.



Project: Light in the Dark

The Light in the Dark project runs from 2023 to 2026 and is funded through EU Interreg, together with national and regional authorities in Estonia, Finland, Latvia, Lithuania, and Sweden. The project has a budget of €2.7 million. As part of the project's challenge inventory, [15] we surveyed 239 blue economy small and medium-sized enterprises (SMES), primarily tourism companies located in coastal regions of Sweden, Finland, Estonia, Lithuania, and Latvia, regarding the principal challenges associated with extending the tourism season. In addition, we conducted 36 structured face-to-face interviews with selected blue economy SMES concerning how entrepreneurs perceive the challenges and opportunities associated with seasonal variation in tourism.

The findings indicate that the principal challenges facing the 239 SMES in the tourism sector are low customer demand during the off-season, low profitability, and a lack of capital for investment. Furthermore, the current branding of Baltic Sea coastal destinations is strongly associated with the summer season. The findings also suggest that access to international markets remains difficult. In addition, many companies close during the off-season, particularly during the winter months, which further reduces the attractiveness of these destinations. We also asked the participating blue economy firms questions concerning new ideas, services, and products, as well as how they market and promote their services. Our aim was to identify future innovative and regenerative products and services. One notable observation was that, during spring 2024, the blue economy SMES did not mention artificial intelligence (AI) as a potential avenue for future development.

Project: Impact of the RRF-project (P3-C2.R3)

The technological revolution has affected society in numerous ways. Within education, the COVID-19 pandemic accelerated the digital transformation of universities, as digital technologies enabled teaching and learning activities to continue (Trevisan et al. 2024).

In 2021, the coronavirus crisis had significantly weakened the employment situation in Finland. In addition, long-term structural challenges within the labour market required new solutions. Åland University of Applied Sciences (ÅUAS) was granted €2.7 million from the EU Recovery and Resilience Facility under Pillar Three: 'Raising the employment rate and upskilling to accelerate sustainable growth.'

For ÅUAS, this involved upskilling initiatives, the reform of contin-

- [16] vious learning, and the digitalisation and modernisation of education. The project consisted of three modules: the digitalisation and modernisation of education; the improvement and updating of digital management and leadership systems; and the development of new learning pathways in digitalisation, automation, and renewable energy through specialised study modules. Within this project, access to funding acted as a catalyst for innovative development and new approaches.

Project: Renewable Energy Laboratories

As a part of this project, ÅUAS invested €0.5 million in new laboratories related to renewable energy, including a solar power plant, a dynamic solar-tracking robot, a heat pump testing facility, and a hydrogen laboratory. These laboratories are being implemented during 2025, and the aim is to foster both teachers and students within the blue economy by enabling experimentation with these new technologies, thereby developing both the mindset and skill set required for sustainability and the blue economy. The objective is for students enrolled in the degree programmes in Energy, Design and Automation, Marine Technology, and the Maritime Captain Programme to work with the energy laboratories and simulate various scenarios that support sustainable blue solutions. Ultimately, the skills acquired by students during their studies should prove beneficial both in their professional careers and within their local communities.

According to Pires Manso et al. (2023), renewable energy within the blue economy also contributes to wealth and job creation, in addition to supporting the diversification, development, and growth of local economies. Another important aspect concerns the extreme vulnerability of small island developing states – such as the Åland Islands – to climate change, natural disasters, and other crises. In this context, renewable energy presents a vital opportunity to strengthen the resilience of both communities and local economies.

According to Prasad et al. (2025), the adoption of renewable energy within secondary schools in Fiji has not only educated students and staff, but has also inspired environmental awareness throughout the wider community. Furthermore, innovation promotes sustainable economic growth within the blue economy by increasing competitiveness and encouraging cooperation between countries and regions (Elston et al. 2024).

Fostering blue sustainability may also involve integrating ocean lit-



eracy into school curricula. Achieving systematic change among students, active citizens, and decision-makers presents a considerable challenge for educational design. According to Costa and Faria (2025), transforming knowledge into tangible action, empowering students, cultivating responsible citizens, and nurturing emotional connections with the ocean are crucial yet demanding objectives. At ÅUAS, the purpose of the technical investments in renewable energy laboratories is to cultivate a new generation of engineers with a foundational understanding of blue sustainability and ocean literacy. [17]

Project: Digivision 2030 and the Educational Platform Opin.fi

In 2021, ÅUAS began collaborating with the other 36 universities in Finland to realise the concept of Digivision 2030. Digivision 2030 is a national initiative in Finland aimed at transforming higher education through digitalisation by 2030. The core objective is to enhance the flexibility and accessibility of learning while promoting continuous education and skills development for all citizens. This involves the creation of a national digital service platform that integrates educational offerings from a range of higher education institutions. Key aspects include personalised learning pathways, data-driven guidance, and the development of digital pedagogy. Ultimately, Digivision 2030 seeks to position Finland as a global leader in digital education, thereby improving both national competence levels and international competitiveness. The initiative also fosters collaboration among higher education institutions in order to build an open and interoperable learning ecosystem.

The platform that has been developed brings together a range of courses organised under ten different themes, almost all of which may include courses that foster blue sustainability and innovation. Examples of these themes include: Sustainable development and growth, Society and interaction, Global diversity and equality, and Well-being & health.

How can digital learning platforms like Opin.fi ('opin' translates as 'I learn') be utilised to support the development of blue sustainability and innovation? Within Opin.fi, courses are organised according to conceptual learning frameworks. In a study conducted by Cocu et al. (2025), the results demonstrate both the feasibility and the benefits of integrating technologies such as generative AI with conceptual learning frameworks in green and sustainable entrepreneurship education. This approach provides educators with a scalable model for embedding

[18] sustainability into curricula, while also offering learners concise educational content that accelerates understanding and fosters innovation. The research establishes a precedent for future technological developments in sustainability-focused entrepreneurship education by combining sustainability principles with emerging technologies, thereby offering actionable solutions for educators and policymakers seeking to advance environmentally sustainable entrepreneurship in line with global sustainability goals.

As an online educational platform Opin.fi will provide course offerings from all thirty-eight universities of applied sciences in Finland. It functions both as a web-based course catalogue and as a national open studies service. By offering concepts that support blue sustainability, innovation, and ocean literacy through Opin.fi, all university students in Finland (approximately 200,000 individuals) will gain access to these course offerings. Naturally, educational institutions must continue to market their degree programmes and courses, but Opin.fi will create new opportunities for universities of applied sciences to reach wider audiences through their educational provision. For example, marine tourism plays a crucial role in the blue economy, making substantial contributions to both economic development and environmental sustainability (Reddy et al. 2024). A student studying tourism and leadership can search the web-based course catalogue, while generative AI assists in identifying material aligned with the student's interests.

As Leal Filho et al. (2025) conclude and recommend, integrating sustainability courses into the core curriculum and making them compulsory for all students, regardless of their field of study, would help ensure that all graduates develop an understanding of sustainability principles and challenges. Furthermore, by incorporating sustainability-related education across various disciplines and departments, including engineering, business, social sciences, and the humanities, students from diverse academic backgrounds would be better equipped to understand and address sustainability challenges from multiple perspectives. Consequently, this objective may also be advanced through the digital service platform Opin.fi, which consolidates the joint efforts of Finland's universities.

The data collected for this study include project reports, evaluations, and anecdotal evidence gathered through participation in and observation of project activities. This qualitative material provides insights into the practical challenges and enabling factors associated with promoting



sustainable entrepreneurship and innovation within the blue economy in real-world context. A common characteristic of all these projects is that they would most likely not have been realised without EU and governmental subsidies; in other words, access to financing opportunities has been a decisive enabling factor.

[19]

FINDINGS AND KEY EDUCATIONAL SUCCESS FACTORS

Our observations from projects in the Baltic Sea region corroborate the initial findings that access to financing, a motivated team leader and team, as well as knowledge of resilient and sustainable solutions, are all crucial factors for the success of blue economy initiatives and innovation. However, the more profound challenge lies in cultivating the underlying mindset and skills required to generate and implement such solutions in a sustainable manner.

Across all the EU projects examined, we observed that cooperating managers within firms were generally familiar with the 17 UN Sustainable Development Goals (SDGs), whereas knowledge of EU sustainability legislation was more limited. EU legislation required that, from 2024 onwards, large companies report in accordance with the Corporate Sustainability Reporting Directive (CSRD), with the first sustainability reports expected to be published in 2025. However, in early 2025, the European Commission announced the first 'Omnibus' package, which included a series of proposals intended to reduce and postpone sustainability reporting requirements, particularly for SMEs. Due to the somewhat unclear direction of EU policy, we argue that the UN sustainability goals (SDG) are more suitable for use within educational settings involving both students and business managers. The UN SDGs (<https://sdgs.un.org/goals>) were adopted by all member states in 2015 as part of the 2030 Agenda for Sustainable Development. Since then, various UN bodies and industries have developed strategies for interpreting and applying the 17 SDGs within specific sectors, including education and culture (UNESCO 2017), tourism (<https://www.unwto.org/tourism4sdgs>), and the maritime sector (<https://www.unwto.org/tourism4sdgs>). These sector-specific sustainability frameworks are highly useful in educational and consultancy contexts.

The issue of innovation and the educational factors that produce tangible positive outcomes in practice is highly complex. Based on our observations, we begin by noting that every blue economy project is

[20]

unique! Nevertheless, a common characteristic of the most resilient blue economy projects is access to financing, a motivated team and team leader, together with knowledge of resilient and sustainable solutions and innovation. These findings are not unexpected; however, the real challenge concerns how to foster sustainable and innovative thinking within the blue economy. The Baltic Sea remains one of the most polluted maritime regions in the world, and climate change is further exacerbating the situation. This calls for tangible action that simultaneously promotes economic development and environmental awareness.

We identify a need for further research into how both students and managers can be encouraged to develop an awareness of future sustainable development needs. One possible way forward would be to integrate aspects of the 17 UN Sustainable Development Goals into every course offered within the EUNICoast universities. This approach has already been implemented at Åland University of Applied Sciences. Every course delivered must include 3 of the 17 UN Sustainable Development Goals. In this way, both teachers and students are given an opportunity to reflect upon the SDGs. Ideally, the SDGs should be addressed across different courses and from different perspectives. Repeated and long-term exposure to the SDGs increases the likelihood of sustainable knowledge adoption as well as strengthening innovation capabilities in environmental management.

*Fostering Sustainable and Innovative Thinking
within the Blue Economy*

How can we influence students, entrepreneurs, businesses, and even coastal communities to focus on sustainability and innovation? Our analysis suggests that effective education in this field must extend beyond traditional business and environmental science curricula. It requires an interdisciplinary approach that integrates sustainability principles, entrepreneurship, and innovative thinking.

An understanding of ecological limits, circular economy principles, and the social dimensions of sustainability is essential. This aligns with the growing recognition of the importance of integrating the 17 UN Sustainable Development Goals (SDGs) into education (UNESCO 2017). Incorporating the SDGs across university courses, as proposed in the abstract, could provide a holistic framework for understanding the interconnected economic, social, and environmental challenges and opportunities associated with the blue economy. Requiring the inclu-



sion of 3 of the 17 SDGs in each course encourages both teachers and students to reflect upon sustainability issues. We also observed that this approach positively influenced managers, as cooperating firms were required to incorporate the SDGs in their collaboration with universities.

[21]

Students and managers need to develop innovation and entrepreneurial skills related to identifying opportunities, generating creative solutions, developing viable business models, and navigating the complexities of bringing innovations to market. This includes fostering a growth mindset, resilience, and the ability to utilise networks effectively (as illustrated in figure 2). When analysing our data, we identified clear advantages in applying principles similar to those found in the highest-performing teams at organisations such as Google and within military units such as the Roman legions. Small, innovative teams consisting of approximately eight participants (typically between 3 and 9), in which all members work towards a common goal, reflect principles emphasised by Henri Fayol and many others. In such settings, the role of the team leader is crucial. Can the team leader create a sense of psychological safety while also motivating the group towards shared and sustainable innovative goals within the blue economy? This is indeed difficult to achieve in an uncertain world characterised by project-based employment, trade wars, pandemics, and economic instability.

In order to make managers and students more innovative, we suggest examining the characteristics of the highest-performing teams within firms, banks, and corporations (Kjellman et al. 2019; 2021). Firstly, teams are essential for innovation within today's highly complex environment. Secondly, innovative organisational teams should excel in the following areas:

- *Creating a safe environment for innovation.* Christensen and Raynor (2003) analyse why companies fail to innovate and struggle to respond to disruptive innovations. Their proposed solution involves teamwork, knowledge sharing, and the creation of a safe environment that enables organisations to develop their own innovations and respond proactively to external disruption.
- *Funding multiple innovative projects.* Hamel and Välikangas (2003) argue that firms invest too heavily in 'what is' and too little in 'what could be.' What do the customers want? Their solution is to adopt a forward-looking perspective and allocate funding to a

broad range of innovative projects, an area in which the EU has been particularly active. We also observed this tendency within our EU projects, where it is often difficult to determine in advance what works and what does not work.

[22]

- *System thinking, lean management, and the learning organisation.* Senge (1990) introduced the concept of the learning organisation, whose purpose is to nurture new and expansive patterns of thinking, create collective aspirations, and help people continually learn how to learn together. Continuous improvement, as promoted through lean management concepts derived from the Toyota Production System of the 1980s, can undoubtedly generate numerous improvements. However, in the contemporary era of AI, organisations must go one step further and think outside the standard solutions.
- *The use of data-driven strategic innovation.* The future of innovation is increasingly likely to be shaped by data-driven methods. The ability to collect and analyse customer-oriented big data, and to identify behavioural trends and– patterns, enables the discovery of emerging markets not only in the political sphere, but also within the blue economy.
- *Applying open-source innovation approaches.* Chesbrough (2003) introduced the concept of open innovation and argued that organisations should make use of both internal knowledge and the best innovative capabilities available outside the organisation. This involves utilising AI and drawing upon expertise from networks of universities, start-ups, suppliers, and even competitors. Today, openness towards AI-based solutions has become increasingly self-evident. Nevertheless, we currently observe only a limited number of maritime, tourism, and other blue economy firms applying open innovation approaches in order to strengthen their capabilities.

Understanding the unique environmental, social, and economic characteristics of a specific blue economy context, such as the Baltic Sea region, is crucial. This includes knowledge of local ecosystems, regulatory frameworks, and stakeholder dynamics. Furthermore, the blue economy often requires collaboration across diverse disciplines. Educational programmes should therefore foster the ability to work effectively within interdisciplinary teams, bridging the gap between scien-



tific knowledge, technological innovation, and business expertise. Naturally, given the potential environmental and social impacts of blue economy activities, education must also emphasise ethical considerations and responsible innovation.

[23]

The Role of Education in Shaping the Individual Life Space

As illustrated in our theoretical framework (figure 2), education plays what we would argue is a critical role in shaping an individual's psychological life space. Our blue economy model is based on field theory and the conception of human behaviour developed by Kurt Lewin. However, the model has been expanded to incorporate modern systems theories, with culture and environment regarded as crucial influencing factors. We view entrepreneurship and innovation as forms of emerging behaviour within a complex social system. The central concept used to understand this emerging behaviour is the psychological life space of the individual. Education is not the only factor influencing the life space. An individual's present life situation is shaped both by past experiences and by future aspirations or 'dreams.' Given this theoretical background, we argue that the individuals' psychological life space can be influenced in ways that enhance innovation and sustainability, thereby fostering growth within the blue economy.

Education, together with the implementation of selected UN Sustainable Development Goals within every university course, can:

- *Expand knowledge and awareness.* Education can provide individuals with the necessary knowledge concerning the blue economy, sustainability challenges, and potential solutions. It can also raise awareness of the environmental vulnerabilities of regions such as the Baltic Sea and the urgency of taking action.
- *Influence attitudes and values.* Through carefully designed curricula and pedagogical approaches, education can foster positive attitudes towards sustainability and cultivate values that prioritise environmental responsibility alongside economic development.
- *Enhance self-efficacy and cultivate a growth mindset.* Entrepreneurship and innovation frequently involve risk and setbacks. Education can help individuals develop a strong sense of self-efficacy and a growth mindset, enabling them to persevere in the face of challenges.
- *Provide access to networks and role models.* Educational institu-

tions can facilitate connections between students, researchers, entrepreneurs, and industry professionals, thereby providing valuable networks and exposure to successful role models.

- [24] • *Address misinformation.* In an era increasingly characterised by ‘fake news’ and the influence of social media, education plays a crucial role in developing critical thinking skills and the ability to distinguish reliable information, particularly in relation to complex environmental and economic issues.

The complexity of the challenges ahead is profound. Based on the expanded model of Lewin’s psychological life space and the insights gained from EU projects, several important conclusions can be drawn regarding the promotion of blue economy entrepreneurship and innovation. Fostering innovation within the blue economy requires a holistic approach that considers not only individual psychological factors, including past experiences, present circumstances, and future aspirations, but also the broader environmental and cultural contexts. Interventions that address only a single aspect are therefore likely to have limited impact.

In this process, we view education as functioning as a catalyst for life space transformation. Education emerges as a powerful tool for reshaping an individual’s life space towards blue sustainability and innovation. By enhancing knowledge, shaping attitudes, instilling values, and correcting misinformation, education directly influences individuals’ perceptions of opportunities and their propensity to engage in sustainable actions. The EU projects demonstrate various ways in which education can be implemented, ranging from targeted upskilling initiatives (RRF) and hands-on laboratory experiences (Renewable Energy Labs) to national digital learning platforms (Digivision/Opin.fi).

Successful initiatives must actively identify and address real-time barriers, such as low demand and lack of capital, while simultaneously expanding the range of perceived opportunities available to individuals and businesses. The EU projects demonstrate this by providing new skills, technological tools, and accessible learning opportunities.

We also need to support a process that moves from individual choices to team-building and systemic change. Although the model focuses on the individual life space, the cumulative effect of many individuals pursuing blue economy entrepreneurship and innovation ultimately contributes to systemic transformation.



CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This paper contributes to the understanding of how education can foster blue sustainability and innovation by proposing a holistic theoretical framework based on the concepts of the individual psychological life space, environment, and culture. This framework highlights the multifaceted influences on individual choices and underlines the critical role of education in shaping the knowledge, attitudes, and skills necessary for engagement in sustainable blue economy entrepreneurship and innovation. The aim of this paper was both to present a blue economy innovation model and to identify the key educational success factors underpinning sustainable blue economy entrepreneurship and innovation training. Our principal findings indicate that: (1) access to financing, (2) a motivated team leader and team, and (3) knowledge of resilient and sustainable solutions are all crucial for the success of blue economy initiatives and innovation. [25]

The proposal to integrate the UN SDGs across all university courses and curricula offers a concrete direction for future educational development, thereby encouraging both teachers and students to reflect upon sustainability. However, further research is required to explore effective pedagogical approaches for such integration and to evaluate its impact on students' engagement with blue economy challenges and opportunities.

Fostering blue sustainability and innovation is a complex yet essential endeavour, particularly in environmentally sensitive regions such as the Baltic Sea. Education plays a pivotal role in equipping individuals with the necessary knowledge, skills, and mindset to drive this transformation. By understanding the multifaceted factors influencing individual choices, as outlined in our proposed theoretical framework, and by embracing innovative pedagogical approaches such as the integration of the UN SDGs, educational institutions can make a substantial contribution to building a sustainable and prosperous blue future. Further research remains essential in order to refine our understanding of effective educational strategies and to translate theoretical insights into tangible action.

In conclusion, the expanded psychological life space model provides a valuable theoretical lens through which to understand the complex factors influencing individual engagement within the blue economy. The examined EU projects serve as practical examples of how targeted interventions across cultural, environmental, and temporal di-

[26] mensions can effectively foster blue sustainability and innovation. The emphasis on education, combined with strategic investment in infrastructure and digital platforms, appears to represent a critical pathway for cultivating a new generation of blue economy actors and advancing sustainable development and innovation.

We argue that strengthening and developing the confidence of students and managers to exert control over their own motivation, behaviour, and social environment represents one important way forward. However, if tangible outcomes are to be achieved in practice, is this alone sufficient? Cognitive self-evaluations and self-efficacy influence all individuals. Consequently, they affect the goals people pursue, the amount of energy devoted to achieving those goals, and levels of performance relating to blue economy activities and innovation. Yet an important question remains: what works most effectively within specific contexts shaped by place, time, environment, and culture?

Future research is therefore needed. This includes identifying specific educational interventions – including technical and AI-based approaches – together with pedagogical methods that are most effective in fostering sustainable and innovative thinking within the blue economy. Is emphasising the 17 UN SDGs an effective strategy? We believe so! Nevertheless, can more effective approaches be identified? How can awareness of the sustainable blue economy be further strengthened within university education systems? What works effectively in practice? Developing metrics capable of assessing the impact of educational programmes on sustainable entrepreneurship and innovation within the blue economy represents one of the major challenges for future research. Investigating the specific needs and challenges of different sectors within the blue economy, and tailoring educational programmes accordingly, also remains a crucial area for future study.

REFERENCES

- AlQudah, N. F., B. Mathani, K. Aldiabab, K. Alshakary, and H. M. Alqudah. 2022. 'Knowledge Sharing and Self-Efficacy Role in Growing Managers' Innovation: Does Job Satisfaction Matter?' *Human Systems Management* 41 (6): 643–54.
- Argyris, C. 1993. *Knowledge for Action: A Guide to Overcoming Barriers to Organizational Change*. Jossey-Bass.
- Argyris, C., and D. A. Schön. 1996. *Organizational Learning 2: Theory, Method, and Practice*. Addison-Wesley.



- Bandura, A. 1977. 'Self-Efficacy: Toward a Unifying Theory of Behavioral Change.' *Psychological Review* 84 (2): 191–215.
- Bandura, A. 1997. *Self-Efficacy: The Exercise of Control*. W. H. Freeman.
- Bandura, A. 2001. 'Social Cognitive Theory: An Agentic Perspective.' *Annual Review of Psychology* 52:1–26. [27]
- Baudeau, N. 1910. *Première introduction à la philosophie économique, ou analyse des états policés* (1767). Edited by A. Dubois. Collection des économistes et des réformateurs sociaux de la France 2. Paul Geuthner.
- Baumol, W. J. 1993. *Entrepreneurship, Management, and the Structure of Payoffs*. MIT Press.
- Béridor, B. F. 1729. *La science des ingénieurs dans la conduite des travaux de fortification et d'architecture civile*. Firmin Didot.
- Burnes, B. 2004. 'Kurt Lewin and Complexity Theories: Back to the Future?' *Journal of Change Management* 4(4): 309–25.
- Cantillon, R. 1755. *Essai sur la nature du commerce en général*. <https://www.institutcoppet.org/wp-content/uploads/2011/12/Essai-sur-la-nature-du-commerce-en-gener-Richard-Cantillon.pdf>.
- Cartwright, D., ed. 1951. *Field Theory in Social Sciences – Selected Theoretical Papers*. Harper.
- Casson, M. 1982. *The Entrepreneur: An Economic Theory*. Martin Robertson.
- Chesbrough, H. 2003. *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business School Press.
- Christensen, C., and M. Raynor. 2003. *The Innovator's Solution: Creating and Sustaining Successful Growth*. Harvard Business School Press.
- Cocu, A., E. Pecheanu, I. Susnea, S. Dingli, A. Istrate, et al. 2025. 'Technology-Enabled Learning for Green and Sustainable Entrepreneurship Education.' *Administrative Sciences* 15 (2): 45.
- Coleman, H. J., Jr. 1999. 'What Enables Self-Organizing Behavior in Businesses.' *Emergence* 1 (1): 33–48.
- Costa, R. L., and C. Faria. 2025. 'The Blue School Program: A Model for Holistic Ocean Literacy Education.' *Sustainability* 17 (2): 661.
- Elston, J., H. Pinto, and C. Nogueira. 2024. 'Tides of Change for a Sustainable Blue Economy: A Systematic Literature Review of Innovation in Maritime Activities.' *Sustainability* 16 (24): 11141.
- European Commission. 2021. 'On a New Approach for a Sustainable Blue Economy in the EU: Transforming the EU's Blue Economy for a Sustainable Future.' COM(2021) 240 final, European Commission.
- Hamel, G., and L. Välikangas. 2003. 'The Quest for Resilience.' *Harvard Business Review* 81 (9): 52–63.

[28]

- Hayek, F. A. 1945. 'The Use of Knowledge in Society.' *American Economic Review* 35 (4): 519–30.
- Kirzner, I. M. 1973. *Competition and Entrepreneurship*. University of Chicago Press.
- Kjellman, A. 2014. 'Family Business Explained by Field Theory.' *Journal of Family Business Management* 4 (2): 194–212.
- Kjellman, A., and M. Ehrsten. 2005. 'A Theory of Homo Entrepreneurus.' In *The Emergence of Entrepreneurial Economics*, edited by T. Vinig and R. van der Voort. Research on Technological Innovation, Management and Policy 9. Emerald.
- Kjellman, A., T. Björkroth, T. Kangas, R. Tainio, and T. Westerholm. 2019. 'Disruptive Innovations and the Challenges for Banking.' *International Journal of Financial Innovation in Banking* 2 (3): 232–49.
- Kjellman, A., T. Kangas, and R. Tainio. 2021. *Nuclear Finance: Bank Management in Disruption*. Novum.
- Knight, F. H. 1921. *Risk, Uncertainty and Profit*. Houghton Mifflin.
- Lang, A. 1979. 'Die Feldtheorie von Kurt Lewin.' In *Lewin und die Folgen*, edited by A. Hegl-Evers. Kindler.
- Lang, A. 1981. 'Vom Nachteil und Nutzen der Gestaltpsychologie für eine Theorie psychischen Entwicklung.' In *Kognitive Strukturen und ihre Entwicklung*, edited by K. Foppa and R. Groner. Huber.
- Leal Filho, W., L. V. Trevisan, S. Sivapalan, M. Mazhar, A. Kounani, M. F. Mbah, I. R. Abubakar, N. R. Matandirotya, M. A. P. Dinis, B. Borsari, and R. Abzug. 2025. 'Assessing the Impacts of Sustainability Teaching at Higher Education Institutions.' *Discover Sustainability* 6:227.
- Manuel-Navarrete, D. 2015. 'Double Coupling: Modeling Subjectivity and Asymmetric Organization in Social-Ecological Systems.' *Ecology and Society* 20 (3): 26.
- Marshall, A. 1920. *Principles of Economics*. 8th ed. Macmillan.
- Mises, L. von. 1949. *Human Action: A Treatise on Economics*. Yale University Press.
- Mittal, E., and P. Kaur. 2023. 'Green HRM, Green Innovation and Environmental Performance: The Moderating Role of Servant Leadership.' *Human Systems Management* 42 (1): 27–41.
- Nordic Council of Ministers. 2025. *Nordic Tourism Plan 2025–30*. Nordic Council of Ministers.
- Norwegian Ministry of Foreign Affairs. 2025. 'Economic Demands and Investments for the Green Shift in the Nordics.' <https://arcticfrontiers.com/wp-content/uploads/2025/03/Economic-Demands-and-Investments-for-the-Green-Shift-in-the-Nordics.pdf>.
- Prasad, R. D., D. A. Chand, S. S. S. L. Lata, and R. S. Kumar. 2025. 'Beyond



- Energy Access: How Renewable Energy Fosters Resilience in Island Communities.' *Resources* 14 (2): 20.
- Pires Manso, J. R., R. M. Martínez Vázquez, J. Milán García, and J. de Pablo Valenciano. 2023. 'Renewable Energies and Blue Economy: New Trends in Global Research.' *Energies* 16 (10): 4210. [29]
- Reddy, K., and B. Sailesh. 2024. 'Integrating Marine Tourism into the Blue Economy Framework.' *Journal of Environmental Management & Tourism* 15 (3): 501–20.
- Renwick, D. W., T. Redman, and S. Maguire. 2013. 'Green Human Resource Management: A Review and Research Agenda.' *International Journal of Management Reviews* 15 (1): 1–14.
- Ricardo, D. 1821. *On the Principles of Political Economy and Taxation*. 3rd ed. John Murray.
- RISE. 2025. 'Nordic Roadmap for Circular Financing.' <https://resource-sip.se/app/uploads/2025/03/Nordic-Roadmap-for-circular-financing.pdf>.
- Say, J.-B. 1814. *Traité d'économie politique*. Deterville.
- Say, J.-B. 1828. *Cours complet d'économie politique pratique*. Rapilly.
- Schumpeter, J. A. 1911. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Harvard University Press.
- Senge, P. 1990. *The Fifth Discipline: The Art and Practice of the Learning Organization*. Doubleday.
- Smith, A. 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*. W. Strahan and T. Cadell.
- Sundnäs, A.-C., A. Kjellman, and H. Eriksson. 2006. *Entreprenörskap och Utveckling*. 2nd ed. Schildts Förlag.
- Trevisan, L. T., J. H. P. P. Eustachio, B. G. Dias, W. L. Filho, and E. A. Pedrozo. 2024. 'Digital Transformation Towards Sustainability in Higher Education: State-of-the-art and Future Research Insights.' *Environment, Development and Sustainability* 26 (2): 2789–810.
- UNESCO. 2017. *Education for Sustainable Development Goals: Learning Objectives*. UNESCO.
- Vadnjal, J. 2008. 'Development and Growth Orientation of Family and Non-family Businesses.' *Economic and Business Review* 10 (3): 197–218.