

Towards a framework for higher education for marine spatial planning

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ARTICLE INFO

Keywords:

Marine spatial planning
Higher education
Curriculum development
Learning-centred approach

ABSTRACT

The implementation of marine spatial planning (MSP) is bringing together a new body of practitioners who are largely drawn from related professions but have relatively little specific education, training or qualifications in MSP. This is partly due to the newness of the field and the limited opportunities available for personal development. Educational capacity is developing, though MSP content is mostly being added on to existing marine-related programmes. Taking a learning-centred approach, this article seeks to contribute to the development of higher-education curricula that can support a newly-forming MSP practitioner and research community. The proposals presented here are based upon existing educational provision, the ongoing experience of an Erasmus + partnership in MSP teaching and learning and the results of a related survey. This lays emphasis upon enabling students: to gain a comprehensive, cross-disciplinary body of knowledge and understanding; to develop a strong set of academic and professional skills to underpin MSP practice and research; and to benefit from a variety of methods of learning, teaching and assessment that are designed to facilitate autonomous learning and skills development. Educators should be encouraged to respond to current practice needs and work collaboratively with students in developing courses that respond to their concerns and ambitions.

1. Introduction

Marine spatial planning (MSP) was largely unheard of until the early 2000s, when the concept started to emerge within international scientific and policy circles. Drawing upon conservation-oriented precursors (and, to some extent, integrated coastal zone management and terrestrial planning), it became seen as a much-needed, systematic approach to managing human activities at sea [11]. It quickly became “an idea whose time has come” ([7], p 787). Equally rapidly, it is being put into practice, firstly through pilot projects and the production of non-binding plans, and secondly by being introduced into national systems of governance, with authorities now working on the preparation of statutory plans [10]. Also, maritime industries and NGOs have caught on to the importance of MSP as far as their interests are concerned, and have been putting their efforts into engaging with MSP processes in various settings (eg. [1,20]).

All of this requires human resources; but just as MSP itself has been introduced “from almost a zero baseline” ([8], p 13), there has been neither the time nor the means for people to become educated and equipped in how to carry it out, and certainly no professional body of MSP experts to call upon. Although educational provision has started to develop, people have tended to move into MSP practice from other fields, predominantly from marine science and management, but also

from a range of other professions, such as planning, law, data management and civil service. Out of necessity, responsible authorities have drawn together their MSP teams out of the pool of existing, related vocations. As a result, many people have come into MSP practice without the kind of education and training that they have in their original field of expertise.

This has not been without its benefits. MSP teams have been multi-disciplinary as a consequence, and various bodies of knowledge and skill have been brought to bear; this has served, to some extent, the multi-tasked nature of MSP. Indeed, Kidd and Shaw [12] question whether the ever-widening scope of spatial planning, expressed partly by MSP, can be handled by a single planning profession. Those involved in MSP have gained experience with practice, accumulating and developing expertise as they go, not least as they have moved between projects and institutions. But it should still be asked whether it is sufficient to compile different backgrounds and transfer knowledge and skills to MSP, or whether a unique expertise is needed? Surely there is still a specialised role that needs to be filled? Might this at least be, for example, the ability to integrate the various technical roles being fulfilled by other team members ([13], p 206)? So people moving into MSP from other fields may feel the need for more specific formation, and those with weighty responsibilities, such as for producing a nation's first ever marine plan, may feel inadequately prepared.

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There is also the issue of professional credibility. The current situation regarding MSP is in contrast to parallel vocations, including those in which MSP practitioners have their origins. These place great emphasis on advanced education and further training, often accredited by institutional bodies, and continued professional development is expected. One cannot imagine people referring to themselves as scientists, engineers, mariners, economists, educators or (terrestrial) planners, let alone being given serious tasks to perform, without the relevant hard-won qualifications! MSP risks being regarded an amateur field by comparison.

This article seeks to address this deficit in MSP education and professional formation. This is done by offering a framework for MSP education that is based upon the current experience that does exist, along with specific needs perceived by the MSP community. Attention is focused on higher education provision, though offer proposals that could be adapted for other formation opportunities. Firstly, the educational provision that does exist is summarised, with reference to published reviews. Secondly, the conceptual basis for advancing this educational provision is presented. Thirdly, the methodology is described for this contribution, based upon the work of a partnership of educational institutions and a survey. Fourthly, the results of this work are presented, in the form of the proposed framework. Finally, comments are offered on the possibilities for advancing MSP education.

2. The beginnings of educational opportunities in MSP

There has been a market response to the need for MSP education, as providers have started to develop and offer courses, ranging from short, professional training, typically of a few days duration, to full, post-graduate programmes of a year or two. These have partly built upon longer-standing traditions of marine education developed by institutions with strong links to maritime industries such as seafaring and fisheries, or with marine science specialisms, such as oceanography and marine ecology [25]. The decline of some of these courses [25] may have turned the attention of some institutions to perceived new opportunities, such as MSP. In any case, there is now a reasonable number of courses with MSP content available in certain parts of the world.

Gissi and Suarez de Vivero [9] analysed educational provision for MSP and closely related subjects throughout Europe, Australia and the USA. They found 51 courses, but only 9 of these referred specifically in the title to marine (or maritime) spatial planning; the rest variously include the terms water, coastal, environmental, resource, management, conservation, engineering, science, etc., though did have MSP content. 65% were Masters-level courses, and 27% were training courses, aimed at professionals; the remaining few were undergraduate courses. Nearly 90% were delivered by universities; the rest by research and international organisations. They note that “existing courses appear as a re-orientation of already established programmes ... towards new questions and demands inherent to MSP, instead of being established to cover specific areas of MSP, except for some training courses” (p 54). A notable exception to this is the Erasmus Mundus Master Course on Maritime Spatial Planning, which has been designed as a two-year, comprehensive MSP programme [27], which the authors of the article referred to in this paragraph are engaged in delivering. Current information on education and training for MSP is available online [16,17,5].

So there has been a move towards providing education and building capacity for a new MSP profession. However, it appears to be being done, for the most part, by adapting existing, related courses and marketing them accordingly. Relatively few courses have been created and designed uniquely with a new MSP profession in mind. There is a greater number of targeted, short training courses, and these will continue to play a valuable role in introducing MSP to interested groups. However, these have limited content and lack the accreditation that comes with graduate or post-graduate programmes. So there remains a pressing need for the expansion of higher education opportunities for

future MSP practitioners and the development of curricula that are more comprehensively and directly focused on their needs.

3. Dimensions of higher education for MSP

To develop provision further, attention needs to be given, firstly, to the overall pedagogy, recognising the broad shift that has taken place throughout much of higher education to a more learning-centred approach. This is a move away from simple knowledge transfer, typified by a focus on course content delivered by lectures, towards facilitating students' own learning, making use of a wide variety of methods [21]. This draws on psychological understandings of how students learn. For example, Kolb [14] suggested that this occurs through a learning cycle of concrete experience, reflective observation, abstract conceptualisation and active experimentation. One can imagine how each of these stages might be related to different aspects of learning about MSP, such as: experience of marine pressures in a given context; observation of an actual MSP process's attempts to address the pressures; conceptualisation of an original approach arising from this observation; and experimentation of this approach in the original or another context.

Enabling students to follow through a process of this kind requires varied methods of learning, which partly map onto different stages of the learning cycle. These methods may in turn cater to different learning styles, in which students exhibit a preference for certain types of learning activity [22]. Using varied methods will also require students to extend beyond their initial preferences and allow them to develop wider aptitudes. This can take place with the support of educators and fellow students, so that they are effectively working together as a learning community [3]. Overall, therefore, there should be a high level of interaction between students and educators, and between students themselves. There should also be oscillation between such things as theory and practice, observation and action, and individual and collective working.

Interestingly, many of these dimensions of learning might be seen to echo participative and adaptive MSP processes. For instance, a preference for methods related to reflective observation may mirror MSP data assembly and organisation, whereas a preference for active experimentation may map onto an interest in the kind of spatial solutions available within MSP. The very substance of an MSP course may therefore lend itself well to a pedagogy of this kind, with the experience of this learning process being in keeping with and formative of good MSP practice.

Secondly, consideration needs to be given to the generally accepted components of higher education programmes. Three broad terms might be used here. First, developing knowledge and understanding, with particular reference to content. MSP course content is likely to be wide-ranging in scope. Glegg [8] suggests a number of broad topic areas, including planning processes, experience of MSP, legal frameworks and maritime activities and interests. The Erasmus Mundus course expands this list with marine and coastal geographies and environments, scenarios and strategies and specific planning tools, such as spatial analysis, mapping and design [27]. Gissi and Suarez de Vivero [9] echo this, but note that in the current provision of courses, there is an imbalance in the content of courses, with planning theory and MSP experience faring poorly compared to other aspects, such as environmental, legal and sectoral considerations.

It is suggested that a course should broadly cover the principles of MSP, with reference to the arguments that have been made in its favour, and the ways in which it is being put into practice internationally. Relevant aspects of contributing fields, such as marine science and maritime law should also be included; however, this should not be simply with a view to providing knowledge, but also to enable students to think critically about MSP and begin to develop skills to engage with MSP professionally, as discussed further below.

Second, gaining skills. Course content should be focused not just on the development of knowledge and understanding, but also on the

formation of specific skills that will help students move into MSP practice and, possibly, research. These cannot be fully formed within the constraints of an education programme, but should be nurtured to the extent possible, so that they can be further developed during ongoing career paths. This may be particularly important for students coming from disciplinary fields where the acquisition of skills is not so strongly emphasised. For example, in their assessment of postgraduate education for marine conservation, Langholz and Abeles [15] point out the lack of skills training, especially for those needed in professional practice. They suggest that there is a need for students to develop skills in innovation (such as the ability to develop visions), collaboration (such as team building and leading) and communication (such as listening and persuading skills).

On a more positive note, MSP education could draw on the strong tradition of skills training that already exists in wider planning education. For instance, Kitchen [13] sets out the skills needs of spatial planners, categorising them according to aspects of planning practice:

- carrying out technical tasks;
- following through the systems and processes of planning;
- knowing the local context (place);
- relating to and providing for customers;
- bringing personal attributes and qualities to bear;
- navigating organisational, managerial and political contexts;
- applying synoptic and integrative approaches.

Claydon [2] claims that those with existing planning skills are well-placed to enter MSP as they can apply these within marine settings. In particular, they can bring skills of:

- foresight: dealing with the future, using approximate forecasts;
- policy: understand political guidance and the need to balance conflicting policies;
- integration: working with complementary organisations at different geographical scales;
- participation: engaging with communities and accommodating their views;
- sustainability: resolving competing demands spatially and temporally.

Some professional bodies also lay emphasis on the need for planning programmes to develop specific skills as a part of their accreditation of those programmes, and for these to be further enhanced through continuing professional development [23].

Third, learning, teaching and assessment methods. Given how wide-ranging the suggested topic areas and set of skills are, a variety of methods of delivery and assessment should be used. This is also out of recognition of different learning styles, and the need to enable students to find approaches most suited to them, whilst also stretching them to adapt to approaches that they may find more difficult. These are likely to include both conventional and more innovative methods, as discussed below.

4. Methodology for developing a framework for MSP higher education

A broad framework is set out below for MSP higher education provision that may support the development of modules or programmes. The framework is structured around the second set of considerations discussed above, namely the elements of higher education programmes, but also integrates into its fabric the first consideration, that of a learning-centred pedagogy.

This methodology is based on the work of a partnership that came together in 2016 and has since been focusing on MSP curriculum development. It was formed within the framework of the European Union's Erasmus+ programme, and brings together five institutions in

France, Germany, the Netherlands and the United Kingdom.¹ The partnership's activities can be viewed online [26].

Firstly, a resource was drawn upon that was developed by the partnership to facilitate the preparation and delivery of a foundation module in MSP at undergraduate or Masters levels [26]. This handbook was put together by assembling and structuring material from the partners' own direct experience of teaching, project activities and research, further elaborated through their engagement with the wider MSP community, including academics, practitioners and stakeholders.

Secondly, a survey was developed that was based upon the handbook, inviting respondents to give their views on the partnership's proposals and to provide their own insights on the educational needs of MSP professionals. The survey was targeted at MSP practitioners, stakeholders and students. It was initially conducted at the closing conference of the SIMCelt (Supporting Implementation of Maritime Spatial Planning in the Celtic Seas) project held in Liverpool in November 2017 [24]. It was then made available online via SurveyMonkey®, the link being publicised through the MSP Research Network [19], the EU MSP Platform (EU MSP Platform, online) and social media, such as Twitter®.

81 complete responses were received. Of these, 41% came from the research community and 25% from students. Other significant groups who participated in the survey were representatives of education, MSP agencies, other government authorities, NGOs, industry, consultancy and European institutions. The great majority of respondents had spatial planning, marine science or environmental science backgrounds; geography was also a common disciplinary background. Most respondents ranked themselves as having a reasonable, good or expert knowledge of MSP, suggesting they could offer well-informed views (Fig. 1). However, they did recognise their own educational needs, referring amongst other things, to wanting better understanding of scientific processes, legal frameworks, skills development and MSP practice.

These two methods provided the input for the framework which could, for example, support a stand-alone module as part of a wider programme. This could enable students on related disciplines, such as marine science or spatial planning, to gain an introduction to MSP. Alternatively, it could form the basis of a more comprehensive MSP education, with separate modules developing the aspects described in much more detail (as in the Erasmus Mundus programme, referred to above).

The findings below are structured along the lines of the three programme components outlined above. For each, survey results are presented first; these are followed by an account of suggested educational elements, drawing together these survey results, the partnership's resources referred to above, and the wider MSP education experience discussed above. Commentary is then added to indicate how these elements should be placed within the context of the learning-centred pedagogy, again as discussed above.

5. A suggested framework for MSP higher education

5.1. Developing knowledge and understanding

Survey responses supported the inclusion of a wide range of topic areas (Fig. 2); importance was given to all of those suggested. Additional suggestions included: introducing economic considerations; knowledge of MSP in different countries; and emphasising more strongly the ecosystem approach and stakeholder engagement. Respondents were asked to differentiate between the importance of each

¹ University of Oldenburg, Germany (lead partner); Leibniz Institute for Baltic Sea Research, Germany; NHTV University of Applied Science Breda, Netherlands; University of Liverpool, United Kingdom; University of Nantes, France.

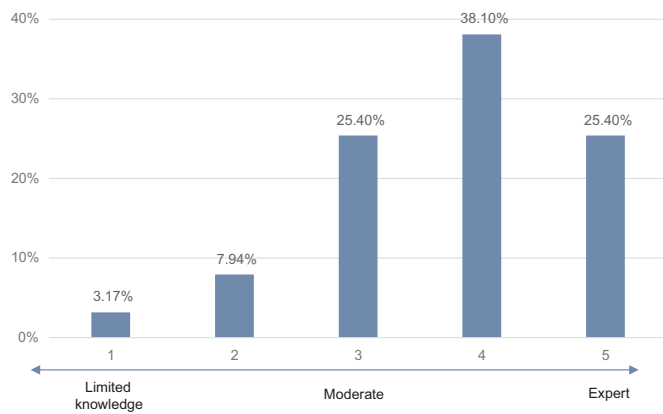


Fig. 1. Respondents' rating of their own knowledge of MSP.

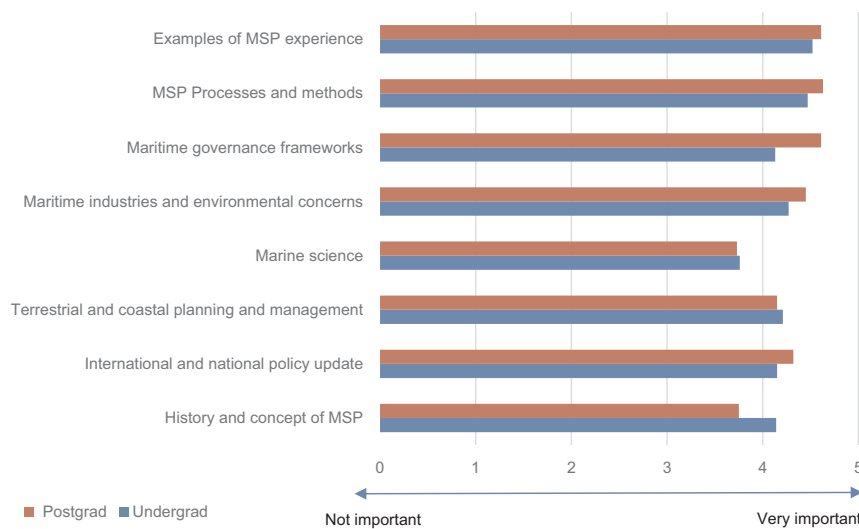


Fig. 2. Importance attached to knowledge areas.

topic area for undergraduate and Masters students; however, relatively little clear distinction came to light here. There is scope for further investigation of the particular needs of students at these different levels; for example, Masters students who are envisaging imminent employment may benefit from more knowledge about current MSP processes, whereas undergraduate students may need more background knowledge about the fundamental concepts underlying MSP.

Taking into these responses, the partnership's work and other MSP educational initiatives, it is suggested that the knowledge areas covered in an MSP course can be categorised as shown in Table 1 (presented as a logical progression, not in order of importance).

It is not suggested that these should all be covered fully and equally in any given course. The relative weight given to each will need to take account of a range of factors, such as the length of course, the expertise available and the needs of the student body.

Importantly, these topic areas are not meant to be simply a matter of knowledge acquisition, most fundamentally because of the emphasis set out above on a learning-centred approach, in which, for example, students have the opportunity to select and develop areas that they see as most beneficial. They might be enabled to give some direction to the choice of topics available and how these are covered. Two other issues should also be kept in mind here.

Firstly, knowledge should be linked to the development of wider intellectual qualities. This should include critical thinking, by which conventional arguments are questioned and there is ongoing discussion of issues raised. For example, the reasoning set out in favour of MSP in policy and academic literature might be challenged, or theoretical

perspectives brought to bear that throw new light on MSP processes. This picks up on Gissi & Suarez de Vivero's observation (2016) that there is a lack of engagement with planning theory in the existing provision for MSP education. This in turn reflects a dearth of critical approaches within academic MSP circles. For example, Flannery and Ellis [6] identified nearly 1200 academic articles related to MSP, of which “only a small handful can be considered as taking a remotely critical position”, “in the sense of raising questions about taken-for-granted ‘truths’ related to MSP” (pp 123, 127). If, as they argue, a ‘critical turn’ is needed in MSP studies, the classroom would be a good place to start, with students themselves being encouraged to bring healthy scepticism and wider perspectives to bear.

Secondly, in common with other disciplines, MSP education should enable continued learning and reflection beyond the award of a qualification. The knowledge gained during a course will inevitably be incomplete and time-bound. Rather than just offering an understanding of

MSP thought and practice as it currently stands, an MSP course should equip students to follow ongoing developments. This is particularly important given the fast-evolving nature of MSP implementation. An MSP course could contribute to this by getting students to engage with resources that continue to be available, as well as nurturing a spirit of curiosity and constructive criticism, as suggested above. This is likely to include introducing students to sources of academic material and policy development, not just in relation to MSP itself, but also the broader scientific and governance frameworks that provide contexts for MSP and which themselves are constantly evolving, such as national strategies for maritime industries and marine conservation and official MSP guidance. It may also include encouraging students to get involved in professional and academic circles, such as ocean-related online networks, MSP-related conferences and other events, and marine plan consultation exercises, and not simply as future professionals, but also as concerned citizens.

5.2. Gaining skills

The survey responses confirmed the importance of skills development within MSP education. Fig. 3 shows almost equal importance being attached to the acquisition of a broad range of skills, with this aspect of education being given a slightly higher priority for Masters students. As mentioned above, the distinction between undergraduate and Masters students merits further investigation; it may be felt, for example, that Masters students are seeking to enter employment more immediately and therefore should be more fully equipped with

Table 1
MSP-related knowledge areas.

1. History of MSP

The conceptual roots of MSP, particularly the scientific arguments that have been used in its promotion. This will help to explore its rise as a management tool, and its international and national-level policy development and uptake. Topics covered here could include:

- Early development of MSP, such as in the Great Barrier Reef Marine Park
- Planning arguments put forward in favour of MSP, especially relating to managing marine resources more effectively
- Scientific support given to these arguments, such as the need to reverse damage to the marine environment
- International policy support given to MSP from inter-governmental bodies, including IOC-UNESCO (Intergovernmental Oceanographic Commission of UNESCO), the European Union, regional sea organisations and international NGOs
- The development of national policy support and implementation in certain countries, showing its historical spread, especially since 2000

2. Spatial planning and management

An introduction to spatial planning as practised on land, to help students (especially from non-planning backgrounds) to understand some of the principles now being adopted for the sea, covering issues such as:

- Legal and administrative frameworks supporting spatial planning systems
- Typical planning methods, including spatial allocations, policy guidance, development support
- The diversity of planning systems around the world
- Coastal planning and management initiatives, including integrated coastal zone management
- A detailed example of a terrestrial planning system and its main provisions

3. Marine science

An introduction to some aspects of marine science, to help students (especially from non-marine science backgrounds) appreciate some of the natural characteristics of the marine environment and the changes being brought about by human activities. Dynamics covered could include aspects of:

- Oceanography, including dynamics such as vertical stratification, currents, tides and waves and chemical composition
- Marine ecology, including benthic and pelagic communities, mobile and migratory species
- Sea basin and transboundary scales of marine processes, including large marine ecosystems
- Methods of understanding and limits of scientific understanding
- Anthropogenic impacts on marine systems, such as eutrophication, pollution, seabed destruction and the effects of climate change
- Environmental sensitivity and effects of climate-change on the oceans

4. Marine interests

An overview of key interests and activities, to help students explore the sectors and issues that MSP seeks to take into account, including:

- Traditional maritime industries, including fishing, commercial shipping and oil and gas extraction
- New, growing and emerging activities, including aquaculture, offshore and marine renewables and deep sea mining
- Environmental interests, including marine protected areas and concern for wider ecological issues such as marine pollution and invasive species
- Social and cultural issues, such as socio-economic dimensions of coastal communities and maritime industries and cultural perceptions of the coast and sea
- Data sources for individual activities and interests
- Examples of the range of issues covered in marine spatial plans

5. Maritime governance

An introduction to the wider governance framework for MSP, to help students appreciate where MSP fits into legal and administrative systems and the capacity of MSP to regulate marine activities:

- Jurisdictional boundaries established through the United Nations Convention on the Law of the Sea and the associated national rights and responsibilities
- International and regional organisations that govern activities such as shipping, fishing and energy production
- The role of regional sea organisations and, in Europe, relevant EU legislation
- Examples of national arrangements for sectoral licencing of activities such as port development and renewable energy infrastructure

6. MSP processes

An overview of the processes being set up to implement MSP in different national contexts, to give students an understanding of the diversity of approaches being taken, with reference to:

- The legal provisions and administrative structures being set up to enable MSP to be implemented in particular contexts
- The definition of boundaries and areas for marine spatial plans
- The responsibilities and overall procedures for producing a marine spatial plan
- Headline principles for MSP, such as the ecosystem approach, evidence-based planning, stakeholder engagement
- The steps that make up a planning cycle for producing a marine spatial plan

Table 1 (continued)

- Examples of more detailed methods used in MSP, such as data collection, objective-setting, making spatial allocations

7. MSP practice

More detailed examples of MSP practice, taken from different countries, to help students explore how the various dimensions covered above shape the development of marine spatial plans and lead to different outputs. The following aspects could be covered, in relation to specific MSP processes:

- Geographical and socio-economic context
- Legal basis and administrative responsibility
- Key planning issues
- Use of spatial data
- Stakeholder engagement and public communication
- Spatial solutions
- Cross-border and land-sea integration
- Implementation and follow-up

professional skills. A number of more particular and additional skills were also suggested by respondents: Geographic Information System (GIS) and other software skills; project management; time management; political awareness; conflict mapping; transdisciplinary thinking; mediation and negotiation skills; and use of decision support tools.

Building on these various perspectives, it is suggested that the areas of skill development shown in Table 2 should be integrated into MSP programmes.

Some of these are generic skills that one would expect to find in many higher education programmes, such as presentation or research skills; nonetheless, they should be stressed within the context of learning about particular aspects or examples of MSP. Others are more specific, relating to discrete elements of an MSP process, such as data-gathering, policy review or integrating uses. Clearly, not all these MSP-specific skills can be covered in one course; it is suggested that students should have the opportunity to develop one or two in depth, not least through project work (see below). There should be scope here, as for other aspects of programmes, for students to express preference for particular skills that they wish to work on, possibly following a 'skills audit' that may help them to identify areas where they are lacking or would like to become more strongly equipped.

5.3. Learning, teaching and assessment methods

The survey responses confirmed the importance of using a variety of teaching and learning methods within MSP education. Fig. 4 shows some preference for more applied methods, such as project work and fieldtrips, especially at Masters' level. There is slightly less preference for academic lectures, except at undergraduate level. Respondents also proposed a number of more particular and additional methods: role play exercises; project and team management training; use of online tools; and participation in MSP conferences and project events. Internships and industrial placements were also suggested. Some respondents also expressed their own need to do more project based work and gain practical experience.

Respondents also supported the use of a variety of assessment methods. Fig. 5 shows a preference for more interactive and applied methods, such as presentations and seminar leadership, especially at Masters' level. Examinations were least preferred, though still relatively important at undergraduate level. Few other methods were suggested, though mention was made of site investigation assessment and a performance based assessment, such as within a conflict management exercise. More generally, additional comments reiterated the questionable value of examinations at postgraduate level and the need to focus more on developing professional skills.

In the light of these responses and wider experience of MSP education, the following methods of teaching and learning are suggested, each with respective methods of assessment.

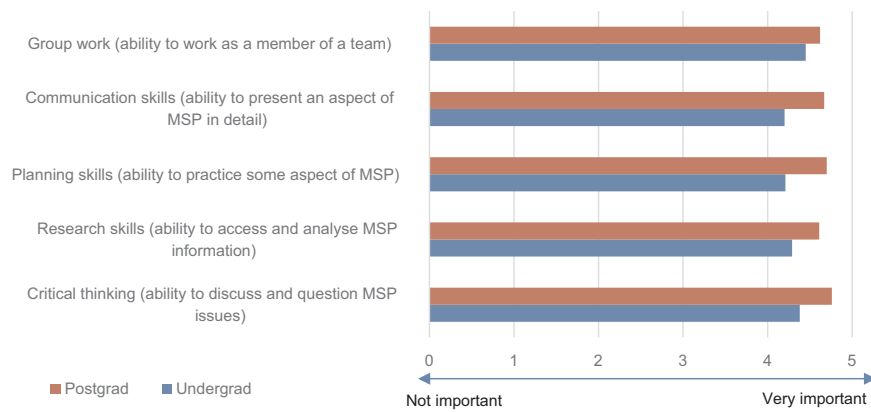


Fig. 3. Importance attached to the development of skills.

Table 2
MSP-related skills development.

1. Information gathering skills, such as the ability to source and organise material and data relating to MSP processes
2. Research skills, such as the ability to access and analyse relevant sources of information about MSP
3. Evaluation skills, such as the ability to assess and critically discuss MSP academic literature and practice documents, such as marine spatial plans
4. Presentation and communication skills, such as the ability to present a particular aspect or example of MSP in some detail
5. Oral and written presentation skills, such as the ability to present effectively information and critical argument relating to MSP theory and practice
6. Individual methods skills in a selected area of MSP practice, such as application of GIS, stakeholder engagement or scenarios-building
7. Individual and group study skills, such as the ability to perform individual academic tasks and work as a member of a group
8. Team-building skills, such as the ability to foster cooperation and effective working of a group as a whole
9. Workplace skills, such as the ability to appreciate the local policy context and the needs of end users of MSP processes
10. Technical skills, including the ability to practice some aspect of MSP at an introductory level, such as data management, stakeholder engagement, creating a vision or developing options, mapping or using geo data services

5.3.1. Lectures

A series of lectures will help to cover the topic areas, possibly with ‘front-loading’, as they can be used to introduce factual information and critical concepts that can then be taken up in, for example, seminars and group work. These should include contributions from MSP or maritime sector practitioners, perhaps representing locally important or current initiatives, such as renewable energy potential or recent stages of plan-making.

These will probably be linked to individual essays and written exams. Essays may be preferred as they require more in-depth research

and more developed argument, exploring, for example, the sectors benefiting most from MSP. Essay answers may also be expected to give practical examples, testing student ability to research MSP practice. They also help therefore in developing skills that are transferable to employment.

5.3.2. Seminars

Group discussion of topics raised during lectures could help to develop critical thinking skills, supported by directed reading. For example, students, particularly at Masters level, could prepare for sessions by studying core texts, such as on the history of MSP, then engage in critical discussion during the seminar, with the opportunity to consider diverging views.

Students could be assessed on their degree of participation in the seminar, testing understanding of the topic and interpersonal skills. Alternatively, they could be tasked with organising a seminar, individually or as a group, and then being assessed on material provided and leadership of discussion. An assessed seminar could also be run as a mock MSP team meeting, with interchange of ideas about, for instance, different national approaches to MSP.

5.3.3. Group work

Some of the research and planning skills would be best developed through group project work, where students can investigate aspects of an MSP process. This could also provide knowledge of MSP processes and practices in a particular context. There is also scope here to focus on aspects of MSP practice, such as techniques of data collection or objectives-setting. This could also involve evaluation of those aspects.

This method of delivery could be linked to the production of a group report, written and formatted in a professional rather than academic style. Students can be given individual responsibilities within their

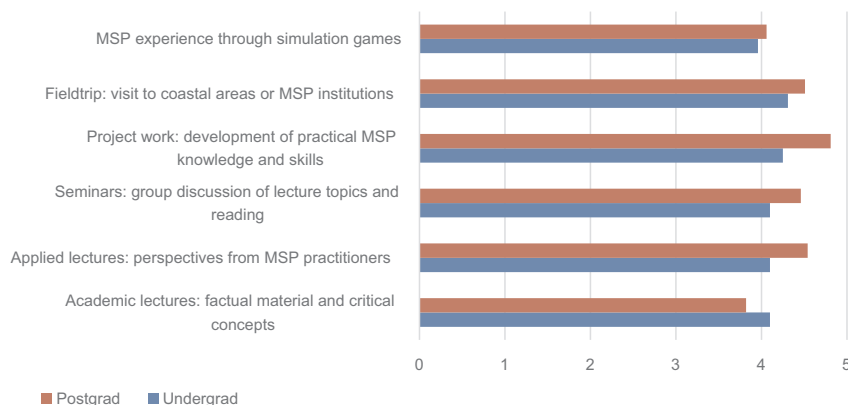


Fig. 4. Importance attached to learning and teaching methods.



Fig. 5. Importance attached to assessment methods.

group, so that they are working as a team with different roles, but still assessed on their overall effort, including through evidence of their ability to work together effectively. In addition, an assessed task may be to present results orally and visually, testing ability to work together and demonstrate findings effectively and persuasively. This could be linked to a mock plan-writing exercise, with shared responsibilities for different aspects of a marine plan.

5.3.4. Fieldtrip

If possible, a fieldtrip or fieldtrips should be organised, such as to a coastal locality to study some of the key issues relating to MSP in the area, or to an organisation concerned with MSP to get practitioner insights. Group activities could be linked to this; for example, students could be given the task of considering the potential issues relevant to the area, or carrying out an assessment of the coastal and marine features and activities. Assessment of such fieldtrips could include presentation of observations and reflections, report-writing or use of fieldtrip experience within an academic essay.

5.3.5. Individual project

Masters and many undergraduate programmes usually include a dissertation or thesis as part of their structure, or may have some other provision for a sustained piece of individual project work, with one-to-one academic supervision. This is clearly an opportunity for students to have a great deal of autonomy in their learning, in selecting a topic, carrying out background research, conducting original empirical work, addressing ethical issues that may arise and placing findings in the context of wider debate and practice. This would allow students to develop specialist knowledge in a particular MSP-related topic, develop a specific skill, related, for example, to MSP data management or policy formation, engage with MSP practitioners and other actors through data-gathering (with the added benefit of allowing career-oriented networking) and offer a contribution to the wider development of MSP in the form of their own results and, possibly, recommendations. The manner of assessment would be determined by the host institution's requirements.

5.3.6. Internship

Students can benefit greatly from any opportunity to engage directly with professional practice through a placement or internship with an external organisation that is carrying out MSP-related work. This is likely to be set within the framework of the programme or host institution's practices; for example, there might be established links with industry or government with internships already agreed, or there might be a placement module in which students proactively approach organisations to request work experience. In any case, this can clearly facilitate the development of professional skills, and assessment should

focus on the extent to which these skills have been gained and demonstrated. This approach has been used successfully in the Erasmus Mundus Masters course on MSP, where students spend their final term on a 6 month internship at an affiliated organisation [27].

5.3.7. MSP challenge

MSP Challenge is a suite of board games and digital games designed to introduce players to the complexities of MSP [18]. These are based on either fictional or real-life sea basins and give a hands-on introduction to an MSP process. Participants take on the roles of sectorial representatives and planners and must collectively develop patterns of sea use. This could help in developing some of the professional skills referred to above, such as team-building and cooperation. Assessment could be based on observed individual or group skills in negotiating solutions. Alternatively, students could teach the use of the game to others and be assessed on their ability to do so. For example, a group of students recently used the game to help government officials working on a marine spatial plan to explore transboundary dynamics in an imaginary sea basin.

It is assumed that any higher education module or programme will have an underlying set of learning outcomes and/or objectives, guiding the structure and content as a whole, and that each part of the module or programme will be geared towards achieving some of these. It would be advisable to ensure that all of the outcomes or objectives are being met adequately, by identifying those components of the module or programme where they are should be met. This process can also highlight where objectives are not being adequately achieved, and where additional provision is needed.

These proposals are not meant to be prescriptive. Courses will need to be shaped according to local conditions. Firstly, the disciplinary backgrounds of the student body should be considered; some aspects may be omitted or covered more fully, depending on their existing knowledge, or supplementary sessions may be held for the benefit of students lacking in some respects. Secondly, context-specific conditions and needs should be taken into account: there may be a focus on the regional initiatives and national legal and planning frameworks and MSP examples that are most relevant, possibly gaining practitioner input from local MSP authorities and stakeholders. Thirdly, the host institution's academic requirements will also have to be followed.

6. Conclusions

MSP has risen to prominence due to perceived needs about the world's seas and oceans. It is felt that their resources should be used in a more sustainable manner, by organising human activities at sea more rationally and protecting marine environmental conditions more carefully. This lofty agenda can only be addressed by people working across

a range of institutions, combining their efforts horizontally and vertically. No doubt, everyone involved in some way could benefit from a certain level of education or training about the principles and techniques of MSP. This could include civil servants from the range of government bodies that provide input, and representatives from maritime industries, NGOs and other stakeholder groups that are consulted in MSP processes. However, there is a particular need for the people at the centre of these efforts, working within authorities that have responsibility for producing marine spatial plans, to develop expertise at a level that is equivalent to the wider planning profession. This is especially so given the preponderance of natural scientists entering the field who may need to complement their existing knowledge with a wider set of skills ([8], p 15), or civil servants moving from related, but non-planning, areas of responsibility such as fisheries or environment.

Having said this, MSP remains a relatively small professional field; the number of people directly employed within it is in no way comparable to those working, for example, in marine science, maritime industries or terrestrial planning. Even within the European Union, where coastal Member States are now under a legal responsibility to deliver maritime spatial plans, this work is generally being done by small, centralised teams, who are producing very large-scale plans that can, for most countries, be counted in single figures. This is in stark contrast to the hundreds, or even thousands, of detailed plans typically produced to cover a nation's terrestrial area by a multitude of localised teams, not to mention the host of supplementary plans that may be produced for site-specific developments. It is true that MSP employment opportunities extend beyond direct involvement in plan-making; for example, some industries, agencies, NGOs, consultancies and research organisations are taking on people with the expertise needed to lead in their engagement with MSP processes. But opportunities are currently relatively few in number, and the uptake of the educational offer will be limited too. Indeed, not all courses, including some of those referred to by Gissi and Suarez de Vivero [9], have succeeded in recruiting sufficient numbers of students.

So committing the resources needed to deliver MSP education is not without its risks. This may explain Gissi & Suarez de Vivero's observation that, for the most part, existing courses are having MSP content added in, with some overall repackaging, rather than completely new courses being developed, with all the recruitment uncertainties that this would entail. The potential for delivering a comprehensive educational package of the sort suggested in this article is likely to be constrained by the relatively niche market that it is seeking to reach. This also suggests that efforts may be best focused mostly on Masters-level education, where smaller numbers of students, with a higher level of existing related knowledge and a more career-oriented perspective, may stand to benefit the most. This is not to dismiss the opportunities for integrating MSP education into undergraduate programmes, by means of a dedicated module, for instance, or by weaving MSP content into related modules; this may best occur as a spin-off of Masters provision.

However, there is the prospect of significant expansion of the sector, as growing interest in MSP around the world may well prove to generate an increased demand for relevant qualifications. Further global expansion of MSP practice may be driven, for example, by the current collaboration between the European Union and IOC-UNESCO [4]. Also, from an educational point of view, it should not be forgotten that MSP, at all levels, represents a relatively new area of study and offers potential students the prospect of entering an innovative field of study and work [2].

The authors' and wider partnership's direct contact with students suggests that many of them are indeed drawn to MSP as an area of study because of its pioneering nature and the sense of anticipation in working within a new and important field. Importantly, they are often drawn not just by career prospects, but also because they see ethically-driven possibilities within MSP, as they feel that it can help to meet their concerns for the future well-being of the seas and oceans. This is in line with the significant ecosystem approach discourse within MSP.

Educators should be encouraged to respond to these aspirations and design programmes that can equip students to understand the main concepts and processes involved, engage in constructive debate and research, move into some aspects of MSP practice, and take forward their own underlying interests. The transfer of expertise should also be kept in mind; there is great potential for knowledge and skills acquired through an MSP course to be exported into related fields of employment, such as the offshore renewables industry, sustainable fisheries management, marine conservation and coastal planning and management.

Clearly, it would be beneficial to continue to monitor the development of MSP-related education and training provision. This should cover not just the courses available, but also the content and manner of education, and the extent to which it is engaging with practice and meeting the needs of plan-making. It is to be hoped that provision will be more geographically spread, with uptake particularly in the global south, especially as MSP rises up the policy agenda in different parts of the world.

Finally, educators should look forward to a formative experience for themselves. Their interaction with students is likely to generate new insights into the emergence and practice of MSP; students will come with their own bodies of knowledge, experiences and perspectives, no doubt from around the world, including from diverse political, environmental and social contexts, and, if encouraged to do so, will bring their own uninhibited thinking to bear on what is taught. Together there is the opportunity to dismantle conventional wisdom and construct new ways of conceptualising and going about various aspects of MSP. The same applies, of course, to the educational programmes themselves. These should be conducted in an adaptive manner, so that formal and informal student feedback and personal reflection on the part of those delivering courses continuously shape the various elements of those courses. This should apply to all of the content and methods of teaching, learning and assessment, and be carried out both through formal review for subsequent years, and modification along the way where possible. MSP education can thus emulate a responsive MSP process itself, and be a stimulating setting for creative engagement between all those involved.

Acknowledgements

The work referred to in this article was partially funded by the ERASMUS+ grant program of the European Union under grant no. 2016-1-DE01-KA203-002909.

The authors wish to thank their colleagues from the partnership for their participation in the work described in this article, especially Thomas Klenke and Malena Ripken (University of Oldenburg), Igor Mayer and Harald Warmelink (NHTV University of Applied Science Breda), Kerstin Schiele (Leibniz Institute for Baltic Sea Research) and Brice Trouillet (University of Nantes).

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