



MAS

Museum Affinity Spaces

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Future challenges report

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Museum Affinity Spaces (MAS): Re-imagining Museum-School Partnerships for the 21st century through a Multiliteracies Lens

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Executive summary

This report describes the results of the research activities performed during the first year of the MAS Project and represents a Milestone in WP6 – Community Building and Support. It is serving the need for the identification of the current and future challenges as it regards Museum Education and the scope and the approach of the MAS Project in order to address them in a holistic and state-of-the-art way.

Therefore, the results and the conclusions are presented as a basis for further work, depending on the participatory engagement activities and how new insights will form and inform the implementation and methodology employed for the project.

In this respect, the last chapter of this report includes a set of open questions that will remain in the agenda and drive future activities.



Table of Contents

EXECUTIVE SUMMARY.....	2
1. INTRODUCTION.....	4
2. THE ORIGINAL RESEARCH HYPOTHESES.....	5
2.1 The original hypotheses of the MAS project and of the study on future challenges.....	5
2.2 The Methods Adopted.....	6
3. INPUT FROM VISIONARY WORKSHOPS.....	6
3.1 Aims and Implementation of Visionary Workshops.....	7
3.2 Feedback on the MAS proposal.....	8
3.3 Suggestions – Concerns in the use of MAS platforms.....	9
4. INPUT FROM STAKEHOLDERS' CONSULTATION.....	11
4.1 Purpose of the consultation.....	11
4.2 Main points of agreement.....	13
5. THE PRESENT AND THE FUTURE OF MUSEUM-SCHOOL PARTNERSHIPS: WHAT IS DESIRABLE?.....	15
Museum-school partnerships in the 21 st century.....	15
Virtual museum environments.....	17
6. INPUTS FROM LITERATURE REVIEW AND OTHER PROJECTS.....	19
Trends affecting education at large.....	19
7. RESULTS OVERVIEW AND CONCLUSIONS.....	32
8. REFERENCES.....	35

1. INTRODUCTION

This report is produced in the framework of the MAS project and summarises the results of the participatory methods implemented and the activities that relate to stakeholders' engagement in the project. The line of fieldwork and desk research activities are also identified, to discuss main challenges that will have to be addressed in the future, so as for the MAS framework to be incorporated in European school systems.

This work reflects the need, which was well acknowledged from the writing of the MAS proposal, to promote sustainable and flexible use of the technical, pedagogical and organisational models proposed, and open its lenses to new developments and insights on risks and challenges arising through implementation, in order to reach the desired level of impact that the project is aiming at.

The report summarises the results of the activities for the first year of the MAS Project, and represents a Milestone in WP6 – Community Building and Support. It is serving the need for the identification of the current and future challenges as it regards Museum Education and the scope and the approach of the MAS Project in order to address them in a holistic and state-of-the-art way. Therefore, the results and the conclusions are presented as a basis for further work.

Different kinds of input and information are therefore collected by the project team, to proceed with implementation and improvement of the methodology for the following stages of work. Of course, as the participatory engagement and prospective study continue over the life-cycle of the project, this document will be updated with new input from many levels to inform the implementation and improvement of the methodology for the following stages of work. In the final chapter of this report, a set of open questions have been identified that will remain in the agenda of the MAS project team and drive further activities.

2. THE ORIGINAL RESEARCH HYPOTHESES

In this section the starting points pertaining to the content of this study are outlined and the methodological approach of the study are presented.

2.1 The original hypotheses of the MAS project and of the study on future challenges

In a very dense manner, this Future Challenges Study builds on the following set of hypotheses, well identifiable in the MAS rationale and articulation:

1. Museum-school partnerships require substantial improvement in order to meet the needs of the knowledge society.
2. ICT has a very high potential to support innovation in education at large and in particular for developing successful museum-school partnerships.
3. Multiliteracies framework of thought is key to improve the learning practices, as well as the learning outcomes in museum-school partnerships; however, it needs to be supported by appropriate guidance measures.
4. Virtual museum environments can substantially increase the motivation of learners and the practice of learning through their multimodal characteristics and accessibility features.
5. The international exchange of cultural experiences is a multiplier of good practice in developing inclusive and meaningful museum-school partnerships.
6. Active involvement of museum educators, teachers and students in the production of new learning resources and learning pathways, is the appropriate approach to scale up the project impact.
7. Bottom-up approaches to innovative practice should be incorporated to achieve system-level impact.

2.2 The Methods Adopted

This report is the result of two types of activities:

- The 2 visionary workshops conducted by the project, in which the teachers' community (44 participants) was consulted on the future of museum-school partnerships and cultural heritage education, on the MAS approach and on the challenges of such an approach in the context of school systems, thus identifying the main opportunities, but also the main barriers to be overcome;
- The consultation of several other categories of stakeholders through interviews, focus group interviews and on-line surveys (in particular museum education experts, school leaders, and policy makers);
- The collaborative 2 academic papers produced regarding the framework of MAS project and potential implementation across European school curricula;
- The systemic review of scientific literature and parallel projects results on the subject of museum education and interdisciplinary approaches to cultural heritage education.

Each of these "methods" to collect stakeholders' views and research results has produced significant results which are presented in this report. The final chapter summarises the results, carries out preliminary conclusions and provides a set of open questions to be further explored by the MAS project and beyond.

3. INPUT FROM VISIONARY WORKSHOPS

Here we discuss the main input from the 2 visionary workshops conducted in Year 1 of the project. These were part of Phase 1, in particular the preliminary context analysis and elicited information on the suggestions coming from teachers and museum educators, as well as the identified challenges in terms of the full implementation of the project and its multiplication potential.

3.1 Aims and Implementation of Visionary Workshops

The first set of participatory activities in the MAS Project was the organisation of 2 Visionary Workshops in Limassol and Nicosia, Cyprus. These workshops were important, as they allowed for the MAS team to approach possible participants for the project, and enabled the preliminary pilot-schools recruitment process. This is a further example of the interaction between WP4 and WP6. The aims of the workshops are:

1. To collect stakeholders' views on the future of museum school partnerships and the specific role that could be played by virtual museum environments, and then to contribute to Multiliteracies Framework Thinking.
2. To collect feedback on the pedagogic, organisational and technological elements of the Framework initially proposed by the MAS Project. The intention is to use this feedback in the development work taking place in year 1, especially as far as the pedagogical framework is concerned.
3. To inform national audiences on the MAS project proposal and to contribute to create favourable institutional conditions for the different iterative cycles of the project, at a larger scale and also contribute to Dissemination activities of WP2.
4. To establish a productive dialogue with a set of national stakeholders who will accompany the development of the project in its different phases.

Most of the participants in the workshops were teachers and museum staff in a lesser degree, the majority of which will be involved in the Pilot Phase 2 of the project.

The workshops featured an open dialogue character, in the form of debate, and had similar structure with concrete elements adapted to the context and expectations of the participants.

3.2 Feedback on the MAS proposal

The MAS project and its outcomes correspond to certain needs of museum educators, school-teachers and students of primary and secondary education. The impression was overall positive in regards to the ideas proposed, the practices to be implemented and the methodologies to be followed. It was perceived that the project would offer substantial benefits to its participants and in the long term. Therefore, it was considered valuable and the participants expressed positive attitudes towards the visionary workshops, which they considered engaging and relevant.

Almost all participants believe that a digital repository of online infrastructure with tools would be useful. Most of the teachers appreciated the idea of a federation of good quality pedagogical learning scenarios and lesson plans.

The majority of the participants seemed to feel comfortable with the proposed MAS working environment. Screenshots and mock-ups of the interfaces to be used in the MAS platform were displayed and participants provided feedback on them. The overall agreement was that a minimalistic approach would bring the optimum results and also help them navigate the different sections and find services in the platform. The simple interface should be matched with short text.

Another mutual impression, was that the best approach would entail the use of scaffolds which would be valuable and helpful to all, including museum educators, teachers and students.

The participants in their vast majority, expressed no hesitation in recommending the MAS activities to their colleagues. They all agreed that it would be useful to have access to educational activities that include the use of virtual museums. On the other hand, a significant proportion of teachers (about 36%) seem to prefer to create new material, rather than reuse some existing ones, while most agreed that it would be useful to create activities with museum educators, in the scope of the MAS focus on museum learning. These conclusions result from the analysis of the data collected during the workshops.

3.3 Suggestions – Concerns in the use of MAS platforms

The majority of participants emphasised the need for training in the use of the MAS platform, at best physical workshops, or even webinars and tutorials. They all agreed it would be essential to have an updated user manual or short screencasts, showing users how to perform the different tasks. In other cases, attendants considered that follow-up training workshops, should be organised before classroom or/and museum implementation. Any kind of online tutorials, should be supplemented by printed guidelines.

In regards to the students' familiarisation with the MAS platform, the attendees suggested some sort of game-based activity in the overview, so as to train them in the use of the platform. A number of participants also suggested having, where possible, a more playful platform interface and virtual museum appearance. They insisted that students nowadays prefer a more game-full learning process.

An important part of the visionary workshops, addressed possible restrains – barriers towards the implementation of the tools, resources and methodologies presented during the visionary workshops. These included, based on the majority of views:

- Extensive curricula – time restraints
- Lack of ICT infrastructure in school
- Teachers' lack of confidence with the use of ICT
- Lack of technical support in school
- Lack of school support to implement new approaches
- Lack of motivation from the students – students' attitude
- Number of students per class
- Language barriers

Out of the above stated barriers, the main organisational barriers in regards to implementation of the MAS project, included a lack of financial support and the lack of correspondence between curriculum and the use of virtual museum environments; further,

lack of time by the teachers and lack of training, in-service professional development, especially in regards to meaningful implementation of the MAS approach.

Finally, the lack of general organisational support and communication between stakeholders, could inhibit the implementation process. Identified technical barriers included, on the one hand, school issues like availability of the ICT infrastructure and internet connection and, on the other hand, problems on the actual providers' side -the MAS team- (e.g., usability problems, experimental failures, availability of technical support, etc.).

The MAS project sought to address some of the barriers identified by the participants in the visionary workshops. Firstly, the intention was to minimise and overcome technical barriers that may arise, like usability problems, online museum/school search and personalisation of the MAS Cabinet, student management and experimental failures. Also, organisational barriers can be minimised with appropriate training and dissemination activities offered by the project team online through the MAS Hub support mechanism, and all envisioned activities.

Still, there are barriers that remain out of scope of MAS project, these include organisational barriers such as the lack of time and curriculum, insufficient funding, and school support. Although these hurdles can be addressed with project dissemination activities, e.g. by increasing the awareness of political and public bodies about the MAS approach and the need to support its implementation by providing funding or changing curriculum, the project does not have a direct influence on the decision makers. Technical barriers include availability of sufficient infrastructure (computers, internet access, etc.), which also needs support at governmental or at least school direction level. These restraints – barriers should be considered as challenges to MAS implementation.

Table 1. Barriers and challenges of implementation for MAS

Barriers	Challenges
Extensive curricula – not enough time	The MAS services help teachers better organise their time and activities.
	MAS offers different tools in the same place, thus helping teachers to gain time.
Lack of ICT tools in school	No special tools or infrastructure are needed, since MAS offers easy to use solutions.

Lack of technical support in school	No special technical support is needed, since MAS offers easy to use solutions.
Lack of school support – cooperation	MAS builds an international community of Use. The MAS Hub will grow with a virtual Community of educators and a support mechanism from stakeholders and key facilitators.
Lack of interest from the students – students' attitude	MAS offers innovative and easy to use tools that can spark the interest of students.

4. INPUT FROM STAKEHOLDERS' CONSULTATION

In this section, the stakeholders' consultation activities are presented. The description of each method used starts with the clarification of their purpose and presenting then the consensus points and the issues that generate debate.

4.1 Purpose of the consultation

The MAS partnership consulted with various categories of 17 stakeholders from 7 European countries through interviews (in particular museum education experts, school leads, and policy makers). These interviews reflected the experts' views on:

Strengths and weaknesses of the present museum-school partnership practice

Likely evolution

- Positive trends, affecting cultural heritage education, literacy education, digital education in general;
- Trends producing a negative impact on cultural heritage education, literacy education, digital education or education at large;
- Necessary actions at institutional and policy level to maximise the impact of favourable trends and reduce the impact of undesirable trends.
- Role of academia in advancing the field.

Teaching and learning practices

- Ways of teaching and learning to increase quality of literacy teaching at school;
- Barriers to their large-scale adoption;
- Role of ICT and virtual museum learning, in improving inclusive multiliteracies teaching and learning.

Specific recommendations

- Educators' competences and motivation to change;
- Learners' attitudes to museums and motivation to learn;
- Organisational (school level) and institutional (Ministries, regional and local authorities) lines of action that could produce positive impact and remove barriers to change;
- New ways of using ICT/elearning platforms for teaching and learning in and through museums;
- Use of multiliteracies and multimodality in education;
- Access to virtual learning environments through ICT to make cultural participation and engagement more effective and attractive;
- Use of open educational resources;
- Evolution of text books for cultural heritage and museum education;

4.2 Main points of agreement

All the stakeholders that were interviewed agreed on certain common views. These are presented in the figure below.

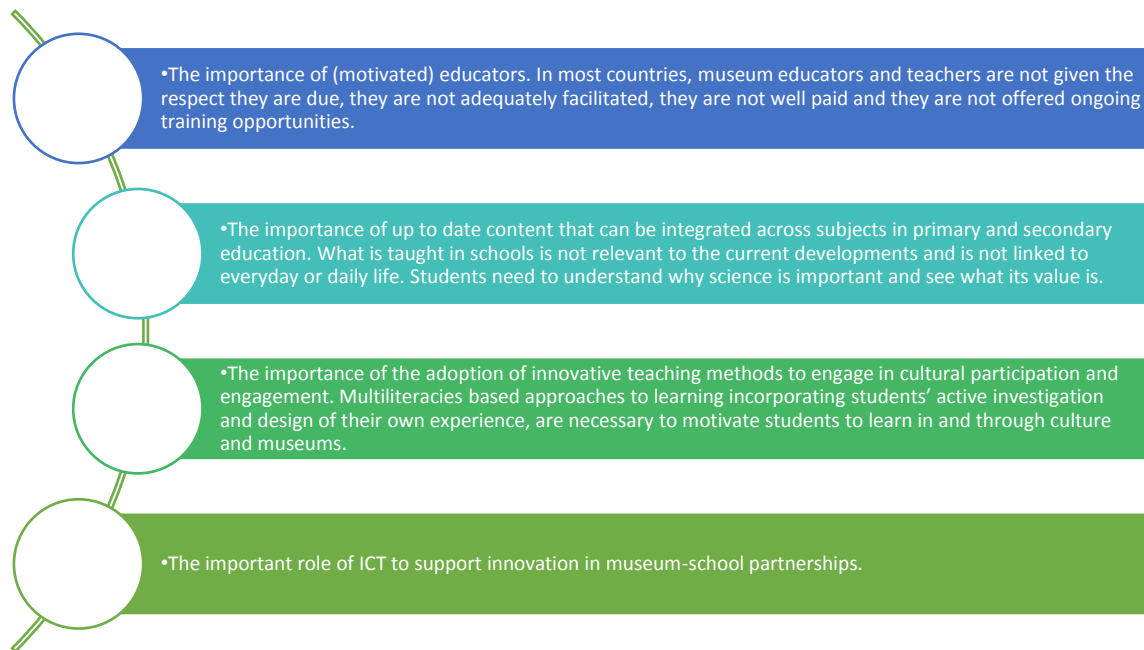


Figure 1. Main points of agreement in regards to museum-school partnerships and cultural participation

Museum-school partnerships are more and more directed towards inclusive cultural participation and learning for social change. This evolution in the scope and premises of the museum-school synergetic learning agenda, is closely related to the proliferation of technologies, and the increasing cultural and linguistic diversity of societies globally. The 21st century has marked a turning point in their existence, responding to the evolution of the colonial 'west and the rest' model, as well as the effects from globalization which increased cultural diversity and cosmopolitanism (Peressut et al., 2013). In this respect, more recent conceptualizations of museum learning acknowledge the sociocultural nature of museum learning experiences. Within the increased discourse of the role of the museum as a place of inclusion, scholars have suggested that "museums may offer important possibilities for engaging in most valuable aspects of literacies, providing additional and alternative cultural capital to that of traditional academic literacy" (Eakle, 2007: 605; 2009, p.205; Mathewson-Mitchell, 2007: 3). In order to truly accomplish the latter, context needs to be established first.

The use of technology in museums, has been acknowledged as a milestone in the future of museums, and their place in the world. Since more students are interested in technology than museums, including technology in the designing of museum experiences, was considered critical to bring the museum closer to the real world and gain more appeal. What is more, the digital opened the window for new potential to create impressive exhibitions and programmes. There are also the affordances of technology to create more inclusive experiences and encourage participation.

The multimodal nature of the world and the increasingly digital reality of our students, requires to foster technologies in a mindful way, relevant to real life experiences and the competences required to cope with everyday demands. Concepts and skills however, should not be dealt with canonically and targeted through standardized tests. Student agency is key and students acting as designers of their learning experiences, is crucial for developing critical thinking, creativity and collaborative competencies.

Engaging students' minds requires changes that are essential to current reform efforts. Such engagement is accomplished when:

- Students help define and design the content, through inquiry and metacognitive processes.
- Students engage in multimodally-mediated activities.
- Students expand their repertoires of literacy practices to include multiliteracies.
- Topics are relevant to students' needs, background and real-world experiences.
- Teachers encourage and request different views and forms of expression.
- Digital means are employed in meaningful ways.
- Students create original and public products that enable them to be experts.
- Students become active designers and flexible learners through participatory activities.
- Students are empowered through both collaborative activities and individual quests.

5. THE PRESENT AND THE FUTURE OF MUSEUM-SCHOOL PARTNERSHIPS: WHAT IS DESIRABLE?

Museum-school partnerships in the 21st century

As much of the literature consistently points out, establishing partnerships is one way for museums and schools, through local communities, to create a new educational infrastructure for young children (Falk & Dierking, 2000). For the purposes of this paper, the term museum-school partnership will be used "to refer to the goal towards which the intervention implemented aspires to reach, rather than the completed product of a fully formed partnership in the specific context" (Savva, 2019c). These two types of institutions provide different sort of experiences and "work together to give students an enriching immersion in ideas, discovery, challenge, and enjoyment...[such that it is] well worth developing and sustaining" (Sheppard, 1993, p.2). Planned partnerships with schools "strengthen a museum's community involvement, enrich its educational capacity, build an enlightened audience, and signal a commitment to educational reform and improvement" (IMLS, 1996, p.49). However, these outcomes do not occur automatically. Many conditions need to be met in order to have an effective partnership that benefits museums and schools.

The challenge for museums is to change traditional concepts of museum-school relationships, so that they can engage fully in supporting education in practical ways in their communities. What has changed in the past decades, is a shift towards the goals and practices of museum-school partnerships as a result of three trends: respect between museum and school educators, teachers needing to find multiple ways to reach students, and museum leadership embracing education as a core principle of museums (Peressut, Lanz & Postiglione, 2013). There exists limited practical and documented evidence of theory-based, museum-school partnerships in Cyprus and abroad (Savva, 2016a). It is this gap, together with our concern for how museum educators, might refine their scopes and purposes to fulfil the purposes of education in the 21st century for multiple competencies and skills required to succeed in a time of evolving technologies, globalization and increasing social crises, which triggered the idea for the proposed project. The intention of the MAS project is to connect these strains and to enhance the

connectedness of intellectual and theoretical understanding of museum teaching and learning across Europe and beyond. The outcome of the project will be empirical findings and theoretical perspectives that can provide a base for informed discussions on how to improve curricula and enhance the interest in interdisciplinary museum learning in a way that:

- Takes into consideration cultural diversity and gender equity
- Promotes personal and social relevance
- Facilitates multiliteracies learning and ensures “multi-skilled profiles” and “multi-contextual learning practices”.
- Empowers the learner for democratic cultural participation and engagement

One important benefit for the classroom is the use of the Internet and the range of materials that are freely available to support teacher learning as well as materials for use in the classroom. The insights from the 2019 EURODICE report on Digital Education at School in Europe, provides an overview of how European education systems address the development of students' digital competences in primary and general secondary education curricula (ISCED 1-3). Looking at the aims and objectives set for the development of this key competence in national curricula is a way of understanding the importance placed on digital competences by top-level education authorities. Becoming digitally competent is essential if young people are to be able participate effectively in a digitalised society and economy; not addressing these skills risks exacerbating the digital divide and perpetuating existing inequalities (OECD, 2019a, p. 38). The development of digital competence is included in the vast majority of countries, at all three education levels. However, unlike other traditional school subjects, it is not only addressed as a topic in its own right, but also as a transversal key competence (OECD, 2019a, p. 38).

At the time of the writing of the MAS proposal, there was a lack of consistent pedagogical framework and pedagogical learning scenarios to support systematic and interdisciplinary technology-enhanced, museum learning practice and participation. Quality museum-school partnerships require quality resources both for teachers and for students. In many countries, educational research is producing materials financed by governments and there is a growing trend for such materials to be freely available on the internet. This practice is a valid approach that encourages educators to take up new strategies and develop learning scenarios and lesson plans to implement in their classroom or museum.

Virtual museum environments

Virtual museums have been used widely in learning settings in recent years. Virtual reality (VR) and mixed reality (MR) are seen as potentially enhancing experiences in museum spaces, while also acting transformative in terms of the way people interact with each other (Sylaiou, Kasapakis, & Dzardanova, 2018). Maintaining a virtual museum is considered a manifestation of digital cultural heritage as part of using technological innovations to aid the long-term preservation of cultural heritage and to promote new models of public engagement (Museums Computer Group, 2011). It is considered that developing community-based digital archives (Tait et al., 2013) therefore is a win-win situation (Stevens, Flinn, & Shepherd, 2010). Incorporating new media technologies to fulfil the museums' educational provision has been widely acknowledged by practitioners and museum educationalists (Anderson, 1999: 2; Dierking & Falk, 1998), yet it wasn't until the early 2000s that it gradually became part of constant dialogues in a European context for developing practice that meets the challenge of the digital divide (Parry, 2001) and cultivating the individual empowerment which derives from the free and equitable access to information (Abid, 2002). Salmon (2009, p.532) suggests that virtual spaces, have created a context for the "new cultural experience". Within these three-dimensional spaces, 3D applications integrate real-life with virtual "learning activities that enable unstructured spaces for interaction" (Savin-Baden, 2008, p.528).

Based fundamentally on the principles of multimodal design, in which "information (is) presented in multiple modes, such as visual and auditory" (Chen & Fu, 2003, p.350), as well as written modes, virtual museums fit naturally in the MAS framework, as they offer a concrete instantiation of New Literacies, allowing instructional elements to be presented in more than one sensory mode (visual, aural, written). At the same time, virtual museums apart from effective exhibition of objects serve issues of accessibility (Cilasun, 2012, p.2); they facilitate dialogue among people sharing the same virtual space (same context) (Wazlawick et al., 2001, p.15).

It appears that such environments carry specific affordances, like particular game styles, visual features, personalization, independence (ownership), and immersion that appeal to high school and college age users (Salmon, 2009). What makes it so appealing for education, is that such experiences relate to what Warburton (2009, p.421) refers to as "experiential learning, cooperative learning, and game-based learning". Hence, virtual learning environments are helping educators extend their pedagogical curricula and

instructional design, beyond the grounds of the classroom, to traditional educational software and paradigms used. Virtual museums have therefore been used widely in learning settings in recent years. Within the last three decades, interest in Computer Supported Cooperative Work (CSCW) applications using virtual reality (VR) has been growing, resulting in the development of Collaborative Virtual Environments (CVEs) (Wazlawick et al., 2001, p.3). Further to this, the technology has also been used to support learning, as for example in the "museuVirtual" project (Wazlawick et al., 2001) and Ho, Nelson and MüllerWittig's study (2011).

Regarding the educational uses of VR technology, Youngblut (1998) classifies existing tools to support learning features into three categories summarized in terms of their objectives, and the age and characteristics of the users (the students). The first category refers to the students' use of pre-developed virtual worlds without any collaboration. The second category concerns the development of virtual worlds by the students. Students have the opportunity to participate in a more effective way by creating, or extending simple virtual worlds that they consider interesting (Youngblut, 1998). The third category of tools concerns multi-user, distributed worlds where students physically placed around the world and connected by the Internet to learn about a subject that is of group interest (Youngblut, 1998).

In the MAS project, the intention is a merge of the second and third category, so as to enable collaborative, multi-user engagement in a loosely structured virtual museum environment that allows for multimodal designs. Theory-based engagement in virtual museum making practice as proposed in the MAS project is limited. In relation to the multimodal and interactive nature of virtual museums, it is considered that these materials may lead learners to perceive that it is easier to learn and improve attention, thus leading to improved learning performance and facilitate understanding (Moreno, 2002) in particular for lower-achieving students (Chen & Fu, 2003; Moreno & Mayer, 2007; Zywno, 2003) such as culturally and linguistically diverse students. Fadel (2008, p.13) found that, students engaged in learning that incorporates multimodal designs, on average, outperform students who learn using traditional approaches with single modes". In addition, this sort of work could be undertaken in the form of informal, inquiry-driven learning (Dewey, 1938, 1991; Kuhn, Black, Keselman & Kaplan, 2000; Vavoula et al., 2009) through active participant engagement. Finally, it was hypothesized that creating a multimodal learning environment would enable collaborative learning (Dillenbourg, 1999). The latter can take place within environments such as a virtual one which allow

communication, exchange of ideas, and decision making (Wazlawick et al., 2001, p.14). This sort of interactivity motivates a wide range of students to learn and carry out tasks due to its social potential (Wazlawick et al., 2001, p.14). This characteristic was a definite element towards utilizing virtual museums to respond to the research questions addressed in this research.

6. INPUTS FROM LITERATURE REVIEW AND OTHER PROJECTS

At the start of the MAS project, an extensive review of literature was carried out: it allowed to strengthen the rationale of the project and to define its place as a contribution to a global movement towards the innovation of science education. It also allows to identify relevant projects and potential partner organisations for the future development of MAS. In this section, we report those results that influence the future of the education.

Trends affecting education at large¹

Savva, S. (2019). *Multiliteracies Dynamic Affinity Spaces: Analysing the Potential of a New Framework to Educate for Knowmad Society*. In Moravec, J. (Ed.), *Emerging Education Futures*. Education Futures, US.

Formal education diachronically appears stiff to changes, and it reflects this in the obsolete mechanisms and practices still adopted in most educational systems around the world. Cristóbal Cobo in *Knowmad Society* (2013) in an attempt to address the “skills and competencies for knowmadic workers.” Cobo (2013, p. 59), seeks to “explore and outline, the conditions required to foster critical skills, such as problem-solving, reflection, creativity, critical thinking, learning to learn, risk taking, collaboration, and entrepreneurship.” The elusive understanding of knowledge lies because as Moravec (2016a) puts it, we cannot measure a person’s knowledge. Yet, deeply rooted in all educational systems until today, has been a mutual agreement that we can quantify knowledge, or else there will be “existential chaos.” This *a priori* assumption has ramifications for the way education unfolds, its premises and promises, and its outcomes.

¹ All references reported here can be found in the respective papers mentioned in this document.

Through failing standardized instruction and testing, we fail ourselves as researchers and practitioners, and lead students to “fail” on a daily basis. The MAS will try to map the landscape of a pedagogical approach that would frame the kind of education expected to nurture the critical skills mentioned above and break through the *educational iceberg*. Cobo (2013, p.59) suggests five trends to explore the conditions necessary to ensure “multi-skilled profiles” and “multi-contextual learning practices”:

- The mismatch between formal education and the challenges of the innovation society (informal and flexible learning approaches);
- The shift from what we learn to how we learn (lifelong, self-learning, and learning to learn);
- The fluctuating relationship between digital technologies and content (ICT and critical thinking skills and new literacies);
- The changing conceptions of space-time and a lifelong learning environment (which is rarely time or context dependent); and,
- The development of soft skills (global, tacit, and social)

Our research paper connected each of the five trends proposed by Cobo in *Knowmad Society*, to explore how the MDAS framework nurtures the conditions necessary to ensure “multi-skilled profiles” and “multi-contextual learning practices” for an expanded understanding of education.

1 Informal and flexible learning approaches

A basic premise in the description of a knowmad society (Society 3.0) and its function, is a distinction from previous forms of societies, namely the industrial society (Society 1.0), and information-based society (2.0). Moravec stresses how, “in the past, we applied for jobs. Now we are asked to design our work” (Moravec, 2013a, p. 19). In other words, the postmodern world, requires individuals to take up ownership of their learning and work, and to become inventors of their work.

Howard Gardner, as early as 1983, emphasized the need to explore more appropriate designs of educational systems to better suit the demands of the changing global economy. He introduced critical thinking skills, as essential to link school learning to the needs of the job market and to develop a strong workforce. In *Five minds for the future* (2006), Gardner revisits his original thoughts and argues how we will each need to master “five minds” that the fast-paced future will demand:

- The disciplinary mind, to learn at least one profession, as well as the major thinking philosophies behind it (science, math, history, etc.);
- The synthesizing mind, to organize the massive amounts of information and communicate effectively to others;
- The creating mind, to revel in unasked questions and uncover new phenomena and insightful answers;
- The respectful mind, to appreciate the differences between human beings and understand and work with all persons; and,
- The ethical mind, to fulfil one's responsibilities as both a worker and a citizen.

These suppositions are meaningful to instil understanding on the “multiskilled profiles” and “multi-contextual learning practices” of knowmadic workers. The fast-paced world in which we live in requires reconsidering the skills future job seekers should have, but also their adaptive capacity—the flexibility to adapt in diverse contexts and challenges—as individuals. This stems from a realization that each of us learns in different ways—our learning ecologies—at their own pace and time. It is therefore impossible to have a single approach to schooling that will serve all learners.

As Moravec (2016a) points out, society needs knowmadic workers who work with context, not within a rigid structure. McCoog (2008) suggests that educators have a new charge: teach *the new three Rs*: rigor, relevance, and real world skills. He captures the critical demands of contemporary societies by stressing that:

Despite the proliferation of the term “21st century skills” over the past three decades, these have yet to be addressed holistically in education. In the context of informal and flexible learning approaches, learner identities and subjectivities become more manifested. Learning is conceived as a journey, in a transformational (rather than static) view of diversity, in which neither the world nor the learner are quite the same as they were at the beginning by the time their journey finishes. Therefore, the intention in this framework of practice, is to cultivate the ground for students to develop a mindset that allows them to be flexible learners, adaptive to different contextual challenges, and therefore become better equipped to respond to multiple job demands.

2 Life-long, self-learning, and learning to learn

Influential theorist John Dewey (1916, p. 239), stated, “education is not preparation for life; education is life itself.” Education is not a result, but rather a lifetime process that is ongoing, experiential, occurs in different environments, and includes communication and

understanding to grow as an individual and collectively. It is widely concerned that we live in the era of lifelong, self-directed learning. However, this does not adequately permeate formal education policy. Cobo agrees with Richard Rowe that, in order to foster a society of lifelong learners, we must seek to identify "how to design successful solutions" (Cobo, 2013, p. 61). This requires a focus on learning how to learn. The focus of learning and education is not children, nor schools, but human lives viewed as trajectories through multiple social practices in various social institutions. (Gee, Hull & Lankshear, 1996, p.4)

3 ICT and critical thinking skills and new literacies

Today's kids, as John Sealy Brown puts it, live and breathe ICTs (2002). They use technologies transparently (Jukes, 2005) and almost instinctively, without a safety net. In particular, for the "millennial generation" born after 1981 (Hagood, Stevens, & Reinking, 2002) reality includes new literacies embedded in these new technologies (Lankshear & Knobel, 2003). The exponential growth of emerging technologies has inevitably altered how we learn and also what it means to be literate.

Davies (2006) contends that although students are becoming increasingly literate multimodally, and although theories and testaments of multiliteracies have been established with increasing research evidence on their feasibility, schools remain focused on traditional print-bound modes and practices. Often new literacies are not part of policy documents, and if they occur, they remain isolated initiatives, supporting traditional literacy practices (Leu, Kinzer, Coiro, & Cammack, 2004). Dyson (2003) argued that there is a critical disconnect between the theory of multiliteracies and classroom pedagogy because "literacy development seldom includes any substantive consideration of such practices" (p. 330).

Moravec (2013b, p. 35) stresses the paradox of the co-existence of "Education 1.0" in "Society 3.0." *Society 3.0*, as he explains, refers to an emerging future that is characterized by accelerating technological and social change, continuing globalization, and horizontalization of knowledge and relationships, driven by knowmads working within an innovation society. A critical factor for the effective incorporation of appropriate and creative blends between the digital and print literacies for young learners is the role of the educator (Miller, 2008). McGee (2007, p. 1) addresses this issue and explains that teachers are usually neither prepared or willing to engage students in any deconstruction of multimedia and multimodal texts, nor in the production of these texts. They often resist learning about new technologies or using them (IEAB, n.d). Educators must seek to repurpose the use of technologies to help students

learn how to learn (Moravec, 2013b), to go beyond simplistic uses and applications, toward employing them as tools to co-create with peers, acting as learning hubs.

Notably, the challenge for educators is “not only to educate for new breadth and forms of literacy but also to have learners delve into a critical interpretation of these forms and modes” (Thwaites, 2003, p. 27). Individuals should consider different perspectives, analyse and problem-solve complex issues, and think critically about social issues. To succeed in the latter, it is important to bring students' prior experiences, knowledge, and interests into learning from the use of technologies, as these offer meaningful contexts for students' literacy learning. Such an approach, requires to consider the concept of multimodality. Kress refers to multimodality as a “domain of inquiry” (2009, p. 54), which discusses learners' movement between written, oral, visual, audio, tactile, gestural, and spatial modes, combined during communication to produce meaning (Kress & van Leeuwen, 1996).

Multimodal literacy (Jewitt & Kress, 2003) emerged from the notion of multimodality. This view of literacy incorporates four types of skills. It encourages a range of language-based skills mediated through multimodal forms and representations; evaluative skills that could critically assess the nature, representational techniques, explicit, and subtle effects of exhibits; oral and presentation skills in communicating proposed plans and perspectives clearly and effectively; and, independent research skills used to source and adapt content from multiple sources for specific purposes (D'Acquisto, 2006).

Therefore, language learning becomes concrete through addressing the multiple dimensions of the multimodal design process (Jewitt, 2006). The aim of teaching literacy with respect to multimodality lies in the acquisition of abilities and skills necessary to produce various text forms linked with information and multimedia technologies (Baldry, 2000, p.21). These multimodalities disrupt students' understandings and encourage learning. A knowmadic worker, is a multiliterate person who possesses a range of literacies, reads multimodal texts in an integrated fashion, and produces multimodal texts managing various resources (Kress, 1995).

4 The changing conceptions of space-time and lifelong learning environments (which are rarely time or context dependent);

A concept close to the release of control structures in education proposed by Moravec and Cobo in *Invisible learning*, is ubiquitous learning. Cope and Kalantzis (2008, p.576) suggest that “ubiquitous learning is a new educational paradigm.” *Ubiquitous learning* relates to spaces of omnipresent learning where means of virtual and electronic resources are made

available through portable devices (Peng, Chou, & Chang, 2008). This broadening of the *where* of learning is part of a greater movement towards 'lifelong learning' which, as discussed earlier, is a central feature of the present.

Cope and Kalantzis (2008) suggest that educational transformation is possible through certain 'moves' characteristic of ubiquitous learning. These include:

- Move 1: Learn at any place and anytime (remove institutional, spatial, and temporal boundaries);
- Move 2: Shift the balance of agency through a blurring of the boundaries between the teacher and the student;
- Move 3: Recognize learner differences and use them as a productive resource for work in groups;
- Move 4: Enable a greater range and mix of meanings in multiple ways, multimodally: the oral, the written, the visual, and the auditory;
- Move 5: Interact with multimodal texts using higher-order abstraction and metacognitive strategies;
- Move 6: Learn how to learn through renewed approaches for teaching and learning; and,
- Move 7: Address learner differences in terms of "experience, knowledge, ways of thinking and ways of seeing" (Cope & Kalantzis, 2008, p. 581) through building collaborative knowledge cultures.

5 The development of soft skills (global, tacit, and social)

Hal Gregersen, Clayton Christensen, and Jeff Dyer, in their book, *The Innovator's DNA: Mastering the five skills of disruptive innovators* (2011), ask a significant question: "Is an innovator born or made?" They conclude that individuals can develop the skills necessary to move progressively from idea to impact, leading to disruptive innovation. Our ability to generate innovative ideas is not just a function of our minds, but of our behaviors. It can be taught.

They identify five distinct 'discovery skills' of disruptive innovators:

- Questioning: Posing queries that challenge common wisdom;
- Observing: Scrutinizing the behavior of customers, suppliers, and competitors to identify new ways of doing things;
- Networking: Meeting people with different ideas and perspectives;
- Experimenting: Constructing interactive experiences and provoking unorthodox responses to see what insights emerge; and,

- Associating: Making connections between questions, problems, or ideas from unrelated fields.

Essentially, Gergersen et al. (2011) maintain that we can build our Innovator's DNA through cultivating a culture and capabilities for innovation. This mindset, instilled as a culture of innovating, is crucial for determining the prerequisites for educating knowmadic workers. Despite a rapid expansion of higher education institutions across Europe in the last three decades, together with an increasing number of qualified candidates available in the job market, graduate employability is doubtful.

There is an evident gap identified between the skills and capabilities of graduates, and the demands and requirements of the work environment in our complex globalized society (Andrews & Higson, 2008). The quality of the graduate labor market and the ability of graduates to meet the needs of employers directly relate to the skills promoted in higher education institutions.

Employers and higher education professors frequently complain of a lack of soft skills among tertiary education graduates. This derives partly from the persistence in an obsolete paradigm for education, focused on quantifiable results related to functional, technical skills pertaining to rigid forms of prefabricated goals for knowledge attainment. Soft skills relate to attributes/traits that are rather difficult to measure and relate to the development of thinking minds like knowmads, and thus are often overlooked in formal educational settings. Dede (2010), as Cobo notes in *Knowmad Society*, acknowledges a platform of key soft skills that inform educational frameworks, including critical thinking, searching, synthesizing and disseminating information, creativity and innovation skills, collaboration skills, contextual learning skills, self-direction, and communication skills.

Lievens & Chan (2017), assert that innovation stems from both soft and hard skills (tangible, functional skills needed for a job). Increasing evidence suggests that the two sets of skills are complementary. Although there is not a consensus of what we mean by *soft skills*, it appears that they derive from practical intelligence, social intelligence, and emotional intelligence.

Lievens and Chan (2017), maintain that these constructs of intelligence share remarkable similarities. They suggest viewing the three in an integrated framework where they exist as inherently multidimensional constructs, unique but overlapping.

Savva, S. (2019). MULTILITERACIES PROFESSIONAL DEVELOPMENT PRACTICE: Design and Evaluation of a Professional Development Programme to Support Multiliteracies-based Teaching and Learning. In Rice, B. (Ed.), *Global Perspectives on Inclusive Teacher Education* (pp. 156-179). IGI Global. DOI: 10.4018/978-1-5225-7703-4.ch010

Teaching Literacy in a Globalized, Digitally Mediated World

A frequently proposed approach that holds great potential to facilitate 21st century learning has been the integration of ICTs in education (Carrington, 2007; Clark, 2010; Morrell, 2012; Nixon & Kerin, 2012; Nixon & Hateley, 2013; Yancey, 2009). This understanding derives from the affordances of digital networks and the dynamic multimodal communication through images, speech, animations, sound and links to other texts (Kress, 2009). Stemming from globalization and digitization, previous notions of literacy instruction are challenged and changed, as the need is evident to move towards screen-based, digitally networked environments (Hetherington, 2013), while still addressing print-based reading and writing practices. Nevertheless, in this discussion it is critical to consider also teachers' perceptions, beliefs and readiness to take up such implementation of ICTs. Findings from empirical studies suggest that teachers may not be fully prepared to implement ICTs in a way other than content transmission (Ertmer & Ottenbreit-Leftwich, 2013; Ward & Parr, 2010).

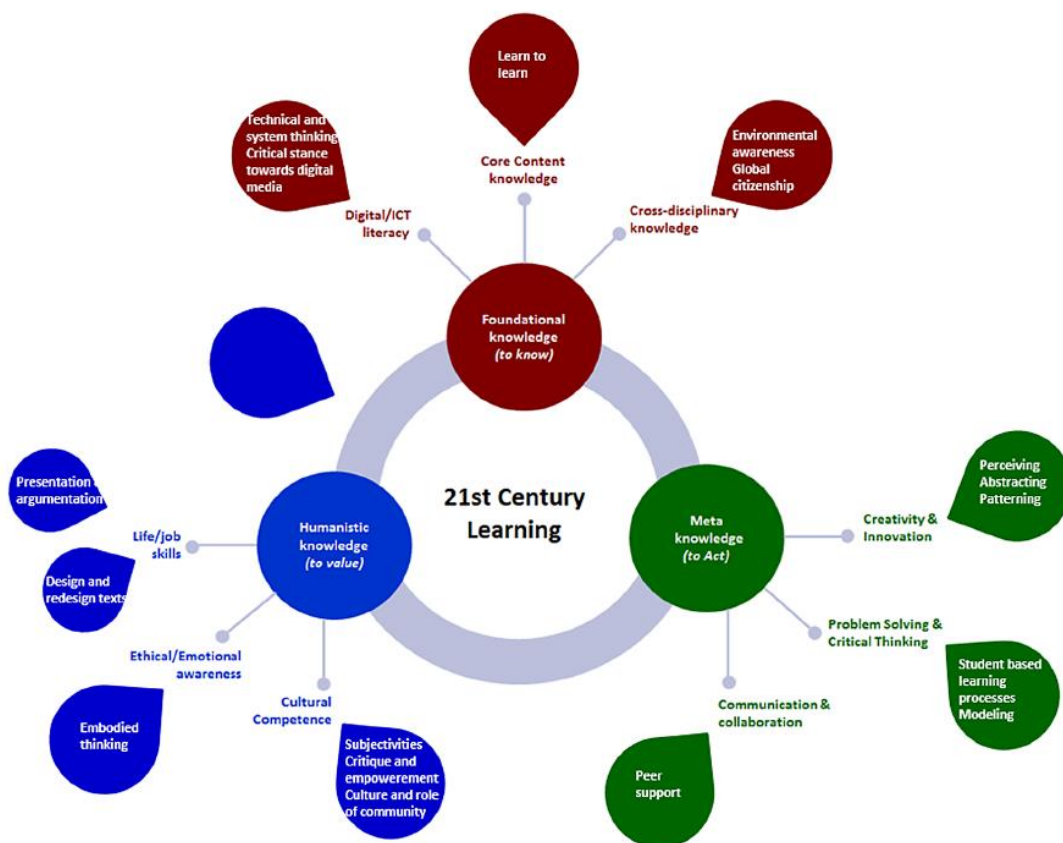


Figure 1. 21st Century learning knowledge framework (Adapted from Kereluik, et al., 2013, p.130) Source: Kereluik et al., 2013.

Taking these into consideration, the rationale for the proposed project is based on local and global imperatives and challenges for inclusive education, including demands of the age of multiliteracies. The concept of 'multiliteracies' refers to a broad and inclusive model of literacy that accounts for the complex and rapidly changing modes of meaning making within our diverse society, as well as the implications of globalization. Taken from a global perspective, the project seeks to set forward the importance of multiliteracies driven pedagogical practices on behalf of teachers (Saavedra & Opfer, 2012; Scott, 2015; Smith & Hu, 2013) who aspire to implement inclusive teaching practices. The intention is to also contribute to a more systematic dialogue about how to promote effective and inclusive 21st century professional development programs.

From the policy makers' and educators' perspective, it is their responsibility to design and enact a curriculum that engages students in experiences that prepare them for this multicultural, multimedia-based world. Yet, contrary to this pervasive need research has consistently shown that print literacy reading and writing activities still dominate mainstream learning contexts (Winch et al., 2004).

The standpoint proposed is clear: to prepare all students for current and future literacy needs in the context of 21st century, we must re-conceptualize how we frame and teach literacy (Hetherington, 2013, p.1). Hetherington (2013) posits that we must therefore seek to change the literacy teaching paradigm, and suggests professional learning communities as a way to succeed so.

Multimodal Literacy in Education

Teaching and learning in the 21st century have been characterized by a constant process of change. It is undeniable that the new millennium has introduced new tools for communication and it is the educators' responsibility to determine the value of these tools and how the curricula is affected. It is critical to question, therefore, what kind of pedagogies are appropriate for the 21st century (Scott, 2015) and how much traditional approaches appeal to today's learner. What do we need to change and how feasible is it?

It is within this evolving context of learning that educators need to expand their pedagogical repertoires to nurture 21st century competencies and skills (Saavedra & Opfer, 2012; Scott, 2015; Smith & Hu, 2013). McCoog (2008) in addressing this issue, suggests that educators have a new charge: teaching the new three r's - "rigor" "relevance" and "real world skills".

It becomes apparent that the learning demands and needs of students are challenged in an increasingly digitally-mediated reality (Fleming, 2005, p.114). In this context, a traditional view

of literacy as reading and writing skills (Fleming, 2005, p.114), becomes obsolete. The nature of literacy pedagogy, research and practice has shifted to embrace the idea of literacy as more of a plurality, discussing about various 'literacies' (Liddicoat, 2007, p.15). This reshaped notion of literacy is aligned with "the exponential growth and adoption of new media and information and communication technologies (ICTs)" (Day & Lau, 2010, p.111). The latter involve not only spoken and written words, but also images and symbols of all kinds, sounds and music, bodily gestures and movement (all kinds of semiotic resources), and physical and virtual objects. This conceptualization in literacy terms, is defined as multimodal literacies (Jewitt & Kress, 2003; Kress, 2003, 2010; Walsh, 2009). The term refers to the proliferation of multimodal texts and the significance of all the semiotic resources and modalities in meaning making. Human beings communicate not only in linguistic modes, but also visual, spatial, gestural, and audio.

Multimodal literacy or literacies acknowledges that all these systems equally contribute to meaning making rather than be ancillary to language. Kress (1999) argues that language "is necessarily a temporally, sequentially organized mode... the visual by contrast is a spatially and simultaneously organized mode" (p. 79). Norris (2004) observes that "[a]ll movements, all noises, and all material objects carry interactional meanings as soon as they are perceived by a person" (p. 2). In this sense, all interaction is multimodal, including teaching and learning. As O'Toole (1994) observes, "we 'read' people in everyday life: facial features and expression, stance, gesture, typical actions and clothing" (p. 15). Hence, there is a need to understand how the lesson experience is constructed by exploring the functional affordances and constraints of these semiotic resources and modalities as well as how they are co-deployed in the orchestration of the lesson which may lead to more effective teaching and learning in the classroom (Lim, O' Halloran, & Podlasov, 2012).

Inclusive Teaching and Learning

Issues of inclusion and equity in formal education are becoming part of a global agenda for educational institutions (Ainscow, Booth, & Dyson, 2006). As Ainscow et al. (2006) note, these institutions "should concern themselves with increasing the participation and broad educational achievements of all groups of learners who have historically been marginalized" (p. 295). Prominent in this growing volume of work on inclusion has been the focus on relative accessibility to learning institutions for students with disabilities (e.g., Fuller, Bradley, & Healey, 2004; Riddell et al., 2007), for instance considering inclusive pedagogical strategies, such as universal design for learning (Burgstahler & Cory, 2009). Other studies have

concentrated on the issues of ethnicity, socio-economic status, religion, and other axes of identity within the spectrum of teaching and learning (e.g., Cole & Ahmadi, 2010; Devlin, Kift, Nelson, Smith, & McKay, 2012; Ladson-Billings, 2014).

Given the variant definition and understandings of what inclusion entails, different strands of research and practice have been developed. May and Bridger (2010), acknowledge that there cannot be conclusive terms related to inclusion, "Because they have different meanings depending on the different point[s] of view of people historically and [in] different contexts" (p. 31). Lawrie et al. (2017) advocate for this diversity of understanding, yet they acknowledge that some attention to terms is essential to clarify the focus in the field, and is also of importance to this research. This chapter adheres to a definition by Hockings (2010) for higher education, which could apply to primary education too: that "inclusive learning and teaching in higher education refers to the ways in which pedagogy, curricula and assessment are designed to engage students in learning that is meaningful, relevant, and accessible to all" (p.1). Incorporated in this definition is a more recent ascertainment regarding the attention to the complex, dynamic, and intersecting identities that all learners and teachers bring to the pedagogical experience (Gibson, 2015; Longstreet, 2011). An important contribution that informs this discourse comes from Thomas and May (2010), who suggest four broad dimensions of diversity across which students might differ: educational, dispositional, circumstantial, and cultural. They highlight the complexities among the attributes and experiences brought into the learning process, and by doing so, go beyond targeting particular groups.

Working along these lines of an alternative consideration of what inclusion entails for teaching and learning, Hockings' (2010) definition allows for consideration of how broader institutional factors relate to and impede the inclusive process. This poignant observation complies with trends in the literature that acknowledge the importance for integrated approaches to inclusion, without disregarding the role of teachers as key players that determine inclusivity of learning and teaching (e.g., Morina Diez, Lopez Gavira, & Molina, 2015; Thomas & Heath, 2014), and how teaching and learning contexts are places where inclusion and exclusion are enacted (e.g., Brookfield, 2007). Although seemingly important, there is a need to opt for a 'whole-of-institution' approach through integrated activities located at other institutional levels as well. This prerequisite informs the professional development scheme addressed in this chapter. Still, Hockings' (2010) recommendations for four broad areas of focus are addressed in the implementation of the MAP framework: inclusive curriculum design, inclusive curriculum delivery, inclusive assessment, and institutional commitment to and management of inclusive learning and teaching (Lawrie et al., 2017). Since 2010,

Differentiated instruction spanned across different levels with a focus on particular pedagogical strategies deployed at the classroom level (e.g., Dierker et al., 2016; Smith, 2012) or on educational development initiatives that support such classroom-level work (e.g., Considine, Mihalick, Mogi-Hein, Penick-Parks, & Van Auken, 2014; Glowacki-Dudka, Murray, & Concepcion, 2012).

Continuing Professional Development (CPD)

Professional development refers to on-going learning opportunities available to teachers and other education personnel (Vu, Cao, Vu, & Cepero, 2014) in an attempt to help them gain the skills necessary to enhance their teaching methods. In this sense, professional development encloses a broad range of experiences and programs (Linnemanstons & Jordan, 2017). Given the complex challenges of the contemporary teaching profession, CPD is at the forefront of educational improvement (Hawley & Valli, 1999). Substantial research efforts over the past three decades have aimed to uncover the particular nature of knowledge used in teaching in order to improve teacher effectiveness, as well as indicate the need for professional development (Burststein, et al., 2004; Hammond & Ingalls, 2003; Kennedy & Shiel, 2010; Sari, 2007; Tschannen-Moran & McMaster, 2009; Wilkins & Nietfeld, 2004). As a result of this research, teacher learning has gone through a "reform" movement, in particular over the past decade. High quality professional development (PD) and growth is linked to higher quality teaching, student achievement and overall higher achieving schools (Colbert, Brown, Choi, & Thomas, 2008; Desimone, 2009; Darling-Hammond, Wei & Andree, 2010; Yoon, Duncan, Lee, Scarloss & Shapely, 2007; Vu et al., 2014).

Teachers working together as part of professional learning communities (PLCs) facilitate the kind of knowledge exchange and collaboration that supports teacher professional learning (Hetherington, 2013). In Bouchard's (2011) perspective, "new and emergent technologies are shaping and being shaped by how people interact and engage with others virtually, and position knowledge as fluid, multi-dimensional, and immediate" (Albers, et al., 2015, p. 31).

Online Professional Development (OPD)

Online (teacher) professional development (OPD) has emerged as a result of the proliferation of technologies, although in general, online professional development has been present since the creation of the Internet (Donavant, 2009). With on-demand access to learning materials, teachers have favoured access to alternative and Open Educational Resources (OER) to continue their learning. Digital tools facilitate the emergence of globalized spaces for learning,

such as open access pathways for sharing and accessing literacy research and practices worldwide (Albers, Pace, & Brown, 2013; Leu, Kinzer, Coiro, & Cammack, 2004). These gateways to professional development have been embraced by the teaching community, as the approach accommodates for the educators' busy schedules. This flexibility offered to participants is among the demonstrated benefits of OPD (Stanford-Bowers, 2008). OPD is possible through different channels of communication and patterns of work: it can vary from distance learning classes, using video conferencing, to online asynchronous courses, which allow participants to fulfil the course requirements at their own pace, regardless of time and place (Russell, Carey, Kleiman, & Venale, 2009; Vu et al., 2014). OPD is also a way to offer access and on-going support, both synchronous and asynchronous, to resources that could not be otherwise affordable or even available to teachers locally (Dede et. al, 2009). As reported in Cavanagh (2013), an increasing number of teachers and principals utilize online classes, webinars, and virtual professional learning communities. Studies exploring the perceptions of educators regarding face-to-face and online professional development suggest positive stances towards OPD and report benefits for teaching methods (Thomas, 2010). Further evidence generated from Cavanagh (2013), illustrates how the head of schools, i.e. principals, increasingly support professional growth through some form of social networking, rising from 8% in 2008, to 25% in 2014 (Vu et al., 2014). It appears that the educational landscape will shift even more, as a result of the need to promote real-time, authentic, self-directed, and on-demand learning (Simonson, Schlosser, & Orellana, 2011). Emerging evidence across studies indicates that OPD involves opportunities for sharing knowledge and experiences, peer learning, and collaborating to address real-world issues (Albers et al., 2013; Bolt, 2012; Laurillard & Masterman, 2010). What seems important and relevant to this research, given this rapid growth in OPD for teachers, is to explore the factors, which drive learners' success in such online training environments (Vu et al., 2014).

7. RESULTS OVERVIEW AND CONCLUSIONS

The Future Challenges Study confirms the relevance of the aims and the approach adopted by MAS: its vision of future education and of the potential of ICT to contribute to it are shared by existing research, stakeholders' views and teachers' expectations; the specific focus to significant trends at international level and integrated in a system of large-scale initiatives supported by the European Union and coherent among themselves.

There are certain areas/challenges to be addressed

- Inclusive education and culturally relevant content
- curricula reform and assessment methods,
- organisation of contents around multiliteracies and soft skills and competences and innovative pedagogy; teachers' and students' ICT competences and motivation to change;
- Learners motivation, organisational routines and constraints, availability of technology and use of resources.
- Lifelong and informal learning
- Interdisciplinary approaches to museum-school synergies

Addressing each of these challenges is possible and small-scale experiences exist to demonstrate good practice, but system-scale innovation is the real challenge.

The findings from recent work in digital competencies for teachers and students suggests that an integrated approach is necessary to produce real impact: technology infrastructure without teachers' competence and motivation will not change the way virtual museum environments are used, nor a change in pedagogical practice without a change in curriculum and learning assessment to incorporate cultural heritage education. It is therefore fundamental that the MAS large scale piloting is institutionally supported in each participating country, in the attempt to combine the bottom-up approach of the participating school with the relevant "innovation policy" framework of the country. The virtuous circle between research, policy and innovative practice must be demonstrated by the project.

It is also essential to consider stakeholders involvement, as without stakeholders' attention and consensus, a mechanistic implementation of innovative experiences will not produce significant impact after the end of the project. Stakeholders must not only know about MAS,

but support its efforts, and to do this they need to gain “ownership” of the pilot experiences and be allowed to get an important role in its future implementation.

Formative Evaluation and Quality Assurance are two fundamental features of the MAS project because they allow/oblige experts and the MAS team to keep a constant communication channel open among and, even more importantly, with the stakeholders that are one of the keys for project impact in the medium and long term. If we look beyond the project “contractual life”, the real success will consist on a large-scale follow up of the project results and their integration into EU and national policies for modernisation of museum-school partnerships through technology enhanced, multiliteracies based approaches. To reach this goal, a systemic and transparent documentation of the working cycle of the project, of difficulties and improvements, of lessons learnt is of the utmost importance.

Finally, MAS has a lot of challenges to face in the coming years, and a real concrete opportunity to be relevant in view of a systemic change for museum-school partnerships and museum education across Europe and beyond. Making this opportunity a reality, will depend on the conditions identified above and probably others that will emerge in the next years of the project. Every identified challenge will drive project activities planning and, in the meantime, some issues that are important and still open will be addressed.

We suggest that it can become meaningful in a discussion of a formal theory for museum-school partnerships and for the conditions that enable the education of learners. Teachers and facilitators should recognize the enormity of social change in today's classrooms. Students bring into the classroom and the museum a complex range of representational resources based on diverse cultures in their lived experiences (Cope & Kalantzis, 2000).

- Literacy learning is situated in the social and cultural practices of students and is distributed across their peers, contexts, and technologies (Gee, 2003).
- Skills are broadly configured and situated in specific contexts that shape understanding. The aim should be co-construction of knowledge and opportunities for authentic engagement and participation, drawing on the identities, agency, and everyday practices of pupils.
- Meaning making requires attention to a wide variety of media and diverse modes of representation. These should be integrated into school practice for students to analyse, critically interpret, and transform for application in new contexts.

- Multiliteracies pedagogy offers the potential to deploy pluralism, linguistic diversity, and cross-cultural synergy through introducing multimodal educational resources.
- Multiliteracies pedagogy recognises differences and meshes students' differing interests, priorities, and needs. Attendant languages, hybrid cross cultural discourses, cross-cultural dialects, intertextuality, and regional dialects server as resources for teaching and learning.
- A multiliteracies-driven curriculum and schooling could facilitate the realisation of a multimodally dynamic society as a site of negotiation, contestation, interpretation, and reconfiguration of relationships of alternative frameworks and mindsets.

For museum-school partnerships to respond to 21st century challenges, the focus should be on the student. Such self-driven, ubiquitous learning, should occur synchronously and asynchronously, unconfined by time and space limitations in a reinvigorating balancing act of letting go, following up from students' interests and topics of interest. The intention should be to draw on students' interests and address their needs, while enabling them to question and critically analyse existing understandings. This can allow them to reach to a level of metalanguage that transforms practice depending on the context.

A basic precondition for MAS to be successful though, is the willingness of the teachers to learn and unlearn, to continually challenge ourselves as educators, and be ready to release ourselves from our bird box. Only then, we may create personally-meaningful value in students' learning (Moravec, 2013b).

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