

MAS

Museum Affinity Spaces

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Deliverable 12

Specifications of the Pedagogical Framework

Authors: Stefania Savva & Nicos Souleles

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

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Executive summary

The current deliverable provides insights into the Pedagogical Framework of the MAS project. This framework portrayed in this document, is used as a roadmap for undertaking teaching and learning during the project. This deliverable begins with a discussion of the contributions of sociocultural theory and constructivist perspectives to the pedagogical framing of the research. The literature review builds on understanding, interpreting, and implementing past research among three areas of study: education, museology, and New Literacy Studies (NLS). Relevant contributions in each one of these areas are, therefore, presented in this chapter in order to describe the core pedagogical framework of the MAS project. These conceptualisations inform the design, implementation and evaluation of the MAS project. The deliverable concludes with a summary of the implications of the conceptual framework for the study.

The specifications are based on an overview of the relevant literature on museum-school partnerships, virtual learning environments and pedagogical approaches to culturally responsive museum learning and multiliteracies pedagogy. These specifications should be read in relation to the Curriculum and Partnerships Analyses (D.13) and Pedagogical Knowledge Scenarios (D.14) of the MAS learning environment.

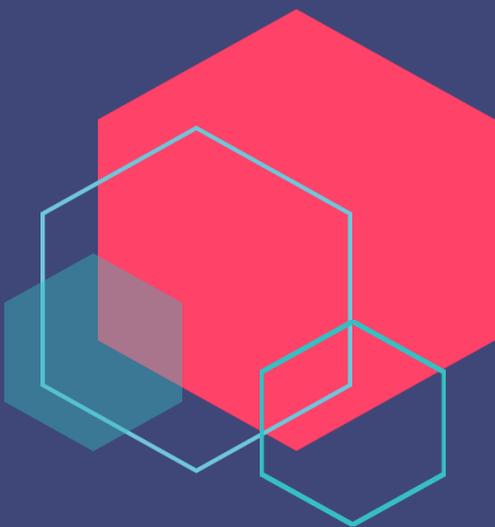


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1. INTRODUCTION

1.1 Interdisciplinary Base Informing the MAS framework

Due to the interdisciplinary nature of the inquiry, we approached the pedagogical framework for this research drawing from a rich network of theoretical views across the fields of interest, chief among them: sociocultural, socio-constructivist theories, and social semiotics. The 'Museum Multiliteracies Affinity Practice' (MAS) framework (Figure 1), is not treated as a model as it does not purport to make predictions; there are, however, some assumptions aligned with socio-cultural research tradition (See Vygotsky 1962; 1978; Heath, 1983; Street, 1984; 1995; 1999) and constructivist (See Bruner, 1993; Jonassen, Peck & Wilson, 1999; Papert, 1993; Von Glasersfeld, 1987, 1995a, 1995b) learning principles. We embarked on this research project with a belief in the value of scaffolding for learning (Bruner, 1983); also the importance of active meaning making based on students' experiences and interests (New London Group, 1996).

Scaffolding (Bruner, 1975, 1983, 1986) is a metaphorical concept for an instructional approach which posits that teachers (as apprentices) accommodate students' individual needs through "the systematic sequencing of prompted content, materials, tasks, and teacher and peer support to optimize learning". (Dickson, Chard, & Simmons, 1993). A basic feature of scaffolds is the establishment of a positive atmosphere between the participants whereby teachers support ("scaffold") the students' enactment of a competent behaviour (Freire, 1973).

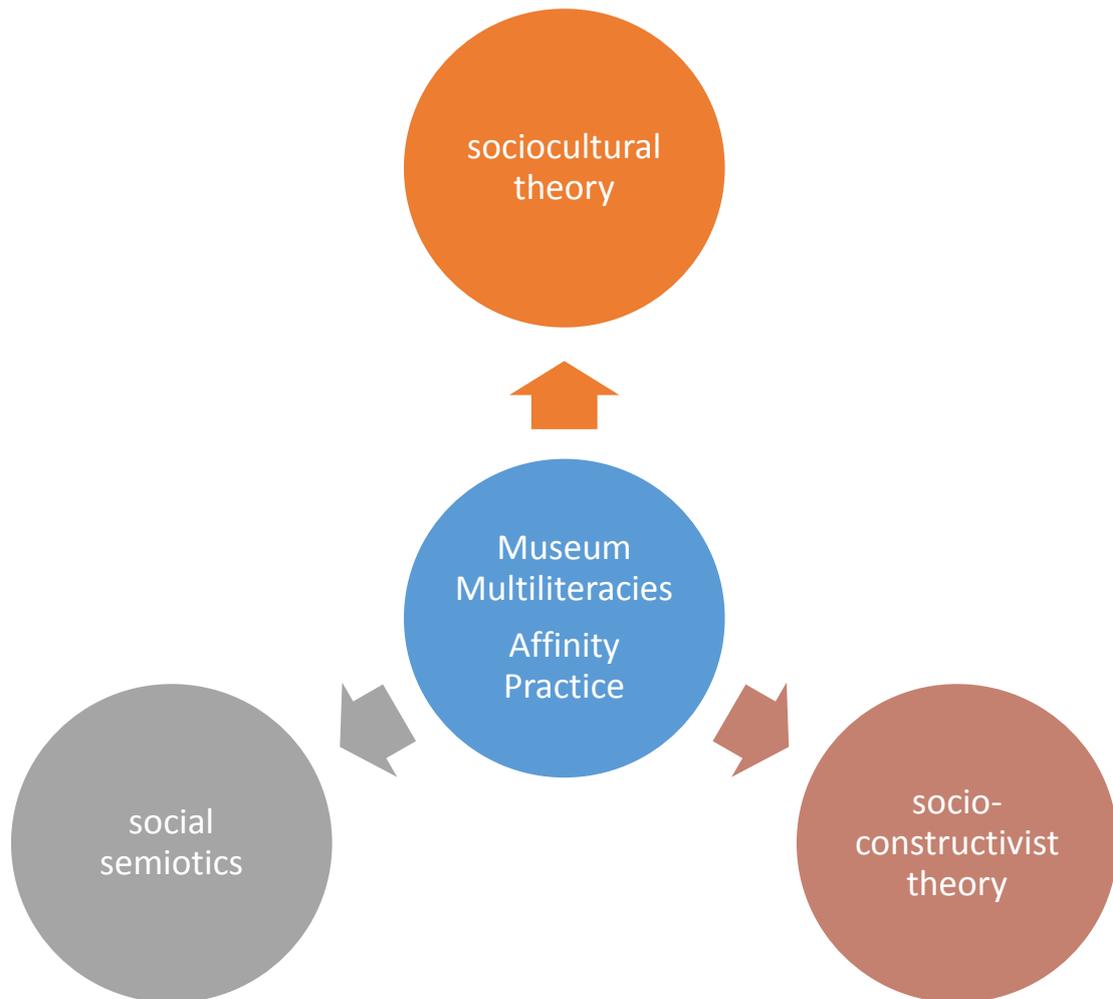


Figure 1. The theories informing the Museum Multiliteracies Affinity Practice framework (Savva, 2016a)

1.2 Contributions of Sociocultural Theory to the research

In developing the Pedagogical Framework for the MAS project, we aligned with sociocultural theorists (Gee, 1992; Vygotsky, 1986) who support the idea that learning is an active process involving social participation. We drew also on Dewey (1938), who suggests that individuals develop by interacting meaningfully with their environment, in alliance with the view that “people construct new knowledge with particular effectiveness when they are engaged in constructing products that are personally meaningful” (Resnick, 1997, pp.23-24). For students to deeply engage in tasks that enable higher order skills, it requires to have passionate, positive feelings about these tasks. In other words, engagement is when the cognitive, the affective and the operative are occurring together at a high level (Fair Go Team, 2006, p.10).

Deeply rooted in the MAS framework is an understanding of the significance of students' learning styles and multiple intelligences in pursuing authentic learning (Gardner, 1989; 1999, p.45). Learning styles reflect cognitive, as well as affective and physiological, domains of knowledge (Oxford, Hollaway & Horton-Murillo, 1992), therefore are considered multidimensional (Kinsella, 1996). The belief is that matching learning styles with appropriate teaching approaches will result in increasing student motivation, performance and achievement (Higgins, 2003). Gardner (1989, 1993) posits that schools which utilise the theory of multiple intelligences will succeed at producing authentic learning. The theory of multiple intelligences is of particular importance to this research, as it relates to the acknowledgement that not all people learning in the same way and that not every learner has to be on the same page, depending on their needs and interests (Cope & Kalantzis, 2000b).

1.2.1 Sociocultural perspectives of literacy

Particularly in relation to literacy and cultural and linguistic diversity, a sociocultural perspective such as the one adopted here views language, learning and literacy development as experiences that are socially constructed and formed by the broader cultural context (Erickson, 1986; Gee, 1996). Sociocultural understandings also appreciate the “messiness” of the different internal and external factors which affect how language and literacy are negotiated and possessed (Brisk, Burgos, & Hamerla, 2004; Dyson, 2003). Prominent among researchers pertaining to a sociocultural approach to language and literacy (e.g. Cazden, 1988; Heath, 1983; Scollon & Scollon, 1981) is also the view that many culturally and linguistically diverse students have negative experiences when their languages and literacies are different than the dominant (mainstream) ones of the country in which they live (Heath, 1983, p.28; Scollon & Scollon, 1981).

Currently, one of the most prominent transformations due to globalisation is the advancement of technology and how it influences the way people do things (Borsheim, Merrit, & Reed, 2008; Kalantzis & Cope, 2006; The New London Group, 1996, 2000). There are several supporters of a sociocultural perspective of literacy, who argue that a close relationship exists between the cognitive skills, cultural technologies and societal

institutions through which understandings and practices are developed (Dooley, 2008; Ferdman, 1990; Heath, 1983; Luke, 1993).

These sociocultural concepts informed the pedagogic approach in the development of the MAS framework (Section 3.6, p.83). In addition to the socio-cultural ideas, there are strong socio-constructivist perspectives underpinning this research as I shall now explain.

1.3 Contributions of Socio-constructivist Theory to the research

There are two important characteristics of social constructivism. Aligned with its Vygotskian roots (1978), and central to sociocultural design, the first is that the learner is an active agent in constructing their own knowledge and therefore responsible for their learning (Vygotsky, 1978; Wertsch, 1991). Therefore, students participating in the MAS framework direct their own investigatory activity, “formulate questions, plan their activity, and draw and justify conclusions about what they have learned” (Kuhn et al., 2000, pp.496–497). At its core, the MAS framework is concerned with learning as a process, and draws on constructivist (Bruner, 1993; Jonassen, Peck & Wilson, 1999; Papert, 1993, 1994; Von Glasersfeld, 1987, 1995a, 1995b) learning principles that address collaborative knowledge construction, based on students' experiences and interests. The intention was to opt for an inquiry-driven (Dewey, 1938, 1991; Kuhn, Black, Keselman & Kaplan, 2000), socially mediated form of learning environment by developing the museum-school partnership through different modes of knowledge representation and interactive, digital media.

Secondly, a social constructivist perspective acknowledges the importance of social interaction in this learning process (Brown & Palincsar, 1989). The latter suggests that learning is context-bound and dependent upon the situation of the learner (CGTV, 1991). Therefore, knowledge derives from the context under which learning takes place, and specifically from interaction with others (Greeno, Collins & Resnick, 1996). Hence, learning is a social activity where knowledge is actively internalized through conversation and interaction between the learner and more knowledgeable others

(Vygotsky, 1978). An interesting addition to this relationship which is of particular significance to this research comes from Salomon and Perkins (1998, p.5) who extended the "concept of social mediation in terms of cultural scaffolding". This perspective suggests that the individual learner constructs meaning using cultural artefacts (whether in the form of books, videos, articles or other resource materials, including technology tools used for handling information), rather than by interacting with other knowledgeable persons. Closely related to this conceptualization is Pahl and Rowsell's (2011, p.130) introduction of the concept of 'artifactual literacies'. The latter acknowledges that every object tells a story, and can potentially be related to community building and identity performance, hence providing an interesting pathway for approaching and engaging with everyday objects.

Apart from the sociocultural and socio-constructivist notions of learning it is imperative in this research to consider the influence of semiotics which inform postmodern conceptualisations of literacy.

1.4 Social semiotics

Social semiotics is an interdisciplinary field of studies that examines how meaning is made through signs. In semiotics a "sign", is something that represents something (Cope & Kalatzis, 1996, p.62). As humans, we construct meaning through our interpretation of some representational system of signs of all kinds, whether sounds, written text, music, electronically produced images, dance, or objects (Siegel, 2006). In Michele Anstey and Geoff Bull's (2006, p.107) textbook, *Teaching and Learning Multiliteracies: Changing Times, Changing Literacies*, semiotic systems are defined as "a set of signs that have shared meaning[s] within a group, whether societal or cultural, that allow members to analyse and discuss how they make meaning [on a more global plane]". Within the context of learning settings such as schools and museums, Anstey and Bull propose a more defined perspective of semiotic systems (Anstey & Bull, 2006, p.25) as displayed in Table 1.

Table 1 Semiotic systems in learning environments

| Name | Type |
|------|------|
|------|------|

| | |
|-------------------|--|
| <i>Linguistic</i> | Oral and written language, for example, use of vocabulary and grammar) |
| <i>Visual</i> | Still and moving images; for example, use of color, vectors, and viewpoint |
| <i>Auditory</i> | Music and sound effects, for example, use of volume, pitch, and rhythm |
| <i>Gestural</i> | Facial expression and body language, for example, use of movement, speed, and stillness |
| <i>Spatial</i> | Layout and organization of objects and space, for example, use of proximity, direction, and position |

Note. Adapted from Anstey and Bull, 2006, p.25.

Anstey and Bull's identification of semiotic codes forms part of a new literacies "metalanguage", an alternative approach to literacy education which argues that we often construct meaning from several signs and modes which might be integrated with the written language. Working together, multiple sign systems produce "texts" that communicate ideas (e.g., writing is both a linguistic sign and a visual one, an image can be interpreted both visually and linguistically). Texts, then, are inherently intertextual (Siegel, 2006).

As a concept, intertextuality emerged from semiotic theory (Kristeva, 1980) to describe the process by which individuals come to know a particular text through their prior experiences with other texts. Fairclough (1992) describes intertextuality as the "potentially complex" (p.82) relationships formed between meaning, text and modes. Importantly, Kress (2003, p.155) added to these relationships the understanding that individuals are "not mere users of a system, who produce no change" but rather that changes take place "incessantly, and that they arise as a result of the interested actions of individuals". In other words, texts are consciously constructed in that the individual actively constructs meaning of the text based on their physical, personal and social understandings; therefore a text may have several possible meanings.

Within the framework of the MAS the goal of identifying the modes (as separate from multimodal) used to derive meaning is to open space for discussion through an explicit metalanguage. In this way, students initiate intertextual chains, create new linkages

between popular texts and adult-sanctioned texts, competencies, and ways of viewing the world (Clark, 2007, p.50).

2. Literature review

2.1 Teaching and learning in the 21st century

Teaching and learning in the 21st century has been characterised 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. 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). This creates both tension and a sense of responsibility among teacher educators, to comprehend what 21st century learning supposes in terms of the knowledge needed to possess and the strategies to facilitate that knowledge (Kereluik, Mishra, Fahnoe, & Terry, 2013, p. 127). McCoog (2008) in addressing this issue suggests that educators have a new charge: teach 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 multimodal and digitally-mediated reality (Fleming, 2005, p.114). In this context, the nature of literacy practice and needs has shifted; no longer is the traditional view of literacy as reading and writing skills acceptable (Fleming, 2005, p.114). Both literacy pedagogy and research now embrace the idea of literacy as more of a plurality, discussing about various 'literacies' (Liddicoat, 2007, p.15). Addressing the complexity of literacy is considered to be one of the incremental goals for education in the new millennium (Leu & Kinzer, 2000, pp.111, 114).

Throughout this project, we use the term literacy to refer to 'the flexible and sustainable mastery of a repertoire of practices with the texts of traditional and new communication

technologies via spoken, print, and multimedia' (Luke & Freebody, 2000, p.9).

Nevertheless, in this definition we incorporate a key proposition concerning the nature of literacy (adapted from Barton & Hamilton, 2000, p.7): that literacy is productively understood as an open-textured category of sociocultural practice. Closely related is the notion of a 'repertoire', which refers to a toolkit (Gutiérrez & Rogoff, 2003), 'an orchestrated set of capabilities and dispositions for acting purposefully in the world' (Alloway et al., 2002, p.127). In other words, repertoire refers to people's diverse ways of engaging and developing 'cultural capabilities' in different activities as a result of participation in a range of cultural practices (Pacheco & Gutiérrez, 2009, p.74).

2.2 Multiliteracies framework of thought

This empirical investigation derives from the need to recognise contemporary teaching demands of our continually evolving, digitally mediated world (Savva, 2019a). In 1996, the term "multiliteracies" was coined by the New London Group (NLG) in a seminal article published in the *Harvard Educational Review*. This landmark article "served as a catalyst for global change in literacy research, policy, curriculum and pedagogy" (Mills, 2006b, p.62). A developing body of research about multiliteracies, also called "new literacies" (Kress, 2003), has emerged since to help us understand how literacy is multimodal (print, art, drama, and language) and multimedial (combining various means of communication such as the Internet, music, and video) (Vasquez et al., 2004). Ajayi (2011), and Rowsell, Kosnik and Beck (2008) highlight how new communication technologies enable the practice of multiple literacies across cultural, social, economic, and national boundaries, and in the process, reconceptualize their self-identities as multiple, hybrid, complex, and dynamic. The cumulative effect of these factors ensures that knowledge afforded by new digital literacies and hybrid textual forms will become increasingly indispensable to literacy teaching/learning (Ajayi, 2009; Leu, Leu & Coiro, 2004).

However, the challenge for education is "not only to educate for new breadth and forms of literacy but also to facilitate learners' critical interpretations of these forms and modes" (Callow, 2006, p.9). Individuals should consider different perspectives, analyze and problem-solve complex issues, and to think critically about social issues. To succeed latter, it requires meaningful and challenging learning experiences that are culturally relevant (Callow, 2006, p.9) and enjoyable while developing students'

repertoires of literacies (Ailwood et al., 2000; Unsworth, 2002). Such an approach relates to a consideration of literacy from a social and cultural perspective (See Cope & Kalantzis, 1997, 2003; Durrant & Green, 2000; Freebody & Luke, 2003; Hagood, 2000; Kress, 2003; Kress & van Leeuwen, 2001; Marsh, 2007; Unsworth, 2002; Zammit & Downes, 2002) that acknowledges the situated and contextual nature of reading and writing. Work in new literacy studies (Barton, Hamilton & Ivanič, 2000; Street, 2001), grounded in a sociological frame, acknowledges literacy as a social practice (Vasquez, Egawa, Harste, & Thompson, 2004), as “dynamic, culturally and historically situated practices of using and interpreting diverse written and spoken texts to fulfill particular social purposes” (Kern, 2000, p.6). These understandings emerge from a discourse on the notion of “critical literacy” which aims to “challenge injustice caused by unequal social negotiation of rules” (Jongsma, 1991, p.518).

Critical literacy is a perspective that is crucial to a social justice agenda such as the multiliteracies framework. Freire's work (1970, 1987) in this area is particularly relevant; he proposed a reconceptualization of literacy as reading and writing the world, and looked beyond reading and writing to the knowledge and power relations in literacy discourses. Agnello (2001) refers to this approach as postmodern literacy, and argues that through this approach “reading and writing become enhanced methods for exploring the democratic self and its formation through ideological exposure to knowledge and power relations formulated by educational policy texts. Through such exploration, Agnello stresses that literacy becomes a tool for self, student, and social advocacy rather than commodity to determine whether one measures up satisfactorily on test scores” (p.24-25).

Unsworth (2001) affirms Freire's and Agnello's notions of literacy when he argues of a shift from tacit and informal, to transformative knowledge. The former refers to a realization that what appears to be a “natural” view of the world is “actually a view produced by particular combinations of historical, social, political influences, and that alternative combinations of these influence could produce different views” (Unsworth, 2001, p.19). In the context of school education, Callow reinforces Unsworth, noting the learning relationship between teacher and students should be informed by this understanding; to succeed in the latter requires practical ideas and pedagogies which teachers can implement in their current contexts (Callow, 2006, p.8). For example, it is imperative that literacy pedagogy should be grounded in intellectual quality and rigor,

equally committed to high cognitive, operative and affective dimensions of engagement (Callow, 2006, p.10). With this in mind, the next section presents multiliteracies pedagogy as both a theory and a practical method integrated into the MAS framework.

2.3 The role of museums

Close to this pedagogically changing landscape is the need for museums, as places that nurture learning, to revise their learning approaches to respond to dramatic shifts in the populations that they serve and the roles which they should practice. 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 globalisation which increased cultural diversity and cosmopolitanism (Peressut et al., 2013, p.x). In this respect, more recent conceptualisations 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, p.605; 2009, p.205; Mathewson-Mitchell, 2007, p.3).

Undertaking the MAS project, is increasingly important for museums nowadays as it responds to the calls for an inclusive agenda in the museum (Sandell, 2003, p.45). Although research suggests social inclusion can occur at individual, community and societal levels (Sandell, 2003, p.45), the challenges for an inclusion agenda for museums are demanding, and little empirical evidence exists that indicates the democratic potential of museums is being realized (Mathewson-Mitchell, 2007, p.2). Different challenges have been acknowledged in teaching culturally and linguistically diverse students. Museum learning in the form of museum educational programmes or partnerships could meaningfully engage these students. Such museum learning practice could be an alternative to traditional curriculum teaching and learning within current reconceptualisations of literacy education. The New London Group's ideal that a pedagogy of multiliteracies can potentially "provide access without children having to leave behind or erase their different subjectivities" (New London Group, 2000, p.18) implies it could open possibilities for greater access. Therefore, the infusion of

multiliteracies pedagogy into museum learning research and educational praxis could prove meaningful as small-scale research findings suggest (Savva, 2016a). Explicit teaching of museum multiliteracies through this project could impact learning in and through museums, and museums/schools relationships by recognising the particular demands of developing learning experiences in the museum setting that enable cultural participation (Mathewson-Mitchell, 2007, p.3).

Taking into consideration the unique nature of the museum learning environment, with its multiple forms of communication, language and practices (Mathewson-Mitchell, 2007, p.8), the need arises for specific models to create opportunities for learning through museum educational programmes that are meaningful and relevant to the visitors and require their active participation in the learning process (Fleming, 2005, p.3). Although a body of research exists that points to approaches and practical applications of multiliteracies pedagogy in formal learning contexts, such as schools, that nurture cultural diversity of students, little empirical evidence is found on how to teach in and through multiliteracies pedagogy in and through museum environments. Schwartz (2008) provides a model of museum-based pedagogy which addresses the consideration of multiliteracies in the planning of museum based activities and is utilised in this research.

2.3.1 Museum-school partnerships

As much of the literature consistently points out, establishing partnerships is one way for museums, schools and communities to create a new educational infrastructure for young children (Falk & Dierking, 2000). These two different institutions provide different sort of experiences and “work together to give students an enriching immersion in ideas, discovery, challenge, and enjoyment. This museum-school collaboration is a partnership 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). It is considered that museum-school partnerships by nature vary greatly in terms of what is offered (Melber 2003; Price & Hein 1991; Blackford, 2009). At its most common use, a partnership is defined as an agreement where two or more people or groups work together towards mutual goals, yet on a deeper level. Every museum-school partnership differs and one cannot guarantee that there is a recipe of some sort to apply in planning and delivering these collaborations. Nevertheless, there are certain characteristics commonly identified among researchers as the steps to establish a successful museum-school partnership. It has been proposed that a successful partnership begins with clear, goal-directed communication, which refers to the schools being clear about their expectations from museums and vice-versa (AAM, 1984; Sheppard, 1993). It is crucial that a culture of dialogue is cultivated. Both museum and school leaders must identify common educational goals, and express how those goals work together for effective and desirable outcomes (Berry, 1998; Huber, 2009; Johnson, 2009; Sheppard, 1993; Talboys, 1996). The partnership must include a commitment to administrative support as well as teacher interest, in order to achieve the ultimate aim of establishing museums as integral components in the total educational experience (Sheppard, 1993; Stone, 1993). There is also the need to undergo a planning process (Berry, 1998; Huber, 2009; Sheppard, 1993), to ensure that the collaboration is successful. Well-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.

A preliminary doctoral investigation into the context of the MAS project (Savva, 2016a), indicated that there is limited practical and documented evidence of museum-school partnerships in Cyprus and abroad. It is this gap, together with our concern for how museum educators in Cyprus, might refine their scopes and purposes to fulfil the objectives of the major educational reform taking place on the island since 2009, 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 in Cypriot school and extend this network across Europe.

2.3.2 Virtual learning environments

The overall intention in the development and implementation of the MAS project is to propose an instructional design with practical implementation and evaluation guidelines that would integrate the MAS framework to promote ubiquitous multiliteracies learning for CLD students in the context of a virtual learning environment (VLE). Virtual museums are considered an appropriate approach to transfer the developed learning framework into practice, as they are perceived as a multidisciplinary research field which is often linked with Technology Enhanced Learning (TEL) (Christal, Montano, Resta & Roy 2001; Goodyear & Retalis, 2010; Jackson & Adamson, 2009; Prosser & Eddisford, 2004). The former is increasingly favourable among researchers, given that new technologies have become increasingly "popular tools" in education (Doering, Beach & O'Brien 2007; Miller, 2008). In fact, there exists an inseparable link between virtual museums and multimedia (Payne et al., 2009, p.292).

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). With the proliferation of technologies, online virtual museums are becoming more immersive and interactive, promoting richer visitor experiences – with scenarios, characters, and objects - with

their collections using the latest in multimedia innovations (Payne et al., 2009, p.292). Therefore, "a virtual museum dematerializes the museum itself by making possible a "remote visit" (Djindjian, 2007, p.9). At the same time, maintaining a virtual museum is one 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 et al., 2010).

Incorporating new media technologies to fulfill the museums' educational provision has been widely acknowledged by practitioners and museum educationalists (Anderson, 1999, p. 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) suggests that virtual spaces, have created a context for the "new cultural experience" (p. 532). Within this three dimensional spaces, 3D applications integrate real-life with virtual "learning activities that enable unstructured spaces for interaction" (Savin-Baden, 2008, p. 528). 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) refers to as "experiential learning, cooperative learning, and game-based learning" (p. 421). 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 MüellerWittig'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.

2.4 A state of flow, the optimal experience

Being in “a state of flow”, or “optimal experience”, means to be immersed in a highly enjoyable state of consciousness, which occurs when our skills match the challenges we are undertaking. Csikszentmihalyi (1997) introduced flow and described it as a feeling of enjoyment and psychological immersion, energized focus, and involvement, accompanied by positive emotions. According to Dunwell, de Freitas, and Jarvis (2011), whenever people reflect on their flow experiences, they mention some, and often all, of the following characteristics: concentration, time distortion, rewarding experience and loss of self-consciousness. During a flow experience, such as during game-play, a person is totally focused on the activity and is able to forget all unpleasant things. Although Csikszentmihalyi’s research was part of the larger field of intrinsic motivation, his investigation of flow was contrary to the traditional utility-centric motivational theories of the time (Csikszentmihalyi & Csikszentmihalyi, 1988; Moneta & Csikszentmihalyi, 1996).

It appears that a person immersed in a flow state, is deeply engaged in it for the sake of the activity itself, without need of conventional rewards (Csikszentmihalyi & Csikszentmihalyi, 1988). This key understanding, is often referred to as the autotelic experience. The autotelic experience is the result of an activity or situation which produces its own intrinsic motivation, rewards, or incentives, and there is no need of any outside goals or rewards. Flow is a complex concept that is difficult to operationalize because of a range of qualifiers. Csikszentmihalyi (1990) describes nine dimensions of flow, which include: (1) clear goals, (2) immediate feedback, (3) a match between personal skills and challenges, (4) merger of action and awareness, (5) concentration on the task, (6) sense of control, (7) loss of self-consciousness, (8) altered sense of time, and (9) the experience of becoming “autotelic,” i.e., doing an activity for its own sake or its own intrinsic reward. A review of the literature by Rodriguez-Sanchez and Schaufeli (2008) suggests that a more condensed definition of flow as an optimal experience can be composed of three basic elements, including: absorption, enjoyment, and intrinsic interest.¹

In what situations or activities does flow occurs though? For example, Jackson and Csikszentmihalyi (1999) have stated that sports can offer such rewarding experiences that one does it for no other reason than to be part of it. Furthermore, they argue that a

sport setting is structured to enhance flow. Despite winning is important in sports, flow does not depend merely on winning or losing. The playing of games is convergent with sports. In this respect, with the prominence of online, virtual games, much research has linked flow experiences with immersion in virtual environments.

At this point, it is important to distinguish immersion from flow, as these terms are often confused. According to Ermi and Mäyrä (2005), immersion refers to a sensation of being surrounded by a completely other reality taking over all of our attention. They divide immersion into three components: sensory, challenge-based and imaginative immersion. Sensory immersion is related to the audiovisual execution of games, whereas the challenge-based immersion focuses on interaction between the game and the player, similar to Csikszentmihalyi's skill dimension, in that it assumes that the feeling of immersion is more intense when there is a balance between challenge and skills. The last component, imaginative immersion, relates to being absorbed by the stories and the game world, or the user identifying with a character, part of interactive narratives at play. In simple terms, this means the player or user can use imagination and enjoy the fantasy of the game. Immersion differs from flow, in that in a flow state, the user concentrates attention in a certain goal directed activity, whereas immersion relates to becoming physically or virtually a part of the experience itself. The flow theory presents more interest for learning, as it entails voluntary direction of attention to relevant content, an essential prerequisite for learning.

2.5 Flow and learning in virtual environments

The benefits stemming from being in a flow state, have turned it into a meaningful goal for building virtual environments for online business, health care, education, and gaming. Flow theory has been a primary theoretical base for exploring the implications of learning through immersion or "being enveloped" by a virtual learning environment because the emotional composition of these experiences resemble flow and precipitate a deeper engagement with learning. Research has explicitly related the sense of "presence," "being there," "immersion," or "flow" in different virtual reality interfaces with positive learning outcomes (e.g., Abrantes & Gouveia, 2012; Fassbender et al., 2012). The notion of intrinsic motivation in particular, has significant implications as researchers try to gain understanding on how learning activities and environments can foster motivation

in students. The concept of intrinsic motivation is associated directly with flow, since according to empirical findings, whatever produces flow becomes its own reward, its own intrinsic motivation. The balance between challenge and skill arises when flow occurs during the learning process as a feeling of pleasure that issues from achieving realistic goals and overcoming prescribed challenges (Csikszentmihalyi, 1990). It is argued that the composition of an activity must be in the context of explicit challenges, focused goals and concentration, and control (Chan & Ahern, 1999), and Finneran and Zhang (2005) cohort that the effect of flow is increased in learning, at which time it has a direct impact on attitude and behavior.

There is indeed a growing body of research examining the effect that flow has on learning. Findings such as Shin's (2006) suggest that students in "high flow were more likely to be satisfied with the virtual course than students in low flow. ...[implying that] a positive impact of flow on student-learning achievement is highly plausible..." (p. 717). If this ascertainment holds true, then further investigation is required to identify variables which, as part of the flow experience in learning, directly influence the intentions or behaviours of users of virtual worlds (Davis, 1989). An example of this interest has been a recent trend of research on online 3D gaming environments and virtual worlds, with other research focusing on Three-dimensional environments at large. Three-dimensional environments like Second Life2 (SL) provide virtual spaces for exploration and creativity that enhance the learning experience. Today, there are over 300 million registered users who spend time within virtual worlds (Spence, 2008).

Previous studies have also found a positive association between engagement and learning (e.g. Hsu, Tsai, and Wang, 2012; Huizenga, Admiraal, Akkerman, and Ten Dam, 2009) and that engagement in game can redirect unwarranted focus on grades to learning (Tüzün, Yılmaz-Soylu, Karakus, Inal, & Kizilkaya, 2009). For example, Sabourin and Lester (2014) found that a game-based learning environment was able to both support learning and promote engagement. Hou (2015) and Brom et al. (2014a), however, establish a positive relationship between flow and learning. Admiraal, Huizenga, Akkerman, & Dam, 2011 found that flow had a positive effect on student performance in the game but did not have an effect on learning outcomes; however, if the students were engaged in a group competition, the more the students learned. Other studies have found that while games lead to learning gains, engagement remained unaffected (van der Spek, van Oostendorp, & Meyer, 2013).

In addition, there is evidence that fantasy through simulations and games promotes intrinsic motivation and can enhance learning compared to instruction without fantasy elements (Lepper & Hodell, 1989; Parker & Lepper, 1992), in part by focusing the learner's attention on relevant features of the learning environment (Lepper & Molone, 1987). 172 J. Hamari et al. / Computers in Human Behavior 54 (2016) 170e179 However, currently there is a dearth of studies that investigate the relationship between immersion and learning in game-based learning environments. The only study (as far as we know) that does so, by Cheng, She, and Annetta (2015), found that immersion has a positive impact on learning outcomes especially when the players gaming performance was high. Overall, according to larger theoretical developments as well as the body of empirical literature there is reason to believe that flow (challenge and skills), engagement, and immersion have a positive impact on learning.

It has been found that, besides individual or personal flow experiences, students can feel a sense of social flow, while using computer games and interact within a virtual learning environment (Inal & Cagiltay, 2007). Elements that facilitate this process, include establishing group affiliations, and creating a strong sense of presence, whereas the small groups of users (represented by avatars), can learn on a range of topics. Designers have vastly applied Csikszentmihalyi and Csikszentmihalyi's (1988) flow principles to the areas of online gameplay and learning, in an attempt to create virtual worlds or immersive virtual learning environments as we call them, which allow for more opportunities for flow. Different studies conducted (Hoffman & Novak, 1996, Trevino & Webster, 1992, Webster, Trevino, & Ryan, 1993), confirm that flow experience is a significant cognitive state in online virtual community behaviour that may influence serious gameplay and learning. It is considered a prerequisite to the design of virtual environments for the future, to facilitate flow experience. Such an advancement requires that designers of virtual worlds understand the mechanisms underlying the enjoyment of virtual experiences and flow. This is argued by Finneran and Zhang (2003), who suggested further research is needed on flow, because of its important contribution to our understanding of the optimal experience.

In a study by Warburton (2009), findings suggest that the "immersive nature of the virtual world, crossing physical, social and cultural dimensions, can provide a compelling educational experience, particularly in relation to simulation and role-playing activities"

(p. 419). The experience of immersion within virtual worlds, allows for both students and teachers the tools to “project themselves into the learning space,” which are “key elements to successful learning transactions” (p. 419). A significant element to consider in regards to flow and learning in IVLEs, is play. The playfulness emerging in virtual worlds, presents a great opportunity to facilitate learning. It is also critical to understand human-computer interaction (HCI), relative to behavioural measures of playfulness (Webster et al., 1993). For this reason, in the MAS project we seek to explore the psychological dimensions and related value of what makes gameplay motivating, specifically in a learning context (Oliver & Carr, 2009).

3. The MAS Pedagogical Framework

3.1 The Museum Multiliteracies Affinity Practice (MAS) framework

Taking into consideration the unique characteristics of the contemporary 21st century environment, a theory-based framework, the Museum Multiliteracies Affinity Practice (MAS) framework is proposed for engaging in museum-school partnerships through immersive virtual learning environments. The MAS framework relies on a creative overlap between the theory of the New London Group (1996) for a pedagogy of multiliteracies, the theory of affinity spaces proposed by Gee (2004) and flow theory by Csikszentmihalyi (1988), adapted by Kiili et al. (2014), for educational games. Figure 2 illustrates the MAS framework and the different overlapping synergies within and across.

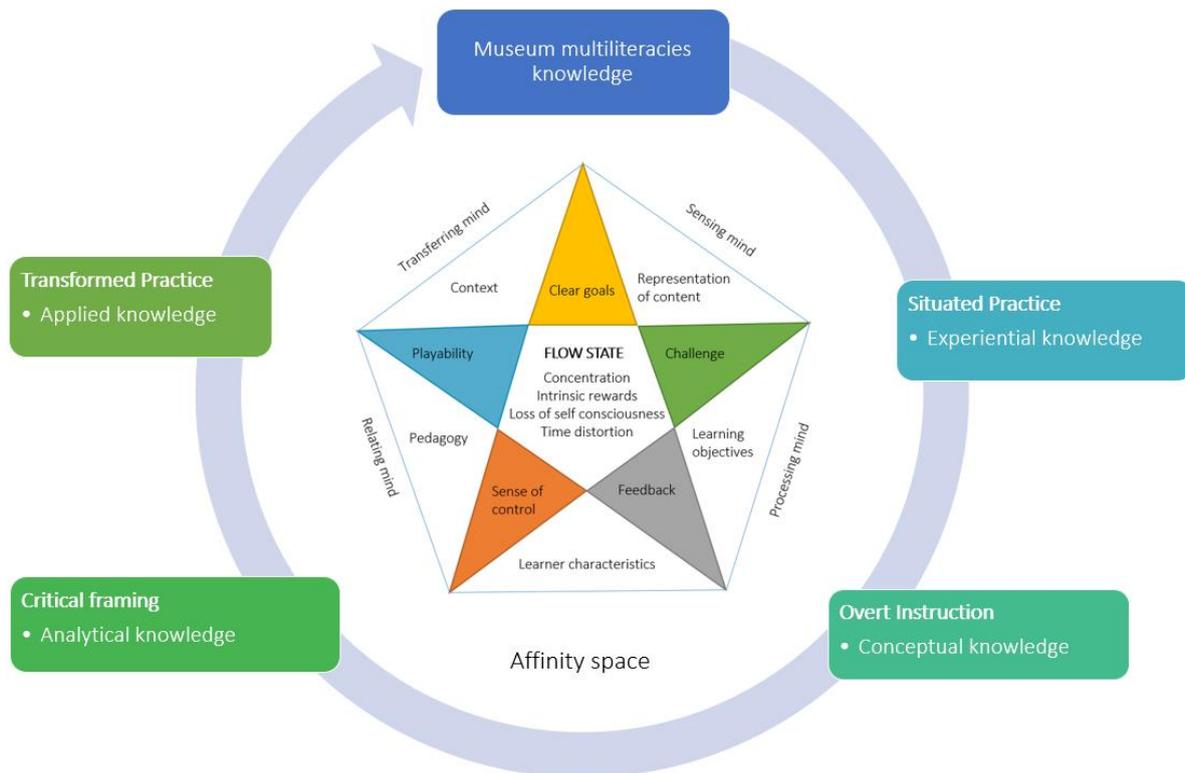


Figure 2. The Museum Multiliteracies Affinity Practice (MAS) framework of practice

3.1.1 Multiteracies pedagogy

It is not a question of whether students are capable of engaging with meaning making in different semiotic systems, but rather a question of finding the appropriate pedagogy. Students can learn semiotic systems if teachers can find a way to teach them (Anstey and Bull, 2006, p.116)

The multiliteracies pedagogy (NLG, 1996) is a pedagogical model first conceived by the New London Group (1996) and further developed by Cope and Kalantzis (2000b). It was proposed as a teaching approach in light of today's context of social, cultural, and linguistic diversity and demands and needs of learners. The premise in utilising multiliteracies pedagogy in the MAS framework is that addressing the knowledge, skills and attitudes for multiliteracies will have significant implications for education in museums, and particularly for museum-school relationships, as it recognizes the particular demands of developing learning experiences in the museum setting that enable cultural participation (Mathewson-Mitchell, 2007, p.3).

The proponents of multiliteracies pedagogy suggest learners in the 21st century have to learn to negotiate multiple literacies that go beyond the traditional print-based materials (Leu, Kinzer, Coiro, & Cammack, 2004; Rowsell, Kosnik & Beck, 2008) to achieve work and overall life success (Kress, 2003). Kalantzis, Cope and Harvey (2003) suggest that successful learners in the 21st century should possess a range of skills:

- Broad Knowledgeability
- Diverse Intelligence
- Autonomy
- Collaboration
- Flexibility
- Problem Solving
- Self-directed design of their learning experiences through multimodal ways of meaning making
- Ability to use a set of tools for meaning making

In short, there is a shift in 21st century learners from being literate persons to being multiliterate. Anstey (2002, p.24) defines a 'multiliterate' person as flexible, strategic and able to understand, produce and use literacy and literate practices with a range of texts and technologies, written, spoken or multimodal texts (Kress 1995; Kress and van Leeuwen, 1996). Making meaning is undertaken in socially responsible ways in order to fully participate in life as an active and informed citizen, a goal that presupposes critical literacy. An individual who is multiliterate should be able to critically analyse texts and contexts, recognize the dominant literacy forms and take informed action (Anstey & Bull 2006, p.24).

Sinclair and Britton Wilson (1999) note that "a culturally inclusive classroom is one in which this diversity is welcomed and integrated into the overall learning of all students". The New London Group describes multiliteracies pedagogy as "a teaching and learning relationship that potentially builds learning conditions that lead to full and equitable social participation" (NLG, 1996, p.60). They propose a multiliteracies "pedagogy that opens possibilities for greater access" (NLG, 2000, p.18). This is pursued, for example, through the open-ended and flexible functional grammar designed to assist language learners to describe language differences and its emphasis on multiple channels of

meaning. These are positive responses to the changing shape of work, private and civic life (Lo Bianco, 2000). Furthermore, it is claimed that multiliteracies pedagogy allows teachers and facilitators to specifically design learning that is student centred, inquiry based and open ended, to allow for student ownership and transformation of that learning into their contexts and meaning making.

Cummins (2005) revisited the case for a pedagogy of multiliteracies. He argued that multiliteracies pedagogy acknowledges students' cultural and linguistic knowledge built on their prior experiences (Cummins, 2005, pp.149-150). A pedagogy of multiliteracies also means that teachers will be incorporating and allowing the use of multimodal means of meaning making within the class and beyond, while promoting the understanding and use of the multimodal relationships between and within these modes of meaning making (Cummins, 2005, pp.149-150). Multiliteracies pedagogy is thus interpreted as an attempt to improve students' learning behaviour and academic achievement in terms of their cognitive and intellectual growth, critical thinking development and identity formation (Lo Bianco, 2000).

3.1.2 Learning by Design Model (LbD)

Kalantzis and Cope (2005, p.72) have extended the multiliteracies pedagogy through the Learning by Design model (LbD) which informs the MAS framework. Learning by Design is building into the curriculum the idea that not every learner will bring the same life experiences and interests to learning (Kalantzis & Cope, 2012), as well as acknowledging that every learner is not on the same page at the same time (Kalantzis & Cope, 2005). Anstey and Bull (2004; 2006, p.34) identify these different domains or identities collectively as Discourse Worlds, and suggest that students draw on two in particular to make meaning, their Lifeworld and their School-Based World. This concept is represented visually in Figure 3, which indicates that these worlds overlap and inform one another. A truly meaningful multimodal integration in schools would require that teachers draw on the key components which comprise school literacies, and use them in combination with outside of school literacies for students to engage attentively with and for others to position themselves in the world.

LbD involves four core knowledge processes – experiencing, conceptualising, analysing and applying. These follow Kolb's (1984), and Bernice McCarthy's (1987) 4MAT model.

The original model moved through four distinct phases of the learning cycle using both right and left-brain strategies for knowing. It was constructed along two continua, namely perceiving and processing. Perceiving occurs in an infinite variety of ways that range from experiencing to conceptualising, while processing occurs in ways that extend from analysing to applying.

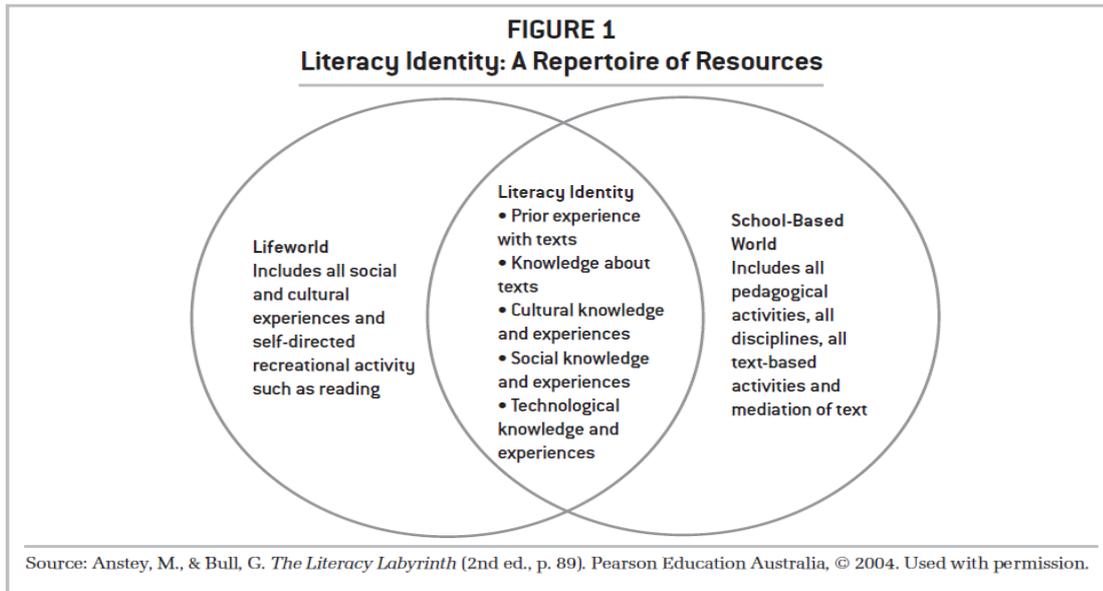


Figure 3. Discourse worlds in a reader's identity (Anstey & Bull 2006, p.34)

The four ways of knowing have been expanded by Kalantzis and Cope (2005) to include eight subcategories (Figure 4) and are intended to correlate to each of the four curriculum orientations of the multiliteracies pedagogy discussed above (Kalantzis & Cope, 2005, p.72):

1. Experiencing: a) the known, and b) the new;
2. Conceptualising: a) naming concepts, and b) theorizing;
3. Analysing: a) functionally, and b) critically;
4. Applying: a) appropriately, and b) creatively;

Experiencing involves personal engagement in sensations, emotions, physical memories, involvement of the self, and immersion in the human and natural world. Conceptualising is the translation and synthesis of experiences, conceptual forms, language, and symbols into abstract generalizations. Analysing is the transformation of knowledge by ordering, reflecting on, and interpreting the underlying rationale for particular designs and representations. Applying is the experiential application of internal thought processes to external situations in the world by testing the world and adapting knowledge to multiple, ambiguous situations (Kalantzis & Cope, 2005, p.96). These knowledge processes are intended to enable teachers to analyse the learning that occurs when pedagogy of multiliteracies is implemented.

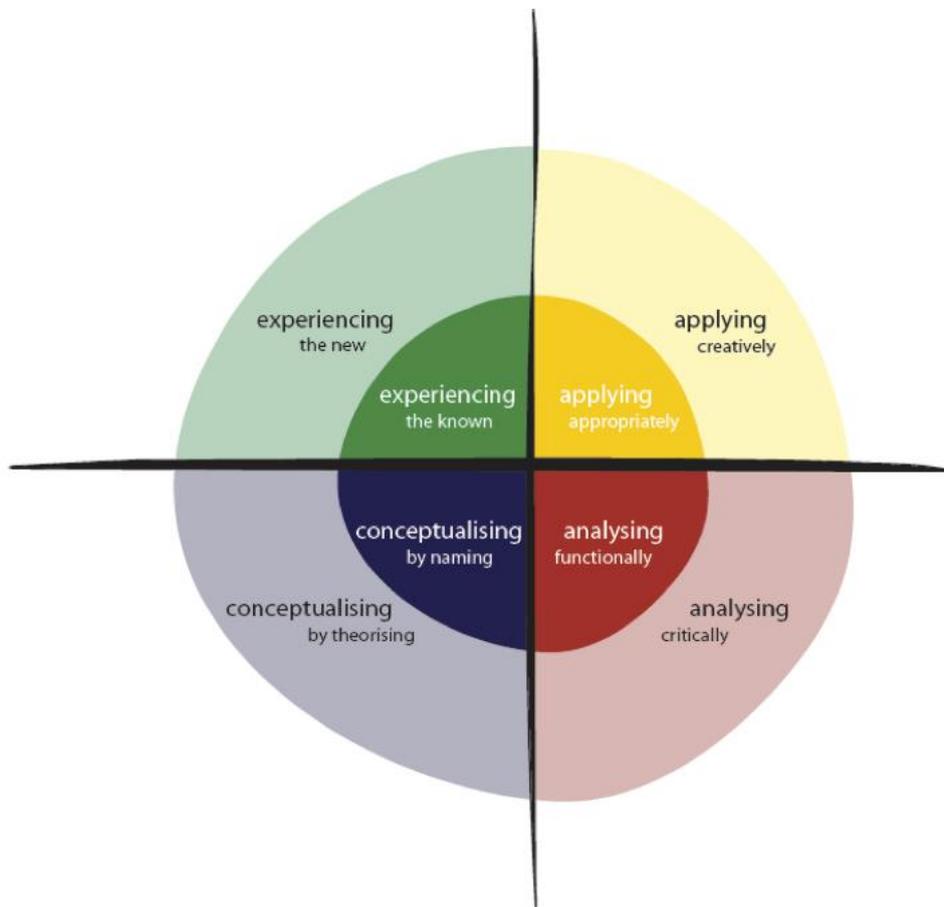


Figure 4. The knowledge processes in the Learning by Design Model (Kalantzis & Cope, 2016, p.5)

The mix of Knowledge Processes in the Learning by Design model is of most relevance to the MAS framework as it allows different emphases and activity types as appropriate to students' different 'learning orientations' (Kalantzis & Cope, 2005, p.97). All the Knowledge Processes also change direction of the knowledge flows and the balance of responsibility for learning toward a more active view of learning-as-engagement; in this context, learner identities and subjectivities become more manifest. 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.

3.1.3 Affinity spaces

The goals and ideas of multiliteracies pedagogy, could be better situated using Gee's theory known as *affinity spaces*. Gee (2004) has opposed the traditional schooling system that persists and promotes dominant discourses and hierarchies and suggests an alternative view of schools. To make a claim on the previous, Gee is building on Jean Lave and Etienne Wenger's (1991) concept of communities of practice, but in contrast to their definition of thinking about groups of people as being either 'in' or 'out' of a community, he suggests that we think of spaces where people interact. An affinity space is a place – virtual or physical – where informal learning takes place. Spaces can be real tangible spaces, like a classroom, or virtual spaces, like an online discussion forum or game.

The point is that this shared space exists for people to interact and share their ideas based on common interests, endeavours, goals, or practices, irrelevant of race, gender, age, disability, or social class (Gee, 2004, p.67). In discussing characteristics of what he terms "affinity spaces," Gee acknowledges how within the affinity space, people are not separated between novices and experienced in these affinity spaces but rather coexist (Gee & Hayes, 2009). Affinity spaces encourage users to gain both intensive (experts or specialists) and extensive (broad knowledge shared with everyone) knowledge while also enable use of dispersed knowledge (available outside the affinity space) and also tacit knowledge (knowledge built up in practice not able to express with words) (Gee & Hayes, 2009). Learners or users of these spaces participate in varied ways and different levels, such as peripherally and centrally. Leadership is porous and leaders are resources; different people lead in different days, different areas, and resourcing, mentoring,

advising people (Gee & Hayes, 2009). Gee points out that schools do not have the features of affinity spaces, since distributed knowledge, networking, and collaboration across and beyond the school rarely occurs. However, these are ways in which students interact and engage in their daily lives and should be incorporated in the school system (Morgan, 2010).

3.1.4 Flow theory in the MAS framework

The MAS framework proposed, offers an example of a creative synergy between the notion of affinity spaces with multiliteracies pedagogy to provide a teaching and learning approach that could apply to the goals and practices of a 21st century school learning context. A concrete instantiation of how to design effective affinity spaces, results from examining flow theory in relation to IVLEs. Kiili et al. (2014) discuss flow framework for educational games, which have been adapted to the MAP framework. The elements of flow can be divided in two groups: flow antecedents (the colored star elements in Figure 2), and the Flow state. The flow antecedents (clear goals, challenge, feedback, sense of control, playability), are factors that contribute to the flow state and therefore it is important to consider them when designing a virtual learning environment. The dimensions of flow state (concentration, intrinsic rewards, loss of self-consciousness, time distortion), are more abstract and describe mostly the feelings of the flow experience. The white elements surrounding the star (context, representation of content, learning objectives, learner characteristics, pedagogy), reflect meaningful factors that affect the design of the learning experience and virtual-based learning artefacts. Kiili et al. (2014) propose five mind lenses, (1) The sensing mind, (2) the processing mind, (3) the integrating mind, (4) the relating mind, and (5) the transferring mind lenses. These lenses, are founded on principles of cognitive load theory (Kirschner, 2002), multimedia learning theory (Mayer, 2004) and constructivism (Jonassen & Land, 2002), and correlate with the knowledge processes described above within the Learning by Design Model by Cope and Kalantzis. Within the MAS framework, Kiili et al.'s (2014) five sets of mind lenses, provide means to consider IVLEs elements systematically from the learning and interaction perspectives and relates flow dimensions to learning processes. The abovementioned psychological factors of challenges, skills, engagement and immersion

are considered critical characteristics of meaningful and deep learning experiences, and the MAS framework applies them.

3.2 Museum based pedagogy

The preliminary literature review suggested that the goals and practice of multiliteracies pedagogy could be implemented in the context of museum teaching and learning to enable social inclusion and meaningful participation. Nevertheless, it was critical for the design of the MAS to re-conceptualize what constitutes museum education and museum literacy before addressing a creative synergy between the school and the museum (Savva & Souleles, 2014, p.121).

As authors including Hein (1998), and Falk and Dierking (2000), observe, educational programmes are increasingly a prerequisite in museums around the world, and we have seen a shift in focus from the transmission of object knowledge to personal meaning making (Hooper-Greenhill, 1999). The idea of education in museums is seen as exploratory, broad, experiential, complex and multi-layered; museum educational strategies are now audience driven (Russo, Watkins, Kelly and Chan, 2007, p.20).

Falk and Dierking (2000, 2002, pp.12, 13, 65) have developed a model that considers three aspects of learning which work together in the making of meaning from museum exhibits. They call it the Contextual Model of Learning. These three contexts are the Personal Context, the Socio-cultural Context, and the Physical Context. Falk and Dierking (2000) refined the model by adding the influence of the passage of time on the learning process and renamed it the Contextual Model of Learning. This model is helpful in examining the phenomenon of museum learning investigated through the lens of NLS. It brings together museology and literacy research in a way that increases the body of knowledge in both areas and creates an inter-disciplinary examination of the process of making meaning from museum exhibits.

This view of museum learning redefines the goals and strategies of educators and the museum curricula; it fits the incorporation of museum learning into the multiliteracies concept; this is facilitated by the realization that a display of material culture conveys messages about the people who created them and the times in which they were used

(Pearce, 2003)¹. Exhibits are not simply displays, but systems of signs that express messages about culture. Museums and their exhibits reflect the ideology of those who create them. Gee (1999, p.93) wrote that "[T]here is no such thing as 'reading' or 'writing,' only reading or writing something . . ."; and the same would hold true for creating exhibits. There is no such thing as displaying an artifact without displaying something about that artefact.

Furthermore, the interpretation of messages is similar to the deciphering of text, using the signs, symbols, objects, etc., of a museum exhibit as part of the process of creating meaning (Roberts, 1997). Griffin (1999, p.8) identifies the unique learning opportunities offered by museums as: opportunities to closely examine objects or specimens; opportunities for comparison that allow trends and patterns to be deciphered; natural learning processes that incorporate the sharing and communication of ideas and the raising of questions; and opportunities to develop perceptual skills that teach how to gather information from objects and experiences. In these conceptualisations of museum learning it is imperative to consider the implications from the introduction of digital cultural heritage in the museum scene within the context of museums operating in a digital age (Parry, 2010). Despite early reticence and suspicion on the use of digital resources and to digital interactives, as well as the problematics of accommodating the 'new media' within museum environments primarily concerned with the presence of genuine, material objects (Parry, 2010), a whole new world opened for visitors at the museums and users of virtual museums concerning their engagement in meaning making. Because museum exhibits make meaning through multiple media, multiple modes, and multiple symbol systems, the literacy practice of museum visiting is a multiliteracy².

Schwartz's (2008) work supports my thesis here. He proposed a museum-based pedagogy as opposed to traditional museum education. Schwartz highlights that museum-based pedagogy differs, in that its main goal is "the teaching of verbal, visual, technological, social, and critical literacies; not museum literacy, which is the ability to access the museum's cultural and intellectual resources" (Stapp, 1984; Schwartz, 2008,

¹ The act of creating an exhibit is parallel to the act of producing knowledge.

² An interesting project is the "Museum Literacy Project" in 2008-2010 involving nine different museums, administrations and training institutions based in five European countries, supported by the EU programme Lifelong Learning- Grundtvig Learning Partnerships 2008. The project focus was on museums and audiences with low schooling levels, and how museum literacy can be reached and maximise the museum experience for these audiences.

p.29). Museum-based pedagogy thus appears to be working within the affirmations of multiliteracies pedagogy. Schwartz (2008, p.29) suggests that the goals of teaching and learning at the museum should be to develop competencies analysing the museum's means of persuasion; the ways in which the museum makes arguments through and about the objects that it displays. The aim is to "actively engage" students to think beyond the museum's contents to its immediate and broader contexts. This contributes to acknowledging "the importance of social and material factors in determining students' empowerment and successes" (Schwartz, 2008, p.29).

Schwartz's theory is a unique example of how to engage in museum learning within the affirmations of multiliteracies pedagogy. Nevertheless, this proposal for museum-based pedagogy was only tested in the context of a university course for student teachers. The doctoral investigation undertaken by Savva (2016a), indicated this theory can be used in the MAS framework to address students at primary level. Using the theory of museum-based pedagogy as a guideline, the intention in designing the activities for the MAS framework is for students to engage in practices related to enhancing verbal, visual, social technological and critical literacy (Figure 5).

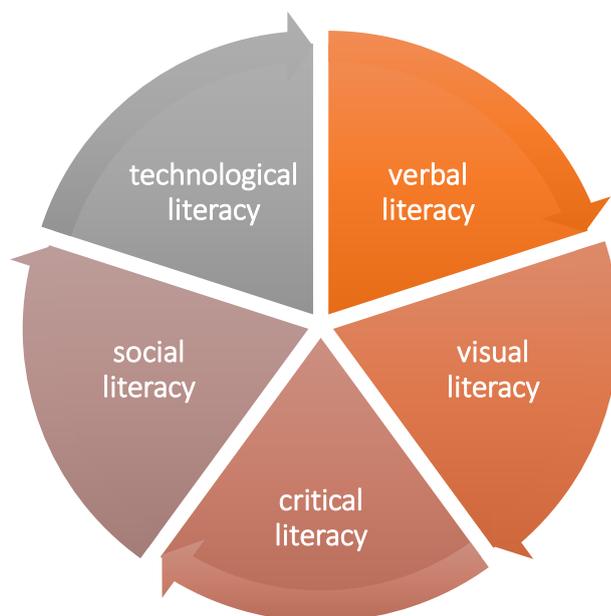


Figure 5. The literacies in museum-based pedagogy (Savva, 2016a)

More specifically, for verbal literacy the objectives are to analyse how words interact with objects and their installations to form persuasive arguments. This is pursued

through looking at the agency of exhibitors (curators, educators, and administrators) in producing an exhibit's meaning. It also considers the audience's role in shaping that meaning. In visual literacy, the importance of the material context in determining an object's meaning is highlighted: whether through display technology (such as walls, vitrines, dioramas, taxidermy, photography, and video), installation (sequence, height, light), layout and design, overall architecture.

The intention is for students to analyse how objects interact with their physical setting to form persuasive arguments that are primarily visual. In social literacy, the focus is on calling students' attention to the collaborative nature of meaning-making in the museum. Students can look at the exhibitors' agency in producing the exhibit's meaning and ponder their goal in mounting the exhibit. Students can contact the exhibitors in order to discuss the exhibition-making process.

Furthermore, in technological literacy the intention is to reveal the ways that technology increasingly mediates the museum's interpretation of objects to visitors. Students can explore how technology facilitates, alters, challenges, or redefines visitors' encounters with the museum object. Lastly, in critical literacy, the purpose is to help students to recognize and consider ideological stances and power structures implicit in museum displays. This calls for students to acknowledge their analysis of an exhibit as a particular and positioned act of interpretation.

In relation to the Cypriot museum educational context, neither multiliteracies nor technology enhanced learning have been addressed in policy making documents (MOEC, 2016a; 2016b). Nevertheless, this research makes a standpoint that museum multiliteracies should be embraced to enrich students' learning experiences.

3.3 The role of the educator in the MAS framework

It has been claimed in relation to a radical transformation of education results in "current reform efforts [that] are reactionary and based on playing catch-up," (Houle, 2017) and soon become obsolete. This situation relates to prevailing limiting beliefs and a rather stiff attitude to stay loyal to an old paradigm. A more translucent approach to education through a new lens could be the way to move beyond this wall of confinement (Savva, 2019d). Hartkamp (2013, p.140) stresses, "we [should] invent a new language" to consider education and schooling.

We suggest that we should view educators as “learning architects” (Davenport, 2016). To better illustrate the identity of a learning architect, it is necessary to look into the objectives this role serves first (Savva, 2019a):

- To consider different ways to imagine education taking place in a post-classroom environment;
- To explore the trends that will affect the evolution of the educational environment;
- To ask new questions about a revolution in future educational systems and where they're heading; and,
- To stimulate interactions between experiences from different professions, geographical locations, and perspectives.

A *learning architect* is therefore a person who exhibits an understanding of good and next practices related to educational leadership, programming, teaching, learning, planning, and facility design. We should re-conceptualise the role of educators. Through the research conducted by Savva (2019b) in relation to museum multiliteracies and teaching practices, she identifies several overlapping roles which can inform the kind of educators we need.

Key to the effective incorporation of appropriate and creative blends between the digital and print literacies for young learners is the role of the educator. Any attempt to meet the challenges of the new communication landscape and enable educators and pupils to engage in new forms of literacy should pay attention to the role of teachers as knowledge creators in this endeavor (Farren, Keane, Hennessy and O'Mahony, 2007, p.1). It is claimed that significant change in student learning outcomes is not in evidence until change in pedagogy occurs (Navehebrahim, 2011, p.866), and educators are the ones who carry this role.

I have identified several overlapping roles for educators within the MAS framework. Firstly, although the MAS framework is not set for teaching a specific curriculum or subject, educators in the framework should position themselves as *teachers of literacy*; yet this conception of literacy is broadened in functional terms of providing access to

multimodal texts, the burgeoning textual forms such as interactive comics, videos, films, graphics, and visual images that students “read” (New London Group, 2000; Rowsell et al., 2008). The premise in utilising the MAS framework is to increase educators’ (museum educators and schoolteachers) multimodal literacy and give them the pedagogical resources to broaden their teaching repertoires in relation to multimodality and the cultural and linguistic diversity of their students.

Secondly, the MAS framework suggests that educators become critical readers of various forms of texts. Freire and Macedo name this role as “teacher as initiator of change” (1987). Ajayi (2011, p.398) and Rowsell et al. (2008) argued that new communication technologies afford learners unlimited potential to practice multiple literacies across cultural, social, economic, and national boundaries, and in the process, re-conceptualize their self-identities as multiple, hybrid, complex, and dynamic.

Another significant role for an educator in the MAS framework is to act not as an authority figure, the only possessor and transmitter of knowledge (Vosniadou, 2006), but rather to become a *co-designer* or *co-inquirer* (Yayli, 2009, p.207) of the social futures for learners drawing from the concept of design found in multiliteracies pedagogy. In this sense, they would act as co-inquirers in meaning making. Cochran-Smith and Lytle (1999, pp.253-274) make a distinction among three approaches to knowledge development in teacher education: knowledge *for* practice (content knowledge), knowledge *in* practice (practice, narrative, reflection) and knowledge *of* practice (systematic inquiry in communities of practice). In the MAS framework the educators should pertain to the third approach: unlike in a student-centred curriculum where the teacher is an expert guide and the student is an explorer, here a practice-oriented curriculum is proposed, where, with an understanding of multiliteracies, the teacher and the student are co-inquirers, which could provide both teachers and students with “social and symbolic interaction” (p.25). Educators take roles as researchers of knowledge.

The above role is also backed up by the notion of *teachers as border-crossers* (Giroux, 1992, p.26), which emphasizes the fact that teachers are learners who continuously develop themselves in their transitions from one sub-culture into another. This notion considers that teachers should become *agents of social inclusion* in teaching students whose cultural backgrounds differ from their own (Helfrich & Bean, 2011, p.215).

Undertaking a culturally responsive approach to teaching within the MAS framework is not an easy task; it has been suggested that many white teachers experience some ambivalence toward minority and immigrant students (Hollins & Torres-Guzman, 2005; Sleeter, 2001) and doubt their efficacy in teaching students whose cultural backgrounds differ from their own (Helfrich & Bean, 2011).

4. Summary

This deliverable provides the overarching framework of pedagogy for the MAS project. The intention is to provide with guiding design principles for instructional practices to be pursued, through creative synergy of overlapping theories and pedagogies to address the current dissonance between home and school practices, specifically the cultures, languages, needs and interests of 21st century learners, in particular culturally and linguistically diverse students.

The study of the MAS framework adhering to multiliteracies pedagogy, Learning by Design and museum based research, all seek to inform consideration of the particular affordances museum-based literacies can offer to the student learner. The objective in this environment is to observe how students can reach a greater level of understanding with regards to necessary and appropriate skills for both the museum context and, more importantly, future contexts outside of the museum. The ultimate goal should be to enable the learner to use any or all of the resources available to transform the meaning of texts so that they become personally meaningful and can be applicable to different contexts. Lave (1996, p.161) refers to this as 'changing participation in changing practices'.

5. References

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