UNDERSTANDING AFFORDANCES IN MUSEUM EDUCATION CONTEXT

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ABSTRACT
The notion of a space presenting a set of inherent affordances for a range of possible actions has gained some traction in recent discourse on learning spaces. However, there are few studies that investigate affordances in the museum context. Far too little attention has been paid to understanding how affordances can inform the pedagogical approach of museum educators. This paper focuses on how educators can utilise the affordances of the museum learning environment in a way that may contribute to impacting more deeply as part of student learning. I argue that understanding affordances is critical in maximising the pedagogical possibilities of learning in museums. Furthermore, examining how museum educators achieve this success may have significant ramifications for suggesting how school teachers may curate learning by intentionally organising the classroom’s physical space and adapting pedagogy to suit.

KEYWORDS: AFFORDANCES, INNOVATIVE LEARNING ENVIRONMENTS, MUSEUM, MUSEUM EDUCATION, PEDAGOGY.

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INTRODUCTION
At the Australasia Regional Conference of the Association for Learning Environments, held from 29th of May to the 1st of June 2016, Professor Kim Dovey stated that, “Every environment is a learning environment”. This statement resonated strongly with my research interest. An array of features found in any environment has potential agency in the learning process. Imagine how a toddler who is just learning how to walk could interact with the objects in an ordinary living room – a space that was not intentionally designed to teach toddlers how to walk. The room has certain features and elements that could be used to assist the learning-to-walk process. He could use an ottoman to pull himself up into a standing position. The edges of the sofa could offer the toddler balance as he glides from one end to the other. Other children currently within that space can also offer him support as he takes his first few steps. These features and elements are called ‘affordances’.

THEORY OF AFFORDANCES
The concept of affordances takes its roots from psychology where it originally pointed to human and animal perceptions of their surroundings. When the term was utilised by Gibson (1979) within the field of ecological psychology, he used it to refer to environmental properties that allow the actor within that environment possibilities for action. He proposed that fundamental elements of the environment such as the substance, medium, surfaces and their layout, objects, other persons and animals, and finally, places and hiding places, have affordances. He gave the following examples to illustrate this concept: air affords breathing, unimpeded movement relative to the ground, and visual perception. Water, on the other hand, affords drinking, pouring from one container to another, bathing, or washing. A surface, such as the ground, affords support, walking, running, or standing.

It is important to note that the existence of affordances does not automatically lead to a specific action or behaviour but rather they contribute to the possibility for those actions to occur (Greeno, 1994). For example, when a person enters a room with a staircase, it does not mean that he will use this to ascend or descend to a different level. However, it allows him the capacity to possibly do so. The same object can also have multiple affordances. The same staircase can be used for sitting and other actions. Also, the same staircase can offer different affordances for other persons with different abilities.

The theory of affordances has been used and applied to various disciplines such as architecture, technology, special education, and even communications. Although it is more popularly employed in design and information and communication technologies (ICT).

If every environment offers affordances for learning then it follows that spaces intentionally designed to stimulate learning, such as museums, would offer even more teaching or learning affordances. However, there are few studies that investigate affordances in the museum context.

One study by Trondle et al. (2014) found that curatorial decisions related to the exhibition space (such as specific arrangement of artworks, choice in wall colour, and differences in floor surface) affect visitor attention and inform their behaviour within that space. Another study by Achiam, May, and Marandino (2014) that followed 12 visitors in a natural history museum concluded that affordances of the exhibition space dictate the interpretive strategies they employ in their meaning-making process. For example, the museum’s discovery room affords the action of touching and manipulating objects, which in turn affords active examination of said objects. They also found that being able to stand close to displays in the exhibition galleries offers visitors with a sense of authenticity in terms of the size and feel of the items on display. Also, putting similar objects closely together in a cluster affords comparison and the ability to examine the similarities and differences between them.
The lack of research on affordances and museum learning is a critical oversight. In many cases museum curators and educators intentionally manipulate the museum environment to curate learning with, arguably, considerable success. I contend that understanding affordances is vital in maximising the pedagogical possibilities of the museum learning environment. Furthermore, examining how museum educators achieve this success is likely to have significant ramifications for understanding how school teachers can curate learning by intentionally organising the classroom’s physical space and adapting pedagogy to suit. This is a gap that my research seeks to address.

ABOUT THE RESEARCH

For the purpose of this study, I assume museums to include art, history, natural history, cultural, heritage, and children’s museums as well as science centres. I use the term educators to refer to individuals who purposely and actively engage students in a learning activity when they visit museums during school field trips. This includes, amongst others, curators, museum education staff, docents, volunteers, as well as school teachers who bring their students to the museum and accompanying parents.

Programmes for students in museums are either held within the exhibition galleries, in purposely built classrooms or lecture halls, or in both. These spaces are the focus of my research and I refer to them as the museum learning environment. However, in defining what encompasses this learning environment, I take into consideration not only the physical and built aspects of the space where the museum educator teaches and students learn. Instead of treating these spaces like classrooms, I move beyond the bounded notion of the classroom as container (Healy, Grant, Villafranca, & Yang, 2015) and embrace Soja’s (2014) view that space is multi-dimensional, simultaneously encompassing the “real-and-imagined” (p. 177), the social and material. Hence, I take a more holistic view of the learning environment as the interaction of the material, social, cultural, digital, conceptual, personal, emotional, and cognitive aspects.

The combination of museum objects, wall colours and arrangements, light levels, sounds, smells, digital media, presence of other museum visitors, conversations with peers, wall texts and captions, as well as the emotional responses elicited by the exhibition narratives (or by just being in that space) are part of what makes the museum learning environment unique. However, far too little attention has been paid to investigating how this impacts on the pedagogical approach of museum educators or how they are utilising these environmental features to improve student learning. I will use Gibson’s theory of affordances as a lens with which to examine what the museum environment can offer to assist pedagogy.

My research will focus on understanding what affordances the museum environment offers and examine how museum educators utilise these. The main question this research study will attempt to answer is: 

**What can school teachers learn from museum educators in maximising affordances of the museum environment to contribute to students’ deep learning?**
The research question separates into four sub-questions:

1. What pedagogical affordances does the museum environment provide?
2. Are museum educators aware of the pedagogical affordances and will enhancing their awareness of these lead to increased/improved use?
3. What strategies are museum educators employing that maximise these pedagogical affordances to contribute to students’ deep learning?
4. How can these strategies be applied in a classroom setting?

**SIGNIFICANCE OF THE RESEARCH**

My research aims to contribute to an emerging body of evidence-based research on the valuable contribution of museums to student learning. Specifically, I plan to examine museum educators’ strategies for utilising affordances of the museum environment that support students’ deep learning.

This research is embedded within a larger ARC Linkage Project, Innovative Learning Environments and Teacher Change (ILETC, LP150100022), that aims to investigate how school teachers across Australia and New Zealand can utilise affordances of innovative learning environments (ILEs) including museums and other alternative spaces to improve pedagogy and impact students’ deep learning. The four-year ILETC project will work in partnership with education departments in New Zealand, Queensland, the ACT and NSW, as well as key industry partners such as furniture designers, ICT and acoustics specialists, school designers and their professional bodies, museums, and leading research-focused schools.

Through the ‘Building the Education Revolution’ (BER) programme implemented in 2009, the Australian Federal Government committed $16.2 billion to construction and refurbishment of Australian school facilities that foster 21st century learning among its students (State of Victoria [Department of Education and Training], n.d.). However, Blackmore et al. (2010) found little empirical evidence indicating that the built learning environment contributes to improved student learning. Furthermore, Hattie’s (2008) synthesis of over 500,000 studies on influences that result in improved student learning in school indicates that space barely makes an impact on student achievement. He notes that one of the biggest contributing factors is the teacher; specifically “what the teachers know, do, and care about” (Hattie, 2003, p. 2). It is, therefore, the teachers’ mind frames, or ways of thinking, that ILETC will focus on and regard as the dependent variable and affordances as an intervening variable. The project argues that changing the learning environment does not automatically result in improved teaching.

Do teachers teach the same way when there is a change in the learning environment? In his opening address for the Terrains 2015: Mapping learning environment evaluation across the design and education landscape international symposium, Hattie says “If you take teachers out of their egg crates and put them into fascinating and innovative designs, they teach the same way; it makes no difference”(Terrains, 2015, p. 11). This proposition is echoed in the framework hypothesis of the ILETC project, which posits that unless teachers change their mind frames about how students can better learn in these spaces, their teaching practices will remain the same.

One of the issues that the ILETC project is trying to address is that school teachers, it would seem, are not maximising the affordances of ILEs to improve student learning. My research will focus on another type of learning environment, museums, that appear to have some success at utilising the environment to positively affect student learning. By investigating museum educators’ use of the museum environment, I aim to identify pedagogical strategies that they employ to maximise the potential of the environment.
in contributing to deep learning in students. The primary contribution of this research to the ILETC project, therefore, is in exploring if and how these strategies of museum educators can be applied by school teachers to their classroom practice.

**TAXONOMY OF AFFORDANCES OF THE MUSEUM ENVIRONMENT**

Identifying affordances of the museum environment will be the initial step in understanding how these can be effectively used and adapted to classroom pedagogy. However, what is meant by the term has become muddled by the various interpretations of the theory and definition of affordance that have been put forward since Gibson first articulated the concept in 1979. Oliver laments that “it is now too ambiguous to be analytically valuable” (Oliver, 2005, p. 402).

A more suitable definition of affordances for use in a museum context is put forward by Pea (1993). He argues affordances to be the perceived and actual functional properties of an object that determine how it could possibly be used. However, this definition is still limited as it only accounts for the physical elements of the environment. What about elements that do not have physical or material manifestations but are also critical to learning and teaching such as prior knowledge? Falk and Dierking’s (2013) *Contextual Model of Learning* proposes that learning in the museum is influenced by the interplay of the following three distinct contexts: the personal context, the socio-cultural context, and the physical context. Decisions museum visitors make are “filtered through the personal context, mediated by the sociocultural context, and embedded within the physical context” (Falk & Dierking, 2013, p. 30). Therefore, for this research, a definition of affordance that encompasses the personal, social, and physical elements of the museum environment has to be developed.

Rather than attempt to identify the infinite number of affordances of every element within the museum environment, a taxonomy of museum affordances will be established that draws on the work of Conole and Dyke (2004), who put forward a taxonomy of ICT affordances. Their taxonomy outlines 10 categories that support teaching and learning within the ICT context. Understandably, not all categories are applicable to the museum context. However, some (such as diversity, communication and collaboration, and reflection) can be applied to both ICT and museums. My initial thoughts on other categories for museum affordances include choice, authority, experience and immersion, and emotional resonance. These categories require further development before they can be utilised in the field. When refined, such a taxonomy may help in understanding how affordances are utilised by museum educators and how these may also be applied to classroom pedagogy. Consequentially, a checklist of affordances may also have implications on how museum curators design exhibitions, particularly those specifically created for schools.

From my own experience curating exhibitions, some elements within the exhibitions are used by visitors beyond my curatorial intentions. This repurposing of elements can be seen as consequential affordances. Hence, under each affordance category are two sub-types, intended and consequential. It is important to note that one affordance can have both sub-types. The proposed taxonomy will also articulate with the relevant learning theories – particularly the *Contextual Model of Learning* (Falk & Dierking, 2013). Development of the taxonomy will be in accord with a process of testing and refinement.
REFERENCES


