

## Learning at Discovery Stations

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To understand learning at Discovery stations, we need to dive into the field of **Informal Science Education (ISE)**. Whereas formal science education takes place within the boundaries of schools, ISE can be found in a wide range of settings outside of the formal education system. Some typical ISE institutions are natural history museums, botanical gardens, zoos, and national parks. In comparison to formal science education, ISE offers some unique strengths that should be considered when designing educational programs, such as discovery stations, in ISE settings.

The biggest difference between formal education and ISE is that people can choose what they want to learn. This type of learning is called **free-choice learning**. Free-choice learning allows people to learn only about things that they find relevant and interesting which can facilitate the learning process.<sup>1</sup> To encourage people to learn in such a free learning environment, we need to design activities that align with visitor expectations.

One of these expectations is that education should be delivered in an **entertaining** way. When Packer and Ballantyne asked museum visitors about the goal of their visit, many indicated wanting to learn something new and exciting as well as wanting to learn something in general.<sup>2</sup> The researchers argued that these expectations should be part of the same category called “Learning and Discovery”. Most people also mentioned that entertainment was required to make the educational experience “palatable”. To effectively fulfill the expectation of “Learning and Discovery”, the authors suggest designing fun activities as an entry point to educational experiences or involving multiple senses in the learning activity.

**Authentic objects** also have implications for the design of ISE interventions and especially Discovery stations. Since a core idea of Discovery stations is to feature a selection of objects, curating the right ones is important. Authentic objects broadly refer to objects that are perceived as real or special and difficult to obtain. Examples could be fern fossils, pine cones or even living insects. Research in this field suggests that such authentic objects inspire visitors to ask more questions and consequently learn more about these objects in comparison to replicas.<sup>3,4,5</sup> Thus, to inspire learning at discovery stations, featuring authentic objects should be considered.

Another consideration is **social interaction**. In ISE settings, learners can freely interact with peers and staff. According to the sociocultural theory of learning, social interactions are an important aspect for the development of knowledge<sup>6</sup> (Dam et al., 2020). Social interactions can be facilitated through questions or group activities.

In summary, to maximize learning at discovery stations, we can use theoretical knowledge in ISE learning to guide our decisions during the design process. First, we can try to understand and cater to visitor expectations, such as that the learning process should be enjoyable. Second, we can include authentic objects where possible. Finally, we can encourage social interactions. This text should only serve as a guide into the theoretical background behind learning at discovery stations, but there is much more literature to be read or areas to be studied.

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<sup>1</sup> Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational psychologist*, 41(2), 111-127.

<sup>2</sup> Packer, J., & Ballantyne, R. (2004). Is educational leisure a contradiction in terms? Exploring the synergy of education and entertainment. *Annals of Leisure Research*, 7(1), 54-71.

<sup>3</sup> Bunce, L. (2016). Appreciation of authenticity promotes curiosity: Implications for object-based learning in museums. *Journal of Museum Education*, 41(3), 230-239.

<sup>4</sup> van Gerven, D., Land-Zandstra, A., & Damsma, W. (2018). Authenticity matters: Children look beyond appearances in their appreciation of museum objects. *International Journal of Science Education, Part B*, 8(4), 325-339.

<sup>5</sup> Pekarik, A. J. (2007). An evaluation of the national museum of natural history discovery room.

<sup>6</sup> Hall, D. M., & Martins, D. J. (2020). Human dimensions of insect pollinator conservation. *Current Opinion in Insect Science*, 38, 107-114. <https://doi.org/10.1016/j.cois.2020.04.001>