



## LEARNING THEORY AND BOTANIC GARDEN EDUCATION PRACTICE

Learning theories guide our education practice either consciously or unconsciously. This paper discusses how botanic garden education practitioners can utilise learning theory to plan for meaningful and enriching learning experiences. These experiences can focus both on the learner as an individual and the impact they have on his or her life, as well as on groups as social units and the process of participation in these groups. The paper traces the roots of key theoretical approaches to two learning metaphors: the acquisition metaphor and the participation metaphor.

One of the central debates in the field of learning is whether the learner is to be understood as an individual or as a community. These are two of the dimensions of learning that have been inspired by two different approaches to learning respectively: a cognitive approach, which sees learning as an acquisition of concepts or knowledge, and a participation approach, which places emphasis on the activity or practice of a community (Sfard 1998). These approaches to learning or learning metaphors dominate learning theory, research and practice across disciplines. They also guide our practice as educators, researchers and learners. In fact, each of those metaphors can offer us different insights into the mechanisms of learning as an individually constructed and socially mediate process.

↑ *BigPicnic co-creators developing digital stories.*  
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This paper aims to show how a theory-based practice can help botanic garden educators plan and run educational provision purposefully and proactively. The paper begins by explaining why learning theory is important. It then examines two of the dominant learning theories in science education – namely constructivism and sociocultural learning theories – the roots of which can be traced back to the acquisition and the participation metaphors. The paper concludes with a case study which illustrates some of the key principles of these theories.

Learning theories guide all education practice either consciously or unconsciously. Using theory in a conscious or purposeful manner can become a very powerful tool in shaping our practice. As Suppes (1974, p 4) stated in his presidential address to the American Educational Research Association, 'A powerful theory changes our perspective on what is important and what is superficial'. It can also help us build evidence-base links to our practice which has a two-fold benefit. On the one hand, it can better meet the expectations and learning needs of your visitors. On the other, it can help us reflect on our practice and improve or even change it (Hohenstein and Moussouri, 2018).

The term learning theory tends to be used to refer to any theoretical approach that tries to explain how people learn. Learning theories consider 'what type of changes take place in the minds, brains, and bodies of the learners.' (Hohenstein and Moussouri 2018, p. 20). In the context of informal learning environments, such as botanic gardens, the most commonly used learning theories are constructivism and, more recently, sociocultural learning theories. It is worth keeping in mind that both of these theories are 'umbrella' theories that have different branches and their interpretation may well differ as they may emphasise particular aspects of learning, e.g. the role of the individual or the environment, the learning process or the outcomes of learning, the role of emotions/affect or the role of motivation.

Constructivism views learning as a process of concept development driven or constructed by the learner. Concepts are seen as the basic units or building blocks of knowledge. Concepts are further developed and combined leading to more complex and richer cognitive structures. Through their interaction with their environment and personal experience, learners construct their understanding of any given subject (Hein, 1998). In other words, they are able to internalise knowledge, to make it their own. Sociocultural theories of learning argue that it is not possible to separate learning from its social and cultural context (Rogoff, 2003). Instead, learning is seen as the process by which learners become participants in knowledge communities (such as the community of botanists or archaeology enthusiasts). So, the focus here shifts to the group/community as a social unity.

In practice, the two learning metaphors on which these theoretical approaches to learning are based are not as mutually exclusive as they may seem. They can be combined and applied in science education practice because of the differing perspectives they offer. Consider the following illustrative case study. Bigpicnic [<https://www.bigpicnic.net/>] is an EC-funded project that brings together different stakeholder (scientists, policy-makers, citizens, etc) to find ways to tackle food security. Coordinated by BGCI, fourteen botanic gardens, with help from other partners, co-create exhibitions and events about food security in collaboration with different visitor groups and other communities. Learning and development is at the heart of this project and involves not only visitors or community members, but also the botanic garden professionals, their colleagues and the botanic gardens as organisations themselves. For example, the Royal Botanic Garden Edinburgh (RBGE) developed a digital storytelling project aimed at giving a voice to disadvantaged communities about access to nutritious food.



↑ Digital storytelling has been helping Royal Botanic Gardens Edinburgh to engage their local community with food security. ©RBGE

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## REFERENCES

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