Creativity, Aha! Moments and Teaching-Research

Hannes Stoppel and Bronislaw Czarnocha

There were four presentations of different approaches to the observation and analysis of Aha! Moment in the classroom. Czarnocha presented bisociation theory and argued for the affective/cognitive duality as an essential component of the phenomenon. Liljedahl presented the point of view developed on the basis of his dissertation and subsequent research proposing a linear process based on Wallace/Poincare/Hadamard four stage theory. As conclusions cognitive experience is unremarkable whereas affective experience is remarkable for illumination. Stoppel presented his research from the course on coding and cryptography, pointing to two different condition of occurrence and related views of students on creativity, and Palatnik presented expanded analysis of his dissertation, which documented an Aha! Moment in connection with the Problem of dividing a Pizza into a maximal number of pieces by a given number of cuts. He argued for the high complexity of the process, expressing the point of view that bisociation is too simple to account for it.

By Czarnocha the definition of bisociation suggests that the construction of mathematical schema takes place during the Aha!moment. An Aha!moment is characterized by both an essential cognitive process and by an affective experience leading to cognitive/affective duality to the Aha! moment, since construction of the schema is a unique mathematical process.

According to Liljedahl Aha! Moments are not unique for mathematics. What characterizes Aha! moments in distinction to other mathematical activities is only affective experience, although Perter was heard accepting the fact that in the light of Koestler definition of bisociation as connecting two frames which by themselves are not connected, there is an important mathematical cognitive process of constructing a schema of thinking taking place. Palatnik argued that bisociation is not enough to imagine what happened before. Furthermore it is too simple a concept to

H. Stoppel (✉)
University of Münster, Münster, Germany
e-mail: hannes.stoppel@uni-muenster.de

account for the complexity of mathematical issues arising during the Aha! moments as e.g. not only the solution makes sense. Here the question appeared whether sense is necessary for an Aha!moment.

There were altogether around 15 participants, although their composition had changed between the first and the second session.

Important questions and comments during the discussion were as follows:

1. Is the creation of a schema of thinking relatively to the problem at hand a central cognitive component of the Aha!Moment or is Aha!Moment primarily an affective experience?
2. How do we know the Aha!Moment has taken place? Do we need the student to explain the content of the Aha!Moment? Is every generalization obtained through Aha!Moment? These questions referred to one Czarnocha's example; the other example, "the Elephant" was accepted as an example exemplifying bisociation.
3. Does the level of complexity of analysis is intrinsic to the nature of Aha! Moment or is the result of the methodology used?
4. Are different conditions in which student see the occurrence of creativity related to different approaches to problem solving?
5. Interesting complementary connection was observed joining Palatnik problem and one of Liljedahl's problems.

Open Access Except where otherwise noted, this chapter is licensed under a Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.