



M. Sci. Jaakko Turkka
 Jaakko.turkka@helsinki.fi
 &
 Prof. Maija Aksela
Maija.aksela@helsinki.fi

Unit of Chemistry Teacher Education
 University of Helsinki
 Finland

AESTHETIC EXPERIENCES: A CASE STUDY OF EMOTION REGULATION IN INTEGRATING DRAMA AND CHEMISTRY CONCEPTS

INTRODUCTION

Emotions are a crucial part of science education. Emotions give unity to learning experiences demarcating them from the continuous stream of experience (Dewey, 1934/2005). According to Dewey this unity involves intelligent, practical action and emotion. Experiences where these components are perceived to come together are called aesthetic and recognized as a feeling of beauty and unity. This encourages investigating emotions in art and science integration, where these components are interwoven (Turkka, Haatainen & Aksela, 2017) such as drama. While the research on emotions in science education is still emerging, emotion regulation offers tools for understanding the moments when emotions can be influenced by teachers (Jacobs & Gross, 2014).

RESEARCH QUESTIONS

What are the key practical actions in integrating drama and chemistry concepts?

What are the emotions related to these dramas?

How are those emotions regulated by student teachers in these dramas?

METHODS

The study setting involved pre-service chemistry teachers who organized drama activities about science concepts (e.g. galvanic cell, carbon cycle, states of matter) first for their peers and afterwards for students of age between 13 and 18. The data consists of a video record of the drama activities for peers and recorded interviews (N=4) after the drama activities for students. The data was analyzed with inductive content analysis (Mayring, 2014). The study is part of doctoral thesis research on drama in chemistry education

RESULTS

The initial results are shown in two tables. Emotion regulation done mainly by students (bolded in the second table) is included, because teacher can influence these as well. The relative frequency of the code is indicated with a number.

Action

Teacher:

- Division of roles (19)
- Manipulating the space (6)
- Narrating the events (44)
- Improvisation prompts (23)
- Expression instructions (17)
- Linking expressions to concepts (12)

Students:

- touch, movement (10)
- spontaneous expression (11)
- Verbal communication (13)

IMPLICATIONS

When facilitating drama about science concepts the instructor can influence the students emotions by modifying the situation as follows:

- Support spontaneous expression of students. E.g. by improvisation tasks.
- Prepare a narration of events based of humor and excitement
- Give respect for students
- Emphasize tasks where an individual doesn't stand out (if the level of anxiety is too high)

Emotion (students)	Regulation (teacher)
Anxiety (16), related to: acting out.	Getting used to drama (11), Managing the amount of standing out (4), building trust (13)
Confusion (4)	Managing the complexity of the drama (9)
Relief (2): relief from initial tension	
Enjoyment (9): from acting and the story	Planning for humor, excitement, music (17), acting out emotions (4), spontaneity (9)
Frustration (4):	Giving value beyond learning content (4) Teacher support (7)
Anger/irritation (5):	Respect for students (1)
Shame (3):	Instructor example (7), Imitation (3), social pressure (3)
Pity (1)	

CONCLUSIONS

The range of emotion in drama about science concepts is wide and revolves around teacher *narrating* and students *acting* the events. Here, enjoyment is related to the humor and excitement and to spontaneity of acting. Anxiety is related to social aspects of acting and therefore has similarities with shame. Anxiety is regulated by managing the standing out of an individual and building trust in the group. Touching and spontaneous expressions stood out as an action that revealed emotions of students for pre-service teachers.

REFERENCES

- Dewey, J. (1934/ 2005). *Art as experience*. Penguin. Original book written in 1934
- Jacobs, S. E., & Gross, J. J. (2014). Emotion regulation in education. *International handbook of Emotions in Education*, 183–217.
- Mayring, P. (2014). *Qualitative content analysis: theoretical foundation, basic procedures and software solution*. Klagenfurt. Retrieved from <http://nbn-resolving.de/urn:nbn:de:0168-ss0ar-395173>
- Turkka, J., Haatainen, O., & Aksela, M. (2017). Integrating art into science education: a survey of science teachers' practices. *International Journal of Science Education*, 1-17.