

The analysis of conspiracy theories as a stimulus to active learning

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Abstract. The development of students' critical thinking, argumentation skills and formulating hypothesis is admittedly considered an integral part of physics education. The aim of our pedagogical experiment is to develop these skills by critical analysis of selected conspiracy theory related to physics phenomena. This paper describes the theoretical background and methodological notes to activity based on students' analysis 5G technology conspiracy theory in the physics education at the upper secondary school. Finally, the paper presents didactically processed experience of implementation the activity in optional subject during distance education with 10 students.

Keywords: critical thinking, argumentation, hypothesising, activity, upper secondary school.

1 Introduction

The conspiracy theories often relate to important spheres of social life. They are seemingly easy to understand and attractive. Although conspiracy theories are usually based on scientific rhetoric, they contain manipulative statements, they argue with concepts taken out of context, and information that is not verified and substantiated by facts.

Nowadays, increasingly more people are confronted with conspiracy theories as a result of the widespread access to the internet [1]. Thus, it is crucial to assess every new piece of information critically. An individual who thinks critically analyses information and situations, evaluates evidence and arguments, and makes conclusions by using reflective decision-making solutions [2]. Critical thinking is not an innate skill, it has to be learned, developed, practiced and continually integrated into the curriculum [3]. The development of critical thinking related to argumentation skills and hypothesis formation, stems not only from the need of the individual, but also from the requirements of society [4].

There is an expectation that education will lead students to form an opinion about conspiracy theories. Here, we utilized 5G technology conspiracy theory as a stimulus to active learning and development of above-mentioned skills in physics education on the age level 17-19 years. While choosing the specific conspiracy theory, its relation to physics content, curriculum, students' age, and relevance to current students' interest was take into account.

2 Activity – Analysis of the 5G conspiracy theory

The aim of suggested activity is to develop critical thinking, argumentation skills and hypothesis formation by critical analysis of a part of an article with conspiracy content [5]. The activity has fixing function in terms of factual knowledge. Its implementation requires students

to have knowledge of electromagnetic spectrum, radiation and energy. The activity is divided into two 90 minutes parts as specified in Table 1.

Table 1 The structure of the activity in distance form of education

I. part	<ul style="list-style-type: none"> • Teacher acquaints students with activity's topic. • Teacher sends the article with conspiracy content to the students and acquaints them with their task. • Students individually read the assigned article and formulate their own opinion about 5G technology. • Students share their opinion by sending an audio recording to the teacher.
Teacher analyses students' answers and assess if they formed opinions based only on the statements in the article or also based on knowledge of electromagnetic radiation or other available information.	
II. part	<ul style="list-style-type: none"> • Students present their opinions in class. • Teacher moderates a discussion aimed at physics phenomena related to 5G technology. • Students formulate hypotheses resulting from the article and/or discussion and propose their verification. • Students (with teacher's support) analyse the article from critical point of view. • Students assess and compare their initial approach to article with critical analysis of the article.

2.1 Implementation and experience

The activity was carried out with 10 students. Each of them read the article and formulated own opinion about 5G technology. Five students considered statements from article to be true. Only two students critically analysed and assessed statements in article spontaneously. This strikingly low threshold for accepting information from an article underlines the need to incorporate this type of activities into the education. The article was stimulating for all students. They actively participated in the discussion, reflection and hypothesis formation. They formulated 4 hypotheses and proposed process of verification one of them.

3 Conclusion

The activity successfully fulfilled the aim to develop critical thinking, argumentation skills and hypothesis formation of students. Moreover, by breaking the lesson' stereotype, all students, including "typically passive" students, actively participated in the activity. Students appreciated the opportunity to discuss about a conspiracy theory and to express their opinion and it is safe to conclude that this activity is suitable for implementation in the education.

References

- [1] Clarke, S. (2007). Conspiracy Theories and the Internet: Controlled Demolition and Arrested Development. *Episteme*, 4(2), 167-180.
- [2] Stobaugh, R. (2016). *Assessing Critical Thinking in Middle and High School: meeting the common core*. New York: Routledge.
- [3] Trúsiková, A. & Velmovská, K. (2020) Critical Thinking and Physics Problems. *EDUreview* 8(2), 119-126.
- [4] Rudinow, J. & Barry, V. E. (2008) *Invitation to critical thinking*. USA: Thomson Wadsworth.
- [5] Mercola, J. (2019) The 5G War – Technology versus Humanity. *Global Research*.