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Educational Myths Debunked. Insights into the Development, Implementation, and Evaluation of a Course for University Faculty

Abstract

This article discusses *Educational Myths Debunked 101 (EMD101)*, a further education course designed to help university faculty identify, analyze, and debunk myths about teaching and learning in higher education. Based on educational psychological findings, *EMD101* covers the theoretical basics such as characteristics, causes, consequences of, and dealing with educational myths. Through an emancipatory, transfer-oriented, and reflective approach the course enables faculty to critically evaluate potential questionable teaching beliefs and practices in higher education. The paper details the course objectives, content, and includes a critical review of its strengths and weaknesses, suggesting areas for future improvement.

Keywords

educational myths, misconceptions, debunking, higher education, faculty

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Bildungsmythen entlarvt. Einblicke in die Entwicklung, Implementierung und Evaluation eines hochschuldidaktischen Kurses

Zusammenfassung

In diesem Artikel wird der Kurs *Educational Myths Debunked 101 (EMD101)* vorgestellt, der Dozierenden helfen soll, Mythen in der Hochschullehre zu erkennen, zu analysieren und zu widerlegen. Auf der Grundlage bildungspsychologischer Erkenntnisse werden die theoretischen Grundlagen wie Merkmale, Ursachen, Folgen und Umgang mit Bildungsmythen behandelt. Durch einen emanzipatorischen, transferorientierten und reflexiven Ansatz befähigt der Kurs Dozierende, mögliche fragwürdige Überzeugungen und Praktiken in der Hochschullehre kritisch zu bewerten. Der Artikel beschreibt die Ziele und Inhalte des Kurses und enthält eine kritische Bewertung seiner Stärken und Schwächen sowie Vorschläge für zukünftige Verbesserungen.

Schlüsselwörter

Bildungsmythen, Fehlvorstellungen, Widerlegung, Hochschulbildung, Dozierende

1 Introduction and Theoretical Background

You're a visual learner. We only use 10 % of our brains. There are multiple intelligences. Educational myths often appear in the form of phrases and platitudes (Siegel, 2024a). As in other domains, many myths exist in education. They are beliefs about teaching and learning phenomena that are held contrary to known evidence. They can be characterized as common and enduring beliefs, that might sound reasonable at first, but are not scientifically sound (e.g., De Bruyckere et al., 2020).

(Inter)national educational psychology research increasingly shows that many educational myths are widespread – not only among lay people, but also (prospective) teachers and other professional educational staff (see for an overview e.g., De Bruyckere et al., 2020; Lilienfeld et al., 2010).

Myths in education often stem from a kernel of truth. However, as *mis*beliefs, they serve as filters, frames, or guides that influence faculty thoughts and practices (Fives & Buehl, 2012). These myths can become problematic, particularly when policymakers, educators, or researchers unconsciously act on them or even spread them (Lilienfeld et al., 2010; Holmes, 2016; Sinatra & Jacobson, 2019).

Educational and cognitive psychological research increasingly provides evidence that these myths a) originate from various causes and sources (e.g., cognitive biases; media), b) can harm various stakeholders (e.g., faculty wasting time or money), c) tend to persist, but at the same time, d) can be remedied (e.g., Lewandowsky et al., 2020). They can impede the professional development of educators, evidence-informed educational practices, student learning, and effective educational policy, ultimately harming the teaching profession (e.g., eroding trust in faculty expertise if they are found spreading myths; Christodoulou, 2014; De Bruyckere et al., 2020; Menz et al., 2021). In short, they are not compatible with professional (initial, continuing, and further) education (e.g., Lilienfeld et al., 2010).

Accordingly, a growing number of publications in educational psychology aim to identify, analyze, and refute common misconceptions about teaching and learning

(e.g., Christodoulou, 2014; Holmes, 2016). But how can findings in education, psychology, and related disciplines be effectively used as a basis for academic staff development (Berendt et al., 2005; Mörth et al., 2023) to foster critically reflective teaching (Brookfield, 2017)?

> "Critically reflective teaching happens when we identify and scrutinize assumptions that undergird how we work. The most effective way to become aware of these assumptions is to view our practice from different perspectives. Seeing how we think and work through different lenses is the core process of reflective practice." (Brookfield, 2017, pp. xii–xiii)

At the same time, the quality of teaching in higher education has become increasingly important for universities and higher education institutions in Germany, Austria, and Switzerland (Berendt, 2005; Mörth et al., 2023). Correspondingly, there has been a significant shift towards evidence-informed practice (e.g., Hattie, 2023) involving scrutinizing subjective theories (Groeben et al., 1988) and teachers' beliefs (Fives & Buehl, 2012) as teaching and learning based on unfounded assumptions can be detrimental to professional practice (e.g., relying on ineffective teaching and learning strategies; e.g., Lilienfeld et al., 2010).

Although misconception-based teaching approaches are used in for instance psychology courses for preservice teachers (Tulis, 2022) or in climate change education (Burls et al., 2019), to the best of my knowledge, no academic development courses exist, that explicitly focus on identifying, analyzing, and prebunking and debunking educational myths (van der Linden, 2023; Lewandowsky et al., 2020). To address the stated gap and meet a practical need at the University of St. Gallen, I designed, implemented, and evaluated an interdisciplinary further education course. Its main aim is to enable and empower instructors to identifying, understanding, and challenging prevailing myths in higher education to foster the participant's individual professionalization (Rhein, 2011) and to help them become reflective practitioners (Schön, 1987).

Academic development draws on the findings of various related disciplines, such as education, psychology, and sociology (Rhein & Wildt, 2023). In line with the main

topic of this issue of ZFHE, the central question of this paper is, how educational psychological theories, models, and findings can be used in a further education course to build the critical thinking and mythbusting competences (Cobley, 2011; Trecek-King, 2022) respectively a certain degree of mental immunity (Norman et al., 2024), i.e., a resistance to questionable and false beliefs in education – ultimately to improve the quality and effectiveness of university teaching (Ulrich, 2023)

Engaging in teaching-related knowledge management[2] (Siegel & Lohner, 2024), I provide insights into the face-to-face version of the further education course *EMD 101*. I describe its development, its structure, and discuss its strengths, and weaknesses as well as suggestions for further development and research.

2 Development and Description of the Course

As a leading business university in Europe, the University of St Gallen (HSG) is committed to excellent teaching based on the latest insights (University of St Gallen, 2024). To contribute to this vision the Centre of Learning and Teaching in Higher Education (HDZ-HSG) created a further education course to support faculty in identifying, understanding, and challenging prevailing myths in higher education.

The course was held for the first time in October 2023 as part of the HDZ-HSG's further education program, was further developed and has become a permanent element of the centre's offer in form of a web-based training (see section 4).

The course primarily addresses the active teaching faculty, but also others interested in learning more about and debunking educational myths in teaching (e.g., program managers).

2 Teaching-related knowledge management refers to the systematic practices of identifying, creating, sharing, using, and preserving knowledge related to teaching (Siegel & Lohner, 2024).

2.1 Goals of the Course

Using a backward design approach – starting with the desired learning outcomes and planning activities and assessments to achieve them (Wiggins & McTighe, 2011) – *EMD101* was designed to foster primarily cognitive and social-affective learning goals. Table 1 shows how the learning outcomes of the course align with different competence areas and dimensions (Biggs et al., 2022; Euler & Hahn, 2014):

Dimensions Areas	**Knowledge**	**Attitudes**	**Skills**
Content Competence	Know about prevalent educational myths; their characteristics, causes, consequences, and effective remedies (e.g., De Bruyckere et al., 2020)	Appreciate the importance of evidence-informed approaches in identifying, analyzing, and debunking educational myths (e.g., Siegel, 2024a)	Produce arguments and construct evidence-informed refutations to educational myths (e.g., Lewandowsky et al., 2020)
Social Competence	Learn strategies for dealing with educational myths / mythspreaders in professional contexts (e.g., Lewandowsky et al., 2020)	Respect diverse perspectives in educational psychology; accept the need for professional learning. Develop empathy towards stakeholders affected by educational myths and join forces with other mythbusters (e.g., Siegel, 2024b)	Discuss challenges in mythbusting with others, deal with them, and provide constructive feedback to peers debunking efforts (e.g., Siegel, 2024b)
Self-Competence	Evaluate personal educational beliefs and practices against evidence-informed standards (e.g., Brookfield, 2017)	Acknowledge self-reflection and involvement in professional growth (e.g., Schön, 1987)	Use reflective practices; implement strategies to debunk myths effectively (e.g., Brookfield, 2017)

Table 1: Learning Outcomes of *EMD101*

These goals were formulated by the developer of the course based on a) their understanding of the anticipated needs and interests of the intended audience and b) a review of the educational-psychological literature on (dealing with educational) myths (e.g., De Bruyckere et al., 2020; Lilienfeld et al., 2010).

2.2 Course Design Principles

For the development of the course, I used three main design principles: a) an emancipatory approach, b) transfer-orientation, and c) critically reflective practice.

Emancipatory Approach

Following an emancipatory educational approach, *EMD101* goes beyond merely transmitting information about the characteristics, causes, consequences, and potential interventions for educational myths. This approach empowers the participants to understand and engage in scrutinizing claims about teaching and learning (including their own; Pennycook et al., 2015). The course focuses on using and reflecting on various tools to identify, analyze, and debunk myths (see suppl. 2–4; section 2.3), and fostering an environment where the participants can become active mythbusters themselves (Cobley, 2011), rather than passive recipients of *the facts* (Trecek-King, 2022).

Within *EMD101*, I teach the participants not primarily *what to think*, but also *how to think*, thereby promoting intellectual independence (Shephard, 2020) within a brave space (Winks, 2018) that balances open dialogue, academic integrity, and critical thinking – valuing and nurturing (relative) academic freedom (Marginson, 1997; Oleksiyenko & Jackson, 2020).

Theory-Practice Connection: Focused on Transfer Orientation

A second fundamental design principle of this course is the strong connection between theory and practice, emphasizing transfer orientation (Anderson & Beavis, 2020). The course leverages carefully selected materials to provide information that is directly applied, enhancing learning transfer. Various tools (see suppl. 2–4) are employed to facilitate the translation of learning in *EMD101* into the participant's

own teaching, preventing disjointed learning and the buildup of inert knowledge (Renkl et al., 1996). For instance, the use of worked examples considers the participant's (lacking) prior knowledge and actively discusses transfer possibilities. This is coupled with activities encouraging metacognition, helping the participants to think about their own thinking processes and outcomes through *reflection-in action* and *reflection-on-actio*n (Anderson & Beavis, 2020; Schön, 1987; see 2.3).

Critically Reflective Practice

Related to that, a third crucial guiding principle for *EMD101* is critically reflective practice (Brookfield, 2017). Inspired by Schön's concept of developing reflective practitioners (Schön, 1987), this course aims to challenge and refine subjective theories of faculty through different lenses (see Fig. 2 in section 3), first and foremost scientific evidence. The goal is to foster participants' individual professionalization (Rhein, 2011) through irritating existing beliefs, triggering cognitive dissonance (Festinger, 1957) to foster conceptual change: This is a process in which an existing misconception is replaced with more differentiated conception (Vosniadou, 2013). As Pennycoock and colleagues would say: "One benefit of gaining a better understanding of how we reject other's bullshit is that it may teach us to be more cognizant of our own bullshit" (Pennycook et al., 2015, p. 26).

2.3 Structure and Contents of the Course

The presented blended learning course entails three parts that vary in their workload: (1) a preparation assignment, (2) a face-to-face workshop, and (3) a follow-up assignment.

The preparatory assignment (see suppl. 1) for *EMD101* involves watching the 15-minute video *The biggest myth in education* (VAK learning styles) and taking notes on specific questions about the myth's claim, counterarguments, persistence, and potential negative effects, to introduce the participants to the topic and to foster critical reflection.

The face-to-face workshop (4h) comprises a rather theoretical and a rather applied module with the following sections:

Module 1:

1. Introduction and Overview
2. The Challenge: Distinguishing Myth from Fact: What are Educational Myths?
3. The Causes, Problems and Consequences

Module 2:

4. The Approach Part 1: Heuristics
5. The Approach Part 2: Refutations
6. The Caveats: Risks to Keep in Mind
7. The Essence: Key Take-aways, Q&A, and Closing

Module 1 serves to familiarize the participants with the structure and aims of *EMD101* and covers relevant theoretical basics of educational myths (i.e., their characteristics, causes, consequences, and effective ways to deal with them (Siegel, 2024a; Lilienfeld et al., 2010). To discuss their experiences and prior knowledge regarding educational myths participants conduct pair interviews with a short guide containing four questions such as *What experiences have you had with educational myths? In what contexts have you encountered them?* Thereafter, participants write down their expectations and goals for the course on cards. Prompts include *I expect ...* or *I aim to ...* Using short videos and/or impulse presentations, interactive graphics (see Fig. 1), and various other resources (e.g., excerpts from texts) the participants gain for instance and overview of prevailing myths in higher education (e.g., De Bruyckere et al., 2020).

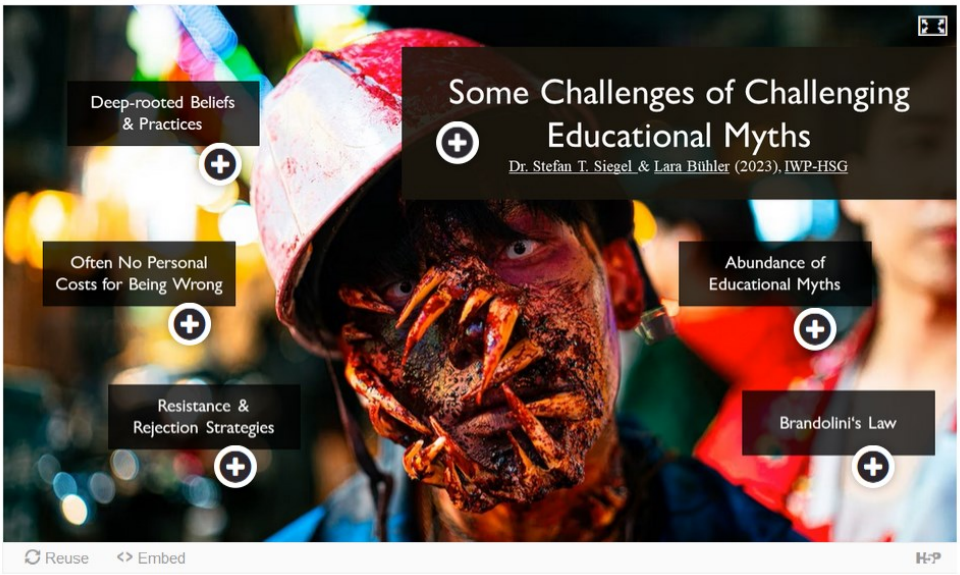

Fig. 1: Exemplary Interactive Infographic Used in *EMD101*: Some Challenges of Challenging Educational Myths

Following a deductive, yet interactive teaching strategy, using methods like buzz groups, brainwriting, or think-pair-share the participants develop answers to questions such as why is the line between myth and fact often challenging to discern (Siegel, 2024b), what are the drivers and sources of (educational) myths (e.g., Lewandowsky et al., 2020; Lilienfeld et al., 2010), and why are they persistent *zombie concepts* that *die hard* (Sinatra & Jacobson, 2019; Menz et al., 2021; see for a short introduction Siegel, 2024a). In a related activity, participants reflect on how lecturers might (un)intentionally keep educational myths alive and even spread them further. Using the reversal technique (Michalko, 2006), they brainstorm ways lecturers could reinforce myths. This rather playful, inverted approach helps to think of strategies to effectively deal with educational myths.

In *Module 2*, the participants explore and apply partly existing, partly self-developed curated resources and tools on educational myths via the platform *Miro*, a digital whiteboard. The aim was to design and provide visually appealing, useful, and accessible open educational materials (e.g., Fig. 1) and content covering different formats (e.g., infographics, videos). To better identify, analyze, and challenge potential myths, in *EMD101* we use different tools such as heuristics for identifying potential myths an educational myths refutation canvas, and a mythbusting decision tree (Siegel, 2024a; Siegel, 2024b). The two central and bigger hands-on tasks in the course involve a) an activity for identifying potential myths and b) for debunking them.

a) Identifying Potential Myths

With many educational myths abound, it can be difficult to keep track. However, there are characteristics that can be used to recognize educational myths without having to know every topic in detail. Asberger et al. (2022) suggest using heuristics, i.e., rules of thumb or cognitive tools (e.g., beware of oversimplifications) to identify potential myths. Within the course the participants are provided a list of statements containing myths, facts, and partially but not entirely correct claims and a heuristics cheat sheet (see suppl. 2). In pairs, the participants task is to use this tool. The exercise closes with a reflection and discussion about the tool and the process (e.g., *did the heuristics assist in evaluating the statements? what are/were limitations?)*

b) Debunking Potential Myths

Thereafter, participants use the newly developed educational myths refutation canvas (see suppl. 3) to examine and dismantle chosen myths, supported by reliable sources and factual evidence. This entails naming a common misconception, explicit refuting it and to provide a scientific explanation for the phenomenon discussed (e.g., Lewandowsky et al., 2020; Lilienfeld et al., 2010). This phase includes documentation of their findings on the canvas, expert and peer-assessment using rubrics for assessing refutations, and feedback from workshop leaders to ensure thorough understanding. Also, this exercise closes with a reflection about and exchange on the tool and the application process.

Module 2 also addresses the ethical dimensions of mythbusting, such as the risks of moral grandstanding and the importance of showing intellectual humility. Final discussions include topics such as when to challenge educational myths and how to (dis)agree well mythbusting (Siegel, 2024c).

The follow-up-assignment encourages the practical application of the heuristics and the educational myths refutations canvas for reflecting on personal beliefs about teaching and learning, transferring insights from *EMD101* to their respective disciplinary teaching contexts. To support this, a template for the educational myths refutation canvas was provided via a Miro board (see suppl. 3). Additionally, this board included a worked example on the *biggest myth in education*, which had been addressed in the video of the preparatory assignment for the course.

3 Discussion and Further Development of the Course

This article provides an insight into the face-to-face version of the further education course *EMD101.* To reflect on the strengths and weaknesses of the course, I used a multi-perspective approach informed by Broofield's *Four Lenses of Critically Reflective Teaching* (Brookfield, 2017) as displayed in Fig. 2:

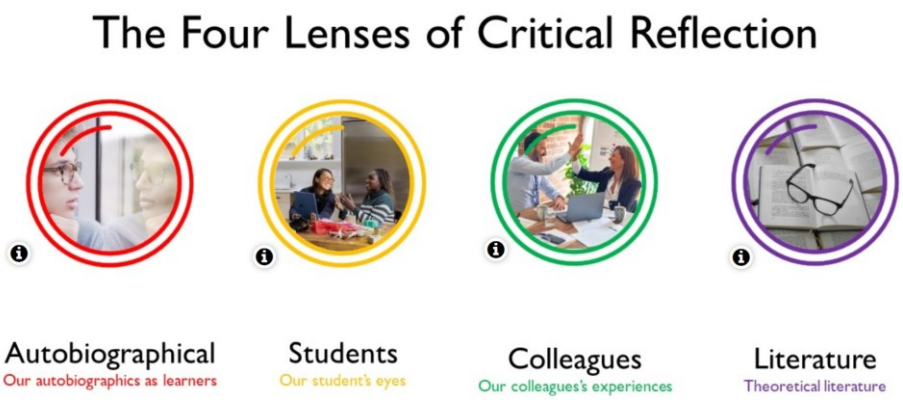

Fig 2: Interactive Infographic. Four Lenses of Critically Reflective Teaching

Learner / Student Perspective

The course evaluation included a standardized report and qualitative formative feedback from six participants (see suppl. 5): Overall, they particularly valued the direct application of the educational psychological evidence to identify and debunk educational myths using the provided tools. This practical application of theoretical concepts was highlighted as essential and beneficial for their professional development. The course received positive feedback for its blend of theoretical insights and practical exercises, coupled with the lecturer's expertise and enthusiasm for the topic. In the qualitative feedback, participants reported that they felt more able to identify and challenge educational myths using the provided tools.

However, the course was critiqued for its demanding nature, with some participants finding the topic(s) complex and the workload too high. Recommendations for improvement included incorporating more relevant myths tailored specifically to higher education and the lecturers' disciplines and providing more time for discussion.

Colleagues Experiences

To gain collegial feedback, EMD101 was presented in the Teaching Exchange (community of practice of faculty at HSG) in April 2024. The feedback from peers (N = 3; active teaching faculty in business education) appreciated the innovative approach of directly addressing misconceptions and using them as learning opportunities and catalysts (see also e.g., Burls et al., 2019; Tulis, 2022).

Colleagues suggested addressing potential concerns related to the diverse academic backgrounds of faculty members, such as those in business or law, who may lack foundational domain-specific knowledge in educational psychology. They recommended allocating additional time and supplementary resources to accommodate variances in prior knowledge, skills, and attitudes. This teaching exchange not only affirmed the course's strengths but also offered first constructive insights for refining the offer.

Autobiographical / Own Eyes of the Instructor and Developer

EMD101, developed as part of the MYTHSE research and practice project, showcases its strength through an evidence-informed approach. It utilizes current, robust, and relevant findings from among others educational psychology without attempting to cover the entire spectrum of the literature for the purpose of didactic reduction.

Aligned with my emancipatory aspirations, I try to equip faculty with open educational resources, including tools and exercises (see section 3.3). These resources serve for developing competences in critical thinking (Trecek-King, 2022), myth-busting (Cobley, 2011), and mental immunity (Norman et al., 2024), thereby enhancing the professionalism of faculty within their teaching contexts (Rhein, 2011).

Despite its strengths, EMD101 faces challenges due to its limited duration and high demands. The tight course schedule restricts in-depth discussions of specific myths, which would, however be, critical for thorough understanding and debunking them. Faculty, particularly those from non-educational or psychological backgrounds, may not have educational training, require more time to effectively engage with the course materials, reflect on their own and their students' beliefs, and apply what they

have learned. These time constraints highlight the need for structural adjustments to maximize the course's impact and efficacy in fostering educational development.

(Theoretical) Literature Lens

The reflection of EMD101 through the lens of literature highlights the alignment with contemporary educational psychological research and practices (e.g., Lewandowsky et al., 2020). However, emphasizing the following approaches and concepts could improve the course's design and its effectiveness:

According to van der Linden (2023), the concept of active inoculation involves having learners create their own educational myths besides exposing them to weakened versions of common misconceptions. Inoculation builds on preemptive refutations respectively protective vaccinations to create antibodies (counterarguments) to strengthen learners' psychological immune systems against questionable and false beliefs (Norman et al., 2024; van der Linden, 2023). This will be integrated in future iterations of the course to strengthen participants' abilities to critically evaluate and dismiss educational myths effectively.

Trecek-King (2022) emphasizes the importance of teaching not only factual knowledge (declarative knowledge about certain educational myths) but also critical thinking and reasoning skills.

EMD101 should utilize more misconception-based learning, a teaching approach that introduces concepts through the debunking of common myths (e.g., myths about mythbusting). This method has been proven across various disciplines to foster deeper engagement, sustained learning gains, and heightened critical thinking abilities (e.g., Burls et al., 2019; Tulis, 2022).

4 Concluding Thoughts and Future Perspectives

This further education course has been designed, implemented, and evaluated first at the HSG. It shows that academic developers can integrate educational psychological knowledge into academic staff development for prebunking and debunking educational myths. Due to *EMD101*'s positive reception, I developed an interactive, multimedia web-based training (duration: approx. 8 hours, Hypertext Markup Language 5 Package (H5P), self-paced, modular structure, certified) according to quality criteria for educational media (see Siegel et al., 2024a) and based on findings of the multiperspective evaluation (see section 4). *EMD101* has become a permanent element of the further education program of the *HDZ-HSG*. Lecturers can choose it as a compulsory elective course within the *Certificate of Advanced Studies Learning and Teaching in Higher Education*.

In addition, the newly and further developed online version of this course is currently being offered to different centres for teaching and learning in Germany respectively networks of higher education teacher training (Berlin, start in Q4 2024; Bavaria, start in Q1 2025) to broaden its distribution and impact in academic development. Although further (e.g., scholarship of teaching and learning) research on EMD101 is needed, first reflections show, that findings from education and psychology provided to faculty in this course may help them in identifying, understanding, debunking misconceptions about teaching and learning on an individual level (Brookfield, 2017; Schön, 1987). It can also provide a starting point for quality development on a collective level within higher education institutions as learning organizations (Argyris & Schön, 1978) and in building "psychological herd immunity" (Basol et al., 2021).

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Supplements & Links

1. Preparatory assignment
2. Heuristics for identifying potential myths
3. Educational myths refutation canvas
4. Mythbusting decision tree
5. Data of the quantitative evaluation