

Storytelling Via Digital Media As A Success Factor In Education For Geological Specialties ©

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Abstract

Telling stories seems to be as old as human language itself and is common in every culture. This provides the framework for the marketing method storytelling that can be used as a didactic instrument to teach complex knowledge through its varied and entertaining effect. Combined with the use of digital and social media, the increase in knowledge, motivation and acquisition of competence can also be increased in the teaching of geological specialties.

Keywords: Storytelling, digital media, education

Presentation of the problem and thematic introduction

For the successful future of the global raw materials and energy industry a sufficient number of skilled workers with suitable skills and social acceptance for the necessary projects (such as opencast mines, underground mines and processing plants) are required. This means that children and young people as the “decision-makers of tomorrow” but also as potential future students need to develop an interest in the subject areas. In order to enable them to do this, it is essential to provide them with sufficient knowledge. However, teachers are increasingly complaining that the pupils hardly perceive their direct surroundings and environment, that they lack a direct encounter with nature and are increasingly alienated from it (Gerl et al. 2018). Moreover, the curricula of most German federal states do not include any educational measures regarding the benefit or necessity of mining sites (Kleeberg and Drebenstedt 2018). As a result, there is a huge need for action in communicating these topics and scientists argue that education can make a decisive contribution (Krombaß 2007).

Students from geological disciplines or attendees of advanced training courses in these disciplines must also be activated in order to maintain their interest and thus their intrinsic motivation to acquire further

knowledge as well as to work in this field.

Public acceptance plays a decisive role here. Only if research and mining projects as well as the dismantling of such projects do not encounter protests by the population these projects can be implemented successfully. Otherwise, protests often lead to severe delays and thus to high costs for the stakeholders. On the other hand, public acceptance for geology, mining and related topics leads to a situation in which professional activity in this sector is regarded as desirable by pupils suited for engineering studies.

In order to meet this diverse field of tension, the Storytelling method should be used in a variety of settings. If people are to be convinced to do something, stories can make an essential contribution (Adamczyk 2015). They are the key to successful communication because they allow facts to be linked with emotions (Adamczyk 2015). This makes the messages embedded in the stories appear stronger (Adamczyk 2015). Although the communication of plain facts offers the alleged advantage of objectivity, it leads to impersonality which is why abstract information may and should be translated into convincing images with the help of storytelling and supplemented by a personal component (Small et al. 2007).

Furthermore, digital media and multimedialisation (also) have changed

teaching and learning considerably in recent years (Otto and Becker 2016). New methods are increasingly creating opportunities for different target groups to absorb information and thus learn, regardless of time and place (de Kraker and Corvers 2014; Otto 2014; Wilson et al. 2011).

Presentation of the methodology and selected practical examples

Telling stories has always been an essential part of human communication; it is one of mankind's oldest methods of communication and seems as old as human communication itself (Hennig et al. 2017; Schneider and Köhler 2017; Herbst 2014; Becker and Otto 2016). Listening to stories is learned from an early age and is an indisputable part of human life (Herskovitz and Crystal 2010). Stories are of elemental importance to all nations, cultures and societies and according to Schmieja (2014) have "the ability to transcend cultural, gender and age barriers." (Schmieja 2014, according to Denning 2011)

The application of storytelling as a didactic tool in schools and other educational settings to teach complex knowledge in a varied and entertaining way can be dated back to the early 1990s (Otto and Becker 2016). In the academic field, storytelling is used in particular when complex problems are to be made handy for knowledge transfer (Floßmann 2014; Schekatz-Schopmeier 2010). Storytelling is a process in which narrating and listening are inseparably linked (Frenzel et al. 2006). In this form of communication, the narrator summarises the complex knowledge in a story and shares it with a person or group (Fisher 1987). Storytelling means

"to use stories purposefully, consciously and skilfully in order to make important information easier to understand, to support the learning and thinking of the listeners in the long term, to spread ideas, to promote intellectual participation and thus to add a new quality to communication." (Frenzel, Müller, Sottong 2006)

Thus, it is a tool that allows placing experiences in a general context and passing them on in such a way that listeners can

empathise with them (Adamczyk 2015).

The essential elements of a story include message, conflict, characters and action that binds them together (Fuchs 2009). The message that is at the heart of a story refers to the values that are to be conveyed (Adamczyk 2015). This central theme is carried by the protagonist (main character), who must generate emotions within the listener so the story appears as intended (Adamczyk 2015). If the four elements of a story are successfully designed to address the recipient, storytelling can achieve a lot. With this method not only facts but also knowledge can be passed on but it enables the presentation of contexts, provides orientation and can convey visions (Thier 2017; Frenzel et al. 2006). Among other things, metaphorical narration and the possibility of actively involving listeners are used to reinforce the remembrance of content and core messages (Becker and Otto 2016; Schneider and Köhler 2017). Neuroscientific research also shows that storytelling can transmit emotions; the listener feels similar to the narrator/protagonist of the story (Stephens et al. 2010). Furthermore, the possible entertainment value of storytelling is very high and the narrator can make use of a certain amount of artistic freedom (Beer 2017). Because of these exemplary advantages, storytelling is nowadays used in various areas such as knowledge management, public relations, value communication, market research and personnel development (Frenzel et al. 2006; Herbst 2014; Thier 2017).

Storytelling today can be described as a classic concept of passing on knowledge (Otto and Becker 2016). Digital storytelling, on the other hand, is a relatively new method (Robin and McNeil 2012). Digital storytelling "combines the narrative transmission of knowledge with new forms of digitisation such as mobile videos [...] [, the] goal is the production, presentation and exchange of digital stories" (Otto and Becker 2016).

One project that considered the process of digital storytelling (see figure 1) was "Living with Climate Change - a Digital Story" (2013-2014) (Becker and Otto 2016; Otto 2016). The learning objective was to enable students from Germany and Tunisia to understand "climate change across disciplinary perspectives



Figure 1 Sequences of the Digital Storytelling Process (Morra 2013)

and cultural boundaries” (Otto and Becker 2016). The project phase, which lasted about three months, included workshops, a virtual learning phase and an individual reflection (Otto and Becker 2016; Otto 2016). The task of the students was to “create a story about the effects of climate change in both countries.” (Otto and Becker 2016) For this purpose, the participants were given insights into how the respective country is dealing with climate change and exchanged views with activists and scientists on site (Otto and Becker 2016). With the help of digital storytelling it was possible to pursue a learning-centered approach, i.e. to place the students at the centre of the learning process (Otto and Becker 2016). The lecturers came to the conclusion that digital storytelling is “a promising didactic method for student interaction and learning success” (Otto and Becker 2016). Otto and Becker (2016) state that the students had understood climate change to be an “interdisciplinary multi-level problem” (Otto and Becker 2016). Approximately half of the participants stated that the use of the method required the ability to “communicate climate science facts and thus put theoretical knowledge into practice” (Becker and Otto 2016), and intercultural competence as well as the critical reflection of cultural models were promoted (Becker and Otto 2016).

However, social media was not used in the first example “Living with Climate Change - a Digital Story”. Yet these are an elementary part of social life nowadays (Fieseler et al. 2010, according to Meckel 2008). In Germany, 97.6% of 14 to 19-year-olds are online every day with an average daily usage of 4:34 hours (Koch and

Frees 2017). Over 62.7% of this time is used for social media such as Facebook, Instagram and YouTube (DAK-Gesundheit 2018). Social media is particularly interesting for young people and has a major effect on their everyday lives. The project “SOCIAL NATURE” was designed to generate interest in geological specialties and to increase knowledge (Walter 2019). Students of a 9th and 10th grade in Saxony (Germany) were trained through excursions, diverse teaching units, various didactic methods and a personalized social media storytelling approach. The whitethroat “Dan” was accompanied as a testimonial using pictures, videos (Walter 2018) and a large number of social media posts (Walter 2019a) for almost a year. The content was created for social media using the view of the whitethroat. The storyteller decides on the perspective from which the event is presented and how the audience experiences it (Adamczyk 2015). The content produced was based on the participants’ research, on-site impressions gained at the mining site, interviews with experts and lectures in an informative and entertaining way. The participants were deeply sensitised and motivated by the research at the mining site because they got involved jointly and put themselves in the bird’s perspective. As a result of the project, the level of knowledge among the participants in the fields of raw materials/energy, biodiversity/environment and digital/social media has increased verifiably in accordance with the increasing overall interest in these topics. The gross reach of the project through website, social media accounts and publications totalled to over 10,000 contacts (Walter 2019).

Comprehensive insights

The presentation of the projects exemplifies the broad spectrum of possibilities in the education of pupils and students in geological specialties. The transfer of knowledge should begin in kindergarten and continue through schools and universities up to adult education. Thus knowledge and interest of the participants increases and thereby enhances the public acceptance for the sectors and their projects. Storytelling is a suitable method for (further) education in this context.

The added didactic value of digital storytelling in terms of enhanced competence acquisition is a high motivation to learn and increased commitment has been confirmed in various studies (Robin 2006; Dogan and Robin 2008). In digital storytelling, researchers like Otto and Becker (2016) refer to the acquisition of competence and according to Robin (2006), problem-solving, interpersonal and technological competence can be increased (Robin 2006).

Due to the strong involvement of the participants as storytellers, the method of (digital) storytelling is suitable for illustrating complex problems in a learner-centred way and thereby promoting networked learning (Otto and Becker 2016). But as with all stories, only the really good ones are told to others (Fuchs 2009).

Outlook on further developments

One possibility to further increase learning success and competence acquisition is the use of augmented reality storytelling although the exact benefit of this approach must be evaluated. As explained above, stories can be produced and consumed by modern media technology regardless of time and place (Zünd 2016). The advantage of Augmented Reality in this case is the high degree of immersion and interaction (Zünd 2016). This can but does not necessarily have to be combined with gamification. Typical elements of a game are transposed into a context that is not familiar with the game in order to enrich the elements of the storytelling (Fondon 2018). The intrinsic desires of the users can be addressed through appealingly designed games and thus increase their motivation to learn through playing (Fondon 2018). Another area that

will only be briefly mentioned here is the use of storytelling in journalistic reporting. The extent to which storytelling can be used to communicate complex topics such as climate change, recultivation, etc. in a more appealing way is of high general relevance (Schaefer 2016).

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