THE EFFICIENCY OF DIFFERENT ONLINE LEARNING MEDIA - AN EMPIRICAL STUDY

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ABSTRACT

In the current study, it was examined whether successful learning is related to using different types of media. We compared the comprehension of an economic concept in novices ($N = 82$) under three conditions: a Wikipedia article, a funny, and a serious YouTube video. The media were presented in English which is a foreign language to most of the German speaking sample. The funny video turned out to be the condition related to better success in learning while individual variables (e.g. Thinking Styles and metacognitive evaluation) were controlled. Regarding metacognition, it was further found out that answering by logical thinking correlated negatively, and that answering by processing the presented material correlated positively with the number of correct answers.

KEYWORDS

Multimedia learning; differences in learning; foreign language; thinking styles; metacognition; humorous learning

1. INTRODUCTION

Since currently the scientific language is English, and most research can be found on the internet, it is interesting to examine learning via different types of English speaking internet media. Especially non-native speaking students are often unable to cope with selecting an appropriate media. Therefore, this study compares the comprehension of an unknown concept in English language in three common media on the internet.

1.1 Medial Learning

According to the "General Factor Model", there is no difference between a read and a heard foreign-language text in terms of comprehension (Leucht et al. 2010). Research on instructional designs (e.g., Sweller 1994; Paas et al. 2003) indicates that pictures support a written or spoken text if they are presented in an appropriate manner. This means that the individual does not have to switch between two sensual modalities but sees a picture and hears a text at the same time, as it is the case in videos (Low & Sweller 2005). Therefore, it is expected that understanding an unknown concept is easier with a video than with a text. A lot of videos on the internet explain difficult concepts in an easy-going or funny way. Fun and laughing decrease anxiety in learners and thus enhance their performance (Stambor 2006). Hence, learning with a funny video might be easier than with a serious one.

1.2 Influences on Learning: Thinking Styles and Metacognition

Thinking Styles interact with personality, educational specialization, career, current job roles, and adaptability (Kolb 2005). Originally, the inventory was developed as a tool for educational and occupational consulting (Kolb 1981). The author found the following four styles on two axes: Assimilation vs. Accommodation and Divergence vs. Convergence. Recent research about Thinking Styles in combination with online learning shows that the style of Assimilation profits the most from reading articles, using Wikipedia, and watching videos (Arp et al. 2008). This style combines learning by "Reflecting Observations"

(RO) with "Abstraction and Conceptualization" (AC). Those ways of learning are both conceptualized as understanding or transformation of knowledge (Atherton 2013). Accommodation oriented persons are rather active and pragmatic which means that they use the strategies of "Concrete Experiences" (CE) and "Active Experimentation" (AE). Divergence oriented persons are active, but also reflective, and profit from CE and RO. Convergence oriented persons use AE and AC. They are pragmatic as well as theoretical oriented which enables them to high-quality problem solving (Kolb 1981). Taking into account these differences in Thinking Styles, they are tested for an influence on learning success.

It is important for students to evaluate, if they really profit from the medium they use because they have to choose it themselves in real life (Antonietti et al. 2014). The skill of thinking about the own cognition is called metacognition (Costelloe et al. 2006). Antonietti and colleagues (2014) discussed that learning is influenced by metacognitive expertise which can strengthen the effects of media. Thus, it is assumed that the observed type of answering (e.g., guessing or answering by presented material) could have an influence on the relationship between presented medium and correct answers.

2. EXPERIMENT

2.1 Participants

The experiment included 46 (56.1 %) women and 36 (43.9 %) men between 20 and 46 years. In average the sample was 23.90 (SD = 3.60) years old and studied for 6.25 (SD = 3.11) semesters. At the time of the experiment, those 82 people were students at the Leopold-Franzens University Innsbruck. In order to ensure a certain level in English, the study only included Psychology students (at Austrian universities, applicants for Psychology have to master an obligatory English test) and students of a B2+ English class. The participants of the B2+ class studied different non-economic disciplines. In order to detect thematic experts, it was also asked for the Psychology students' former and second disciplines. 63 (76.8 %) persons studied only Psychology and 9 (11.0 %) persons studied a second subject, too. Persons who did not finish all items or stated more than one time that they knew the correct answer from somewhere else (e.g., former studies) were dropped out. The sample was invited personally as well as using Web-Mail and Facebook, and oral consent was given. All probands had normal or corrected-to-normal vision.

2.2 Materials and Procedure

The sample was randomly assigned to one of the different media conditions described below. The questionnaire was answered in the same order as shown in the following. The respective medium was presented two times with a break of 130 seconds between the first and the second presentation. After a second break, the participants were asked to fill in the questionnaire. These breaks should enable the participants to process the knowledge gained from the material. This length was chosen because according to Preim (1999) 130 seconds are sufficient for cognitive processing.[1] The gathered data were computed using SPSS 21.

2.2.1 Media

All used media were presented in English language and about the topic of Opportunity Costs. The reading passage was taken out of Wikipedia and the videos out of YouTube. Every medium was presented the way it was found in the internet. The idea behind using this raw material from those pages was that most students use these sources (Kleimann et al. 2008) in order to prepare for tests or the like. Because it was the aim of the study to show a real life situation, differences between the three media conditions relating to the written or spoken text were part of the approach. It is in their nature that the spoken text of a funny video cannot be the same as the spoken text of a serious one because the linguistic style changes with the underlying intention. The same is true for a written and a spoken text in comparison. The topic was chosen because it is largely

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[1] Media and questionnaire are available upon request.

unknown among Psychology students. Therefore, it was possible to minimalize that the participants apply their already existing knowledge to answer the questions. The length of the videos was approximately the same, and the time for reading the text was limited to the same length. The videos were presented in full screen mode on a 2x3 meter wall with a beamer. The loudness was regulated accordingly to the participants' wishes.

2.2.2 Questionnaire: Description

German was chosen as language for the multiple choice test because the study should demonstrate a "real-life" situation of a student preparing for a German speaking test using English speaking online sources. The questionnaire included a short description of the process at the beginning. In the text condition, the text was on the second page. The following pages were the same for all experimental conditions.

2.2.3 Questionnaire: Multiple Choice and Metacognitive Evaluation

The participants had to choose the correct one out of four possible answers. Three of the six questions were rather abstract questions which required a transfer to an example that was not directly part of the presented material. The sheet was horizontally presented, and one third of it was folded backwards. Thereby, people were not able to see the second column next to the multiple choice questions. In this column, the following statements regarding metacognitive evaluation were to be chosen: "it seemed logical", "I have already heard about it somewhere else", "I knew it from the text/video", or "I guessed". The multiple choice questions had to be answered before the metacognitive self-report and were similar for all three conditions.

2.2.4 Questionnaire: Demographical Data and Personal Information

Afterwards, demographical data were raised. Furthermore, it was asked if the participants studied only Psychology or an additionally discipline. Moreover, it was asked if they had studied another discipline before they started Psychology. If they were or had been enrolled to an additional one, they had the opportunity to fill in which discipline they studied besides, respectively, before Psychology. Due to the information about the participants' academically background, it was possible to exclude those who had an extremely higher pre-knowledge by attending an economic subject.

2.2.5 Questionnaire: Thinking Styles

The last page was an adapted German speaking self-report measurement (Wehner 2014) based on the Learning Style Inventory (LSI) by Kolb (1981). On the top of the page, a sentence said: 'If you think about learning of new English terms, how was your approach, respectively, attitude one year ago?'. Then, four columns and nine rows followed. Each cell contained an adjective. The examiner instructed the participants to restart thinking for each row in reference to the sentence above. Then, the participants were asked to assign a number between one and four to every term per row (4 = high agreement, 1 = low agreement). Using the method of Wehner (2014) the four styles defined by Kolb (1981) were generated.

2.3 Results

In order to find out differences between the different media conditions, while controlling for Thinking Styles and metacognition, an One-Way ANCOVA was computed. Results indicated existing differences between the different groups (F (2, 72) = 5.13, p = .01). In the humorous video condition significantly more items were answered correctly (M = 4.89, SD = 0.80) than in the serious video condition (M = 4.31, SD = 1.07) and the written text condition (M = 4.15, SD = 0.92). Neither Thinking Styles (which were converted into dummy variables) nor metacognitive evaluation had an influence on the relationship between the presented medium and the learning outcome. Regarding metacognition, it was additionally examined if the overall number of correct answers was related to the other answering types. Interestingly, the number of questions which were answered by logical thinking were negatively related to the number of correct answers (r = -.215, p = .03). A positive correlation was found between correct given answers and the number of items which were answered by learning through material (r = .231, p = .02).

3. CONCLUSION

The positive results of the funny video indicate that humor facilitates learning which substitutes the findings of Stambor (2006). Because this seems to be true even for foreign languages and more abstract tasks, funny videos should be used for the comprehension of new terms in a foreign language. Future research should examine, if this is also true for two different text versions (e.g., funny vs. serious). Likewise, it could be compared, if a funny text and a funny video differ from each other. If that was not the case, it would be accordant to the actual results of comparing both serious conditions which did not differ here. It would also be a proof for the General Factor Model (Leucht et al., 2010). Because the positive effect of the humor condition is independent of Thinking Styles and metacognition, the presentation (e.g., funny vs. serious) of the foreign-language medium seems to play the bigger role. Another suggestion is that the whole process of watching or reading, translating, and answering is so complex that every Thinking Style can profit of its very own special abilities.

Metacognitive self-reports referred to how the multiple choice items were answered. Regarding differences in the presented media, no influence of metacognition was detected. However, considering the big picture, answering by logical thinking impairs the sum of correctly given answers whereas answering by internalized material enhances it. The finding about the logical answering suggests that it is not always an expedient solution to answer by logical conclusion. One's own ability of straight reasoning might be overestimated. This can be seen as an example of the Dunning-Kruger-Effect which argues that someone who is incompetent in a certain social or intellectual field overestimates his or her competences in it. The authors did investigations on it in humor, grammar, and logical reasoning. Incompetence in a certain domain leads not only to bad performance in it but also to a misperception of the same (Kruger & Dunning 1999).

A possible point of criticism could be that the three media lack comparability. This is due to a slightly different approach to the topic, since the study refers to an everyday-life situation. As already mentioned, the choice of language changes with the underlying intention. Therefore, this variability can be seen as part of the approach.

To put it in a nutshell, funny videos, as well as thinking about the material during answering increases the chance of good results in the next test independent of one's own Thinking Style.

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