

MISSION IMPOSSIBLE? MAKING A VISIT REALLY MEANINGFUL FOR THE VISITOR

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1: EXPERIMENTA I.Z.ZNL

THE TALENTSUCHE – GIVING FEEDBACK TO VISITORS ABOUT THEIR ABILITIES

The Talentsuche invites visitors to explore their individual interests and abilities playfully. Therefore, they can use 20 interactive exhibits designed to address different cognitive abilities and motor skills. In order to serve the visitors best we continuously refine and improve talent exhibits by using the talent server's data. For better explanation, we demonstrate an example.



Fig. 1: Steps and procedure of the quest for talent

BICYCLE CAROUSEL – AN EXAMPLE

> THE EXHIBIT

The Bicycle Carousel requires gross motor skills (Figure 2). Players pedal to move the construction forward in a circle. To keep balance either a big wheel and two ropes or a small wheel and a single handle were provided as support (Figure 2). The instruction was to complete 5 rounds as fast as possible.

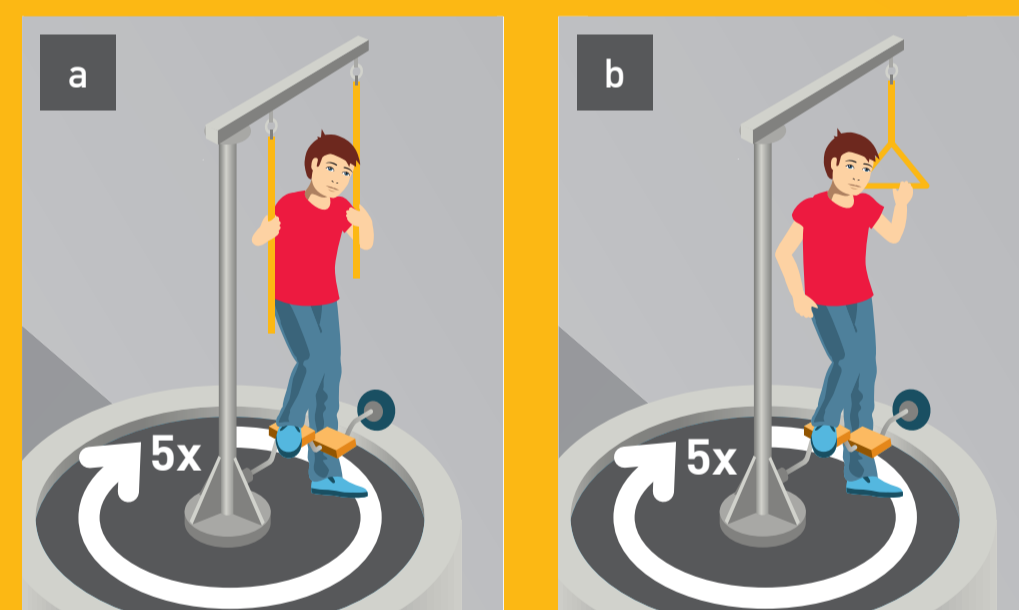


Fig. 2: Condition with a) a big wheel and two ropes (easy) and b) a small wheel and one handle (more difficult).

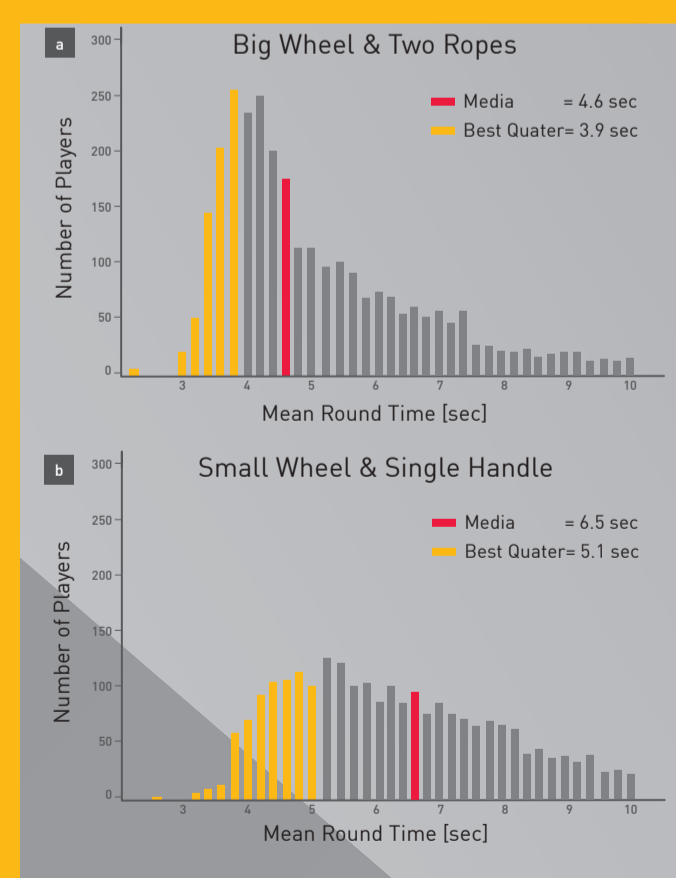


Fig. 3: Mean round time [sec] of the number of players with a) a big wheel and two ropes, and b) a small wheel and a single handle

> METHODS + RESULTS

All in all we tested six conditions. Here, we concentrate on only the first and the last one. For each condition the data of 3010 visitors matched for age and sex (Mage=12 years; SDage=2 years; 50% female) was extracted from the talent server. The performance of each group was plotted in a histogram (Figure 3). We found only small differences of the players' performance in the original condition. Half of the players finished a round in 4.6 sec or less. The modification to the small wheel and a single handle enabled us to differentiate better between good and excellent users (Figure 3).

> CONCLUSION

An analysis of the collected talent server's data provides insight into the exhibits quality. To adapt the visitor's abilities to the example, we varied the difficulty in single steps. Moreover, we transform this one and other exhibits to its best form for the future exhibition of the Talentsuche.

EXPERIMENTA AS SCIENCE BROKER CONCEPT OF PARTICIPATION

In order to really connect with our audience we redefine our own position as a Science Centre. Thus, we elaborated a science broker concept in which visitor's participation is deeply embedded in a specific manner. The new concept has been developed in cooperation with the Transfer Zentrum für Neurowissenschaften und Lernen (ZNL) in Ulm.

> CONCEPT

1. SCIENCE BROKER

The concept involves a significant change of the experimenta from a science "provider" to a science "broker". A science broker strives for linkage between creators and consumers of knowledge. The visitor is no longer seen as a mere consumer of knowledge, but as a motivated learner who shares experiences and questions. Hence, the experimenta has to turn into an exchange platform for STEM topics and questions of science.



Fig. 4: The experimenta presents scientific knowledge visitor-friendly in different characteristic formats

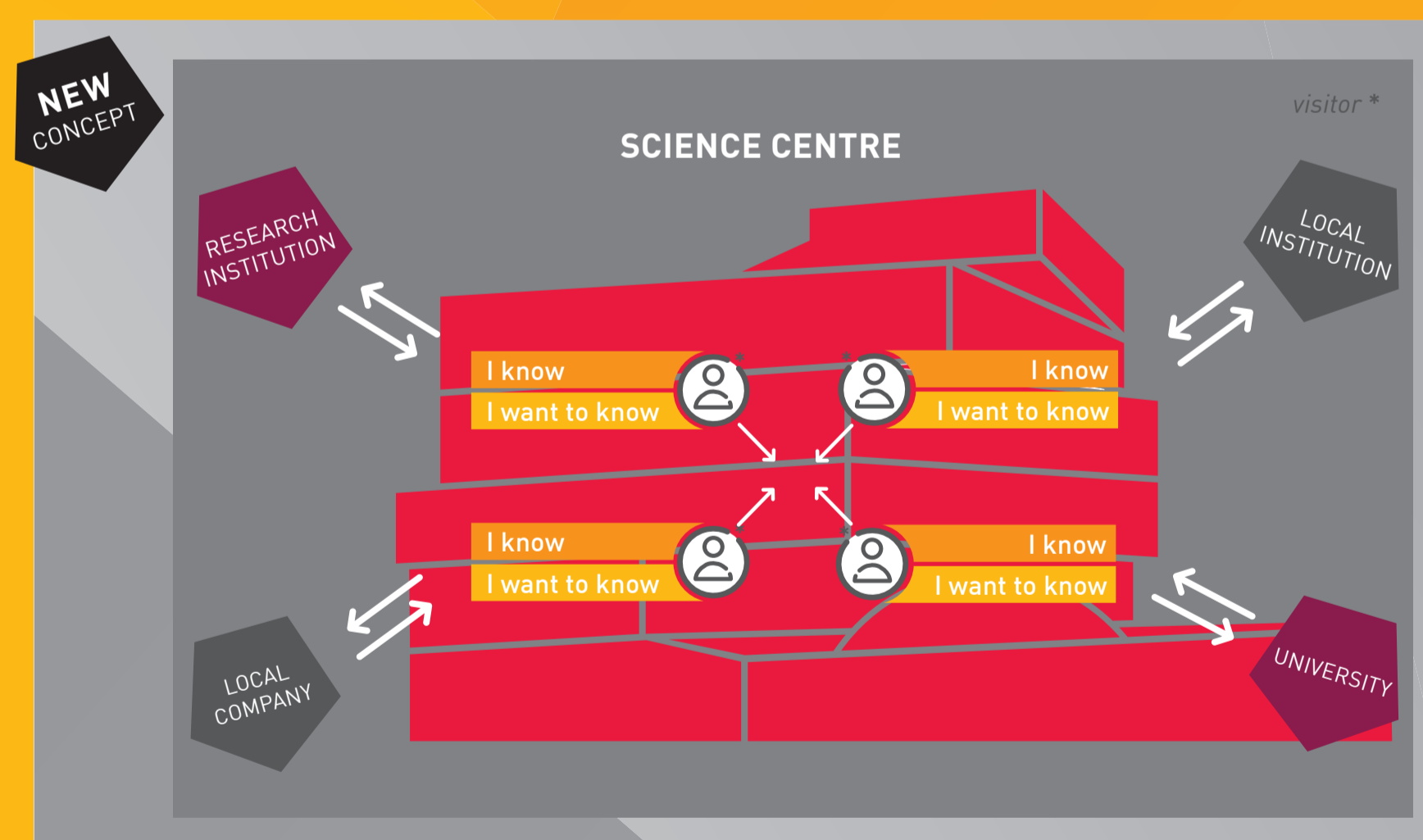


Fig. 5: Visitors are no passive consumer of knowledge; visitors have already knowledge before they enter the Science Centre. At the same time, they learn something new while engaging with the exhibits. Sharing knowledge and experience is at the heart of the visitor - Science Centre - relation.

2. PARTICIPATION

The communicative strategy of the science broker concept is participation.

With participative offers we want to...

- ... activate our visitors that they become scientific citizens
- ... illustrate how science works
- ... meet the visitor's requirements
- ... establish participation as the "normal" case.

LONG TERM EFFECTS OF SCIENCE CENTRE VISITS

Do our exhibits and exhibitions really help visitors to learn something and to take something home? Our aim was to find out whether there exist measurable long term effects of the exhibition's content after visitors engaged with the exhibits. We investigated this effect on the basis of the special exhibition "Unter Strom" in 2011.

> METHODS

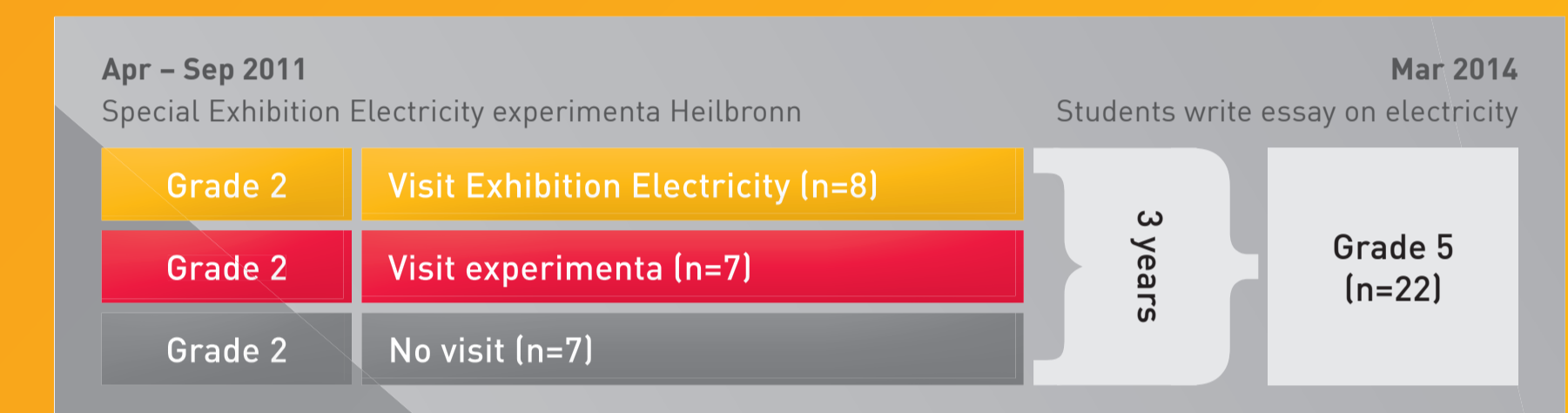


Fig. 7: Study design

A class of 5th graders (n = 22) was recruited in 2014. Some of them visited the special exhibition in 2nd grade. Two other groups have not. All students wrote an essay on electricity three years later. The essays were independently analyzed by two examiners who coded the amount of:

conceptions (e.g. "Without electricity TVs and computer would not work.")

misconception (e.g. "We cannot live without electricity.")

positive emotions (e.g. "Electricity is very useful for us.")

negative emotions (e.g. "I don't like it. I nearly got an electric shock once.")

technical terms (e.g. "There are solar panels on the roof of our super market.")

> RESULTS

We found that the results differed among groups (Figure 2). Visitors of the special exhibition used more technical terms (0.63) and described less negative (0.25) and more positive emotions of electricity (1.63) than the other groups. The difference for positive emotions was significant ($F(2, 19) = 3.64, p = .046$) with large effect sizes ($d > 1.1$). The difference for negative emotions failed to reach significance ($F(2, 19) = 1.64, p = .22$), but revealed large effect sizes ($d > 0.78$).

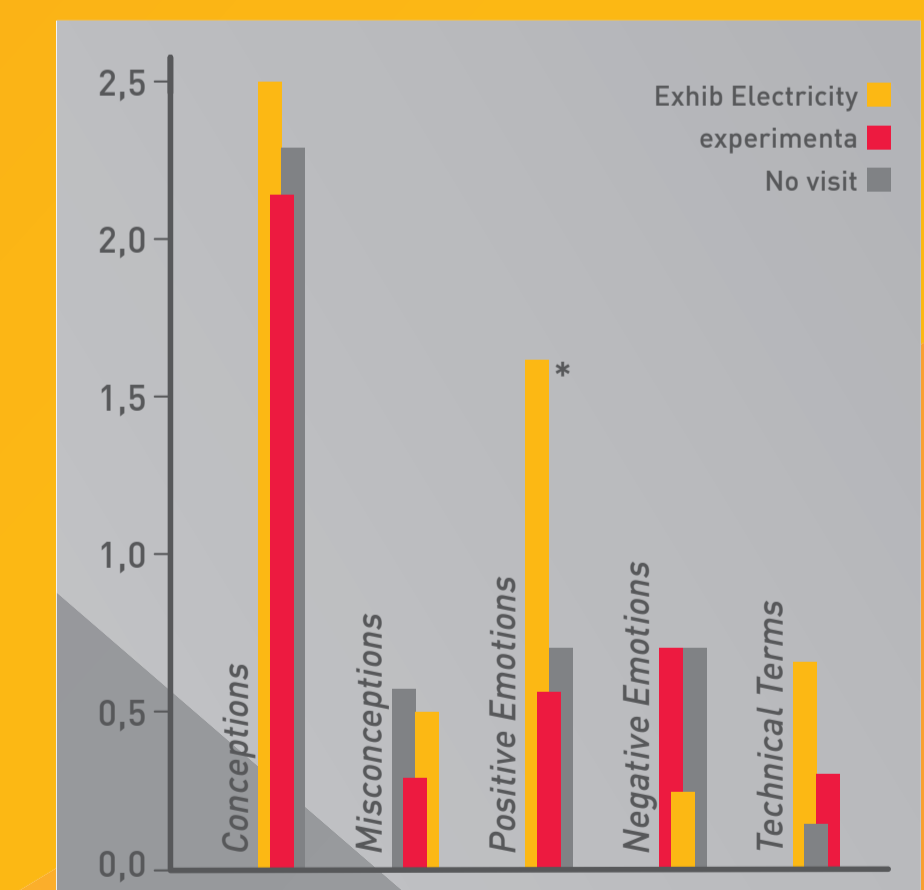


Fig. 8: Content of Students' Essays on Electricity in Relation to the Science Centre Visit.

> CONCLUSION

The study and the interpretation of the results were limited by the small sample size. Large effects seem promising, however, and indicate a lasting effect of the special exhibition. Further research has to substantiate the effect and its workings. It is proposed that the effect works indirectly by influencing visitors' attitude to the topic and in due course their experiences with the phenomena.