

Will a child remember the visit to *your* museum? An approach to improve the museum visit

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Track 6: Museum: Cultural Stories For Young People

ABSTRACT

Many things have been tried by the museums with large funds, to attract more children to museums. Especially the smaller museums still find it very difficult to attract the younger generation because of their smaller budget and capabilities. A new idea to handle this difficult situation is to look from the brains' perspective on how the children remember and comparing the museum visit to a lesson given by a teacher. This perspective gave me new insights on how to change a museum so that children can remember and thereby enjoy the visit more. Changing the approach, the structure, and the visualisation of the many features in the museum, will book improvement which are feasible and viable for the small museums while being desirable for the children.

Keywords

Metacognition, cognitive development, frontal cortex, memorising, recalling, emphasis, association, patterns, trigger, involve, wholeness, persona, structure

INTRODUCTION

In order to know how to attract more children to museums, you first have to know how they remember their visit. Small museums will greatly benefit from mouth-to-mouth advertisement once the visitors are enthusiastic about what they have learned and what they have remembered. The brain of youngsters (aging from 12 to 18) work in a different way than adults because the younger brains are still in development. The information that you want them to remember and the way you represent that information has to be changed to fit the children so that their brain will pick it up best. Telling stories is a good way of transferring this information but this is in most cases not completely adjusted to the youngsters. In this paper I will discuss in which way a child's brain changes, how they memorise information best, my own experience in teaching physics while using cognitive literature, and how you can use these aspects to change the way museums deliver their information to the younger generation.

THEORY

Metacognition

Before discussing the development of the brain, we have to know how children learn. Metacognition is a key word when teaching and making the younger generation learn, remember, and apply what they have

learned (Chick, 2016). Roughly translated from Latin metacognition is "knowledge about gaining knowledge". Metacognition needs to be developed in the developing brain (Westenberg, 2008). You will see that the metacognition comes in two parts; first the knowledge about the children themselves, then the applications because of this knowledge. Meaning they firstly need to learn to look at themselves or their learning process before they can react upon it. Knowing this information can help to understand what process children have to go through before they can actively remember the information in the museum.

Brain development and stimulants

The developing brain of a child changes to transform into the brain of an adult, but the development is not distributed evenly over time. This development will have consequences for the changing behaviour and reaction to stimulants of the child (Westenberg, 2008). The development of the brain starts from the bottom to the top and from the back to the front. This means that the anterior brain regions are the last to be developed. Connections between areas are developed, enhanced or decreased in this process. Sensitivity to negative consequences of behaviour is located further (front and upwards) than the sensitivity to positive consequences of behaviour. Because this sensitivity to negative consequences are "later addressed" in the growth of the brain, teens are more responsive to rewards and less responsive to punishment. With adults it is the other way around: the negative consequences have more effect than the positive consequences in the brain of the adult.

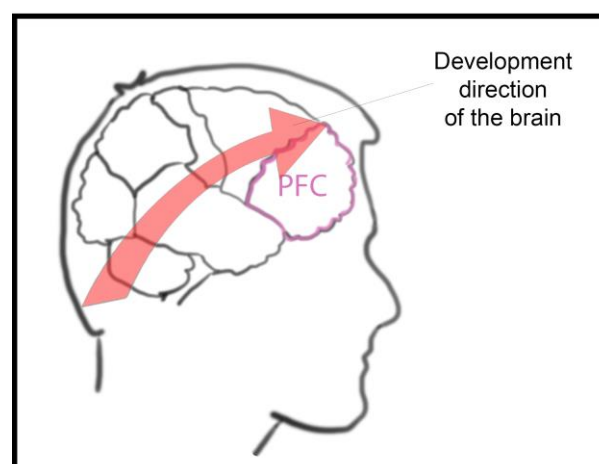


Figure 1. The development of the brain starts in the back of the head to the top and front, where the PFC (pre-frontal cortex) is located. The PFC, which responds to negative consequences, is the last to be fully developed.

The negative responses are present in the pre-frontal cortex (PFC). The activation of this part of the brain works as a warning that they find themselves in a risky situation. Teens do not get this signal and are guided by emotions and thus the focus on rewards in a teens' brain is not slowed down by the warning. This means that the rational part of the brain loses to the emotional part. The frontal cortex plays a major role in psychosocial development. The PFC is critical for social behaviour, especially in understanding themselves and others. The children need to learn to reflect on their own actions and knowledge to find consequences and a fitting reaction (See the headline Metacognition). This way they will be conscious about learning and using skills that they just have learned. To completely stimulate the development of the younger brain the environment must provide the right incentives at the right times, to fully develop a healthy brain.

Memorising the story

To efficiently use the knowledge mentioned above the children need to be able to recall the information. The two most important factors of recalling are emphasis and association. These factors are associated with how the brain processes new subjects and skills (Buzan and Buzan, 2009). By creating links and paths between brain cells, which creates patterns, the knowledge gets more accessible. The path to the wanted information gets broader or clearer when this path is used more often or when it is used in different angles or situations. In conclusion; intuitive relations and patterns should be made to triggering existing memories and emotional responses (Stappers and Sanders, 2003).

Through the learning progress there are things that the brain tends to remember primarily (Buzan and Buzan, 2009). The things that can be remembered are referred as items and are as follows:

- 1) The items from the beginning and the end of the learning period, due to the primacy and recency effect;
- 2) Items that are associated with patterns or other items that can be linked to what have already learned;
- 3) Items that are in some way unique or outstanding because it is emphasized;
- 4) Items that are strong in any of the five senses;
- 5) And items that are already viewed as interesting to the person.

It does not mean that information that is not part of these five items is not important. You simply cannot have a story where everything is important or everything has to be remembered.

The brain seeks for *wholeness* when interpreting data because the brain has a tendency to search for completion. For example, when you yell; "One, two.." Your mind screams for completion and yells: "Three!". Another way to give a complete feeling is to add visuals to text. It has been proven that visuals next to text have a bigger impact and are easier to remember than just

words. Visuals are important for information holding, analysing and recalling, thus remembering the whole story.

It is important to know that adding visuals and emphasizing words is most of the time not enough to describe something. Next to adding visuals and wholeness to a text, visual rhythm, visual pattern, colour, images, dimension, and spatial awareness (always leave at least 30% blank) are important factors that have to be included into the design of the text (J. Hoftijzer, 2016). Without these factors the brain tends to get into a state of unconsciousness where there is no information recollected from what was written.

Personas can be the last attribution to make the wholeness complete. The use of personas is a design technique to represent a situation or a proceeding to trigger imagination and empathy of a designer to make better adjusted products for specific users. Through adding a picture, a story and some quotes the persona becomes real in the minds of readers. By adding personal (fake) stories of people to the whole story or information, the mind gets triggered to use the partial personal knowledge to create wholeness (Grudin, Pruitt, 2002). These little fragments of a person's life can be enough to create a curiosity to stimulate our imagination. This way the person reading the displayed information is more involved in the story and thereby more likely to remember.

PERSONAL EXPERIENCE

Introduction to literature usage in teaching

In relation to my experiences as a physics teacher I can relate to all of these literature findings. Especially when I was teaching to Havo-students next to my Vwo-students (Vwo is the highest education which is followed by Havo, then Mavo). The age of the pupils I taught were thirteen to seventeen years old. I had trouble making the Havo-students remember information and making the subject understandable in a way that they can use the knowledge in exercises so that they can build further on those skills. Next to that I felt that the pupils could not grasp what was required of them in an equation and therefore found it difficult to start an equation. I had to change my way of teaching and I used my acquired knowledge to do this. I will elaborate in this paper on my change of teaching in the next paragraphs.

Structuring

The level of metacognition differs by age and pupil. When you are able to make the pupil aware of their behaviour, you can change it. Pupils can have difficulty in addressing their own behaviour, let alone their reaction upon it or to change it into a more fitted or better behaviour. You can address these difficulties individually and give them structure as a group. This shall comply with not only changing the behaviour of the pupils, but also yours.

The students find it difficult to make a structure of a subject, connect patterns in the subject or in between subjects. This is because their brains are just starting to develop these skills. Structuring is essential for analysing, holding and recalling the information and must be maintained throughout the lesson in different ways. I found three different ways in which the teacher must be consistent throughout his lesson to have the greatest impact and the least doubts and resistance during the lesson. You have to use:

- 1) Structure in your lesson: a quick content of what you are going to do in the lesson;
- 2) Structure in presenting the new information: Start with what is already known, then an example, after this the new lecture, and lastly the exercise;
- 3) Structure in the way the pupils can address a problem: You have to help the pupils to grasp what is needed from them by giving them structure on how to start and evaluate a problem. See figure 2.

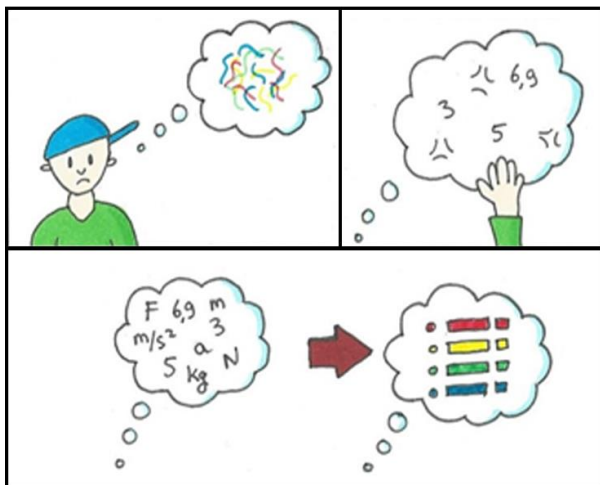


Figure 2. Structuring the thoughts of pupils by clearing up the information in the story step by step.

How to involve pupils by changing how you present

I learned that by introducing the subject with a funny or relevant example you can trigger the pupils to get involved with the subject. To first mention something of interest to them, you stimulate the parts in the brain that react to positive signals. This way the pupils are more inclined to listen to what you have to say about the subject. Negative attention seems to be easily forgotten, while positive attention can completely turn around the attitude of the pupil. Talking about the students' interest, using pupils in examples and connecting relevant or trending topics to the subject can do more than the negative attention of threatening or punishing.

I saw that emphasis and structure are two important factors when speaking for a class. It has been known that speaking in a monotone voice or talking with too much emphasis is revulsive. This can also be referred to text. No emphasis or too much emphasis on words leads to no attention given to the text and adding the right

visuals and examples can emphasise what you just have told. To trigger and involve the pupils visuals can be used to make the overall picture more clear and can help to make room for a humorous approach or a different angle.

How to involve pupils by changing your lesson content or structure

Pupils like structure in their lessons, because they know where they stand and what is expected of them. This is why I always start my lesson with something funny or something else that feels relevant to introduce the new subject. I always summarize what we did in the prior lesson, before starting on the new subject. This way I force the pupils to recall what we did the last time so that they can build on this information rather than storing the new information separately in their brain. Structuring your lessons will make the overall working scheme clear, so that they know what comes next and know what to do when they are finished with their task. The summary at the end of the lesson helps them to structure what they have learned, to make the path in their brain to the new information more clear, so that the information can be easier to recall the next time.

MUSEUMS

How to use this information in small museums

Structure seems to be the key in the implementation of the earlier mentioned elements. When comparing the museum to an ideal lesson structure, the structure of the museum can be compared and adjusted in multiple levels;

- 1) in the overall structure;
- 2) with each exhibit; and
- 3) per object display.

In the overall structure it is important to know what the exhibits are, how they are connected and that the exhibits follow up on each other. It must be clear beforehand what the children can do at each exhibit. You want to guide the children through the museum in a natural way. You can even take this literally and make a path for them to follow. Each exhibit could be portrayed the same, but with each exhibit portraying a different era for example. During the visit the children must receive positive feedback when guiding and helping them which will lead to them giving more attention to the museum experience.

With each exhibit the beginning and ending must be similar and clear. This can be done by the ending of a story, an exercise, a summary, how the exhibit is structured or by symbols. Each exhibit should have the same structure in what kind of things and information is shown. For example; first mention something that they can relate to, then tell more information about the local scenery, followed by the people and the animals. It must be clear what the children can do in the exhibit, how to do it, and in what order. Before and after the exhibit the overall view of the exhibit and the relation

between exhibits or the whole museum has to be made clear. It could be useful to start each exhibit with what already interests them, what they already know, or something humorous to trigger and involve them. Funny or personal stories or objects can be a good example to involve the children.

Exhibition wise every object or display should have a clear presentation of what it is, and what its relation is to other objects or displays. The object or display should have a clear representation with text and visuals with an emphasis on important or associative (fun) facts. The use of personas should also be stimulated whenever possible. It is important that the students have a clear overview of what they are experiencing. The layout of the text together with the additional features should be to stimulate the brain rather than to bore the brain. This can be improved by the use of colour, dimension, special awareness, visual patterns, etc.

DISCUSSION

The usage of literature in practice is personal and can be different or incomplete for others. Giving a good lecture or presentation can also be about personal touch. However some teachers think that having too much structure is predictable so they would rather work with an element of surprise during their lessons.

Humour as a positive factor was not a part of the literature provided in this paper. This knowledge was gained during the education track. Therefore the information about humour is not researched enough together with the cognitive development of the brain.

My theories were tested during a period of six months where I was trained to teach by the TU Delft Education team and the Dalton School teachers in Dordrecht, The Netherlands. My experiences are limited to this time span and the one school where I gave physics lessons. While I already gained much knowledge and did a lot of research while at the same time implementing this, the information I have now gathered is more complete for the museum subject. Next to that, when I was teaching I did not have the museum subject in mind.

Implementing these ideas seem less costly than what the museums with more resources do with their use of technology and workshops, but it can be more time consuming and costly than you might think. This is because the building or the structure of the building has to be altered, the cost of a renovation, new displays, guidance or a path will also generate costs. Next to that the museum staff has to be trained to think in a structured way and to stimulate the children in the right way to make the museum a complete success. Only with this combination the museum can function in its best possible way.

CONCLUSION

Structure has to be applied in every aspect of the museum when changing a museum to better fit the needs of the child's brain to remember. Structure is all about having a complete overview, the right visuals, examples, emphasis and association. Structure has to be seen in every part of the museum; the relation between exhibitions, the path to follow in the exhibition and the way the displays are represented must be consistent. Visuals can be used for clearness, structuring and triggering the children. You need structure and a trigger to let the children create associations with their own stories and their prior knowledge to let them remember the content more efficiently. Humour is a powerful tool to involve children because they react best to positive signals. Together with the use of personas, the brain of the child can connect its knowledge to its previous knowledge to better hold, analyse and recall the newly learned information and skills.

The new knowledge that can be implemented for museums is still very general, for better understanding of the small museums more research about small museums in particular needs to be done. Next to that, the level of implementation can be different for each museum and can be made with different personal changes.

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