

HOW TO ASSESS EXPERIENCE - THE NEW TREND IN RESEARCH TECHNIQUE, USE IN NONPROFIT SECTOR OF ENTERTAINMENT AND EDUCATIONAL INDUSTRIES

E + M

Alena Šuldová, Petr Cimler

Introduction

Customer relationship management (CRM) is an internal strategy and endeavor of a company that addresses the company's relationship with its environment, customers and suppliers. Its purpose is to improve the company's reactions to the requirements of external subjects, to ensure effective use of the gained information and to prevent the loss of this information. [8]

According to Hommerová, who is dealing with the problematic of CRM, there are many ways of looking at CRM. "It can be perceived as a company philosophy or as the technological and software solution which facilitates its implementation." [8, s.112] This paper does not fit into any previous definitions of CRM, but some of the aspects it deals with are connected with CRM. It shows how to gain very detailed data about customer behavior and it demonstrates how to assess the depth of learning experience in museums, or in this case in science centers. It is important to study this phenomenon, because learning experience is one of the excitement attributes described in the KENO model. As a consequence, implementation of this experience leads to an increase in the level of customer satisfaction. [9]

And why is learning so important? "Since the Industrial Revolution science and technology are the main factors affecting our daily lives. Thanks to them, we fulfill our needs. Even Maslow's pyramid of needs was created with the help of technology and science. Today's young generation stays on the peak of this pyramid. They want to realize themselves. In the future rich people from western world will demand Transformation Offering [7]. Those are words of Asger Høeg, the director of Experimentarium, which is a science center in Copenhagen. He and his team are trying to supply the new self-fulfillment demanding generation with opportunities for transformation, trying to teach them something through experience. His words also support a re-

cently presented study dealing with preferences of university students, which concluded that in the field of job offers, university students prefer interesting jobs that provide an opportunity to fulfill their dreams. [4]

Many of today's companies are aware of this trend; their strategic goals are therefore aimed at the transformation of their customers by providing the best conditions for personal learning, which are usually related to popularization of science.

This raises some questions as well: Are these companies fulfilling their goals? Are people really learning something during their visit? In what way are they learning? We are now talking about museums, ZOOs, aquaria, botanical gardens and science centers which made a specific science topic available to the public through their programs and exhibitions. Those are often referred to as "informal learning settings" where "free-choice learning" occurs. [3]

1. How to Assess Learning in the Museum

The assessment of learning in such institutions is problematic. There have been many researches and papers on this topic. One of the options of how to assess learning is to look at the nature of learning and learning processes which take place in the museum [8]. The study presented in this paper partly incorporates this idea, but mostly it draws on the two following frameworks: the MARVEL Project (Museum Activity Researching the Visitor Experience and Learning) and the Visitors Engagement Framework.

1.1 MARVEL Project

Janette Griffin and her colleagues suggested that to assess learning, one could look at the learning outcomes and/or at the presence of learning processes or behaviors during a museum visit [5].

They developed a framework with a main aim to find out how to [6]:

- Assess the degree of learning that takes place in an exhibition.
- Understand the nature of learning that takes place in an exhibition.
- Establish benchmarks for learning outcomes.
- Compare the learning outcomes for different exhibitions.
- Share data with others and make comparisons with them.

Thanks to the experimental nature of learning, which is based on encounters with real objects, where people are looking, questioning, examining and comparing and where, above all, education and enjoyment are linked, Griffin was able to describe seven indicators of favorable conditions for learning as follows [5]:

- Showing responsibility for and initiating their own learning.
- Actively involved in learning.
- Purposefully manipulating and playing with objects and ideas.
- Making links and transferring ideas and skills.
- Sharing learning with peers and experts.
- Showing confidence in personal learning abilities.
- Responding to new information or evidence.

To reach the aim of the project, three main strategies for uncovering the visitors' learning were developed. By using the above mentioned

indicators, a behavior that indicates learning is happening could be found through observing visitors and listening to their conversations (the analyses of their conversations were done thanks to the voice recording). Questionnaires with the statements related to the visitors' learning and with open-ended questions were used in order to determine the visitor's personal evaluation of their learning and whether they understood the main ideas of the exhibition. This tool was tested at the Australian Museum and the Royal Botanic Gardens. [6]

By observing the visitors and recording their conversations, the museum employees gain very useful information about the visitors' behavior. In the case of the MARVEL method, the one-hour recording was analyzed in 30 seconds sequences [5]. The disadvantage of this method is that it does not bring any video recording, only audio, and it does not analyze the depth of the learning.

1.2 VEF (Visitors Engagement Framework)

Barriault also developed a framework for assessing learning experience in museums. This framework draws on observable behavior and activities related to engagement which indicate learning. [2] The main difference between the MARVEL method and the VEF framework consists in observing the visitors. While by using the MARVEL method, the observers follow one group of visitors (school children) and analyze their be-

Tab. 1: Learning Behavior

Learning behavior	Depth of learning
Engaging in the activity	Initiation behaviors
Spending time watching others engaging in the activity	
Information or assistance offered by staff or other visitors	
Repeating the activity	Transition behaviors
Expressing a positive emotional response in reaction to the engagement in the activity	
Referring to past experiences while engaging in the activity	Breakthrough behaviors
Seeking and sharing information	
Testing variations, making comparisons, using gained information	

Source: own illustration based on [1]

havior every 30 seconds, in the VEF method cameras and microphones are installed within the exhibition and the behavior of a random visitor is observed in that specific area. [2]

This framework consists of several discrete learning behaviors that occur as part of a visitor's interaction with an exhibit. The types of learning behavior can be grouped into three categories that reflect the level of engagement and the depth of the learning experience. These levels of engagement capture the progression in a visitor's learning experience. [2]

The table 1 presents the specific learning behaviors connected to the depth of learning.

The results of the VEF are presented in the VEP (Visitors Engagement Profile). Each of the three engagement level categories is presented by a bar showing the percentage of visitors who show one or more of the behaviors characteristic for each category. The base of the VEP is the number of visitors who approach an exhibit and pay attention to it or, to be specific, who interact with it. [2]

An example of the VEP in the "U" shape is shown in Figure 1. This figure presents a situation where the exhibit elicited high breakthrough behavior without intermediary transition level.

This is the kind of the results the science centers would like to reach.

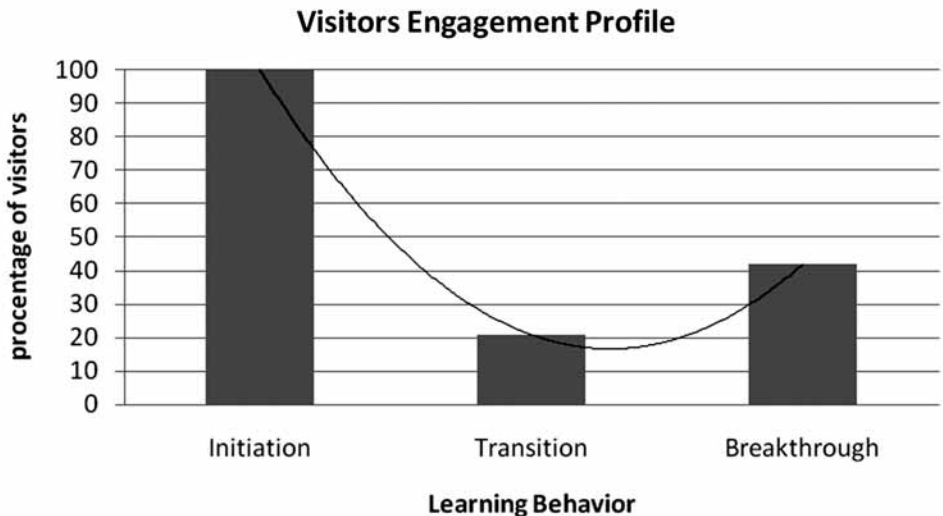
Another example of the VEP, which is optimal for the science centers, is shown in Figure 2. Such a result appears within an exhibition that brings out both Transition and Breakthrough behavior in a high proportion of visitors.

The weak point of this framework consists in the methodology of observation. The observers do not gain knowledge about the visitors themselves, but about the particular exhibit. However, without knowing the temporal and spatial division of the visit, it is not possible to explain why the deeper level of learning did not appear. To be specific, VEF does not count with information over-saturation, where the visitor shows no deeper learning behavior not because of the nature of the exhibit, but because he or she is not able to absorb more new information due to the acquisition of previous information during the visit.

2. A New Tool for Assessing the Learning Behaviour in Museums

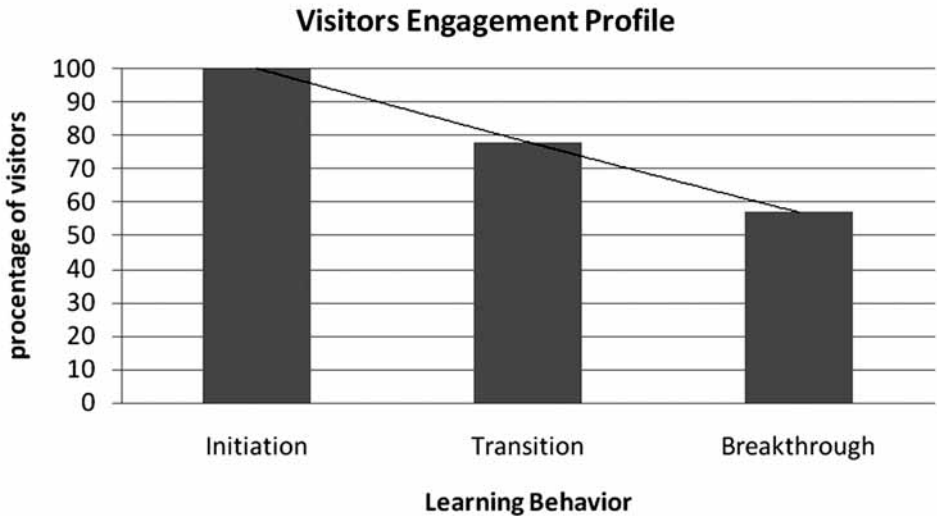
After studying these two methods and understanding their advantages and disadvantages, a new framework was established in order to assess lear-

Fig. 1: An Example of VEP with an „U“ Shaped Engagement Curve



Source: own illustration based on [2]

Fig. 2: An Example of VEP Showing an Engagement Curve with a Low Slope



Source: own illustration based on [2]

ning experience in museums. This method was already tested in two European science centers: the Danish Centre for Information about Natural Science and Modern Technology better known under its brand name Experimentarium and in the Czech Techmania Science Center o.p.s. The new methodology mainly leans on the MARVEL methodology. The main difference lies in the manner of observing the visitors. Special glasses with the ability to record what the visitor sees and what he or she says are used in order to gain video and audio recording of the visit. One visitor wears these glasses during the whole visit, no matter how long the visit takes. The main advantage of these glasses is that the observer does not have to be present in person; the group (it was tested on a group of 2 to 4 people and only one person from the group wore the glasses) therefore acts more naturally. The analysis of the obtained record provides the observer with data on learning behavior, which are analyzed in the way as described in the VEF, so the depth of the learning is identified for each exhibit visited by the group.

2.1 Research Plan of the New Method

This research plan underlay the observations which were conducted in Techmania Science

Center in Plzeň and Experimentarium in Copenhagen.

2.1.1 Purpose of the Study

The purpose is to gain an understanding of the visitors' behavior and the structure of the visit in a particular science center with the main focus on the level of the visitors' engagement and the depth of the learning experience during the visit.

2.1.2 Objectives

The main objectives are to find out:

- Whether learning has taken place – the nature of learning behavior.

- How the visit is structured – in relation to time and local distribution.

- What the personal reflection of the visit is.

- What has been learnt – the information the visitors acquire during the visit of a science center.

2.1.3 The Target Group

The target group was students aged 20 to 25, who were recruited for the research purposes. This age group was chosen because science

centers do not know much about their behavior. The management therefore thought it could be interesting to learn something about this group of people. The second reason is practical and resides in the language barrier in Denmark, so a group of English speaking people was required.

2.1.4 Method Used for Data Collection and Analysis

The methodology of this method was briefly described in the introduction to this method. It is described in more detail below; step by step.

I. Looking for the Behavior that Indicates Learning is happening

To analyze the learning behavior, recorded data from the previously described glasses are used. These glasses are worn by one member of the group, which, in an ideal case, consists of three people. The group is instructed on how to use the glasses and they are told not to split and move together all the time. They are then left on their own and do not meet the observer until their visit is over (which is the case for the common visitor as well).

I.A) Data Structure

When the observer analyzes the collected data, The observer fills in information about the visit to the table shown in Table 2. The data are filled in chronologically for each exhibit. The observer focuses on the behavior of the group as a whole. This can be done, because the group always moves together and they cooperate. Also the previous knowledge of one person affects the learning behavior of the rest of the group, and that is the reason why the observer does not analyze one specific person in the group, but the entire group.

I.B) Modified Version of VEP

A modified version of VEP is created for each group. For creating the VEP, the observer must reveal the learning behavior for each exhibit. He counts the number of visited exhibits (those the visitors stopped by and interacted with) and then he counts number of exhibits where only initiation behavior appeared; number of exhibits where initiation behavior changed into transition behavior, but did not change to breakthrough behavior, or only transition behavior appeared; and he counts the number of exhibits where transition behavior

Tab. 2: Data Observation Sheet

	Number of the exhibit	1.
General info	Name of the exhibit	
	Time spent by the exhibit in minutes	
	Time spent by the exhibit (from/to)	
Initiation behaviors	Engaging in the activity	
	Time spent watching other people engaging in the activity	
	Information or assistance offered by staff or other visitors	
Transition behaviors	Repeating the activity	
	Expressing a positive emotional response in reaction to the engagement in the activity	
Breakthrough behaviors	Referring to past experiences while engaging in the activity	
	Seeking and sharing information	
	Testing variations, making comparisons, using gained information	
	NOTE (interesting comments of the visitors, interesting behavior)	

Source: own

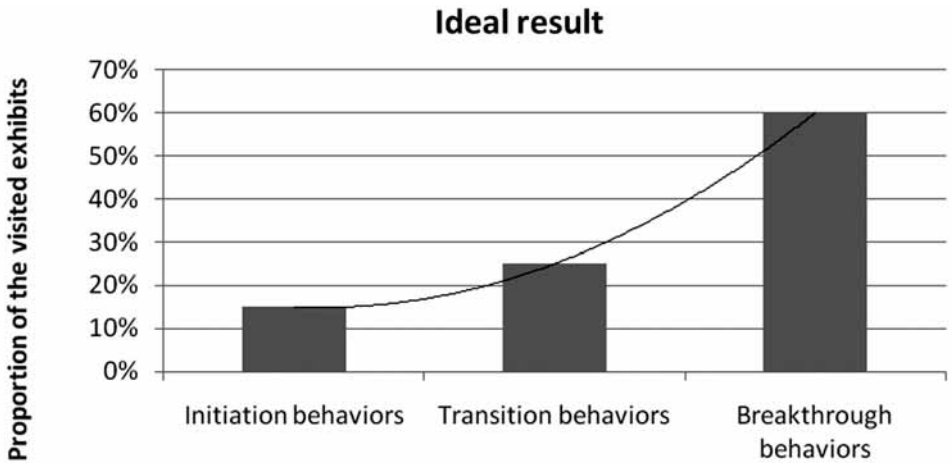
changed into breakthrough behavior, or only breakthrough behavior appeared.

From such information the VEP is created. VEP shows in what proportion the particular type of learning behavior appears. An example of an ideal VEP solution, a real solution and a bad solution

is shown in figure 3–5. The higher the proportion of the breakthrough behavior observed during the visit, the more valuable the whole visit was for the visitor.

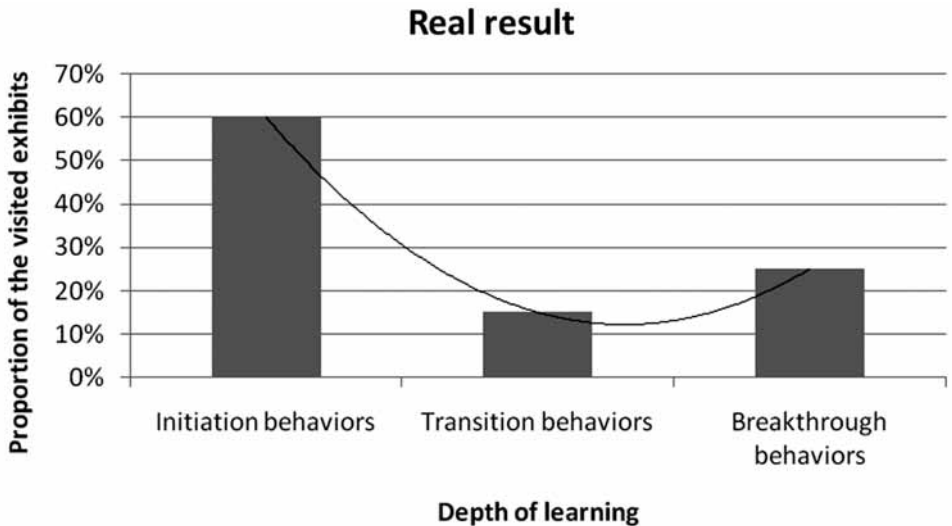
NOTICE: The original VEP described by Barriault shows something else, this is a modified

Fig. 3: Modified VEP Ideal Result



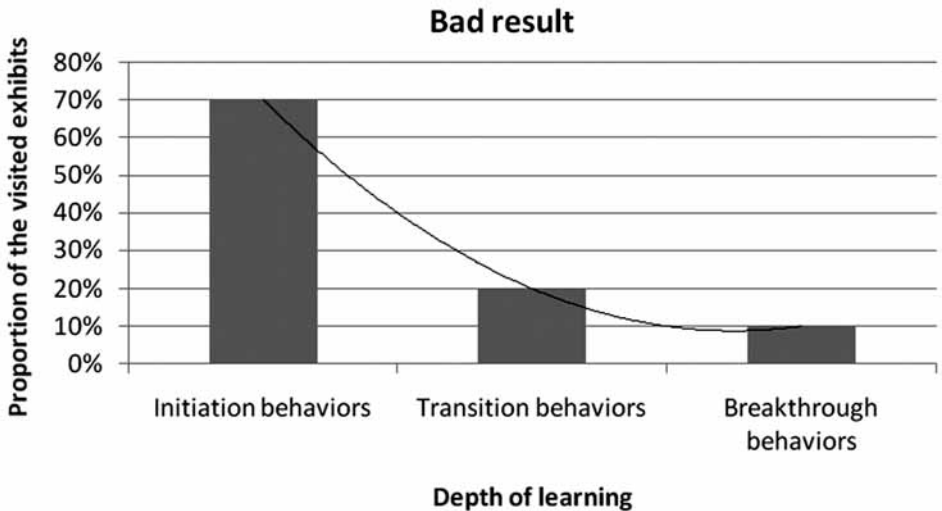
Source: own

Fig. 4: Modified VEP Real result



Source: own

Fig. 5: Modified VEP Real result



Source: own

version of VEP created for the purposes of this research.

I.C) Time Distribution Analysis

In the **TIME DISTRIBUTION** analysis, the observer calculates the listed indicators. He gains the data for those indicators from the data observation sheet. He also creates a table, which presents the total time spent in each section and the total time of deeper levels of learning in each section. The last analysis done in this section is the timeline, which presents time consumption of the visit. It shows how people were learning and not learning over time.

Time indicators

- Total time spent in the science center.
- Average time spent in one exhibit (that can be calculated for different types of exhibits).
- Average time spent doing different activities than working with the exhibit.
- Average time spent in exhibits, where only initiation behavior appeared.
- Average time spent in exhibits, where deeper learning behavior appeared.

I.D) Local Distribution Analysis

In the local distribution analysis the observer works with the map of the science center and identifies the way the visitor moves around the

exhibition and shows the points which are often passed by the group.

II. The Visitor's Own Evaluation of Their Learning

II.A) Exit Interview: Statements

For the personal declaration of the visitors' own views of the learning, the model of MOLI (the Modes of Learning Inventory) was used in the same way as in the MARVEL Project. Thanks to MOLI statements, it will be possible to find out whether the visitors considered themselves to have been learning and also examine the way how they have been learning. There will be several statements, each evaluated on a five point scale from "strongly disagree" to "strongly agree."

Statements: [6]

- I discovered things that I didn't know.
- I learnt more about things I already knew.
- I remembered things I hadn't thought of for a while.
- I shared some of my knowledge with other people.
- I got curious about finding out more about some things.
- I was reminded of the importance of some issues.
- I got a real buzz out of what I learnt.

- It was pleasant to be reminded and to learn more.
- It was all very familiar to me.
- Some of the things I learnt will be very useful to me.
- I found the exhibition fun/ I found the exhibition educational.

II.B) Exit Interview: Open Ended Questions

Visitors will also answer four open-ended questions in order to find out their perception of the ideas behind the exhibition.

Questions [6]:

The open-ended questions:

- What do you think are the main messages that the science center is trying to communicate?
- Were there some things that you found particularly interesting in the science center that you might tell other people about? If yes, what were they?
- Can you describe some exhibits that held your interest and what you learned from them?
- Will you visit the science center again? Give reasons for your answer.

2.1.5 Conclusions Made from the Observation

I. Visual observation: from the analysis of the audio and video data, we can find out the following: when the learning happened; how deep the learning experience was; in which time period of the visit the learning appeared; where the learning appeared; how the learning happened; when the information over-saturation appeared; how large the interval when visitor is not interacting with the exhibition but just walking around or doing something else is; how visitors move around the exhibition; what exactly was interesting for the visitors and how the visitors responded to the stimulus which should support learning (information tables, demonstrations etc.).

II. Questionnaires analysis: from the questionnaires, particularly from the statements part, we can see how the visitors value their experience. The open-ended questions show the visitors' opinions on the exhibition and what engaged them. The gained information is confronted with the observer's opinion. The purpose of the questions related to what the visitors learned is to see

whether the visitors are able to subsequently sum up the ideas behind the particular exhibit.

3. Limits and Weaknesses of the Presented Method

There are some limitations in the method described above. The methodology presented above is very time-consuming and it is hard to collect a representative number of observations to make general statements.

Besides, the collected data are affected by the observer's subjective opinion – they present the visitor's experience as interpreted by another person that is the observer. Due to this factor, indiscernible processes of learning are not included in the conclusion – the observer does not know what is happening in the visitor's mind. This weak point is compensated for by the questionnaires, where people list the exhibits they liked most. Their list is confronted with the observer's list.

This method also neglects the fact that assessing learning experience is still a controversial topic and many experts are inclined to the opinion that the process of learning and learning behavior cannot be observed and assessed. Apart from that, the borders between the levels of the depth of learning are very individual and it is difficult to decide where to draw the line. This method also presumes that it is only an interaction with some exhibit in the science center that stimulates the initiation behavior. Considering all those facts, this method assumes that it is possible to assess learning in terms of predefined behavior which matches with a particular depth of learning.

Conclusion

After the application of the new presented methodology for assessing learning in science centers (Techmania Science Center and Experimentarium), a lot of interesting information for the strategic management was obtained. The results show which exhibits were the most interesting for the group; how the learning behavior changes over the time spent in the museum; when the information over-saturation appears and how the group behaves afterwards; what the proportion of the time spent in a particular section of the whole exhibition to the time spent learning in that particular section is; how long it takes on average to interact with one exhibit and how long it takes

to interact with an exhibit where learning behavior appears.

Such detailed information about the visitors of science centers are very important when the science center makes strategic decisions connected with their exhibitions. These decisions can be connected with removing exhibitions, moving exhibitions around the interior, developing and implementing new exhibitions, but also with the way of changing the concept of a present exhibition so as to adjust it to the visitors' needs.

Apart from that, by observing the visitors of Experimentarium along with the visitors of Techmania Science Center, certain similarities in the visitors' behavior were observed. However, due to the lack of a representative number of observations, no general conclusions were reached. Nevertheless, it would be very interesting to assess learning in science centers around the world by the same methodology, so that a representative number of observations would be gathered and some general statements about the behavior of visitors in science centers could be made. This would help science centers adapt their exhibitions to the visitors' demands and thereby accomplish their purpose more efficiently.

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Bc. Alena Šuldová

Techmania Science Center o.p.s
Tylova 1/57, 316 00 Plzeň
alena.suldova@techmania.com

doc. Ing. Petr Cimler, Csc.

University of West Bohemia in Pilsen
Faculty of Economics
Department of Marketing, Trade and Services
cimler@kmo.zcu.cz

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ABSTRACT**HOW TO ASSESS EXPERIENCE - THE NEW TREND IN RESEARCH TECHNIQUE, USE IN NONPROFIT SECTOR OF ENTERTAINMENT AND EDUCATIONAL INDUSTRIES****Alena Šuldová, Petr Cimler**

This paper presents a pre-test research on the assessment of learning experience in a museum, developed for the particular purposes of science centers. This tool is a combination of two existing frameworks for the assessment of learning: The MARVEL project from Australia and Visitors Engagement Framework described by Chantel Barriault. The new methodology uses and explores the benefit of these in order to obtain even more valuable information about the one day visit of a particular visitor. This will help the science centers improve their concept and educational environment. The main difference from already presented methodologies consists in the way of observation, using a pair of special glasses with the ability to record audio and video. Thanks to these glasses, the observer does not have to be present in person, so, in the end, more realistic data about natural behavior of the visitors are collected. Especially the audio data, which allow us to hear the conversations and the immediate opinion and understanding of the visitors, are very valuable.

By applying this method, the science centers will gain information on the depth of the visitor's learning experience, on how the learning took place as well as on the spatial and time division of the visit and learning process and, finally, on the visitors' personal reflections.

Key Words: *learning behavior, depth of learning, science center, learning experience.*

JEL Classification: *D83, L31, L82, M31, O31.*