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ABSTRACT

The competence of interpreters, so called "docents," influences visitors' learning in museums. The study reported in this paper investigated 16 interpreters' perceptions about: the educational goals of the science museum in Taiwan, the function of the interpreter in the science museum, the requirements for a competent interpreter, and the interpreter as a professional using open-ended questionnaires, follow-up interviews, and observation from the interpretation. Results indicate that interpreters believe that the goal of the science museum was mainly to transfuse scientific knowledge to visitors. Although instructional skills were employed to motivate museum visitors, most of the interpreters did not consider the importance of affective objectives in informal science learning. Interpreters also thought that science museums should build firm relationships with the public and the school systems and that they could become more professional. Problems regarding training policy, welfare, and job descriptions are discussed. An open-ended questionnaire about interpreter's perceptions of museum education is appended. Contains 5 tables and 16 references. (Author/JRH)

INTERPRETERS' PERCEPTIONS ABOUT THE GOALS OF THE SCIENCE MUSEUM IN TAIWAN

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Abstract: Interpreters play the role as the bridge between museum visitors and exhibits. The competence of interpreters especially influences visitors' learning in the museum. This study focused on the National Museum of Natural Science in Taiwan to investigate interpreters' perceptions about 1) the educational goals of science museum, 2) the function of interpreter in the science museum, 3) the requirements for a competent interpreter, and 4) the interpretation as a professional. Interpretive methods including open-ended questionnaires, interviews, and observation were used in gathering the data. The results revealed interpreters recognized the goal of science museum was mainly to transfuse scientific knowledge to the visitors. Although instructional skills were employed to motivate museum visitors, most of interpreters didn't regard the importance of affective objectives in informal science learning. Interpreters also thought science museum should build a firm relationship with both 'the public' and the school systems. Interpreters expected they could become more professional. However, they also mentioned training policy, welfare problems, and clarified job description should be solved first.

The objective and significant of the study

Informal sicnece learning has earned more attention in recent years. Since most of people will learn science outside the schools for the most portion of their lifetime (Lucas,1983), science educators also began to employ the educational resources from a variety of informal institutions to assist students and the public in learning science (Igoe,1993). Such strategies not only expand the realm of teaching and learning, but also provide an opportunity to establish the cooperative relationship between formal and informal educational systems. Science museum, as one vital part of the institutions in social education provides a place with abundant educational resources not only for the public visitation, but also for kids' field trips. In the last few years, both science and museum educators focused on the several issues to explicit the nature of the science museum as a learning environment. These issues include:

1) the learning of students and the public(Finson & Enochs,1987),
2) visitors' behaviors in the science museum (Dierking & Falk, 1994;Hood & Roberts,1994;Diamond,1994;Boisverrt & Slez,1994; Lewenstein,1993;Screven,1993),
3) the educational function of the exhibits (Bernfeld,1993),and
4) the evaluation of the device for enhancing visitors' learning (Silverman,1993).

Since the interpreters, so-called docents, act as a bridge between museum exhibits and visitors, this study mainly explored their perceptions about 1) the educational goals of science museum, 2) the purpose of interpretation, 3) the requirements for the interpreters, and 4) the interpretation as a professional. In this study, sixteen interpreters serving in the National Museum of Natural Science (NMNS)in Taiwan were included as samples for data collection.

Since the interpreters are the resource persons easily available for visitors in the museum, the competence of the interpreters might be one of the crucial indicators for judging the educational function of the museum. The perceptions about the museum education held by the interpreters must bring impacts on visitors and influenced visitors' visiting and/or learning behaviors while viewing the exhibits, or even after leaving the museum. The result of this study would help museum curators improve their interpretive systems and training policy. For other instititions of social education, the findings of this study can also provide the valuable information while they are going to build a system for assisting visitors to learning something in their institutions.

Reasearch design and procedure

Qualitative method was used for fulfilling the purpose of this study. The data were collected from 16 interpreters serving in the National Museum of Natural Science through open-ended questionnaires, follow-up interviews, and observation from the interpretation. The data were then analyzed by analytic induction. Through this procedure, open-coding system was established and some assertions were also formed. The triangulation was used to support the findings and establish credibility for this study by comparing the information from various sources.

Findings

1. Most of the interpreters regarded the trasfusion of scientific knowledge to the museum visitors as the main goal of science museum.

In "The Birth of a National Museum" published by NMNS in Taiwan, the goals of exhibition and education were announced as follows:

"To implicit the phenomena and principles of the nature, motivate the interests and curiosity of the public toward science, and establish the foundation for future development of science."

Pao-Teh Han, the president of the NMNS, also recomeneded science museum should devote to promote the scientific literacy of the public, nuture citizens to acquire the abilities of rational thinking and stimulate them to be curious on scientific knowledge. Apparently, the science museum not only emphasizes the achievement of the goals in the cognitive domain, but also those in both the affective and the pychomotor domains. However, according to the responses from interpreters of NMNS, most of them stressed on the importance of knowledge level. Among nine interprters who mentioned science museum should trasmit scientific knowledge, only two of them recognized the importance of both affective and cognitive goals. Some evidences illustrated below show the general view about the educational goals of science museum.

I1:The educational goal of science museum is to enhance schoolchildren to learn scientific knowledge.
I2:Science museum provides the opportunities in learning scientific knowledge from everyday-life environment.
I3:The educational goals of science museum are to transmit science-related knowledge to the public.
I4:.... make visitors to expand their scope of knowledge.

As the bridge built between exhibits and visitors, the interpreters are responsible for expliciting the rationale of the museum designs and scientific exhibits to the visitors. They mainly employ oral communicative skills to stimulate visitors to acquire the understandings about the science museum. From the above illustrations, Interpreters regarded "to transmit scientific knowledge to visitors" is very important. While asked the point of view toward students visiting the science museum, an interpreter (I5)said:

> The major function of the museum is trasmitting knowledge, because they(students)might learn some knowledge from the textbooks, they may find the correlation through museum visit. Or, they might find there is something they have never seen before. From viewing the exhibits, they can learn some knowledge from the museum.

This interpreter has mentioned "knowledge" three times in this short interviewing period. These include 1) the knowledge museum should transmit, 2) the knowledge museum and school can cooperate to teach, and 3) the knowledge students can acquire through viewing the exhibits. This interpreter then expressed his feeling about the interaction with the visitors. He said:

> Actually, sometimes I doubt how much they have learned through listening my interprtation. However, I am really sure all of us do our best at the work.

What he said the objects student learned and interpreters were devoted to do are all concerned with "knowledge".

2. Although the factors such as motivation, interest, and the fun of science were emphasized, most of museum interpreters did not think achieving affective objectives was the main purpose for the science museum.

Four of sixteen interpreters expressed museum should educate visitors through more comfortable ways. Other interpreters also said visitors' interests in science should be motivated first, and then it might be easier to make them continuous doing scientific inquiry in the future. But only three interpreters clearly mentioned "to nuture visitors' interest in science is one of the educational goals for science museum. They said:

I6:The educational goals of science museum are to promote the public to understand scientific knowledge, connect scientific knowledge with daily life experience of the public and stimulate their interests in learning science.

I7:To make all citizens interset in science, and find science is existing everywhere around us, and not afraid of learning science.

I8:To promote the spiritual life of the public, then enlighten their interests and cababilities in inquiring natural science.

Above three interpreters emphasized the importance of affective goals achieved in the science museum. One of them(I8) also explained:

> .....in the science museums, visitors can be enlightened in the cognitive level. For those things they have never seen before, they also can be motivated while visiting the science museum.

She then described what "enlighten" meant in the interview.

I8:"Enlighten" means "to motivate visitors' interest, then attract them to search for, to inquire something deeply.

However, most of the interpreters did not recognize the importance of the goals in affective domain, although they employed motivative ways to attract visitors in their interpretation. For example, an interpreter expressed his positive attitude about how to stimulate visitors' motivation, but he did not regard it as one of the educational goals for the science museum.

I5:Although he (visitor) has never visited the museum before, while he comes here and listens to my interpretation, he must be motivated and wants to learn more. .....However, as a part of social education,

science museum play a role to provide some knowledge formal education do not have. It must focus on cognitive domain. About the educational goals, I have not consider anything esle in addtion to this.

Although this interpreter perceived visitors' changes in affective elements about learning science, he did not consider it is one of the educational goals for the science museum. From his view, to motivate visitors' interests is merely the vehicle to transfuse scientific knowledge, but not as a goal itself.

3. Interpreters look the public as their educational targets; science museum should build a firm relationship both with the society and school systems.

Interpreters mentioned their educational objects included ordinary people, citizens, all age groups, every social class, schoolchildren, and familiy groups. Following examples reflect the recognition of interpreters about the nature and the objects of the science museum.

I1:The service to family visiting groups should be enhanced in the science museum.
I4:...to provide the materials both school and family cannot offer, and make knowledge more interesting.
I5:Science museum should attain the goals of social education through a non-formal route.
I9:Science museum should promote social education to meet with the needs of the society according to the official policies.

Two interpreters described their expectations and acts while facing different kinds of the visitors.

I5:Because science museum is a part of social education, its duty is quite different from schools. In school, teachers face relatively more homogeneous age groups. But in the museum, there are quite different kind of groups according to both age and social economic status. Therefore we should prepare our interpretation according to the nature of the group we talk to.

I9:While talking with visitors, no matter whom they are, I always talk to myself if there is only one tenth visitors understand what I am saying, I would be feel satisfied with my interpretation. To tell the truth, the ideal situation to promote education through non-formal system is just based on such a kind of expectation.

The first interpreter here compared the difference in the educational objects between school and museum, and suggested interpreter should adjust their interpretive behaviors. Another indicated he did not care if visitor would learn something after listening to his talk. He said the process for learning need time.

In regard of the relationship between museum exhibits and school curriculum, an interpreter used "Ancient Chinese" exhibition area to describe how she combined these two together.

I4:Junior-high students have learned the concepts about ancient Chinese before. Based on this, I usually introduce more information for them. However, I would not go much too far. I just tell them a little bit more than what included in the history textbook.

General speaking, science museum provides educational services to the public no matter their sexes, ages, ethnic groups, and social economic status. Although museum educators will change their ways in education while facing different groups according to their background in natural science, interpreters showed the understanding of the fact that museum should connect with both school and society.

4. The interpreters thought the function of guided-tour mainly focused on the pratical level to assist visitors actively.

Most of interpreters indicated the guided-tour had two functions:

1) to help visitors understand the meaning of the exhibits, and 2) to instruct visitors the efficient visiting tracks. They expressed:

I10:Visitors could get the insight of the exhibits from interpreter's services.

I11:The service of interpreter makes exhibits easier to understand.

I12:The sign for instruction is not so clear that visitors need the guide from the interpreters.

I13:The area inside the science museum is so broad that visitors always get lost. They really need our help in instructing them the directions while viewing around the exhibition hall.

An interpreter(I1) also said:

Visitors can get the quick answer from the interpreter.

The interpreters recognize they should active to help visitors in the science museum. An interpreter (I14)explicated:

Interpretation creates a dynamic interactive relationship between museum educators and visitors. It also makes museum more active to meet visitors' needs.

Another interpreter(I13) expressed her point of view in economic perspective:

Interpretation can help visitors to consume less time to view the exhibits and gain the most knowledge as possible.

Actually, how to assist visitors utilize the museum more effectively is one of the important issues for museum educators. From the interviewees' responses, interpretation is looked as an essential part for the museum education. Museum should not only help visitors actively, but also realize the desire of the public.

5. The interpreters were more likely to create a genial atmosphere based on visitors' characteristics and their own personalities to motivate visitors to listen to the interpretation.

The interpreters viewed ones personality as the crucial factor to determine a competent interpreter. They thought one should create a genial atmosphere for attracting visitors to listen to the interpretation. Baesd on such a condition, interpreter can futhermore employs communicative skills in conveying the scientific content. The following statement reveals an interpreter's view about how to manage the interpretation based on ones personality, communicative skills and professional knowldege.

> I5:No matter how well you explain the content to the audience, I feel the atmosphere is the most important. If you can attract them first based on your personal character, and make them familiar with you, you will be more advantage in the following interpretation.

This interpreter also emphasized on the importance of the audiences' responses. He thought interpreter ought to adjust his content and skills when facing different kind of the visitor groups.

Another Interpreter(I9)said:

> The inclusion of my interpretation is not so profound. It is not possible to tell the audience everything I know. If I do so, The visitors might get sleepy. Thus, I try to make the interpretation attractive simply to understand. Some of instances are included in my inter-

pretation. These examples are on the everyday life basis. I think it is relatively easier way for visitors to understand scientific knowledge.

Interpreters described their work is so similar to salesman. One of them(I9)said:

> We behave like a salesman. I usually need to convince visitors to listen to my interpretation by several strategies such as caring for their feelings, attracting them interest with me, and so on. After establishing the mutual relationship, I set forth to talk about the exhibits. They might be interest with "this guy" so that support what he will do in the following period of the time.

From his words, we know interpreters are not like school teachers in handling knowledge. It is not feasible for he or she treat visitors as a schoolchildren, even if he or she is facing a student group. What teachers do under the atmosphere of classroom is not exactly the same as what they face in the museum, thus he or she usually needs to act as salesman and try to keep the audience curious and happy in the group as possible.

6. Interpreters thought interpretation should become a professional; however, the supports from training and administrative levels were the key factor for accomplishing such a goal.

Interpreters expected their work became professional. Although they were not satisfied with the current situation, they proposed some ways such as in-service training, welfare improvement, and simplified working condition for the future development. The following examples would represent the typical views of the interpreters toward this issue.

I13:Professional interpreters can facilitate the spread of scientific knowledge.

I5 :Through professional interpretation, the meaning of the exhibits could more precise to be conveyed.

About the feasible way to get the work professional, several interpreters suggested as follows.

I5 :Only if the working condition become reasonable and simplified, the interpretation might become professional.

I6 :Unless pays are elevated, there will be short of competent applcicants for this job.

I11:The opportunities about in-service training is not sufficient for the interpreters. Sometimes, we suspect ourselves if really understanding the rationale of the exhibits or not. We need training to help us improve the quality of the interpretation.

In addition to the above, the decisions made by the leaderships in the museum play as the top priority role for determining if professional interpretation would come true or not.

I14:Leaders' will is above everything in the science museum. If they agree, then we can head for such a goal.

I13:Because the pay is so low, I don't think the work could become professional.

On the contrary, an interpreter retrospected about his performance and state his self-expectation in the future.

I9:I think the best way to earn dignity from the public is through acquiring professional knowledge and skills for the interpretation. If our talks are more attractive than what university professors give, I am sure the visitors would give us a positive feedback.

To summarize, to achieve the professional interpretation is the agreement of interpreters in the science museum. But they also proposed that if we want to attain such a goal in the future, there would be a lot of administrative work to adapt with such a policy.

Discussion and Recommendations

From the result of this study, interpreters' perceptions about the educational goals of the science museum, the objectives of interpretation, the requirements for a competent interpreters, and interpretation as a professional were revealed. In conclusion, interpreters mainly focused on cognitive level to consider the educational goals of the science museum. Although they employed lots of strategies to motivate visitors' willingness to learn science and become more positive attitude toward science, they did not regard these themselves were the goals. The strategies were only used as the strategies to attain the goals in transmitting scientific knowledge.

According to Bloom (1956), the objectives for learning are classified into cognitive, affective, and psychomotor domains. Since the science instructions in the classroom are based on a series of curriculum, it is comparatively feasible for students and teacher to develop a firmly mutual relationship. Teachers also could select instruction materials and methods suitable for children through self-retrospect and the feedback from the interactive process with the students. However, the nature of the interpretation is not the same as that in the formal educational system. Interpreters usually face the audience groups heterogeneous in age, background, education received and social economic status. The nature of audiences is diverse, and the relationship between the interpreter and the audiences is weak. If interpreters focus on the extent the visitor could learn through the museum visit, they might over-estimate the effect of cognitive learning but leave out the value of the goals in the affective domain such as attitudinal change, and interest

motivation. Therefore, the inclusion of this element in the in-service training is critically necessary for the interpreters serveing in the NMNS.

Knox(1981) described an interpreter should not only have the interest and the basic knowledge in the museum exhibits, but also be able to perceive the backgrounds and needs of the visitors and employ the suitable skills to make exhibits connect with their daiy-life experiences. The in-service program for the interpreters should be composed of these three dimensions. The pedagogical content knowledge (PCK) (Shulman,1986) owned by the museum interpreters would also be one of the interesting issues for museum curators to explore. For example, whether there are specific barriers for the interpreters to construct a sound form of PCK and how to solve the problems by the training are the major issues in designing the program for the interpreters.

Interpreters expected their work become more professional. In order to attain this goal, the policy in the museum should be adjusted first. Although interpreters' expectations are strong, the leadership in the museum would be the key factor to make this goal come true.

Appendix

Open-ended Questionnaire of Interpreter's Perception about Museum education and the Interpretation

Personal Information

Sex:_Male _Female Age__
Years served in NMNS:__year(s)__month(s)

Education:__Graduate School
__College
__Junior College
__Others(Please Note:_____)

Major:_____

1. What is the educational goals of the National Museum of Natural Science?
2. What is the purpose for NMNS to provide guided-tour?
3. What are the requirements a competent interpreter should have?
4. What is your attitude about the interpretation becoming professional?

Table 1. Demographic Data of the Interpreters in the National Museum of Natural Museum

Sex		Subject Background	
Male	5	Chinese Literature	1
Female	11	History	2
		Japanese Literature	1
Education		Spanish Literature	3
Graduate School	2	Education	1
College	11	Anthropology	1
Junior Colledge	3	Economics	1
		Acccounting	1
Age		International Commercial	1
30-35	6	Biology	1
25-30	10	Pharmacy	1
		Hospital Management	1
		Chemestry Engineering	1

Table 2. Interpreters' Perceptions about the Educational Goals of the Science Museum

ITEM	FREQUENCIES
A. The ways or the inclusion to attain the goals	
(1) Learning through an interesting atmosphere	4
(2) Promote positive attitude toward science	3
(3) Transmit scientific knowldge	9
B. The Nature of Museum Education	
(1) social education	5
(2) continuous education	1
(3) education for all	7
(4) the complement for formal education	3
C. The Targets of the Museum Education	
Generalized Group	13
(1) ordinary people	1
(2) for all Chinese	2
(3) the public	1
(4) whole society	2
(5) every age group	4
(6) every SES	3
Specific Group	4
(7) schoolchildren	3
(8) family visitors	1

Table 3. Interpreters' Views toward the Functions of Guided-tour in the Science Museum

ITEM	FREQUENCIES
A. Education for the Visitors	
(1) Interpreting the exhibits	11
(2) Interactive Communicating with the Visitors	3
(3) Educating the Visitors Actively	1
(4) Answering the Questions	1
B. Guiding for the visitors	
(5) Help Visiting effectively	2
(6) Instruct and Guide the Visitors	4

Table 4. The Reqirements of the Competent Interpreters According to Interpreters' Views

ITEM	FREQUENCIES
A. Personality	
(1) Geniality	8
(2) Cordiality	1
(3) Sympathy	2
(4) Attraction	1
(5) Insight	1
(6) Self-pursuit	2
B. Communicative Skills	
(1) Oral Communicative Skills	5
(2) The Accumulation of Experience	1
C. Appearances and Attitudes	
(1) Appearences	1
(2) Attitudes	1
B. Professional Knowledge	5

Table 5. Interpreters' Views toward the Professionalized Interpretation in the Future

ITEM	FREQUENCIES
A. Support or not	
(1) Yes	6
(2) Suspicious	1
B. Problems should be solved	
(1) Inservice Training	5
(2) Working Condition Simplified	3
(3) Welfare Improvement	3

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