

relevant literature. This thesis is structured according to the chronology of the approach to the topic and considers American literature almost exclusively. The first section

what zoos want to be - why evaluate?

describes what zoos in general stand for. It explains why evaluation processes are critical for the zoos' success and gives a general view concerning the tasks of zoos, their strengths and weaknesses. Besides some relevant American research institutions are listed.

what zoos are - how do we know?

is the main section of the thesis dealing with discrepancies between design intention and actual impacts upon visitors. Ways to find and evaluate

them are shown. Research methods and evaluation instruments are defined and exemplified. Finally, results of completed studies are discussed. In order to evaluate educational efforts in zoos there is a detailed chapter on learning psychology. Another chapter explores the American zoo audience. The last chapter discusses the visitor's response to zoo design. It analyses how people are orienting in zoos, reacting to exhibits and using support facilities and programs.

what zoos may be - do they change?

This section of the thesis draws conclusions from the preceding parts and gives an outlook. It summarizes current trends in zoo design and considers ecological requirements that may lead to a changing face of zoos.

Learn your ABC's of Zoo Architecture Z to A

Technical terms related to zoo design

<http://www.zoolex.org/glossary.html>

A

Advance Organizer: Advance or pre-organizers offer information on conceptual and topographic orientation. They can be provided by staff, posters, kiosks, self-testing devices, headline questions, films, computers, videodiscs, flip panels, and other means.

Alignment Principle: When a (vertical) map is aligned, then the upper part of the map corresponds to the area forward in the terrain.

Allocentric orientation: Allocentric orientation is maintained through the use of either environmental features such as landmarks, or coordinate systems (i.e., north-south, east-west), which are independent of the observer.

Animal welfare: physical and psychological well-being of animals. For the assessment of animal welfare, Dr. John Webster, Professor of Animal Husbandry at the University of Bristol, developed the concept of "five freedoms" for farm animals in the 1960's. The British Farm Animal Welfare Council has promoted the **five freedoms** and many organizations worldwide use them. (See F for Five Freedoms).

Attitude: The feelings and beliefs that predispose an individual to react in a certain way to an object or stimulus.

Attracting power: The ability of an exhibit to attract the attention of visitors usually is measured as ratio of the number of visitors who stop at an exhibit to the total number of visitors who pass by this exhibit. For example, if 10 out of 20 people stop at an exhibit, the attracting power is 50 %.

B

Browse: Branches, twigs, shoots, leaves, and blooms of various plants given to the animals for food.

C

Ceiling effect: When a sample of visitors respond so positively to a programmatic effort that little information is gained from an investigation, one may assume a ceiling effect. This has special significance for evaluations of theatrical shows, slide shows or film programs.

Concept learning: The ability to group or name a class of objects, events, or symbols that differ among themselves on some common characteristics.

Conceptual orientation: An overview of what can be seen, done and learned, a brief information about exhibits.

Cued testing: Method of formal analysis when subjects are aware they are to be observed and questioned; reflects ability of materials to communicate under motivated conditions.

D

Den: sleeping place

Dependent variable: Changing variable, assumably influenced by the independent variables.

Developmental evaluation: See formative evaluation.

Diurnal: daylight active

Dutch door: split door which allows to leave the top half open (for ventilation) and the bottom half closed.

E

Egocentric orientation: Egocentric orientation involves cues that depend upon the position of the observer (i.e., left - right, in front - behind). The relative absence of external cues maximizes the likelihood that subjects will rely on egocentric reference systems.

Entering knowledge: Knowledge/attitudes/skills shown in pretests.

Environmental enrichment: Provision of stimuli which promote the expression of species-appropriate behavioural and mental activities in an understimulating artificial environment.

Erosion technique: Method of indirect observation using traces like worn pathways in the grass.

Evaluation: Systematic assessment of the value of a display, exhibit, gallery, film, brochure, or tour with respect to some goal for the purpose of making decisions.

F

Five Freedoms of Animal Welfare are:

1. Freedom from hunger and thirst - by ready access to fresh water and a diet to maintain full health and vigour.

2. Freedom from discomfort - by providing an appropriate environment including shelter and a comfortable resting area.

3. Freedom from pain, injury and disease - by prevention or rapid diagnosis and treatment.

4. Freedom to express normal behaviour - by providing sufficient space, proper facilities and company of the animal's own kind.

5. Freedom from fear and distress - by ensuring conditions and treatment which avoid mental suffering.

Feasibility study: See Front-end evaluation.

Flip panel: Interactive label; viewers answer questions by choosing and lifting one of several hinged flip panels that depict correct/incorrect photos, objects, statements etc.

Focus group method: A method from marketing research in which a small group of consumers participates in in-depth interview focused on a particular topic of product.

Formal learning: Learning that is evaluated or assessed according to prescribed standards such as a letter grades or numbers in schools or courses as opposed to informal learning.

Formative evaluation: Evaluation with the major purpose to improve the functioning of the exhibit.

Freedom: having options. See animal welfare.

Front-end evaluation: Evaluation undertaken before an exhibit is installed or project developed; used to help establish goals and objectives of the project.

G

GIS: geographic information system. A GIS is a computer-based system for the storage, management, analysis, and display of geographic and associated data. GIS is a powerful tool designed specifically for

integrating, analyzing and mapping all types of spatial information.

Goal-free evaluation: Evaluation that is shaped from the information collected; attempts to not impose evaluators' goals and objectives before the start of the evaluation.

Goal-referenced evaluation: Evaluation undertaken to assess whether or not specified objectives are being met.

Gunite: Mixture of cement, sand, and water sprayed to specifications, used throughout zoos to duplicate rock formations.

Guy-rope, guy-wire: rope or wire used to steady anything or hold in position; most often used to describe ropes or cable securing such things as tents or tall poles.

H

Holding power: A measure of time spent viewing an exhibit. Often used as a ratio of average viewing time by uncued visitors. The quotient of the mean viewing time and the minimum time needed, e.g. the length of the program, also is referred to as the program's holding power. For example, if the required minimum viewing time of an exhibit is 30 seconds and a person stops for 10 seconds (actual viewing time), the holding power is 0.33.

HVAC system: heating, ventilating and air conditioning system.

Hypothesis: The assumption of a relationship between variables.

I

Independent variables: Conditions of an hypothesis, should be held constant to learn the relationship between dependent and independent variables.

Informal learning: Free-choice learning that is nonlinear, self-paced, voluntary, and exploratory as opposed to formal learning.

Informal setting: Learning environment for informal learning such as museums, zoos, aquariums etc.

Instrumental learning: See operant learning.

Interaction: Any movement associated with gaining better comprehension such as stepping closer, touching, discussion, and use of the senses.

K

Knowledge gain: The retention of previously learned material and the ability to grasp the meaning of the material.

L

Landscape immersion: Term used by COE (1986) to describe zoo exhibitions that provide the illusion of

“naturalism” to the point that visitors are perceptually immersed in the environment.

Leftover technique: Method of indirect observation using traces like pieces of litter, fingerprints, photos and video/audio recording.

LSS: Live Support System (waste, air and water recycling)

M

Mock-up: Prototype, model; an inexpensive simulation of an exhibit or object often used during formative evaluation in order to determine its effectiveness before a final exhibit is completed.

N

Nocturnal: night active

Noncued testing: Method of formal analysis when subjects are not aware they are to be observed; reflects the motivational impact of exhibit elements.

Non-participatory learning devices: Learning devices with a one-way flow of information.

Nonreactive measures: Methods of collecting data which do not change the behavior of the subject that is being observed.

O

Obtrusive observation: The subject knows that he/she is being observed.

Operant learning: An operant is a voluntary reaction, unlike a reflex, that has been learned to be successful by non-aimed acting. The likelihood of a particular response then is a function of the immediate consequences that have been associated with it.

Orientation: General term that includes conceptual orientation, wayfinding, and circulation.

P

Participatory learning devices: Learning devices offering the possibility of interaction.

P.O.E.: Predict - Observe - Explain; a procedure from a publication called “84 Ways to Add Sparkle to Your Teaching” from PEEL (Project for Enhancement of Effective Learning), Monash University, Melbourne, Australia

Post-design evaluation: See summative evaluation.

Post-occupancy evaluation: Term used in architectural literature to mean evaluation of a building after the facility is in use. Similar to post-design or summative evaluation.

Pre-design evaluation: See front-end evaluation.

Pre-organizer: See advance organizer.

Pretest: Test given before exhibit exposure.

R

Reliability: Reliable measurements refer to the consistency and stability of measurements and depend upon objectivity and standardization.

Remedial evaluation: The term refers to a post-design evaluation with the intention of improving exhibits.

Rule learning: As result from learning a rule (that defines a concept) one can use this rule by stating it and selecting new examples of the rule.

S

Spatial patterns: Actual routes followed by visitors through an institution.

Summative evaluation: Focused on installed exhibits, evaluates the extent to which an exhibit/program is meeting its objectives and is cost-effective for future exhibits.

Survey: Self-report method that includes questionnaires, interviews, and rating scales.

Summative evaluation: Evaluation of the extent to which a project is successful, usually in terms of goals and objectives.

T

Temporal patterns: They describe how recreational visitors divide total time spent, e.g. among walking and viewing exhibits, eating, shopping, and other activities such as restrooms, entertainment, playing ground etc.

Topographic orientation: This element to visitor orientation involves being able to find or locate places in a facility. Orientation devices such as maps and direction signs are critical for wayfinding.

Tracking: Direct observation of visitor behaviour throughout an exhibit area or facility to find spatial, temporal and behavioural patterns. It gives a more complete picture of the visitors' behaviour than does focused observation as they move through the facility.

Triangulation: This term refers to the ability of some person or object to promote social interaction between viewers who otherwise would not interact.

V

Validity: The accuracy of conclusions about measurements depends on several concepts of validity: Is your sample representative? Are your measurements really measuring the concepts you think they are? Does your measurement distort the system? Are the results due to the factors that you think? Do your results generalize? etc.

Variable: Observable/measurable values used for the verification/falsification of hypotheses.

VESDA system: very early smoke detection alert system.

W

Wayfinding: See topographic orientation.