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## Web-Ob for multiple intelligences observation

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### Abstract

Observation is a daily practice in scholastic and educational contexts, but it needs to develop into a professional competence in order to be helpful. In fact, to design an educative and didactic plan and to provide useful tools, activities and tasks, teachers and educators need to collect information about the learners. We present the Web-Observation (Web-Ob) application as a tool to support good practices in observation. In particular, Web-Ob can provide Multiple Intelligences Theory as a framework through which children's behaviors and attitudes can be observed, assessed and evaluated.

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*Keywords:* Observation process; observation competencies; multiple intelligences theory; community of practice.

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### Introduction

Our scholarly interest and practical interest in the application of Multiple Intelligence Theory (MIT), has led us to develop an online environment for educators, teachers and experts who are, or wish to, work with this theory. MIT's use in classrooms greatly relies on qualitative observation and monitoring of children. Yet, such observation generates a large quantity of qualitative data, which is difficult to manage. In this article, we describe the experience in an Italian nursery school, which has been applying MIT for the last 8 years. After an initial period, during which educators' observational work relied on paper and pencil, a web application was developed to facilitate their task. The web application enabled educators to monitor children's behaviors and development in real time, and to take brief written observations texts in a laptop to describe *what* a particular child is doing, *when*, *with whom*, *during* what kind of activity and so on. The on-line environment, devised for this school, can also be used by different groups in different schools in different countries in order to form a community of practice in the MIT field.

### 1. The Multiple Intelligences Theory as background

Multiple Intelligences Theory was proposed by Howard Gardner, a developmental psychologist at Harvard University. Using a wide variety of evidences, initially detailed in "Frames of Mind: The Theory of Multiple Intelligences" (1983), Gardner argues for seven relatively autonomous intelligences, briefly described below:

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- *Linguistic intelligence* (LI) features sensitivity to language in spoken and/or written forms, the ability to learn languages, and to use language in pursuit of one's goals.
  - *Logical-mathematical intelligence* (LMI) concerns the capacities for mathematical operations, logical analyses, and scientific investigation.
  - *Musical intelligence* (MI) facilitates composition, performance, and appreciation of musical patterns.
  - *Bodily-kinaesthetic intelligence* (BKI) involves the use of all or parts of the body to solve problems or fashion products.
  - *Spatial intelligence* (SI) entails the perception, use, and transformation of spatial information.
  - *Personal intelligences* (PI) enable individuals to recognize and make distinctions among others' feelings and intentions as well as to understand themselves and to use this understanding effectively to manage their own lives.
  - *Naturalist intelligence* (NI) allows people to distinguish among, classify, and use features of the environment.
- Gardner has also tentatively proposed the following kind of intelligence, but it is not yet in place:
- *Existential intelligence* (EI) consists in the capacity to use philosophical reasoning, to manage justice, to deal with religious issues.

Over the years, Gardner's theory has been applied in a wide range of educational settings and student populations.

## 2. The Web Observation application

The Web Observation application (Web-Ob) is intended for educators and teachers. It offers scaffolding for their daily observational activity and facilitates the attainment of good observation practices through its structure, as we will show. Web-Ob contains specific references to MIT, such as a list of the intelligences, and the key abilities related to each one.

### 2.1. The structure of the program

Web-Ob provides a useful path for observation activity and windows by which to collect data such as name of the school/observer/child, age of children, main goal of the observation (for example, to figure out a profile of a child or to collect data to solve learning or emotional problems), the main focus (for example the relationship between child and known adults), the general context (place, situation in which the observation is conducted, the present persons, the persons actually involved etc.). The structure of the application includes a box in which to describe the behaviours of the observed child in terms of actions, non verbal communication, and verbal expressions. Another box encourages the user to provide her/his interpretation of the observed situation. A final part is available to put in evidence, other comments or notes, suggestions for further observations, advice for educative or didactic interventions, and so on.

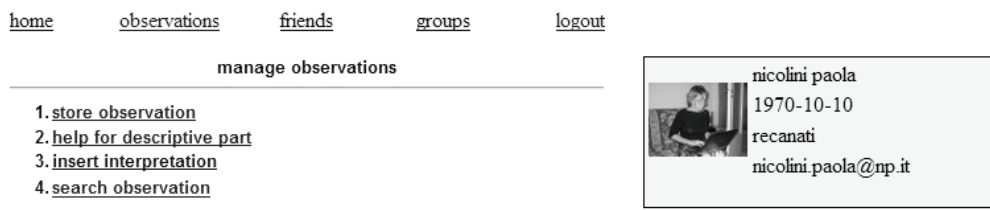


Figure 1: Possible actions in Web-Ob

In this part of the program's environment, users can refer to some model observation texts that are included to scaffold users' skill development. The examples provide users with reference points of what kind of children actions and behaviours can be observed with reference to one or more intelligences. The following table shows some examples related to the observation of spatial intelligence and includes notes about perception of colours, orientation in a familiar context, capacity to recognize forms, ability to use eye-hand coordination in order to fulfil a draw, etc.

Table 1: Observation text models

Child's name and surname: C.S.	Spatial intelligence
6 months h 10:30 Location: section	Spatial activity: the educator spreads a number of coloured balls on the floor, letting the children follow them with their eyes. C. watches the balls showed by the educator. He shifts his gaze up and down. He follows the trajectories of some balls on the floor. <b>C. seems able to orient his gaze in order to follow the movements of objects.</b>
13 months h 10:20 Location: hall	The teacher asks the children to move to the section of the infants for the activity. C. smiles and heads straight for . <b>C. shows to know the location of the named room. He confidently moves into the school.</b>
27 months h 10:00 Location: class	A sheet with a grid is delivered to each child, then two-tone cardstock squares are made available. C. notices the paper and then spontaneously attacks each square within its own space in the grid. <b>C. seems to take into account the grid and the coloured boundaries.</b>
32 months h 10:50 Location: section	The children are engaged in an activity with geometric shapes-square, triangle, trapezoid and circle. C. recognizes the forms and pastes them in the corresponding places. <b>C. shows to recognize shapes and is precise in outline.</b>

The program also puts at users' disposal a tutorial package, designed to acquire competences in the observation method and to facilitate the transition from a naive approach to an expert one in the observation activity. The tutorial contains:

- a short course articulated in 8 activities;
- a synthetic theoretical paper;
- a list of figures useful to identify strengths and weaknesses in the observation text written as essays requested by the course, to be able to conduct a self assessment.

## 2.2. To automatically elaborate information

The environment allows information to be sorted and retrieved from an available database. The program automatically enables some quantitative data to be generated, such as:

- how many observations a specific user carried out and accomplished;
- how many children were observed;
- how many times a child was observed;
- how many times a child was observed with respect to a specific goal [;
- the chronology of observations on a child (for example to check her/his development and evolution in specific fields);
- info on the contexts frequently chosen by the users to observe;
- ... and so on.

The program makes it possible to consider the attitude of the educator towards the children/the contexts/the abilities/etc. In fact, through the monitoring of how many observations one user did, how many children she/he observed or not, how many contexts she or he selected or not, the user herself/himself is enabled to self manage the professional behaviour and adopt educative actions.

The table below shows a synthetic, quantitative view of the observational work for one month. The most observed child and the most observed intelligences are clearly outlined. Educators and teacher can reflect on the data in order to understand if they use to pay attention only to some children/behaviours and/or if it is an effect of the real life in the section/class. In any case, reading the table educators can acquire awareness and they can decide in which way to revise and modulate both the observational and the educational activity.

Table 2: Quantitative overview of observational activity in a month

Child's Surname & Name	March 2009								
	LMI	BKI	PI	SI	LI	NI	MI	EI	TOT
W. D.	1	1	2	1	0	0	1	0	6
M. L.	1	1	1	1	1	0	1	1	7
G. S.	1	2	0	2	1	1	1	0	8
M. A.	2	2	0	1	1	1	0	1	8

B. A. L.	2	2	1	1	0	2	1	0	9
W. L.	1	1	2	1	2	1	1	0	9
P. T.	2	2	2	1	1	1	1	0	10
V. A.	1	1	2	2	1	1	2	0	10
D. L.	2	2	1	3	1	2	0	0	11
G. G.	3	1	1	1	2	2	0	1	11
D. G.	2	2	2	2	1	1	3	0	13
R. G.	2	3	1	2	1	2	1	1	13
S. C.	2	2	2	1	1	2	3	0	13
T. M.	3	2	2	1	3	1	0	1	13
S. M.	3	2	2	1	2	2	2	0	14
C. G.	4	3	2	3	3	1	1	1	18
Tot.	34	32	24	24	23	21	18	6	

As it can be seen in the above table, C.G. is the most observed child (18 observations are centred on C.G.) and the logical-mathematic intelligence largely considered (34 observations are related to ilm). The synthesis the program can deliver is important for educators and teachers in order to understand who are the less considered children (if so) and the less observed intelligences. In this way Web-Ob provides users a tool for self monitoring and self assessment.

The program also allows users to retrieve information and to print it, according to one or more criteria: for example, an educator can have all the chronologically organized observations documenting one child's relationships with the other children. Such data can help educators to reflect on, and perhaps modify, educative actions in this field. The following table shows a child developmental trend in the field of interpersonal interactions.

Table 3: Qualitative overview of a child development within personal intelligences

Child's name and surname: A. M.	Personal Intelligences
6 months h 09:20 Location: meeting room	A. is sitting in a little lawn chair. An educator is next to him and A. is attentively observing her. As soon as the educator of the section enters in the room A. immediately lights up, smiling and waving his arms and legs. <b>A. seems to recognize the teacher and to show pleasure in seeing her.</b>
13 months h 12:30 Location: meeting room	It is nap time. A. is lying on a cot, and is waiting to be rocked. A baby is next to him. He observes her for few minutes then starts to cuddle her. When the child is about to fall asleep, A. gives her a kiss on her forehead. <b>A. shows friendliness towards the babies.</b>
25 months h 10:10 Location: Section	The educator calls a child to do an activity. After his turn A. remains near to the table and, as a child approaches it to do the work, he picks up the apron and handed it to her/him. When he hears a child asking to go to the bathroom, A. comes to the door and held it open. <b>A. often shows spontaneous consideration to the needs of others</b>
32 months h 17:10 Location: meeting room	We are in the meeting room, A. is close to a baby who is crying. A. gives him a small bell, saying, "Don't worry! I'm here! Your mother is going to arrive in few minutes!" <b>A. shows empathy and seems to be able to take care of a friend</b>

The above example helps to show the way in which educators (and parents) can see M.A's increasing ability to manage relationships with others. It is a way to longitudinally visualize the development of a child. When a great amount of observations are put together in a chronological order, it can be possible to appreciate more subtle differences from one month to another. If a child's development is not progressing, the observation data may help educators and parents to provide useful activities and contexts in order to move the child's progression. Another possibility is to have a synchronic view of a child during a specific moment in his/her life. The table below shows an example.

Table 4: Qualitative synthesized synchronic overview of a child development

Child's name and surname: M.T.	Musical intelligence	Naturalistic intelligence	Bodily kinaesthetic intelligence
6 months	h 10:30 Location: section The teacher presents a noisy toy to	h 10:30 Location: section The educator offers the children a naturalistic activity,	h 09:50 Location: section The teacher is doing bubbles.

<p>T. He squeezes it in his hands, smiles and begins to shake it. T. repeats the action several times, smiling at every time the toy produces a noise. <b>T. seems to like sounds and enjoy noises</b></p>	<p>providing them with a bunch of different herbs such as rosemary, mint, lemon balm, chives, in order to observe, to touch and to smell them. T. grabs two sprigs of rosemary, one in each hand. He passes them on his face, keeps them, touching the leaves with the tips of his fingers. <b>T. shows interest exploring scented plants</b></p>	<p>T. follows the trajectories from the top to the bottom. When the bubbles are at hand, T. tries to grab them with hands. He breaks a few and smile. <b>T. demonstrates an eye-hand coordination</b></p>
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Through some simple actions within the program, Web-Ob provides specific monitoring and continuous feedback. Nothing similar can be done only *by hands*.

### 2.3. The community area

As well as we considered knowledge building process as a social one (Bruner 1990), Web-Ob offers the possibility to make use of collaborative devices such as blogs, web forums, social networks, wikis and links to other Web 2.0 applications. The community area is intended as a space within which to participate and share refined observation texts or even conclusions, in order to confront and negotiate meanings, doubts, hypothesis, in a continuous formal and informal mediation among the community of users (Wilson 1996). A useful device at users' disposal as a reciprocal help in order to carry on, share and negotiate observation practices through multiple intelligence theory.

### 3. Conclusion

We are now testing the program with a group of teachers in training, in order to verify the effectiveness and usefulness. We are developing a system of self-correction, allowing the users to edit, correct and improve their own observational texts.

We also see many interesting possibilities in Web-Ob utilization by professional communities such as:

- to build a great storage of observation texts organized on the base of the 8 different intelligences used as entry points;
- to share problems in the interpretation of children behaviors as an expression of one or more intelligences;
- to organize the observation texts on the base of children's ages in order to make it possible to find recurrences or differences;
- to compare in a cross-cultural overview the best practices and problematic situations.

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