

Teachers for the Knowledge Society

How to assess intelligences through the observational method. The Italian experience

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Abstract

Different Authors were involved in the elaboration of systems to assess Multiple Intelligences. These efforts mainly produced questionnaires and check lists. These devices need users to possess and use linguistic abilities, and intra personal intelligence. For these reasons they cannot be considered tools coherent to the theory. Accordingly to the Gardner's definition, the intelligences have to be identified in daily life problem solving. The most effective way to set up this work is to observe them. Key distinctions in the Italian way to assess the intelligences are provided, in particular the adoption of the observation method through an online environment.

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Introduction

We use to train educators and teachers within Multiple Intelligences Theory (Gardner 1983) framework and ask them to observe children in their daily life at school, according to a descriptive method, the aim being to identify the key abilities of one or more intelligences beyond children's actions and behaviours¹. The trainees' work is supervised, in order to discuss ambiguous data and problematic interpretation. We describe in this paper the outcomes of the training process, in terms of what educators and teachers recognized as specific actions, with relation to each of the eight intelligences: Linguistic, Logical-Mathematical, Musical, Bodily-Kinaesthetic, Spatial, Interpersonal and Intrapersonal, Naturalistic and Existential.

1. Linguistic intelligence observations

With regard to the linguistic intelligence, the educators were suggested to take note of children's: interest to/on listening speeches; attention to linguistic production; use of language to describe, to explain ideas, to give information, to speak with others, to play with words, to create poems, to comment on an event, to invent a story, to give voices to different characters in a fiction. The outcomes of this work are showed in the table below (Tab. 1).

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¹ We mostly referred to previous papers in this field such as Chen, J., Krechevsky, M. & Viens, J. (1998); Chen, J., Isberg, R., & Krechevsky, M. (1998); Krechevsky, M. (1998); Kornhaber, M., Fierros, E., & Veenema, S.V. (2004).

Tab. 1 – Longitudinal observation of a child Linguistic Intelligence

M. (8 months)	h 14:30	Location: section
M. seats on the educator's lap. The educator is reading a story to the children. M. points to the pictures in the book and seems to follow the tale.		
M. shows to share attention with the educator and to follow the main meaning of the story		
M. (18 months)	h 15:00	Location: bathroom
During the change of clothes, the teacher asks M. about the previous activity. M. answers: "I slept with the star Bea*, Mara and the kids". The teacher asks her to continue, wondering what happened next. M. continues: "We went up above the cloud Lulù ² and Mara!"		
M. articulates correctly and clearly a speech, describing the events in the right order		
M. (22 months)	h 10:30	Location: section
The educator is reading the story of three little pigs, showing the pictures. At the end of the story she asks the children what the pictures represent. M. is actively involved in the activity, asking questions or making comments: "Are they pigs? Are they brothers? Small... the house is small... Wolf escaped!"		
M. pays attention to the story and participates verbally. She correctly expresses short sentences, using plain language.		
M. (30 months)	h 09:40	Location: section
The teacher observes the window coloured by the children and asks if they remember the story of the disobedient star. M. says: "The star does not listen to her mom, then goes away and the cloud takes it and the wind pushes her away: but the moon helps her!"		
M. seems to be able to sum up the story, using simple and clear sentences.		

2. Logical-mathematical intelligence observation

In the field of logical-mathematical intelligence the kinds of actions and behaviours indicated to observe are: detecting patterns; reasoning in a logical way; trying to make deductions; analysing problems; performing calculations; understanding relationship between cause and effect; devising a strategy to achieve an aim. Some sketches on logical-mathematical abilities in action are provided in the following table (Tab. 2).

Tab. 2 – Longitudinal observations of a child Logical-Mathematical Intelligence

S. (10 months)	h 10:30	Location: section
The teacher brings some bowls in class. She shows to the children some green objects, such as small pieces of tape, pieces of artificial grass, small strips of cardboard. Then she hides the objects under the bowls. After having explored a bowl, S. takes a second one. A piece of cloth and a card are hidden under it. They are similar to those found in the first bowl. S. takes them, looking at them with curiosity. She puts the similar pieces all together. Then she continued to lift up the bowls and to collect all the hidden objects in different stacks.		
S. shows to discriminate by type, separating the objects and recognizing each of them as belonging to a group		
S. (15 months)	h 10:30	Location: section
The teacher prepares a table with three baskets. She puts a carrot in a basket, a potato in another basket and a zucchini in the third. She provides children with the same three kinds of vegetables, asking them to arrange the vegetables in the baskets. S. looks at the contents of the baskets and at the vegetables she has in front of her, on the table. Then she reorganizes all the fruit types, placing them in the baskets with respect to an identical criterion.		
S. discriminates the different kinds of vegetables, separating them by type		
S. (29 months)	h 10:00	Location: section
The educator is drawing some rows on a sheet. S. approaches her, watching at her work. Then she asks: "What are you doing?". After the explanation, she begins to count the rows, naming each one with a number.		
Even though S. not yet really counts – because she jumps from one number to another – she coordinates the movement of her finger: a square in the row and a name of a number		
S. (33 months)	h 15:40	Location: section
The teacher is reading "Three bears and Goldilocks". S. takes 3 figures from a basket, three chairs and three little beds, then representing the heard story.		
S. seems to use a numerical reasoning		

3. Musical intelligence observations

The main kinds of accomplishments linked to the musical intelligence are: to appreciate and use sounds; to recognize tonal and rhythmic patterns; to attentively listen musical pieces; to sing songs; to coach someone to sing or play music. Descriptions of a child while using his musical abilities are presented in the next table (Tab. 3).

Tab. 3 – Longitudinal observations of a child Musical Intelligence

T. (6 months)	h 10:30	Location: section
The teacher presents a noisy toy to T. He squeezes it in his hands, smiling and beginning to shake it. T. repeats the action several times, smiling at every time the toy produces a noise.		
T. seems to like sounds and enjoy noises		
T. (15 months)	h 10:20	Location: section

² A toy.

During the musical activity a drum music is played in the section. It is a Turkish dance, with changing rhythms. T. listens for a moment, smiling. He approaches the source of the sound crawling, then sitting down and repeatedly clapping his hands. He smiles, moving his upper body, and listening the music till it finished.		
T. seems to enjoy listening music, also involving the body		
T. (29 months)	h 11:10	Location: bathroom
The educator invites the children to play a ring-a-ring-o-roses. All of them respond with enthusiasm. T. takes his place singing. When the teacher stops singing, T. takes her place and continues playing her role. The other children run at pace.		
T. shows interest in listening and self confidence when singing		
T. (33 months)	h 10:30	Location: laboratory
Sound path. The teacher provides various materials on the floor like tin box, cardboard box, foam rubber, leaves, grass, clothes. Then she invites children to experience the sounds resulting from the different materials, beating them either with a potato and with a stone. T. tests all the materials and says: "The grass does not sound, even the rubber... but the leaves sound a little. I really like this (the can) because it sounds so much!" Then he moves towards the cardboard box, trying to drop the potato and the rock. He also tries to rub them, continuing to experiment with various speeds.		
T. shows curiosity to experiment with sounds		

4. Bodily kinaesthetic intelligence observations

The main performances linked to the bodily kinaesthetic intelligence are: control of the body movement; manual dexterity; physical agility and balance; hands and eyes coordination; mime; acting drama. In the following table some observational texts are available, related to this intelligence (Tab. 4).

Tab. 4 – Longitudinal observations on a child Bodily-Kinaesthetic Intelligence

F. (6 months)	h 09:50	Location: section
The teacher is doing bubbles. F. follows the trajectories from the top to the bottom. When the bubbles are at hand, F. tries to grab them with hands. He breaks a few and smiles.		
F. demonstrates an eye-hand coordination		
F. (18 months)	h 10:15	Location: meeting room
Educator has prepared forms on the mattresses, building a high pile from which children can jump down. F. gets on forms, comes at the top with the help of the educator, and then launches himself on mattresses, exclaiming with joy. He tries many times again by himself.		
F. shows safety and agility		
F. (23 months)	h 09:50	Location: meeting room
A hole is prepared in the meeting room, mattresses are at the centre of the space. There are also four beds stacked to lie, sit or jump down. F. enters and goes out of the hole many times. He invites his friends to join the game. He turns around the hole, chasing someone and running away. He plays hide and seek using the hole. He runs up on the beds, then rolling down. He takes the pillows and stacked them, then he rises above on his feet.		
F. shows balance, energy and pleasure in movement		
F. (27 months)	h 10:20	Location: meeting room
The teacher proposes to run on soft cushions. F. soon passes away, crawling under bridges. He tries to hop, helping himself with the hands. Then he remains standing for few seconds, walking again on the cushions; he climbs on the platform and, ready for the jump, launches himself landing on his back. Finally, he rolls back and forth.		
F. seems to possess agility and bodily coordination		

5. Spatial intelligence observations

The spatial intelligence is related to the abilities of: interpretation and creation of visual images; pictorial imagination and expression; understanding of the relationship between images and meanings, and between space and effect; designing buildings, shapes, images, and so on. The table below (Tab. 5) illustrates what a child can do with these abilities.

Tab. 5 – Longitudinal observations of a child Spatial Intelligence

C. (6 months)	h 10:30	Location: section
The educator spreads a number of coloured balls on the floor, letting the children follow them with their eyes. C. watches to the balls showed by the educator. He shifts his gaze up and down. He follows the trajectories of some balls on the floor.		
C. seems able to orient his gaze in order to follow the movements of objects		
C. (13 months)	h 10:20	Location: hall
The teacher asks the children to move toward a space in which other infants are playing. C. smiles and heads straight on the room.		
C. shows to know the location of the named room. He confidently moves in the school		
C. (27 months)	h 10:00	Location: section
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 sticks each square within its own space in the grid.		
C. seems to take into account the grid and the coloured boundaries		
C. (32 months)	h 10:50	Location: section
The children are engaged in an activity with geometric shapes like triangle, trapezium and circle. C. recognizes the forms and pastes them in the corresponding places.		
C. shows to recognize shapes. He is precise in outline		

6. Personal intelligence observations

The abilities linked to the interpersonal intelligence are: to relate to others; to interpret behaviours and communications in a correct way; to demonstrate feelings through body language; to coach or counsel other persons; to cooperate. Intrapersonal intelligence, on the contrary, is related to: self-awareness, and capability to understand themselves. The next table quotes some observational texts in this field (Tab. 6).

Tab. 6 – Longitudinal observations of a child Personal Intelligences

A. (6 months)	h 09:20	Location: meeting room
A. is sitting on 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.		
A. seems to recognize the teacher and to show pleasure when seeing her		
A. (13 months)	h 12:30	Location: meeting room
It is time to sleep. 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. kisses her on her forehead.		
A. shows friendliness towards the baby		
A. (25 months)	h 10:10	Location: section
The educator calls a child at a time 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.		
A. often shows spontaneous consideration to the needs of others		
A. (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!"		
A. shows empathy and seems to be able to take care of a little friend		

7. Naturalistic intelligence observations

The individuals who are high in the naturalistic intelligence: are in tune with nature; are often interested in exploring the environment; enjoy to learn about animals and plants, also cultivating and nurturing them; are highly aware of even subtle changes in their environments; are interested in subjects such as botany, biology and zoology; may enjoy exploring the outdoors spaces. The following table cites observations on naturalistic intelligence (Tab. 7).

Tab. 7 – Longitudinal observations of a child Naturalistic Intelligence

L. (6 months)	h 10:30	Location: section
The educator offers the children a naturalistic activity, 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. L. grabs two sprigs of rosemary, one in each hand. She passes them on her face, keeps them, touching the leaves with the tips of her fingers.		
L. shows interest in scented plants		
L. (18 months)	h 07:40	Location: section
L. has just entered the hall. She immediately goes to the corner in which there are the fishes. Pointing at them she says "The fishes need to eat!" Then the teacher asks if she wants to feed the fish, and she replied: "Yes!"		
L. shows concern and ability to take care of the fishes		
L. (21 months)	h 10:30	Location: section
We are feeding the fishes. L. turns immediately towards the aquarium and comes near to us. Even after having fed the fishes, she stills for a long time watching, pointing and naming them. She constantly smiles.		
L. shows to be interested in the activity with the aquarium and seems to posses useful information		
L. (29 months)	h 10:50	Location: section
We are in a circle time activity, watching at a cricket that a baby has brought from the countryside. L. says: "The cricket is green! It jumps! Look at these antennae! It lives in the grass".		
L. shows interest in the insect, she is not afraid and describes its parts.		

8. Existential intelligence observations

The existential intelligence can be defined as the ability to be sensitive to, or have the capacity for, conceptualizing or tackling deeper or larger questions about human existence. Individuals with this kind of ability show to be able to: reflect on the meaning of life; ask questions such as “Why are we born?”, “Why do we die?”, or “How we get here?”; try to give answers to the previous questions. Some examples about existential intelligence in action are provided in the next table (Tab. 8).

Tab. 8 – Longitudinal observations of a child Existential Intelligence

H. (17 months)	h 10:20	Location: meeting room
The teacher gathers the children in the <i>soft corner</i> , puts a relaxing music, then begins to tell the story of the little fish Goofy, whose pacifier was stolen by a big fish. H. carefully listens to the story, her little face darkens when the fish steals in Goofy's pacifier. She says "It's not right!"		
H. shows through facial and verbal expressions that she understands the injustice		
H. (24 months)	h 09:30	Location: section

It is time for free play. H., while playing one of her game, sees a child carrying away a toy to a kid. H. leaves her game, resumes the toy, and returns it to her companion.

H. seems to possess the sense of justice

H. (35 months)	h 09:00	Location: section
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We have just entered the section. Julia notes that the fish does not move. She exclaims: "It is dead!" The teacher moves towards the aquarium, and says "You are right, the fish is dead". H. is silent for awhile, maybe reflecting. Then she asks: "How can the fish be here if it has to go into the sky?"

She raises existential questions about death

9. To assess intelligences in the digital age

We did a lot of work to train the educators we collaborate with, to reach the outcomes showed in the tables³. When the activity of observing children was made through a paper and pencil method, it was very expensive - in terms of energy - to arrange children's intelligences profile's. Thanks to the new technologies, as further outcome of our research, we built an online application that supports observation as a systematic method to work in class with MI (Nicolini, Alessandri & Bilancioni 2010). The Web Observation application (Web-Ob) is mainly addressed to educators and teachers to offer scaffolding to their daily observational activity, and to facilitate the accomplishment of good practices in this field. The environment allows: to learn how to observe in an expert way; to write effective observation texts; to control the observation texts; to automatically elaborate, store and retrieve observation texts; to self monitoring and assess the observation texts. The environment enables also other data to be generated, such as: how many times a child was observed with respect to a specific intelligence; the chronology of observations on a child (development in specific fields); the synchronic overview of a child development taking into account his/her eight intelligences; a punctual profile of the specific abilities of a child in different periods.

Conclusions

Avoiding the use of questionnaires, check lists and, in general, quantitative kinds of measures, we reached the aim to assess intelligences in the real life and daily routines of a kindergarten. We demonstrated it is possible, even when the children are so young as those we referred to in the quoted observations. A deep knowledge of the theory is requested, and also the competence to identify different abilities in the flow of every day experiences. In addition, skills to translate the identified actions into language necessitate. We are aware that this kind of assessment needs a certain amount of work by educators and teachers, but tools such as our Web-Ob can support this work and make it more easy to accomplish.

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³ All the quoted observation protocols were made by the educators of La Giacomotiva (Milano – Italy).