

HOW ARE THE MULTIPLE INTELLIGENCES FOSTERED IN SOME ROMANIAN TEXTBOOKS FOR 6th GRADE

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Abstract: This article represents a synthesis of a study from our PhD thesis that aims to investigate to what extent the Romanian textbooks value and develop students' multiple intelligences as defined by Howard Gardner. We used as methodology the content analysis and nonparametrical statistics in order to analyze the data collected. We confirmed our hypothesis that in the Romanian 6th grade textbooks of Romanian, History and Physics there is still a strong preference for traditional or academic intelligences (namely logico-mathematical and linguistic intelligences) but we did not expect to find such a huge discrepancy, since all the other six intelligences proved to be covered only 20% in various activities.

Keywords: multiple intelligences; textbooks; Gardner; content analysis;

1. Introduction

In 1983 Howard Gardner launched his exciting theory about humans' intelligence, stating that our cognitive profile is made of at least 8 types of different intelligences: logical-mathematical, linguistic, spatial, bodily-kinesthetic, musical, naturalistic, interpersonal and intrapersonal, distinctly situated in the brain but interdependent in everyday activities and that can be continuously developed. He defined intelligence as "a biopsychosocial potential of solving problems or creating new products valued in at least one culture" [Gardner, 2004].

Since then many educators all over the world put it into practice as they considered it a valuable tool (and not a mean!) to be used in the teaching and learning process and some of them such as [Bocoş, 2013] even appreciated it as basis for differentiated instruction.

In this article we will present the results of a research we have done in order to check how multiple intelligences are fostered in some textbooks from 6th grade since in Romania the textbook is unfortunately still considered by many teachers as the main support of the educational process.

2. The research

The main objective was to explore to what extent the activities proposed in the textbooks value the multiple intelligences. The research hypothesis was that the textbooks value significantly more the logical-mathematical and linguistic intelligences (so called *academic* intelligence) compared to the other 6 types. The null hypothesis was that there is no such a difference, all the 8 types of intelligences being equally fostered.

We did a content analysis mainly based on Agabrian's theory [Agabrian, 2006]. We used 6 textbooks selected from the official list approved by the Ministry of Education for the year 2015-2016 as follows: 2 Romanian textbooks (from the Printing Houses Humanitas and EDP), 2 Physics textbooks (from the Printing Houses Teora and Radical) and 2 History textbooks (from the Printing Houses Corint and All Educational).

The theme chosen for investigation is intelligence as defined by Gardner, coded IM with eight sub-themes, namely: logical-mathematical intelligence, linguistic intelligence, spatial intelligence, kinesthetic intelligence, interpersonal intelligence, intrapersonal intelligence, musical intelligence and naturalistic intelligence, shortened as follows: ILM, ILINGV, ISP, IKI, IINTER, IINTRA, IMUZ and INAT and coded from 1 to 8 in the order already mentioned. We stress that these are nominal variables as they do not imply any order therefore numbers are simply labels since none of the intelligences mentioned is more or less valuable than the others. In order to define the sub-themes we based on Gardner's theory and also on the list of activities that value the 8 intelligences proposed by Campbell and collab. [Campbell et al., 2004, p.253]. But since in that list one can find some activities valuing two or more intelligences (due to their interdependence in the real life) we carefully assigned

only distinct activities for developing each type of intelligences in order to respect the principle that the categories be mutually-exclusive.

For example, if in this list the activity to create graphs is considered to value both the spatial intelligences and the logical-mathematical one, for our content analysis we will keep it as being representative especially for the development level of spatial intelligence. Other examples: classifying facts /data was assigned to naturalistic intelligences based on theory, map identification was assigned to spatial intelligence, the activity of identification or transformation of various relations was assigned to logical-mathematical intelligence, while the activity of identification or transformation of various speech parts was assigned to linguistic intelligence. In order to test the reliability we calculated the intra-coder agreement following the formula proposed by Agabrian on 10 activities coded twice within more than two weeks and we got the value .80 which means a very good reliability. But for a more accurate analysis we consider that it is very important to have 2 or more independent coders since the interdependence of the intelligences in the real life might generate different interpretations.

2.1. Establishing the unit of registering and analysis

The unit of registering (collection) for this analysis, namely that part which is to be coded (labelled) and after that analyzed – is represented by each sentence/phrase or paragraph, or by any exercise, problem and/or activity proposed at the end of each lesson in the textbook and in the tests. The unit of analysis (numbering) is represented by the verbs. The analysis will be done on all the units of registering and analysis from the textbooks mentioned above.

2.2. Defining the categories of content

We list below the activities-key words for each sub-theme of research:

- **ILM (1)** :calculate, demonstrate, explain, proof, transform, infer, give examples, compare, combine, order, substitute, make the plan of main ideas, identify, (de)compose, use the formula, invent, imagine an experiment, use Venn diagram, choose the correct answer, make analogies, create a code for, fill in, find the correspondence between two sets of facts, observe.
- **ILINGV (2)** :write, (re)read, copy, orally present, answer, formulate, enumerate, discuss, make sentences/expressions/a composition etc, find synonyms/antonyms etc, correct the spelling, crosswords, give the definition, transform the text, sintaxis analysis, use the story for, debate, write a poem/article about, write a guidebook about, invent slogans for, take an interview to a character, write a letter to the author/historical character/inventor etc
- **ISP (3)** :create graphs/ maps/schemes, PPT, make a poster for, use a mnemonic system to learn, make an artwork, draw, vary size and shape, give colour codes to.., underline, paint, carve, use the videoprojector for
- **IKI (4)** :play a role, simulate, mime, create a dance, create a game, make cards, build, manipulate objects, use your hands or materials for.. make a product for..
- **IINTER (5)** : work in pairs/team, analyze in groups various perspectives on, do a group project, teach somebody, establish rules of the group, do collaborative plans for the lesson, take a role in the group, interact with, identify the character's feelings, identify the main moral traits of, give feedback, evaluate your peers work, do a SWOT analysis for the character, give a title for
- **IINTRA (6)** :identify your strengths and weaknesses, do the personal SWOT, do you identify yourself with the character, describe your feelings about, describe your personal values, keep a personal diary, do a project for.., express your opinion about, get feedback, self evaluate your work, reflect upon, imagine another ending for, continue the text
- **IMUZ (7)** :find an appropriate musical background for.., write a song for a topic in the lesson, sing a song, identify the rhythm, break the word into syllables, put the correct accent, choose a song for.., make a musical collage for, use the musical technology for

- **INAT (8)** : collect and classify /group data, keep a diary with observations about nature/phenomena, compare to natural phenomena, use the telescope/microscope for, take care of plants and animals, go for a trip outdoor

2.3. Defining the categories of content

We present below the distribution of the activities that value the eight intelligences in each of the six textbooks (tab.1).

Table 1. Distribution of the activities that value the multiple intelligences in each textbook

| Manual | ILM | ILING V | ISP | IKI | IM UZ | INA T | IINT ER | IINT RA | TOTAL |
|------------------------------------|--------------------|--------------------|-------------------|-------------------|-----------------|------------------|----------------|-----------------|--------------------------------|
| Romanian Humanitas | 542 41.85 % | 538 41.54 % | 30 2.31 % | 27 2.8 % | 38 2.9 % | 21 1.6 % | 38 2.9 % | 61 4.7 % | 1295 100 % |
| Romanian EDP | 329 35.22 % | 450 48.17 % | 19 2 % | 0 0 % | 18 1.9 % | 40 4.2 % | 61 6.5 % | 17 1.8 % | 934 100 % |
| Physics Teora | 575 66.86 % | 28 3.25 % | 66 7.67 % | 162 18.83 % | 0 0 % | 23 2.67 % | 2 0.2 % | 4 0.4 % | 860 100 % |
| Physics Radical | 608 58.97 % | 114 11.05 % | 110 10.66 % | 156 15.13 % | 0 0 % | 40 3.87 % | 0 0 % | 3 0.2 % | 1031 100 % |
| History All Educational | 204 53.96 % | 119 31.48 % | 10 2.64 % | 0 0 % | 0 0 % | 0 0 % | 17 4.4 % | 28 7.40 % | 378 100 % |
| Hystory Corint | 133 44.78 % | 133 44.78 % | 18 6.06 % | 0 0 % | 0 0 % | 0 0 % | 6 2.0 % | 7 2.35 % | 297 100 % |
| TOTAL | 2391 49.86 % | 1382 28.82 % | 253 5.27 % | 345 7.19 % | 56 1.17 % | 124 2.59 % | 12 4 % | 120 2.5 % | 4795 100 % |

We mention that in the Physics textbook from Radical Printing House even there is a section named "We work together", the exercises proposed there did not have a clear structure or clear specifications in order to suggest the team work as we found in other textbooks (e.g.: you divide in groups of x pupils, each works independently for a while and after that share the results of their work to the whole class, often by delegating a spokesman of the group etc) and that is why we could not include them into the IINTER category but in ILM, ISP or IKI. When we have a look at the table above we can clearly see that there is a strong unbalanced distribution of the activities, some of the intelligences being by far more valued and stimulated than the others. In order to have an objective approach we used the non parametric tests after having removed previously the categories with less than 5 activities considered by field and the results are presented in Table 2.

Table 2. Contingency table of the distribution of the activities by the three fields

| Subject | ILM | ILINGV | ISP | IINTER | IINTRA | TOTAL |
|-----------------|----------------|---------------|--------------|-------------|-------------|-------------|
| ROMANIAN | 871 1167.50 | 988 674.81 | 49 117.6 | 99 60.54 | 78 58.59 | 2085 |
| PHYSICS | 1183 845.52 | 142 488.71 | 176 89.46 | 2 43.85 | 7 42.43 | 1510 |
| HYSTORY | 337 377.96 | 252 218.46 | 28 39.99 | 23 19.60 | 35 18.96 | 675 |
| TOTAL | 2391 | 1382 | 253 | 124 | 120 | 4270 |

χ^2 (8) expected for $\alpha=0.005$ is 21.955. We have got χ^2 (8)=857.56 \gg 21.955, $p=0.005$, $\Phi=.44$, V Cramer = .33, which allows us to reject the null hypothesis with a risk less than 0.005 and to state that there are significant differences in how multiple intelligences are valued in the three field of study, with an effect size medium to high.

We can also notice that the averages of the activities that value the multiple intelligences differ a lot as we can see in Table 3.

Table 3. The average of the activities valuing each of the 8 intelligences in the 6 textbooks

| Type of intelligence valued | N | Average |
|-----------------------------|---|---------|
| ILM | 6 | 398.50 |
| ILINGV | 6 | 230.33 |
| ISP | 6 | 42,17 |
| IKI | 6 | 57.50 |
| IMUZ | 6 | 9,33 |
| INAT | 6 | 20,67 |
| IINTER | 6 | 20.67 |
| IINTRA | 6 | 20,00 |

2.4. Results

For a better visualisation we illustrate with some graphs (Fig.1-5):

In Figure 1 we notice that ILM is by far stimulated in both Physics textbooks as it was expected and is also highly valued in both Romanian textbooks and in History textbooks. As expected ILINGV is highly stimulated in Romanian and less in History textbooks, but all the other 6 intelligences are very very little stimulated, some of them being practically absent. Basically our textbooks miss the great opportunity to tailor the 2 extremely important personal intelligences IINTER and IINTRA... It is in vain if someone knows tons of formulas and complicated problems to solve if that person does not have a strong sens of Self or does not know how to work in groups, how to solve conflicts , how to adapt himself or herself, key abilities that will make the difference later in the real life.

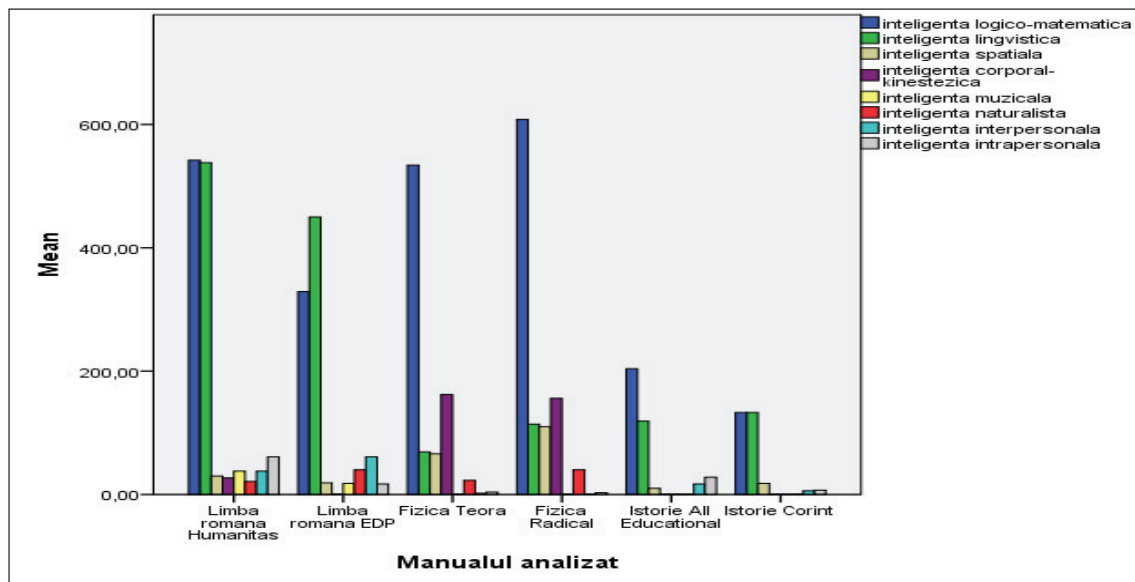


Fig.1 Distribution by textbooks of the activities that value multiple intelligences

In Figure 2 we can clearly see how much the two "academic" intelligences are valued compared to the others.

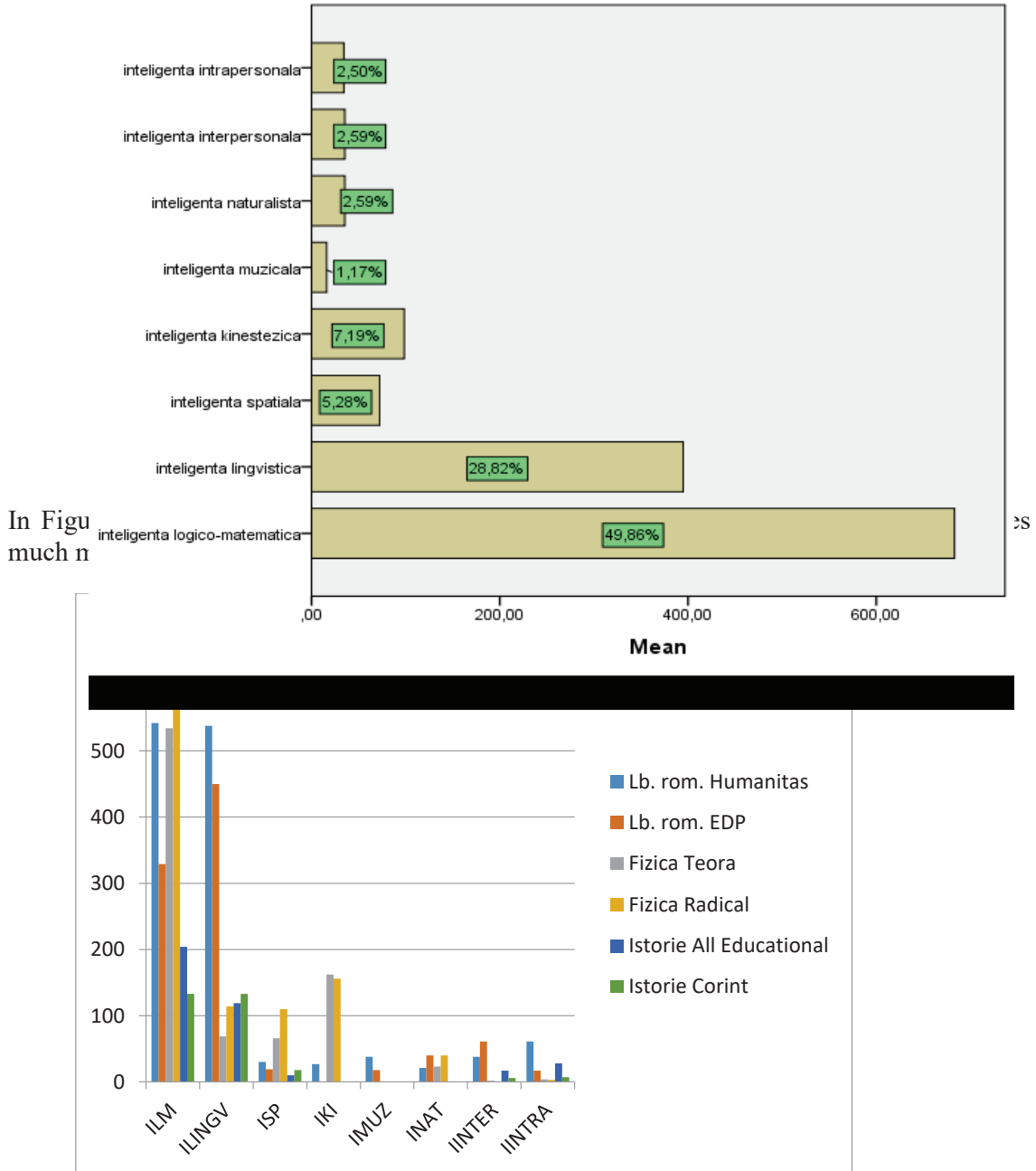


Fig. 3 Distribution of the activities by type of intelligence in each textbook

In Figure 4 we have the same perspective as in Figure 2 but more evidently pictured as the dominant intelligences are by far ILM and ILINGV.

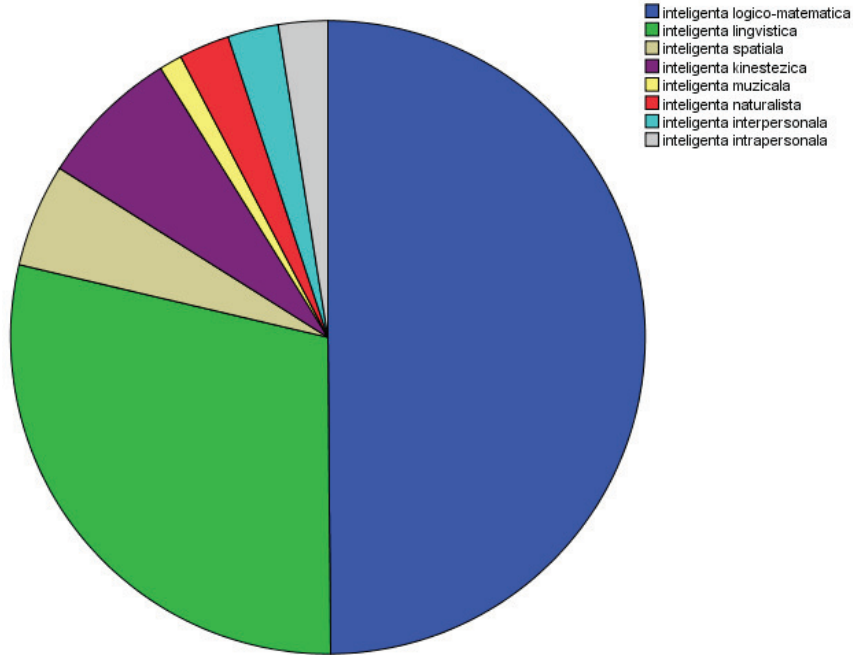


Fig.4. Distribution of the activities by type of intelligence in each textbook. Valuing the 8 types of intelligences in the 6 textbooks analyzed

Finally in Figure 5 we can notice that also if compared by subjects the most dominant intelligences valued are also ILM and ILINGV.

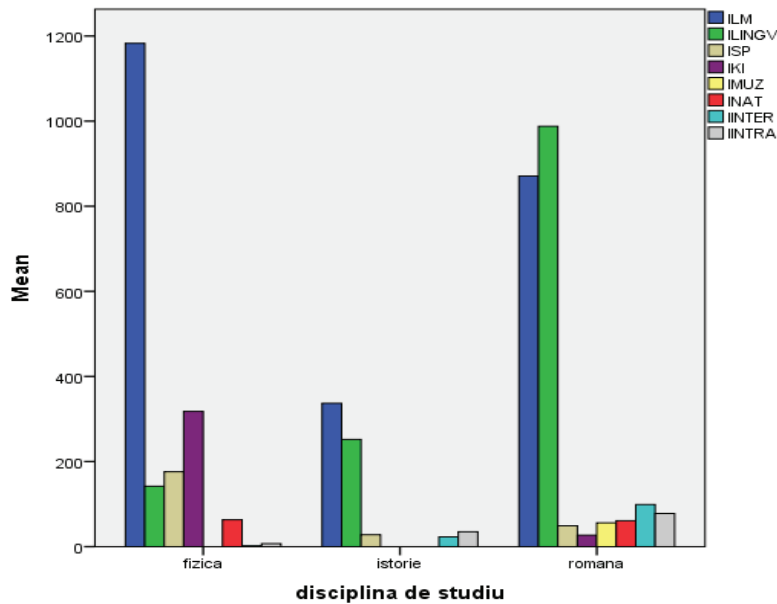


Fig.5 Distribution by subjects of the activities valuing the multiple intelligences

2.5 Conclusions

- ✓ There is a significant difference in the way the multiple intelligences are valued in the textbooks analyzed
- ✓ ILM and ILINGV are by far the most valued, no matter the subject
- ✓ IMUZ and IINTRA are the least valued, no matter the subject
- ✓ ISP is best valued in Physics

- ✓ IINTER and IINTRA are best valued in Romanian and almost neglected in Physics but overall are very little addressed.

2.6. Discussions

We confirmed our hypothesis that in the textbooks there is a preference for traditional or academic intelligences (ILM and ILINGV) but we did not expect to find such a huge discrepancy, since all the other six intelligences proved to be covered only 20% in various activities. This means that the cognitive profile of the pupils is incompletely formed in school and we can even talk about a severe discrimination among children, as the ones who have musical or personal intelligences as dominant, for example, will be obviously disadvantaged and school will be a tough challenge for them, while the ones with traditional intelligences as dominant will be at ease in school [Gardner, 2011a, p.161].

Besides the very poor valuing of musical intelligence we also remark the same situation regarding the kinaesthetic one, which is absent in the History books analyzed, vaguely represented in the Romanian ones and a little better in the Physics ones. It is an unexpected absence with huge impact on the development of independence and initiative of pupils and also on long term memory.

Interpersonal intelligence is almost missing in Physics and a little better represented in the other two fields, especially in History. In other words pupils are not offered time and space to analyze themselves, to express their own opinions, to express their emotions and feelings, to make choices, to agree or disagree and it seems that they are expected to act rather as mere robots that get information and less as human beings with emotions and personal opinions.

The same stays for interpersonal intelligence, very little valued in Physics and a little more in Romanian. We notice again that the pupils are not stimulated to cooperate, to work in teams or pairs, to interact, to mediate and solve conflicts, to negotiate, to learn to play different roles and to accept different points of view and thus to become more tolerant and prepared for the real world. Individualism and competition are unfortunately still strongly encouraged in school, both in the class and in the homework, with a negative impact on long term .

Another big surprise was the poor valuing of the naturalistic intelligence, missing from History books and very little present in the others. Apart from classification and grouping activities, which are associated by Gardner with the naturalistic intelligence but that have a strong link with the ILM, we have found very few activities related to the natural world and phenomena our lives depend so much on. ISP was valued in all the three fields but also very little, and it is a pity that the pupils are prevented from developing important abilities such as making diagrams, drawings, presentations.

In the end we would like to restate the limit of our study regarding the number of coders and also to conclude that in our opinion the textbooks should be profoundly changed in order to become more attractive , more interactive , to better stimulate the curiosity of the pupils and to help them get multiple perspectives about different topics , to better understand themselves and the others, to think and make deductions, to understand and connect to nature, to be active, motivated and happy about learning and celebrating all their intelligences.

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