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GUIDE TO ONLINE STIMULATION OF MULTIPLE INTELLIGENCES: MAPPINGS AND ELABORATION

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This article is presented with the aim of publicizing the results of the research “Educational Design and Multiple Intelligences: Building a Guiding Instrument for Stimulating the use of Intelligences in Online EaD”, developed at the level of a master’s thesis.

Distance education (EaD in Portuguese) has been rapidly expanded due to the use of Information and Communication Technologies (ICT), being the web, today, the basic technology of this process that reaches more and more students and education professionals in the country. EaD plays a very important role in ensuring that more people have access to education, which is why it deserves increasing investments, since it helps Brazilians to become professionals, as well as to improve increasingly research in the area.

In order to provide education to more people through EaD, it is necessary to research and work on several fronts. For example, it is necessary to ensure that public policies are always adequate and adapted to the Brazilian reality. In addition, among other factors, professionals who give life to EaD must be trained. The research aimed to contribute specifically to the area of educational design in EaD, observing the approach of online EaD, based on the web, in which the teaching-learning process is based on Virtual Environment for Teaching and Learning (AVEA in Portuguese), such as the Moodle¹, which uses different types of tools, media and activities that facilitate online learning.

Educational design plays an important role in distance education, mainly because it is responsible for planning courses in online distance education, as well as for adapting and selecting available tools and strategies to be used, defining the “pedagogical path” of each course.

Among the various possible approaches to qualify teaching in EaD, there are the cognitive

studies of education through neuroscience. Through educational design, we sought to promote a dialogue between the elements of educational design and Howard Gardner’s theory of multiple intelligences, in order to enhance the learning processes mediated by technologies.

The main objective of the research was to create a guiding instrument that would support the activities of this EaD sector – educational design –, so that they could be based on the ideas of Howard Gardner (1994), who explains the multiple intelligences theory as the one that relates human learning to the development of interconnected and independent characteristics, located in different parts of the brain, with individual and cultural variations. This guide was entitled Guide to Online Stimulation of Multiple Intelligences (**GOSMI**).

To encourage the use of this guide, the authors drew inspiration from Gardner’s theory of multiple intelligences, in particular, in his eight intelligences established through criteria arising from the biological sciences, logic, developmental psychology, neuroscience, and research in the field of traditional psychology. The instrument will enable educational designer to stimulate effectively each of the intelligences in the EaD student, using the instrument as a reference for planning different courses.

The research was based on a fundamental premise obtained from Gardner’s theory, which suggests that **learning, in EaD, can be enhanced by the stimulating and using one or several intelligences to work on different contentes, and thus trigger the learner’s learning to a greater or lesser extent probability**, since, in EaD, there is less opportunity to understand the particularities (more exponent intelligences) of each student. According to Gardner, the fact of multiplying the approaches (the number of intelligences

1 Moodle – AVEA system used by the Universidade Aberta do Brasil (UAB), widely spread in Brazil and worldwide.

used) has several beneficial effects. This multiple approach allows reaching a greater number of students simultaneously. This is what I call “opening multiple windows in the same space”. (GARDNER, 1997, p. 377).

To establish tangible criteria for the functioning of the final instrument, a research study was applied directed to the Universidade Aberta do Brasil (UAB) and to the EaD practices of the Sul-Rio-Grandense Federal Institute of Education, Science and Technology (IFSul) and Federal University of Pelotas (UFPEL), where the authors work, choosing to work with Moodle activities, which is the system used to build the AVEA in this context.

The final product of this research was made available as an online guide (webpage) that includes “activities x intelligences” mapping, which can serve as a reference for educational designers when defining the activities to be used in the disciplines planned by them. With this guide, it was intended to leave a legacy not only for the scientific field, but mainly for the daily professional practice of EaD.

In the following topics, there is a report on the theoretical-methodological strategy used and the establishment of the theoretical criteria used for the construction of the instrument, in addition to the presentation of the instrument itself and some considerations regarding this research.

THEORETICAL-METHODOLOGICAL STRATEGY

The instrument was constructed through bibliographical research, a process that, according to Silva & Menezes (2001), results from surveying and analyzing published Works on the topic, based on the analysis of the literature already published.

The core of this research lies in the integrative synthesis (SALVADOR, 1986) of the bibliographical research, which was

the basis for the construction of the guiding tool, with the intersections between Moodle activities and multiple intelligences. Figure 1, below, shows the methodological path presented in the original research.

In the scheme, one can see the GOSMI (guiding instrument) as an **initial objective** and also as a **final product** of the research.

As an **initial objective**, GOSMI should work as a creative reference for educational design, which plans the contents displayed on Moodle, through, among other didactic planning actions, the choice of activities available in the system. It was studied, in order to support the research, the distance education, its relationship with the technologies and media present in AVEA, the professionals who bring it to life, and the educational design. We also sought the contributions of learning theories and neuroscience, to bring educational design and the theory of multiple intelligences even closer. The references used for the addressed topics are not fully mentioned here due to the search for a better use of the available space, but they can be easily found in the dissertation work (NEVES, 2014) available on the GOSMI website.

As a **final product**, GOSMI needed to be supplied by both sides of the intersection: on one side, the multiple intelligences, on the other, the Moodle activities. For the construction of the instrument, bibliographic data was mapped, allowing the visualization of Moodle activities that stimulate each intelligence, based on McKenzie’s action verbs (2005), as explained in the diagram.

Simultaneously, strategies proposed by the authors regarding the stimulation of each multiple intelligence in education were sought, which would provide the necessary foundation for the execution of the intersections. By identifying each intelligence, and in possession of a list of action verbs, the intersections were carried out, resulting

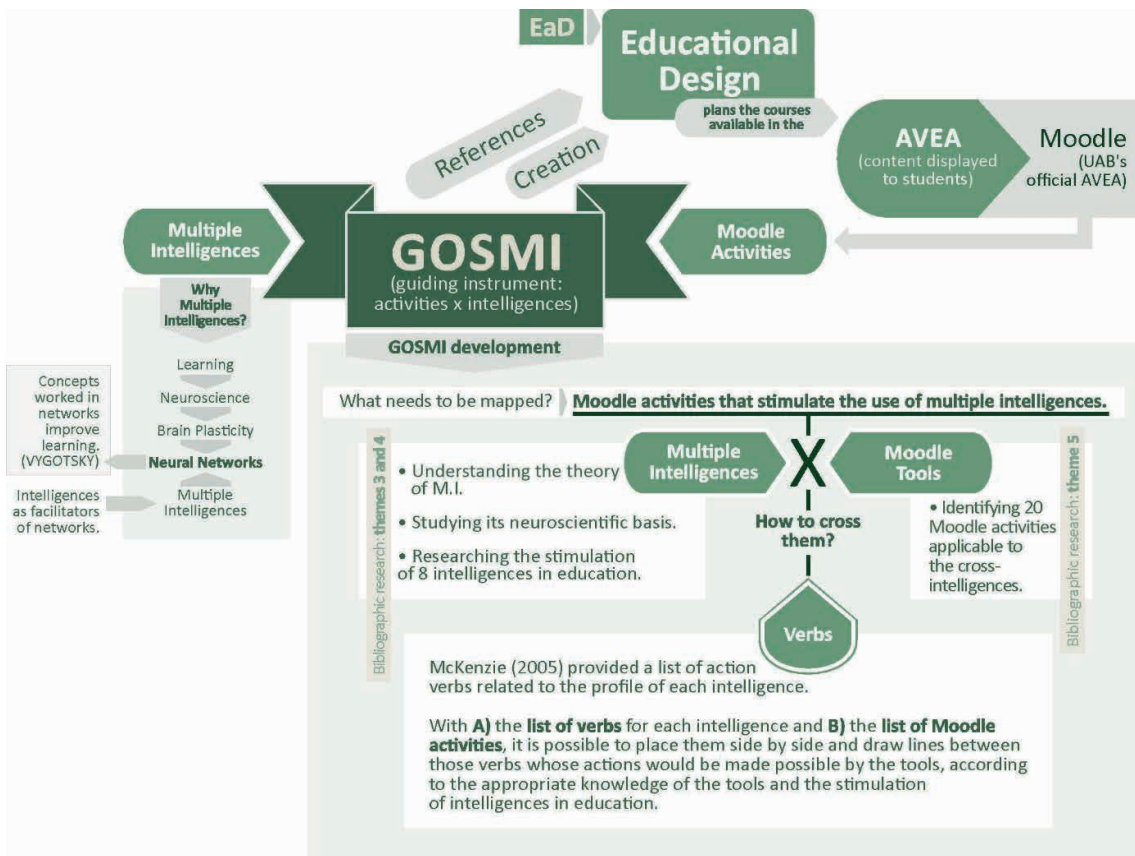


Figure 1 - Methodological outline of the research.

Source: developed by the authors

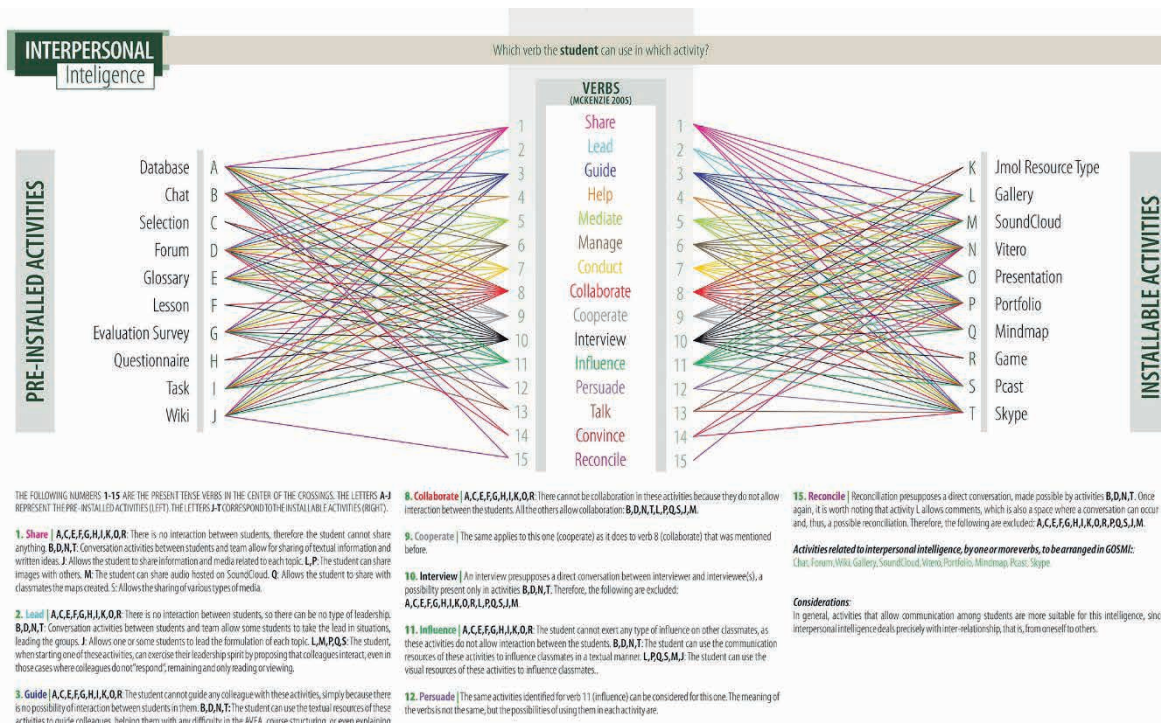


Figure 2 - Mappings developed for interpersonal intelligence.

Source: developed by the authors.

in a mapping that identifies activities that can stimulate specific intelligences. The intersections were graphically constructed (as in the example in Figure 2), with connecting lines between McKenzie's (2005) proposed action verbs (in the center, numbered from 1 to 15) and pre-installed activities (in the left side, listed from A to J) and installable activities (on the right side, listed from K to T), along with the justification for each connection (bottom part). The connections (lines) are the answer to the question "which activities allow the student to put the verbs into action?" Each verb has a color on the mapping, and this same color is seen in the lines that connect this verb to its related activities, making it easier to find information.

After the mappings and the construction of the website, it was made available on the internet at www.gosmi.info (figure 3). The tool is an intuitive version for displaying mapping results, where the user can search for stimuli for each intelligence by clicking on each of the Moodle activities, or do the opposite by clicking on the intelligences to find activities that stimulate them.

GENERAL THEORETICAL CONTEXT AND THE ESTABLISHMENT OF CROSSING CRITERIA

In the following subsections, we sought to provide a theoretical overview of the framework that led to the definition of Moodle activities (EaD) and action verbs (multiple intelligences) used in the intersections that make up the mappings.

EDUCATIONAL DESIGN IN EAD AND MOODLE ACTIVITIES

For Ramos (2010), EaD is a teaching modality that is characterized by the physical separation between teacher and student, but it still allows the manipulation and study of

knowledge/content. Maia & Mattar (2007) provide a general overview of the distance education situation in the country, addressing its expansion, context, and actors, pointing out that, despite the incredible speed at which this market has been expanding, the human resources to operate in the new paradigm have not developed with the same agility.

In the modelo of online EaD based on ICT, in which the teacher, faculty, or institution communicate with the student through digital materials over the Internet, the entire process is mediated by a system called Virtual Environment for Teaching and Learning (AVEA).

All the media resources that EaD professionals plan and execute for the teaching and learning processes are delivered or displayed to the student in the AVEA. For Behar (2009), digital resources (computerized elements such as images, videos, animations, hypertexts, among others that enable interactivity between the user and a specific activity or action) have been allowing new practices to expand old possibilities. They enable content to be approached in the form of digital images, videos, hypertexts, animations, simulations, learning objects, websites, educational games, among others (figure 4).

In this context of online distance learning based on AVEAs, the role of the educational designer is important, since it is an element that, for Ramos (2010), is responsible for the dialogue between the technical and pedagogical areas, acting as a mediator element in the development process of these resources, performing the following functions: guidance and assistance to the professional responsible for writing the content (content developer); strategies creation taking advantage of available potentialities and resources; content structuring, considering content navigation and access modes; prediction of resources, such as animations, simulations, interactions;



Figure 3 - GOSMI.info, website that constitutes the guiding instrument, result of this research.

Source: screenshot of the page www.gosmi.info.

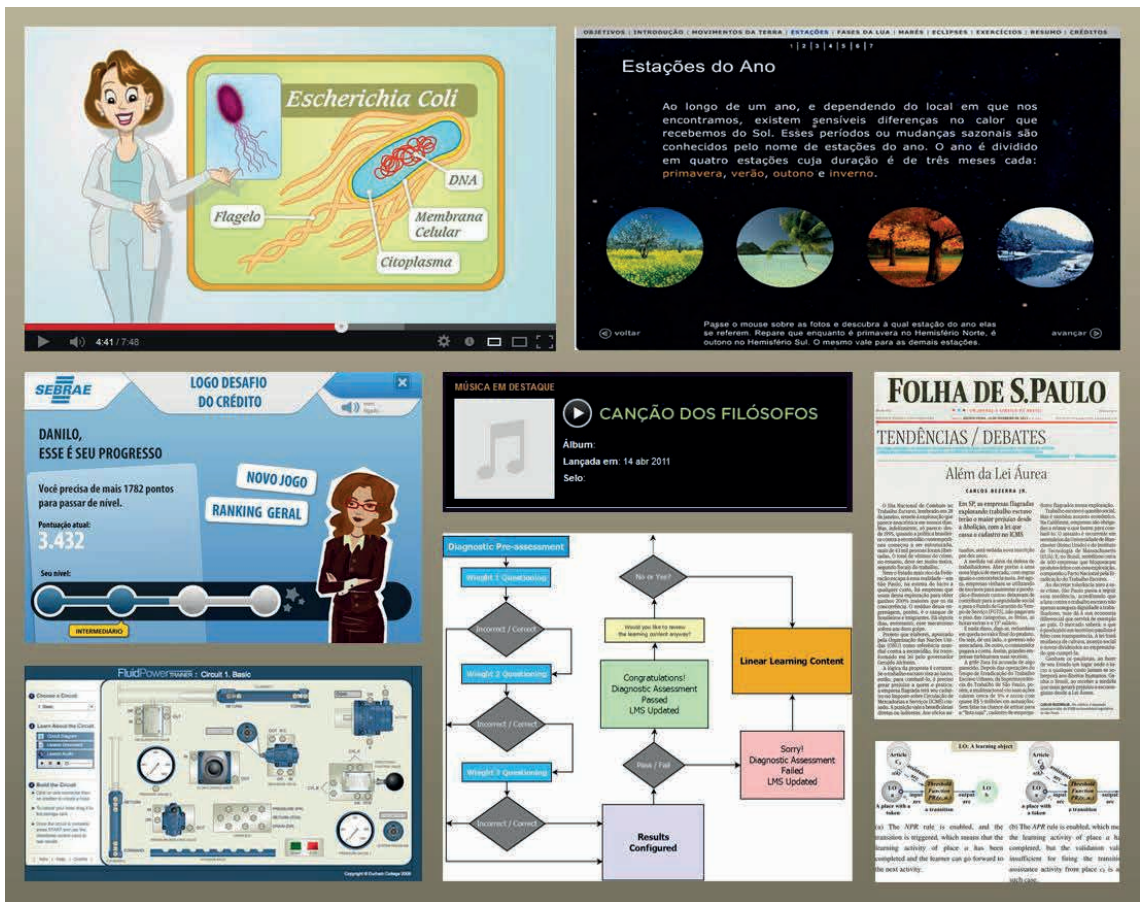


Figure 4 - Resources: videos, hyperlinks, games, audios, graphics, diagrams and texts.

Source: Elaborated by the authors.

and monitoring of content production activities by the technical team.

For Ramos (2010), the educational designer is the responsible for the dialogue between the technical and pedagogical areas, acting as a mediator element in the content development process, developing the following functions:

- Guidance and assistance to the professional responsible for writing the content, who can be a professor of the discipline, a professional of the area, or another person who masters the course's topic, usually called a content developer.
- Online content organization, aiming to adapt the format and language to the web.
- Strategies creation taking advantage of the potentialities and resources available on the internet, together with the content developer.
- Content structuring, for example, in modules, obeying the sequencing or not, observing the navigation in the content and the access modes.
- Prediction of resources, such as animations, simulations, interactions.
- Mediation between the different professionals involved in the production of online content.
- Monitoring of content production activities by the technical team (RAMOS, 2010, p. 53-54).

Therefore, it can be observed that the educational designer mediates (Figure 5) between the theoretical-technical part and the teachers responsible for creating the content. Thus, he guides the teacher responsible for creating the content, discussing intrinsic aspects of the online content, answering questions, revising and adapting the content to the online format, and managing the continuation of this content for the technical teams.

According to Cole & Foster (2008), Moodle is an open course management system (AVEA). It is currently the most widely used AVEA system in Brazilian public institutions that offer distance courses. Figure 6 illustrates the basic appearance (which can be changed by each institution) of a Moodle-based AVEA: the main content, planned by the authors and designers, is displayed to the student in the central area, with navigation options through the menus on the left, search, etc.

For Silva, the activities menu (figure 7) is the main driver of learning in Moodle, since it allows the availability of important functionalities for interactivity and interaction (SILVA, 2013). Due to its important role in the practice of educational design for courses within the researched scope, the activities were defined as criteria for the research intersections.

The "External Tool" and "Scorm/AICC" activities, shown in figure 7, were ignored in the intersections because they allow the addition of different types of external content. Its consideration would imply its presence in the results of all crosses. Thus, not 12, but 10 pre-installed activities were considered, in order to have the same number of installable activities, limiting the total number to 20 and making the research possible. As a criterion for defining the 10 installable activities, we sought those that were not conceptually repeated and that were necessarily in the official Moodle modules directory, arriving at the following: Jmol Resource Type; Gallery; SoundCloud; Vitero; Presentation; Portfolio; Mindmap; Game; Pcast; Skype. A brief explanation for each of the twenty selected activities can be found in the original research (NEVES, 2014).

MULTIPLE INTELLIGENCES AND THE ACTION VERBS

The theory of multiple intelligences had its genesis from the "Project Zero", at the

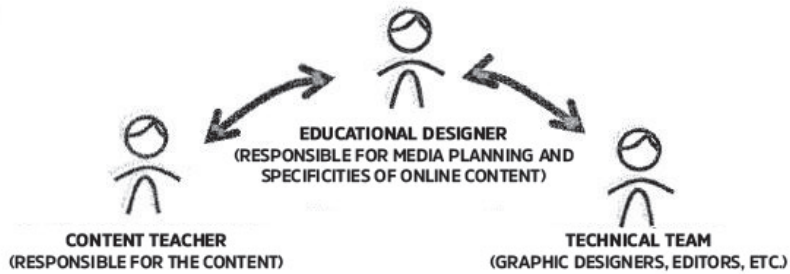


Figure 5 - Relationships established by the educational designer with the team.

Source: Elaborated by the authors based on RAMOS, 2010.

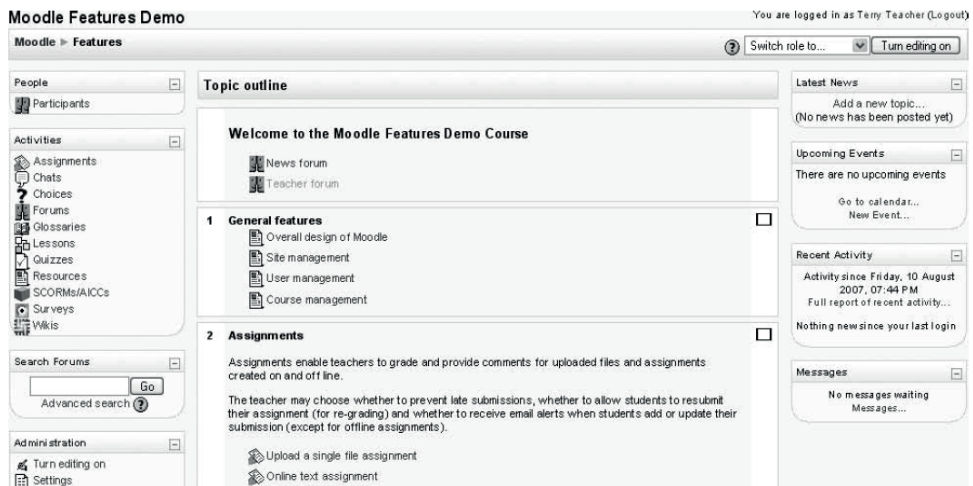


Figure 6 – Moodle's basic appearance.

Source: COLE; FOSTER, 2008, p. 15.

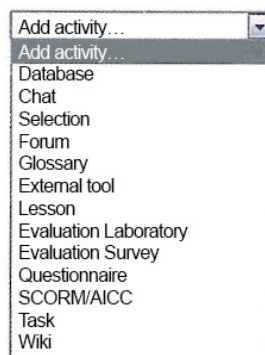


Figure 7 - Menu for adding activities.

Source: SILVA, 2013, p. 83.

Harvard Graduate School of Education, in Cambridge, USA. Researchers from field like genetics, neurobiology, history, philosophy, international development, anthropology, and psychology contributed to this project. One of the psychologists was named Howard Gardner, author of the theory of multiple intelligences, which decomposes the potential of human cognition into several individual intelligences.

Gardner (1994) explains the theory of multiple intelligences as one that relates human learning to interconnected and independent human potentials, located in different parts of the brain, with individual and cultural variations.

Gardner (1993) advocated the idea that each intelligence represents a distinct form of mental representation, as if each person worked like a computer that, when given information in an appropriate format, activates a specific intelligence to do its job.

The following paragraphs summarize each intelligence with interpretations from Gardner (1994), supported by Antunes (1998), also providing a list of McKenzie's (2005) action verbs for each of them.

Linguistic intelligence is associated with the ability to acquire, understand and master language expressions, putting semantics and beauty into action in the construction of syntax. It is the ability to use language to express and evaluate complex meanings. **Action verbs:** Read, write, speak, narrate, explain, inform, articulate, present, announce, debate, discuss, talk, quote, describe, clarify.

Musical intelligence is expressed in the ability to combine and compose music, chaining sounds in a logical and rhythmic sequence and structuring melodies. People with expressive musical intelligence are sensitive to sounds and their environments, easily remembering rhythms and melodies. **Action verbs:** Hear, listen, infer, notice, sing,

play, chant, recite, reproduce, echo, represent, compose, orchestrate, dub, resonate.

Logical-mathematical intelligence is linked to competence in understanding the elements of logic and mathematics, allowing ordering numerical and algebraic symbols, as well as quantities, space and time. **Action verbs:** Solve, suppose, theorize, inspect, analyze, deduce, prove, verify, decipher, determine, predict, estimate, measure, calculate, quantify.

Spatial intelligence is related to the ability to relate one's own space with the surrounding space, perceiving and managing distances and reference points, revealing the ability to perceive objects visually and spatially, transforming or combining them in new positions. **Action Verbs:** Observe, symbolize, draw, design, sketch, illustrate, paint, outline, rearrange, redraw, trace, create, imagine, visualize, locate.

Bodily-kinesthetic intelligence is identified with the ability to control and to use the body, or a part of it, in complex motor activities and in specific situations, as well as manipulating objects in creative and differentiated ways. **Action Verbs:** Assemble, lift, build, move, create, structure, reproduce, perform, walk, jump, dance, duplicate, exercise, transport, move.

Interpersonal intelligence is very clear in people who reveal an extreme ability to understand the human nature of other people, proceeding to a true "reading of the other" as to their emotional aspects, as well as the outstanding facility in creating interpersonal relationships and understanding the dynamics of social groups. **Action verbs:** Share, lead, guide, help, mediate, manage, conduct, collaborate, cooperate, interview, influence, persuade, talk, convince, reconcile.

Intrapersonal intelligence is the intelligence of those who express great ease in establishing affective relations with

themselves, building an accurate perception of themselves, raising self-esteem and deepening the knowledge of feelings, temperaments and intentions, generated by social relationships. **Action verbs:** Express, support, promote, guide, defend, favor, justify, rationalize, characterize, reflect, address, evaluate, judge, challenge, research.

Naturalist intelligence is associated with the sensitivity of perception and understanding of natural elements and the interdependence between life and ecosystems, with a coherent and rational reading of nature in all its splendor. Induces the observations of patterns, identifying and classifying systems. **Action verbs:** Order, organize, classify, compare, contrast, differentiate, separate, map, align, distribute, sequence, catalogue, group, archive, index.

This list of action verbs for each intelligence was chosen as a solution for defining the criteria for intersections at the time of research qualification, as a concise suggestion from the committee. The selection of each group of 15 was made by removing those that were most similar to others already selected.

After it has been consolidated, the theory of intelligences began to be tested internationally in schools, creating a legion of followers who try to apply it from early childhood education to higher education. Gardner realized the potential that his theory would bring to education, and sought to delve into research in the field of educational practice. He indicates that, in education, “an intelligence serves both as the content of instruction and as the means to communicate that content” (GARDNER, 1995, p. 35).

Gardner and his followers frequently use the expression “stimulus” of intelligences to connote this process. That is, stimulating – or using elements of – a particular intelligence or network of concepts linked to it benefits individuals who possess this particular

intelligence. The stimulus consists not only in terms of memory, the contents already learned, but also the capacities of this network, such as body movement in bodily-kinesthetic intelligence, which can be used or stimulated to exercise elaborations.

For McKenzie (2005), the theory of multiple intelligences was developed to promote the success of all students, allowing them to choose different paths for learning. Therefore, while intelligences function as distinct entities, there is also a great deal of overlap when we observe them functioning in the classroom. The intelligences stimulation is the key to the process. McKenzie (2005) gives some examples so that a content can be worked on using intelligences as a means: interaction with the environment (bodily-kinesthetic); interaction with others (interpersonal), valuing feelings, values and attitudes (intrapersonal); reasoning and problem solving (logical-mathematical); sound and patterning (musical); classifications, categories, and hierarchies (naturalistic); spoken and written word (linguistics); and seeing and imagining (spatial).

GUIDING INSTRUMENT

After obtaining the data, the development of the guiding tool was started, which is available at the virtual address www.gosmi.info. Figure 3 shows the appearance of the initial screen of the instrument, which we will explore in detail below. The tool was built in Adobe Photoshop and Adobe Dreamweaver software, with simple HTML programming.

On the homepage, the user finds a brief explanation about the theory of multiple intelligences (figure 8), a call to use them in EaD (figure 9), and the invitation for the reader to read the complete research (figure 10), if they want to go deeper into the subject or learn about the creation of the tool.

The arrows on the homepage are intended



Figure 8 - Brief explanation of Gardner's theory.
Source: screenshot of the page www.gosmi.info.

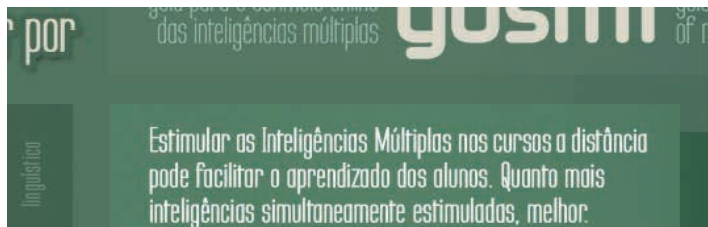


Figure 9 - Call to intelligences stimulation in EaD.
Source: screenshot of the page www.gosmi.info.



Figure 10 - Invitation to download the complete survey.
Source: screenshot of the page www.gosmi.info.



Figure 11 - Choosing to stimulate through Moodle activities.
Source: screenshot of the page www.gosmi.info.

to take the user to the menu on the left, which is used for navigation. First, the user must select the how he wants to stimulate the intelligences (figure 11). So far, only the option “Moodle activities” is available, based on the research reported here.

Within the “Moodle activities” section, the user can navigate through the intelligences menu (figure 12) by clicking on the intelligence they wish to stimulate. Then, the selected intelligence page opens (figure 13), displaying the list of recommended activities from the research.

In figure 14, it is possible to see how the activities are displayed to the user: on the left, the name of the activity. On the right, icons that link to other intelligences pages that can be stimulated by the same activity.

Clicking on the name of the activity, on the left, a screen opens (figure 15) with the specifics of each activity. This screen shows the activity’s name, image, description, and official link (figure 16).

FINAL CONSIDERATIONS

The research was performed intensively by the authors, achieving the intended objectives. Through extensive bibliographic research, the appropriation of numerous concepts and theories was sought. With each new volume added in the luggage, several others had to accommodate. Then with the theoretical shelves organized, there was still the practice of mapping: 8 intelligences, with 15 verbs and 20 activities for each, totaling 2400 possible connections that would justify the use of an activity to stimulate each intelligence. With mental work to be done, we sought to seriously analyze each colored line that appears in the mappings. The result was also the creation of the website, the GOSMI, available online at www.gosmi.info, so as not to leave research only in the academic field.

Regarding the mappings themselves, the

choice to work with Moodle activities proved to be really suitable, due to its more practical aspect, especially because the methodology of crossing with McKenzie’s (2005) action verbs.

In addition to the construction itself and the results obtained, revealed in the instrument, it was noticed, from what this research identified, that the possibilities of working with intelligences may also be related to the strategic choices within each activity, and not only the type of activity used. The choice of activities, obviously, also influences, and this work has its legacy there, which is believed to be of some value, although there is a desire to deepen the study.

Some intelligences presented, and it could not be different, very few activities suitable for them, such as the case of bodily-kinesthetic intelligence, since the possible connections within its context were seriously analyzed. The verb “to dance”, for example, could only be taken into account if the student needed to dance in front of the computer, which would characterize something unlikely. On the other hand, it is known that today there are electronic games that require the player to literally dance, jump, exercise or reproduce situations. This means that, beyond the limits imposed by Moodle’s list of activities, dancing in front of the computer to understand a content could not be something unreasonable.

There were also more complex cases, such as that of musical intelligence, in which it became difficult to define the limits of what would be accepted or rejected. It was necessary to make an effort not to raise any kind of mention, warning that the Database, Forum, Glossary, Wiki and Presentation activities could be used to stimulate this intelligence, as long as musical content was explored. These activities do not immediately suggest the idea of exploring this type of content and they were therefore discarded. Despite the low number of activities selected for



Figure 12 – Selecting linguistic intelligence.
 Source: screenshot of the page www.gosmi.info.



Figure 13 – Linguistic intelligence page.
 Source: screenshot of the page www.gosmi.info.

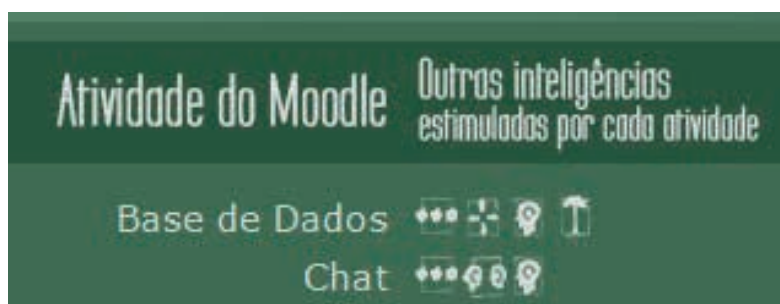


Figure 14 – Detail of the page of each intelligence, showing the activities.
 Source: screenshot of the page www.gosmi.info.



Figure 15 – When clicking on an activity, a new screen with its specifications is opened.

Source: screenshot of the page www.gosmi.info.

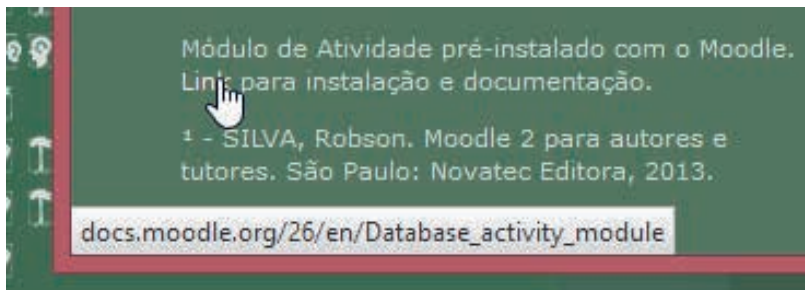


Figure 16 – At the bottom of each activity screen, the official Moodle link for it.

Source: screenshot of the page www.gosmi.info.

musical intelligence, it was decided to rigidly maintain the criterion, and to place only those in which the appearance of musical content was more likely. The threshold is very wide, and even some selected activities require the educational designer's good judgment to use them with appropriate content or strategies. It would have been easier to link the verb "to listen" to all activities that somehow allowed music to be uploaded, but that way GOSMI would start to lose its meaning. The analysis, in these cases, had to be more subjective, but it made this GOSMI category (by Moodle activities) possible with user support.

From the establishment of GOSMI, the educational designer can consult it and search for ideas to approach the use of several intelligences in their planning with teaching teams, as suggested by the premise worked out here that, in EaD, and without knowing the individualities of each student, encouraging the use of more intelligences can favor more students. It should be noted that, according to Gardner (1997), the ideal would be a personalization, that is, students would have content created to stimulate the use of their most prominent intelligences. There are tests and exercises (GARDNER, 1997; TEELE, 1995; MCKENZIE, 2005) applied in face-to-face teaching that seek to identify the most exponent intelligences in each student, but the issue here is their applicability to distance education. How do we get to know each student when we have an online class? The teacher-student relationship, despite being increasingly close through means of communication, it is not as close as in face-to-face teaching. These tests could perhaps be adapted and developed for distance education, which is considered another issue for future research opportunity, or even for other researchers to try to answer.

As a future possibility, we intend to add, in some way, content strategies, ideas, and new

technologies to GOSMI, with a methodology to be defined. We understand that the tool should never be considered closed or defined, and should be updated with new scientific discoveries. As Gardner himself would say, "I hope this research inspires anthropologists oriented towards education to develop a model of how intellectual competences can be fostered in different cultural scenes" (GARDNER, 1994, p. 8), to encourage other researchers to also seek to improve the use of the theory of multiple intelligences in distance education.

Therefore, GOSMI is considered the result of a complex work that sought to answer, for now, to the research outline. This effort to disseminate Gardner's ideas in distance education is now starting, but it is by no means considered finished, since there are still many possibilities to be explored.

REFERENCES

- ANTUNES, Celso. **As inteligências múltiplas e seus estímulos**. Campinas: Papyrus, 1998.
- BEHAR, Patricia (org.). **Modelos pedagógicos em educação a distância**. Porto Alegre: Artmed, 2009.
- COLE, Jason; FOSTER, Helen. **Using Moodle**. Teaching with the popular opens source course management system. Sebastopol: O'Reilly Media, 2008.
- GARDNER, Howard. **Estruturas da mente: a teoria das inteligências múltiplas**. Porto Alegre: Artmed, 1994.
- _____. **Inteligências múltiplas: a teoria na prática**. Porto Alegre: Artmed, 1995.
- _____. **Multiple intelligences: new horizons**. Basic Books, 1993
- _____. **Encourager la diversité en personnalisant l'éducation**. Perspectives, Vol. XXVII, n. 3, pp.372-377. UNESCO, Bureau International d'Éducation, 1997.
- MAIA, Carmem; MATTAR, João. **ABC da EaD: a educação a distância hoje**. São Paulo: Pearson Prentice Hall, 2007.
- MCKENZIE, Walter. **Multiple Intelligences and Instructional Technology**. Washington: International Society for Technology in Education (ISTE), 2005.
- NEVES, Marcus. **Design Educacional e Inteligências Múltiplas: Construindo um Instrumento Norteador para o Estímulo ao uso das Inteligências em EaD Online**. Pelotas, 2014. Dissertação (Mestrado em Educação) – Programa de Pós-graduação em Educação, Universidade Federal de Pelotas.
- RAMOS, Daniela. **Cursos on-line: planejamento e organização**. Florianópolis: Ed. da UFSC, 2010.
- SALVADOR, Ângelo. **Métodos e técnicas de pesquisa bibliográfica**. Porto Alegre: Sulina, 1986.
- SILVA, Edna; MENEZES, Estera. **Metodologia da pesquisa e elaboração de dissertação**. Florianópolis: UFSC, 2001.
- SILVA, Robson. **Moodle 2 para autores e tutores**. São Paulo: Novatec Editora, 2013.
- TEELE, Sue. **The multiple intelligences school: a place for all students to succeed**. Redlands: ST&A, 1995.