

High Education and Spirituality

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Abstract. Object: The aim of the paper is to present some concepts able to be used in high education teaching based on different pedagogical methodologies. A profound teaching process that combines e-learning and alternative learning elements will promote security in real life. A multi-agent case study based on observation for OOP was developed for e-learning direction. As alternative elements for education different methods were considered as: Brainstorming, Think/Pair work/Communication, I Know/I want to know/I learned, Clustering, Mosaic, Cube, etc. The Enneagram principle was experimented to compose practical and research teams depending on compatibility personalities.

Methods and Results: During the study were developed some dedicated practical applications with students. In a second stage considering the enneagram model for creating working teams in specific groups, it is possible to better understand the learning evolution of students. The connection between the technical teaching and the spiritual evolution of participants was also considered.

In a learning session, a teacher is usually involved in many tasks simultaneously. For this reason, it cannot observe entirely and continually the activity of each learner. Observation tools available on a learning platform must thus help to observe and then to adapt the actions during the learning session, without additional work required from the teacher.

The e-learning experiment was preceded with a class of first year students in a Technical University. The object was a practical work during one hour and a half on C/C++ programming languages, OOP. The students were working by pairs and they were asked to perform a recommended learning scenario: in the first part, they were asked to develop and execute an introductory application. In the second part of the session, the students were asked to develop and test a set of small applications in any order from a proposed set of applications. Finally, the students were informed that they were observed during the work. For the license and Master of Science students a brainstorming technique was realized in groups. Using an initial "Task Notebook" the integrated group will divide the main tasks to each member and in the "Extern/Intern Reunion meetings" the drawbacks will be clear specified and analyzed. The final result is a "Specification Notebook" and the implemented technical product.

Such a technique was used for a test period of 3 years for software development products at the Technical University of Cluj, at some Software classes. At the end two aspects were relevant:

- in the brainstorming team groups with enneagram selection the evolution of each member was more relevant than in the normal groups.

- the developed products were original, full of creativity and more reliable.

Conclusions: As an educational process, some concepts exposed in this paper

were verified and quantized during courses and practical activities with first class, license and Master of Science students. The technical and the general progress considering e-learning, brainstorming groups and the principles of enneagram model will increase the results in an exponential mode..

Keywords: e-learning, enneagram, alternative learning, security

1 Introduction

The Information Society needs well trained people able to adapt to the dynamic evolution of technologies. If the education will offer only technical experts considering high technologies training, the results may be good for a temporary moment.

A profound teaching process that combines e-learning and alternative learning elements will promote security in real life. A multi-agent case study based on observation for OOP was developed for e-learning direction. As alternative elements for education different methods may be considered as: Brainstorming, Think/Pair work/Communication, I Know/I want to know/I learned, Clustering, Mosaic, Cube, Three-Step Interview, etc. [5]. The Enneagram principle was experimented to compose practical and research teams depending on compatibility personalities.

Education in technical domains must respond to the scientific progress that introduces many new elements, but may also remain more appropriate to the student perception. Different solutions based on pedagogical methods are used, usually considering advanced software solutions as mobile agents or different expert / neural systems, [6], [11].

Classical education techniques and modern techniques that involve pedagogical, psychological methods and high technologies were considered during few years in the Electronics, Telecommunications and Information Technologies faculty. Some experiences and case studies were realized considering first year, license and Master of Science classes.

Brainstorming is a technique used in different domains. Brainstorming is defined as a lateral thinking process, [12]. It asks that people to come up with ideas and thoughts that seem to be shocking. The ideas can be changed and improved into new ideas that are useful, and often original. Ideas should only be evaluated at the end of the brainstorming session. Classical and conventional solutions can be used in implementation.

The new advanced technical solutions are difficult to be integrated in the education process considering only a pure technical approach. Using alternative techniques based on the (profound) resonance concept, or resonance, we are able to eliminate some deviations and mistakes in the education process, [9].

The fundamental principle of resonance comes from physics as a response induced by different vibrations, the resonance vibrations being able to offer an ordered system and not an aggregate of components. In education, resonance may be represented by a teacher-student *interconnection*. *This interconnection is a reverse one that will be able to offer a cyclic process with a given frequency.* For the human being the subtle

aspects will resonate with the material ones, as expressed Rudolph Steiner, [8]. The energetically fields of a human being are influenced by the human thoughts, the communication between the soul and the body, spirit and mind, etc., are in accordance with the resonance. Rupert Sheldrake, [7], considering some Jung's ideas, uses the morphogenetic field, as an alternative to the mechanist/reductionism approach, and morphogenetic resonance, as a principle that operates in the entire universe and is able to describe some non-quantitative results. All these aspects may offer a holistic perspective of the entire education. Holographic and fractal models could offer a real perspective in the complex education process because these models include a holistic perspective.

Developing some dedicated practical applications with students using brainstorming, and in a second stage considering the enneagram model for creating working teams in specific groups, it is possible to better understand the learning evolution of students.

2 Education process and spirituality

The education process including the technical domain must offer an opened mind people, not a limited technical expert. The human spiritual evolution may be represented considering different philosophical orientations. The Oriental, Egyptian, Greek, etc., conceptions arrive at the end to remark the infinite power of an awaked human. Considering the wisdom of the shamans of ancient Mexico, Carlos Castaneda [2] presents the man of knowledge concept with the main directions and the enemies involved in the evolution process. We are able to make a connection with the higher education process and Castaneda point of view as follows.

The main directions of a spiritual human will start with *teaching*. In teaching, the aim at the beginning is not clear, the intention is indefinite. Each step is a new task and the fright will increase out of pity. The first enemy in this step is the *fright*. If the fright will dominate, the instruction process will never finish. The instruction is difficult but will be realized step by step, and the first natural enemy, the fright, will be defeated. The human will enter in the second step. In this step, the *clarity* is the new enemy.

The clarity is very difficult to be obtained but at the same time will blind the human. The clarity will oblige the human not to doubt himself, will offer a safety state to realize everything that he will wish, will be brave, etc. If this enemy will defeat the human, the human will grope in the education process, being unable to learn something else. At this level, the clarity will never be transformed once again into darkness and fright, but the spiritual aspiration will be stopped. If we want to advance, we must defy the clarity, using it only to "see" and to wait with passion until we understand that the clarity was only a point in front of the eyes. In the next step, the clarity will be transformed into real *power*. The power is the most difficult enemy and it is very easy to give up. The human seems to be invincible, will command, will assume calculated risks, and will finish by establishing rules because he is the master. For the human it is very difficult to perceive this enemy, being transformed into a cruel and freakish one. The power will be a burden for his faith. The human will be defeated only if he definitively gives up fighting. To defeat the power enemy the human must deliberately defy it. The human must understand the power that

apparently was conquered but does not belong to him. If he understands that the power and the clarity without a self-control are very bad, then he will be able to know when and how to use the power.

The last enemy, *wise maturity*, will stop the last step of the knowledge man's way. This is the cruelest enemy that will not be entirely defeated, only reprieved for some time. It is the time for no fear, when it is able to master the power and huge wishes for relax. If he gives up in this step by tiredness, he will lose the last round like a helpless and old age human.

The clarity, power and cognition will be defeated by the abandoning wish. If he does not give up by tiredness and if he reaches the initial aim, the human may be named a *man of knowledge* for a short time. This moment of clarity, power and cognition is sufficient to obtain the advanced profound human status.

To reach an elevated status, a human must fight to pass all these four steps. The compassion will offer the possibility to understand that each result represents a step in the general evolution.

The resonance is able to model any aspect, everything being in essence resonance. As a universal law, resonance is considered to have an initiate role.

The Japan scientist, Masaru Emoto, experienced how the human thoughts are able to structure the mater. His experiences are relevant for subtle crystallizations, [4].

A study of the human evolution based on 9 typologies was realized considering the enneagram representation, [12]. In this mode the own compulsory will be identified, understood and passed. Group teaching and research activity is more efficient considering enneagram results and the typology connections established among the group components. It is important to understand that in a spiritual group will be always manifested the all 9 typologies, as complementary aspects. The manifestation of all typologies could be realized considering a limited number of members, less than nine, but with specific interactions.

Usual a natural process of selection is realized so that compatible typologies are in connection and only we must open the eyes of the members to obtain a harmonious integration mode.

In software applications, a connection usually refers to classes being more general, and a link refers to instantiated objects. To refine the elements in that direction based on connections, can be a new orientation in research activity. The Professor-Students connection must be considered as a spiritual force that will offer the cohesion, the community, the serenity, the welfare, etc., [9]. The synergy in this case will manifest as the Professor-Students force, being a spiritual force expressed by the mind power, which is a very huge power.

The resonance and the holographic principle may represent a future direction for the human evolution from the scientifically to the spiritual point of view.

3 Experiences and case studies in technical education and research

Experiences and case studies were realized considering first year, license and Master of Science classes.

A part of the experiences were realized as a study of a PhD thesis, [6] with the observation of pedagogical activities in an educational platform. Users' behavior is observed through the traces of their activity. The observation process was realized considering a multi-agent system.

The first year students' experiences were realized in some practical works considering Object Oriented Programming in C++.

The students worked by pairs (2 students on each station), 9 groups in a lab repeated for 3 different classes, and they were asked to perform a recommended learning scenario. In the first part, they were asked to develop and execute an introductory application step by step (composed of several C++ classes to be developed and tested sequentially). In the second part of the session, the students were asked to develop and test a set of small applications in any order from a proposed set of applications. Finally, the students were informed that they were observed and they were strongly requested to respect the proposed learning scenario (mainly the names of the source files proposed in the scenario). The teacher was present in the classroom, and was able to observe the activity of learners through a station dedicated to the teacher.

The activity was focused on pairs of students concerning how was consulted the offered documentation, which was the activity during the practical work, Figure 1-2.

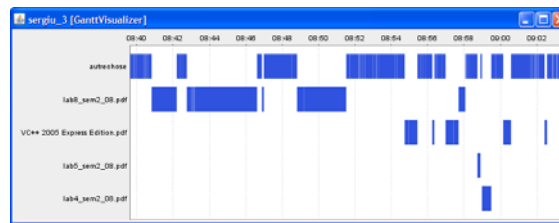


Figure 1. Consulted documents by a particular student

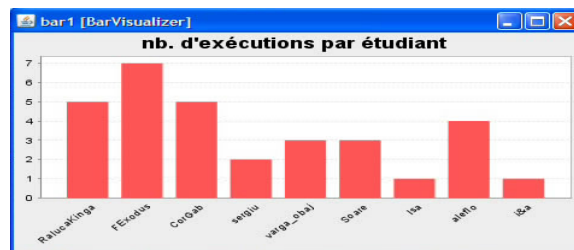


Figure 2. Number of successful executions per student

The teacher's station which monitors the students' activity using agents is in Figure 3.

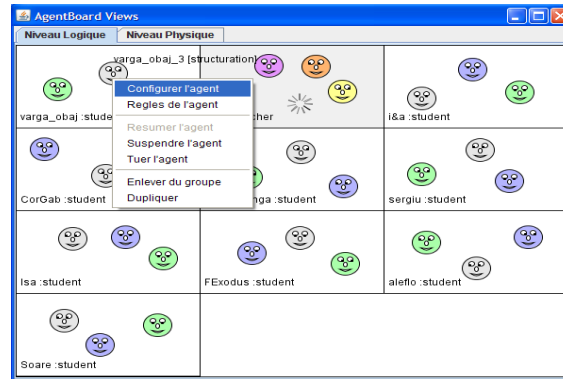


Figure 3. View of the deployed groups of agents

For the license and Master of Science students a brainstorming technique was realized.

The general aspects of brainstorming specify the main elements of a group and individual brainstorming technique.

Group brainstorming can be very effective as it uses the experience and creativity of all members of the group. When individual members reach their limit on an idea, another member's creativity and experience can take the idea to the next stage. Therefore, group brainstorming tends to develop ideas in more depth than individual brainstorming.

Individual brainstorming will tend to produce a wider range of ideas do not considering other people's selfishness or opinions, and can therefore be more freely creative. Collaboration and none competitively is specific to brainstorming.

In a group the opening skills and spiritual level is more important at the beginning than the technical level of each member.

A variant of the brainstorming technique can be used in the technical teaching process.

The rules considered in such a group must be simple but not simpler. Using an initial "Task Notebook" clear specified from the beginning, key solutions will be easy to be considered.

Such an integrated group will divide the main tasks to each member and in the "Extern/Intern Reunion meetings" the drawbacks will be clear specified and analyzed. Any new proposed solution will not be rejected being criticized, and if possible, a new solution will be chosen in the meeting. In this mode the creativity and the originality are possible to be manifested. The Intern Reunions were realized among the members of the team group and the Extern Reunion was realized with the teacher.

Mental connections that are able to choose new technical solutions are not limited to the classical standard solutions. At the end, elegant and useful solutions are obtained in these brainstorm group activity. The final result is a "Specification Notebook" and the implemented technical product.

Such a technique was used for a test period of 3 years for software development products at the Technical University of Cluj-Napoca, at the Software in

Telecommunication discipline, and Software Engineering at Master of Science classes.

The number of members in a group was established from two to five. The medium number was three.

The total number of the team groups established in the test process was 52. From these team groups only about half accepted to use a brainstorming technique to develop mini-projects (in the test period the technique was optional).

At the end two aspects were relevant:

-in the brainstorming team groups the evolution of each member was more relevant than in the normal groups. In about 25% of the brainstorming groups the evolution was spectacular.

-the developed products were original, full of creativity and more reliable.

The domain of the chosen mini-projects was not restricted to a narrow field with standard names and directions. Interesting and motivated directions, mini-projects names, adapted solutions were chosen by students. As examples of relevant mini-projects and the Graphic User Interfaces for a few of these applications are presented in Figure 4-7.

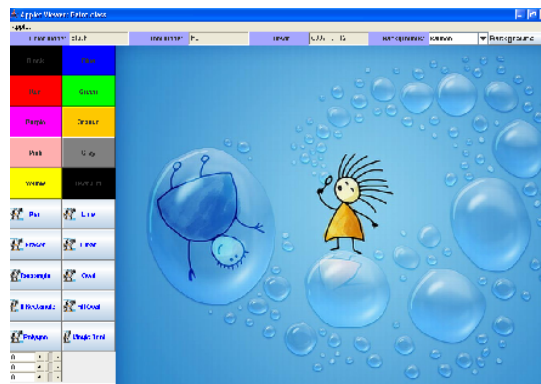


Figure 4. Mr. Doodle. Drawings and Colors



Figure 5. Stewie's On-Line Diner



Figure 6. Ambrosia



Figure 7. Voicenger

The Voicenger product [3], was developed considering the imposed protocol established by the brainstorming technique and in this case, the evolution of the members was very significant considering technical and human relations. Main results are presented in Figures 8-10.

Key words

- Multithreading
- GUI
- ServerSocket
- Socket
- Port
- Compression

History of the Document			
Author Name	Date	Version	Actions
Diana Iosifescu	02/11/2005	A	Creation
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Andrei Marcu	17/11/2005	A	Reading and adding new ideas
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All	21/12/2005	A	All project is 85% done
Andrei Marcu	24/12/2005	A	Creating Documentation

Figure 8. Task Notebook Voicenger

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Figure 9. Specification Notebook of mini-projects

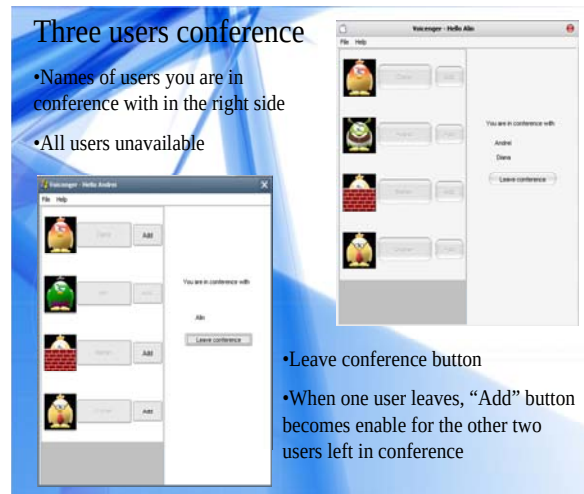


Figure 10. User conference management

Such a teaching process based on brainstorming is more flexible, relevant and useful for a complete evolution of the students. The main goal of these dedicated products was to offer the possibility to obtain practical technical abilities in a more opened and intuitive mode.

Another experiment was realized during the summer first year students' internship at a Danish software company, Wirtek, Cluj-Napoca subsidiary.

Three periods of three weeks was allocated for the internships. Twelve students in each period, grouped in two teams. Software projects considering new technologies in C# and Java were considered.

The first group included the best students. They were grouped considering preferences, in the teams dividing process.

The second group was divided considering an enneagram methodology and was composed by students with lower software capabilities.

The third group was divided in accordance with some personality criteria established by the software company.

The final evaluation realized by the software company included obtained technical abilities, general training responses and team collaboration abilities.

The first group obtained the best technical results with a linear evolution. The collaboration process during the teams was limited each student working on dedicated tasks.

The second group started with huge difficulties considering technical abilities. The compatibilities of the members from the teams helped them to have an evolution in an exponential mode. At the final evaluation the results were very promising for technical abilities and the human relations were very opened and harmonious.

In the third group the teams were realized using some company criteria based on five personalities type. They were in accordance with the nine enneagram personalities.

The final evaluation determined that the second group teams' evolution was more complete than the first and third groups as technical and social results.

4 Conclusions

As an educational process, some concepts exposed in this paper were verified and quantized during courses and practical activities with first class, license and Master of Science students. The first year students were tested using a multi-agent system designed to deal with the observation of pedagogical activities, [6]. This approach can provide to the educational platforms quantitative data, complementary to a classical "questionnaire" methodology.

The license work was realized in the "Software in Telecommunication" mini-project discipline at the Technical University of Cluj-Napoca, [10] and "Software Engineering", Master of Science Classes in two different years. The brainstorming methodology was optional in the testing period. In the first year the students were divided in 19 teams of minimum 2 students, maximum 5. Other 33 teams were considered in the second year the total number of team groups being 52 for both years. 5 groups were considered at the Master of Science class with a very enthusiastic and more efficient result as in previous years. In the first year, 12 teams were composed considering the principles of resonance (morphogenetic), and the brainstorming methodology, and 7 considering a pure technical association. During the semester, the evolution in the first 12 teams was remarkable, and the results were significant. The other 7 teams obtained results depending on the person's level that composed the team and the progress was insignificant to the other team members. After the second year tests, the results obtained in the team groups composed using the enneagram methodology and the brainstorming technique (33) confirmed the good results from the first year. We consider that the educational results using a flexible brainstorming group are more relevant than a classical one, and it is possible to generalize the methodology for a large number of students.

The technical and the general progress considering brainstorming groups and the principles of enneagram model will increase in an exponential mode, as the spiritual concepts specifies.

The performances of the dedicated obtained products are obtained as a result of the complex interaction established between a technical and spiritual methodology.

The same mechanism may be used in research activity, and we hope that students prepared in such a mode will be more efficient in their activity as the summer students internship shows.

Such technologies that consider a fusion among pedagogical, spiritual, psychological and technical concepts as: resonance, enneagram, collaborative learning, brainstorming, software engineering, etc. involves more flexibility, hard activity, but at the end the results are more consistent.

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