Applying Gianni Rodari Techniques to Develop Creative Educational Environments

Habib M. Fardoun[1], Iyad A. Kateb[1],
Antonio Paules Ciprés[2], and Jaime Ramírez Castillo[3]

[1] Faculty of Computing and Information Technology, King Abdulaziz University (KAU),
Jeddah, Saudi Arabia
{hfardoun,iakatib}@kau.edu.sa
[2] European University of Madrid, Madrid, Spain
apcipres@gmail.com
[3] ITKnowingness, Madrid, Spain
jaime.ram@gmail.com

Abstract. In this article we will conduct a study of the Gianni Rodari School, a technique used in the initial educational levels of pre-schools and primary schools, but in this case for the use in the development of new creative ideas for the college projects, and vocational training subjects. For this we define and justify the essence of creativity as ideas, using a structure that can be stored in the cloud. To validate the system, we present a case study by using abstract concepts of human knowledge in the cloud. The presented work takes into consideration the interaction and collaborative work to promote creativity and the generation of new ideas in a clear and ordered way for the students.

Keywords: Creativity, Teaching Techniques, Cloud Computing, developing ideas, education environments.

1 Introduction

In this article we will conduct a study of the Gianni Rodari School [1], a technique used in the initial educational levels of pre-schools and primary schools, but in this case for the use in the development of new creative ideas for the college projects, and vocational training subjects.

Gianni Rodari is an inventor of children's stories, that aim to develop basic skills and general primary cycles through the children read of those stories. This technique facilitates learning of children by the use of techniques that foster creativity. Our idea is to apply this technique in the vocational training level, in order to encourage creativity and imagination in the course of advanced vocational training projects. The study of this technique by the teachers and the implementation of methods that foster creativity and imagination are important in the industrial products development and innovation of new ideas. Gianni Rodari in his book "Grammar of Fantasy"[1] uses his personal experience of working with children. This book is based on the explanation of many creative techniques that help children, to allow their imagination, to create

fanciful stories in which anything can happen. As he does not limit the children thoughts, he encourage creative thinking which helps them look for different options to solve problems throughout life. The next sentence, captured from Gianni book describes his technique about creativity in childhood education centers:

> *"It is one more propose to put off all those who try to enrich the stimulus* of *the environment (home or school, whatever) in which the child grows. The mind is only one. His creativity must be cultivated in all directions."*

Our labor as teachers is to be able to help students through techniques that promote creativity, and educate students in the development of new designs, new products and new technologies. For that, During these past courses, we have conducted researches on educational environments in the cloud on the documentation of learning units, from creation to evaluation [4], and on employing methods of interaction in the cloud systems [5] considering the usability in collaborative environments in the cloud [6]. After considering the technical part of the research, we develop the "Montessori Method" as the application of ICT in the classroom [7]. As we appointed, we dispose the technology to develop such methods. So, our goal in this article is to establish a set of guidelines for the development of a technique using Rodari School for project subjects, which our university sets as follows:

> *"... Individual or collective work with well-defined roles, predominantly creative and design side, which will take place in a university department, institution or company, domestic or foreign, or at another university as part of a mobility agreement..."*

2   State of Art

In our quest searching for tools that enable the collaborative work, defined to encourage creativity and document the entire process, we found many of these, based on conceptual design, logical design, and modeling languages, that allow capturing the students' ideas on paper. Thus, the achievement would be getting questions that may not have answers, as any question could be a new idea or a new product.

For example, In software engineering methodology, we can find the client requirements: starting from a discussion of customer requirements, when the analyst develops cases with the need for future implementation, *Rational Requisite Pro* is the used tool [8] which interfaces with *Rational Enterprise Pro* [9], these known engineers software tools allow defining the functional requirements through users interaction in an technology information environment. The rest of the Web 2.0 tools are premises where documents are shared and collaborative online environments are limited to working with similar tools as *Google Docs* [10]. By performing a search in the Web, we can find many Web Sites that use these type of tools and explain it in detail, as we all know, some of these are: Wikis, Blogs, Forums, and Moodle.

3   Resume of the Creativity Technique

Rodari technique is presented throughout its literature [3]. From these texts, the basic premises of the Rodari School extracted are as follow:

- The belief in the transformative power of language.
- Trust in the game as possibility of freedom and the most natural expression of childhood.
- Calls for a happy school, not a boring one.
- Considers magic and knowledge as two interacting components.
- Squeezing the language to sprout new ways of understanding reality.

The techniques developed in the books written by the author are:

- **Fantastic Hypothesis:** What if...? Ask a known situation where a foreign element is introduced. For example, what would happen if an alien landed our school?
- **Tales backwards:** From a well-known story is to imagine what would happen if things happened in that story backwards or if a change in the characteristic element occurs.
- **Creative Analysis:** Many stories have secondary characters we know nothing about them. These characters can be taken as a starting point of a new imaginary story, to try to imagine what are their stories: where he/she comes from? , What was their role in the story, etc.
- **Salad stories:** tales mix, allows other story characters to participate in other stories.
- **Creative Error:** it is about taking note of the mistakes made by people when answering questions, writing, or other school situations, and try to explore its possibilities. For example, if I write the word "ures" (instead of "user") ... what world " ures" could be? What are its characteristics, what would it mean? ...

As we can see, these techniques and their description are designed for schools and exposes a new method:

- Encourage creativity and imagination since childhood.
- It shows the transformative power of language
- It transmits to us the importance of training for the world transformation.

4   Definition

In section 3 we have seen the various techniques developed by Rodari, we can observe that these techniques are of the question-answer type, with a point text, a word game, and interaction of various techniques. In this paper we will transfer these techniques for the identification of projects, so that the creative process is able to focus on the definition of objectives and its idea.

Creativity in our case concerns the creation and definition of milestones project, as it is in these phases where students can make new products, for expanding the objectives. Where the objects in the cloud systems interact with each other, and growth depending on user need. So, the question here can these ideas be represented in the cloud? For that, first we have to identify the meaning of an idea. According to the classic notions as Platon's theory of ideas, taken from his works "The Republic", "Phaedo" and "Phaedrus"[11] is:

> *"The Idea is the object of an intellectual intuition and represents the immutable and eternal essence of reality (that is alien to change, therefore), and having independent existence of sensible reality (i.e., which is subsisting). The Idea is a real object that exists independently of sensible reality and thoughts. In the dual theory of ideas, is the term of the universal definition represent the " essence " of the objects of knowledge, i.e., that which is in the concept, but with the peculiarity that can not be confused with the concept, so the Platonic Ideas are not mental contents, but objects that mental contents designated by the concept relate and express through language. "*

As we can see, the ideas are immutable in time and do not change, while the concept changes, and where the mental contents become the objects that define the ideas. According to Rodari School, ideas come from the techniques that work through contents, so we can use the content to define ideas that results in a product associated with it.
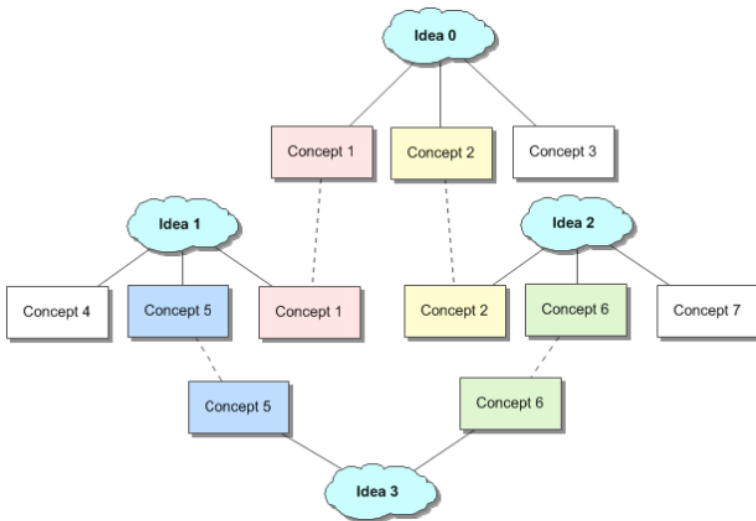

Fig. 1. The Idea and the concepts

As we can see in Figure 1, the ideas consist of concepts that define the idea itself. Furthermore, there are ideas that can arise from different composition concepts of other ideas, graphically and according to the level of the problem we are defining we can see the relationship with the Rodari School. Rodari performs his techniques according to the concepts and that is why these concepts help defining the ideas as their realization and development within the cloud of ideas. Working creative can help developing ideas by defining concepts. The concepts developed by students based on their needs and the content of the materials. And by this Rodari technique streamline the process of creating and defining ideas.

Figure 2. shows how the ideas and creativity in the university environment can be obtained from:

- The content of the subjects taught in the classroom.
- From the path chosen the mistake-test and the questions we have.
- From the current technology and its applications, the fact of considering new uses of technology makes us think about the development of a new technology, a new product.
- The working experience in the field.
- The collaborative work to share ideas.

Rodari adapt techniques to the projects subject, which we are all familiar within the computer terminology:

- **Hypothesis doubt:** we propose the doubt to the student on the technological future and let him consider the off-label use, as a new way to interact with a device, regardless of the labeled technology used.
- **Backwards Engineering:** From selected scientific texts, we try to motivate students to wonder what would have happened if something had changed. Could be realized from made applications or outdated applications that could be changed, or starting from the same prototypes.
- **Creative Analysis:** An analysis of market requirements, the project itself, or searching for projects that are being conducted.
- **Salad of Contents:** using a selected content from the courses, the student may have more motivation and focused thoughts on the creation of products.
- **Error:** Defining the mistakes they have committed and the analysis with the techniques described above, we can reach the solution to the error and encourage the student interrogations as a way to solve to a problem.

As we can observe, we have just made a translation of the method to another education level. In our case, it is not grammar or creating children's stories, we are developing a technique that fosters creativity for students in college and also allow the creation of new products to the industry. Rodari technique is widespread and tested in primary and pre-school lessons; we are only upgrading it for higher educational and to the students cognitive level. Thus, the rapid evolution in the information technology and the emergence for new products in the market requires us to experiment with techniques like this one.

Fig. 2. Development and creation of an idea

5   Architecture

We have developed an architecture that can deploy and develop ideas. In addition, it allows us to have a repository of ideas that permits linking the present ideas with new ideas so that it can emerge. In the previous section, we said that ideas are objects that are made up of concepts, then following this definition, we can say that a cloud where ideas are represented as objects with no relationship between different objects, are defined by a set of concepts where Rodari technique would facilitate the extension of these ideas.
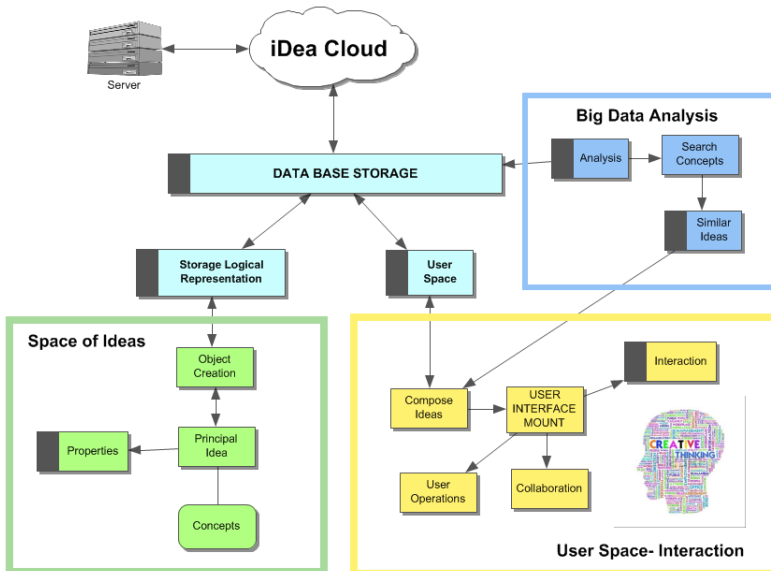
Fig. 3. Conceptual Architecture

As a result, we have the following parts in the logical objects storage where we have a representation of objects and ideas, and then we have a space for the shared work of users where users interact with the system and among them with permission to work in groups. On the other hand, we have a section for the analysis of the network of ideas through the link, also, for associating concepts and ideas in order to modify the existence of proven ideas and its feedback to produce creativity throughout the creative process.

Figure 3. contains the different parts of such system, a database, we choose object-oriented database. In order to reduce the complexity, we only have two objects in the system of ideas and the concepts associated with users. The green area includes reserved space for ideas and concepts. As we see, the ideas have some properties and consist of concepts that define the logical storage. The structure, detailed in the Figure 3, is similar to an indexed list in a file system; these ideas are stored with a unique identifier where the database is associated with users or group of users who are using the system.

In the blue area, we can find the section for the analysis of data in the database. With this, we managed to extract new ideas by associations of ideas through the concepts that define these ideas. By this way, we make the system offers new possibilities created from the analysis of these characteristics. This point is important because the system feeds itself on the new definitions and associations, the authorized users will have the ability to visualize these results and derive these ideas to those responsible for them or for the system, which developed these ideas over time from the definitions of users.
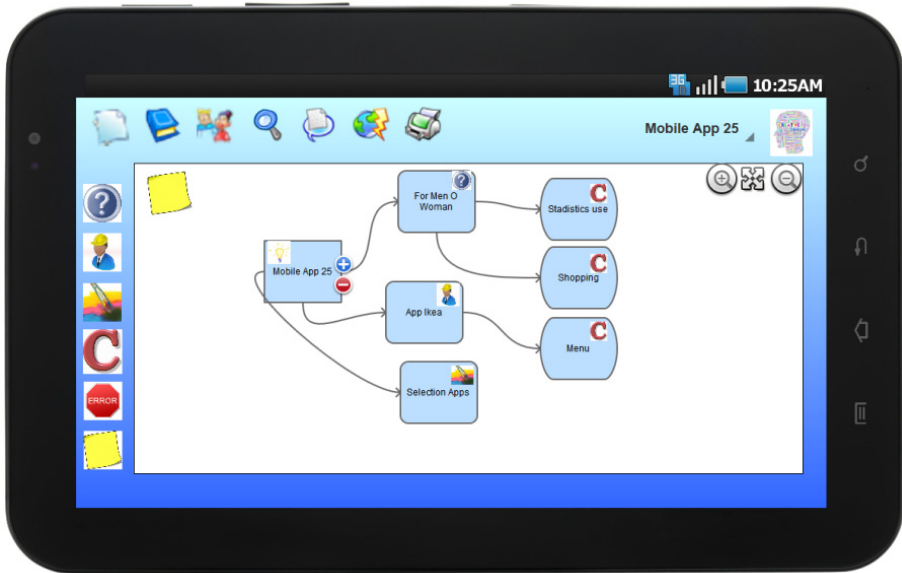

Fig. 4. Desiging creative idea

In yellow we find the logic of interaction. The logic interaction of a system assemble and compose the ideas that the user has made over time to adapt the way the user has determined. This is a personal workspace where Rodari technique is applied; the graphical interface ensures collaboration and interaction from any mobile device, anywhere, because the cloud system is the one that provides the resources by means of a viewer in the user device.

Running a system with these characteristics is easy once the user has started with the creation of ideas in the application, it is stored in the reserved space for it, and so the structure would be saved in the cloud system. The cloud replicates in the database and keep in sync all the information. From the interaction point of view, its not complex for the viewers to access these systems by creating web service, services that transfer information from the client side, cloud system, as parameters or by passing through remote programming methods for sending information. Assigning permissions to the object can perform collaborative work and by this all the users can work in the same session and view the changes. The System growth is guaranteed as the accommodation in cloud systems is dynamic and can increase over time and even in different machines.

6   Study Case

We present the case study of a student who wants to make a mobile application. This interface shows the different parts the student can perform the modeling of the idea, based on the Rodari method, Table 2.

**Table 1.** Applications options

	With this menu the user creates a new idea that will be stored in the cloud.
	The user can access the resource bank of the school, where he access to both projects for an inquiry as to the works of the subjects listed, in order to be able to get filtered and quality information for the realization of his idea.
	Search users who share his idea with and share the space of thought on that particular idea in order to streamline the process through collaborative work.
	Text search on the entire system returns the items that are in accordance with the entered text in order to expedite the navigation in a specific content.
	Establish communication using text or voice audio with his companion to share experiences.
	Once the idea is set, the user may search for similar trips in the system in order to be able to associate these ideas. In this way the system allows the user to take ideas from other ideas in order to improve them or redesign the existing one.
	Print the diagram; everyone likes to put something on the wall.

**Table 2.** Menu options using Rodari Terminology

	Hypothe-sis doubt		Backward Enginering		Error
	Creative Analysis		Content Salad		Tip note to re-member

Figure 4., represents an editor where the user develops his ideas graphically. This editor has graphic content to identify the element of the method; it is simple. Further interaction tablet allows the user to work comfortably anywhere in order to enable him ordering his ideas at any time. Table 1. shows the menu options of the application, and Table 2. Show the options of menu options using Rodari terminology.

7   Conclusions

In this paper we have represent an approach for the creation of an application according to *Rodari Technique* for the development of ideas, using our expertise in cloud computing, educational environments and considering what teachers have already apply these techniques in primary schools. We don't find in universities, the use of specific techniques for this issue; we understand the need for these techniques and we consider adapting and applying them for other educational levels, due to its size and use along large time.

Once again, we have used cloud computing during the creation of this application, but in this case it is the definition of the system itself, which determines the architecture design, as we have seen it couldn't be simpler to perform. Usually, cloud systems work in a complex way, with hundreds of thousands of users and data, but in this case the system is simplified by creating a user space each time the user accesses the application. In this way, we cheapen costs and provide a space for independent work.

The application is being created and tested now in several courses in the University of Castilla-La Mancha (Spain).

References

1. Biografía Gianno Rodari,
   http://muse.jhu.edu/login?auth=0&type=summary&url=/
   journals/lion_and_the_unicorn/v026/26.2salvadori.pdf
2. Gramatica De La Fantasia: Introduccion Al Arte De Contar Historias Gianni Rodari, Ed Bronce (2002) ISBN 9788484531647
3. Álvarez, M.: Reseña de" Gramática de la fantasía" de Gianni Rodari. Sapiens. Revista Universitaria de Investigación 7(1), 233–234 (2006)

4. Fardoun, H.M., Cipres, A.P., Mashat, A.S.: Cataloguing Teaching Units: Resources, Evaluation and Collaboration. Knowledge and Information Systems: An International Journal, by Springer. Impact Factor 2.225. ©2012 (2013); Thomson Reuters, 2010 Journal Citation Reports®.

5. Fardoun, H.M., Ciprés, A.P., Alghazzawi, D.M.: CSchool - DUI for Educational System using Clouds. In: Proceedings of the 2nd Workshop on Distributed User Interfaces: Collaboration and Usability, in Conjunction with CHI 2012 Conference, Austin, Texas, USA, May 2012, pp. 35–39. ACM (May 2012) ISBN 84-695-3318-5

6. Fardoun, H.M., Alghazzawi, D.M., Cipres, A.P.: Distributed User Interfaces: Usability and Collaboration. Distributed User Interfaces. In: Human–Computer Interaction Series 2013, pp. 151–163. Springer, London (2013)

7. Fardoun, H.M., AL-Malaise, A., Paules, A.: Creating new Teaching Techniques with ITCs Following the Montessori Method for Uneducable Young Students. In: Proceedings of the 2nd International Workshop on Interaction Design in Educational Environments, IDEE 2013, in Conjunction with ICEIS 2013, SCOPUS (2013)

8. Rational REquisite Pro, link:
    `http://www-03.ibm.com/software/products/en/reqpro`

9. Rational Rose Enterprise, link:
    `http://www-03.ibm.com/software/products/es/enterprise/`

10. `https://docs.google.com`

11. `http://www.webdianoia.com/platon/platon_fil.htm`