

## **Digital Storytelling in Teacher Education for Inclusion**

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### **Narración digital en la formación de profesores para la inclusión**

#### **Resumen:**

En este artículo, primero compartimos el concepto de narración digital basada en talleres que adoptamos para un proyecto internacional llamado SELI (Smart Ecosystem for Learning and Inclusion) y su valor educativo en términos de inclusión. En segundo lugar, brindamos información sobre el contexto de la formación del profesorado en el caso de Turquía y Bolivia, explicando el contexto de diferentes grupos destinatarios como profesores de educación física y personas de culturas alternativas donde el patrimonio escrito no es importante. Finalmente, compartimos la arquitectura de nuestra solución de narración digital comparando la propuesta SELI. Varias soluciones implementadas, incluida la propuesta SELI, intentan resolver la Narración Digital como una herramienta simple con una solución dentro de un marco de aprendizaje que lo respalde, frente a una propuesta con un amplio alcance de conceptualización sin un marco, haciendo posible múltiples usos no solo dentro de contextos de aprendizaje.

# Digital Storytelling in Teacher Education for Inclusion

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**Abstract.** In this paper first we share concept of digital storytelling we adopted for an International project called SELI and it's educational value in terms of inclusion. Secondly we give information about the context of teacher education in the case of Turkey and Bolivia by explaining the context of different target groups as physical education teachers and people from alternate cultures where the heritage written is not important. Finally, we share the architecture of our digital storytelling solution comparing the SELI proposal. Many solutions implemented and SELI proposal included, try to resolve the DST like a simple tool with a solution within a learning framework that support it, versus a proposal with a strong scope of conceptualization without a framework, making possible multiples uses not only within learning contexts.

**Keywords:** Digital Storytelling, Physical education, Teacher education, Quechua-speaking community

## 1 Introduction

There are various ways of using Digital Storytelling(DST) as an educational tool in the field of education including pre-school, K-12, higher education and non-formal education. As we discussed in another paper digital stories can be created both by teachers and students in a formal education [1]. Therefore, similar researches made in the field of higher education provide evidence for expected results of our study. For example a study implemented with college students from Industrial Design program reflects benefits of using digital storytelling as the authentic learning, the polished end products, the engagement of students with the material, the decidedly independent learning, and for the collaborative practice highlighted [2]. In another study, researchers developed a digital storytelling system called Digital Storytelling Teaching System-University (DSTS-U) in order to help college students to quickly create stories with a structural architecture and enhance the variation of the contents of stories through different story structures. In this study researchers see DST not only useful for skill development but also it provides learning from experience as it allows listening and sharing together.

## 2 Digital storytelling Support for Teacher who provides inclusive education

Burgess, argues that debates about the digital divide based on the difficulty of access to ICT have shifted towards concerns about social inclusion and inequality in access to ‘voice’ [3]. We cannot simply expect from disadvantaged groups to provide inclusiveness on their own. It can be said that the institutions determining the educational policy and the teachers who directly implement this policy have an important role. Particularly institutions need to make sure quality teacher education who can work with disadvantaged groups.

Hargreaves and Fullan reminds teachers are not only need to have knowledge and skills but also able to create trust-based relation with others and to have judgmental skills [4]. They call the combination of these three capitals Professional capital. In order to contribute to the continuing professional development of this multi-faceted capital of the teacher, the opportunities provided by new technologies to create participatory and inclusive learning communities can be utilized by taking into consideration the opportunities provided by today’s rapid changes and developments in teacher education. In [4] states that in order to improve teachers and teaching, the conditions in which teachers are involved and the communities and cultures in which they are part should be improved.

Therefore, it can be foreseen that workshop-based DST may contribute to the improvement of the cultures in which prospective teachers and teachers are present by allowing the creation of a climate of trust and telling experiences and sharing of experiences with wider ecosystem. By using DST in teacher education, a positive contribution can be made to the prospective teachers’ learning and active participation. Therefore, DST can be used as a means of empowering prospective teachers to build their stories based on their specific contexts so that they can reflect on their own experiences and engage in constructive actions for educational transformation. This corresponds to the autobiographical learning described by Rossiter and Garcia [5] as the third use of DST. In particular, as a change agent, prospective teachers may be provided with the opportunity to experience with active participation that the main source of motivation is not the satisfaction of school principal but directly contributing to the student’s life. In this context, DST can provide an empowering resource to enhance the professional capital of the teacher through sharing experiences. In this regard we can say DST has great potential for supporting teachers and prospective teachers’ learning as an educational empowerment tool.

## 3 Creating and Sharing Digital Stories in context of Active Quality Living Research Guidance and Discovering Roots of Indigenous cultures

Randall tries to clarify the strong relationship between story and life by saying that life is never given, it is always partially created, built, re-created, just like the story [6]. When these statements are combined with John Dewey’s statement,

“Education is life itself” we can simulate that education is an art and teacher is a designer / artist and should use his / her creativity continuously. Therefore, teachers may need to be able to produce innovative and creative educational activities in order to create inclusive learning environments for the needs of students of different characteristics. As Randall quoted researchers such as John Dixon and Leslie Stratta, who followed John Devey’s philosophy in the field of education describe narrative as the main action of the mind and telling as “as a basic human trait” which is an indispensable way of making human experience meaningful [6]. His explanations to write the poetics of learning provide a very important resource for a researcher interested in the professional development of teachers. He argues that the mentoring approach primarily uses a version of the “story” model. The basic assumption here is that consciousness rises, knowledge is created, society is created and a perspective with transformative powers is established by sharing personal and public stories, We need to highlight that not only the story, but also the process of story formation is necessary. Therefore, our basic assumption is that the teachers and prospective teachers, have an active role in improving the education system to be more inclusive in terms of creating learning opportunities and will contribute to the improvement of the quality of life of the individuals with their stories. In addition, there is a need for digital story to be used beyond self-expression and communication, as Hartley reminded digital media should be used to create a new target, definition and imagination [7].It is precisely at this point that the use of DST by physical education teachers and students in the context of active quality life research offers the goal of creating a new world design. Because, education starts with education of the body. Moreover, the majority of physical education and sports activities are based on learning by doing, and each learning process creates a story of its own. On the other hand, it can be said that human life is based on movement. However, cognitive and affective domains cannot be denied. This perspective leads us to serve holistic development. These are the main components of active and quality life, and this can be achieved through holistic development.

The Quechua and Aymara peoples build a collective memory through stories of oral tradition. These peoples do not have a written tradition; they have begun to recover the stories in writing only in the twentieth century with higher intensity.

These stories are not considered as memories, instead of as the history and thought of the people. Its conception is of transmission of values and teachings that go form the worldview, philosophical, religious, economic, artistic, technological, and political knowledge of an entire culture. These oral stories also make up the social order in the town.

A story that is part of the oral tradition is a complex construction of language, and does not require writing. The story demands a skilled narrator, who knows the tradition and guarantees the transmission of the most in-depth ideas present in the story.

In the stories, these native peoples create a link between the past and the future. The past is interpreted and chained to the interpretation of current ac-

tions (the present) to project into the future. This projection into the future corresponds to the people as a whole. The story is a circular experience for these cultures. That is transforming the past into a present continuum. Tradition and its experiences are always current according to the social life of the people. In the narration, the opening and ending of a story break with the temporal boundary. The temporal boundary break is between when happened the story and the time it is narrated. These two moments have no distance; on the contrary, the events can be going on in the present at the moment of the story. According to [8] coloniality refers to the unique patriarchal power of western expansion against the original people. This coloniality point to the idea of differentiating races: a superior and a lower one. Superiority is transferred to all areas like knowledge, society, work. The result is the hegemony of knowledge from the west (it is understood by the ways of thinking and building from the cultural approach of those who conquered these peoples).

According to [8] “The construction of knowledge is a complex situation that requires the rupture of the dominant cultur”. At this point, the traditional oral story of the Aymara and Quechua peoples, in their conception of collective memory, has maintained a space of rupture with the forms of Western thought.

According to [9] the native people (Quechua and Aymara, among others) in Bolivia have been victims of non-national and non-democratic states. Victims in the sense of freedom to develop a culture. They seek democratization by creating another state approach that includes their history, which flows as the oral narration in their villages, so far closed in written sources of western tradition.

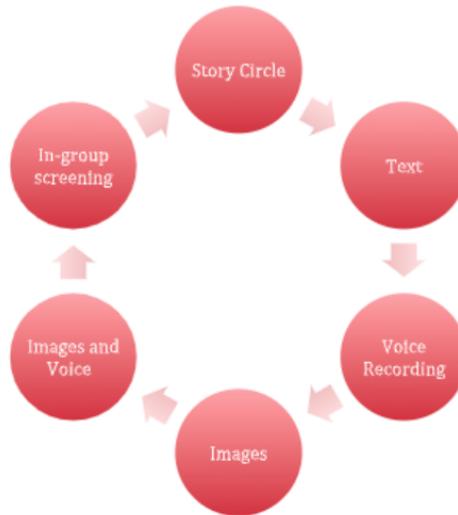
According to [10], in the 2001 census, 62.2% of the Bolivian population declares that they belong to some of the original peoples: Aymara, Quechua, Guaraní, Chiquitano, Mojeño. In the 2012 census, referred to [11], the population identified as part of an original inhabitant is 40.6%, a reduction near to 20% since 2001 census. Some people did not declare belonging to original inhabitants due to the omission of the “mestizo” option (eliminated because it had a pejorative concept in Bolivia). The population in Bolivia is approximately 10,896,000 inhabitants in the 2015 Household Survey [12], 31.5% of Bolivians live in the rural area. The inhabitants of the rural area, for the most part, belong to some native people. The native language is the most spoken in rural areas (46.4% of rural inhabitants declare to speak Spanish).

Quechuas and Aymaras can get rid of stories in a digital format than technologies that favour writing. This empowerment will improve the possibilities to remain in the time the collective oral memory. The chances of this culture to accept technology help is digital storytelling; because digital storytelling is the expressiveness approach likely to his oral experience, they have a preference for the oral transfer of knowledge and history. The oral narrative helped by DTS will promote re-discovering roots for people living in Bolivia, and also alleviate the misunderstanding between indigenous and people living in cities. It also will help the second generation of rural area inhabitants which migrate to cities know about his roots.

The empowerment of digital narration as a mechanism of education and inclusion for cultures originating in Bolivia relies on the PRONTIS Program (Programa Nacional de Telecomunicaciones de Inclusión Social - Prontis) [13], which in its first stage aims to reduce the digital divide in small cities and achieve 2025 connectivity at the national level of 100% to the Internet. Also relies on the effort to increase the use of ICT and inclusion in education. The later is in Bolivian objectives of PRONTIS program.

#### 4 Tool development based on workshop based digital storytelling

SELI(Smart Ecosystem for Learning and Inclusion) project is based on situative and sociocultural perspectives [14–17] to understand teacher learning in a digital storytelling-embedded learning ecosystem instead of conceptualizing learning as changes in an individual’s mental structure, we consider “learning by individual in a community as a trajectory of that person’s participation in the community—a path with a past and present, shaping possibilities for future participation” [16] by calling from [19]. Therefore we prefer implementing tool based on workshop based digital storytelling as a process rather than various examples of using digital storytelling as a product or tool. Workshop-based digital storytelling practices are used in higher education ecologies as a co-creative process in which six main stages of the workshop process defined by the six following phases defined by Lambert [20], see Figure 1



**Fig. 1.** Phases of workshop-based digital storytelling

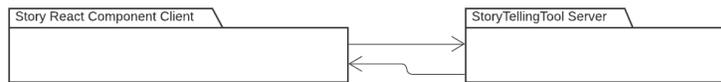
We aim to bridge the gap of transferring educational experience in to real life situations through workshop-based digital storytelling as it is a natural way to exchange experiences between the educator and the student throughout multimedia which brings both audio and visual communication together. In this sense, digital storytelling tool can allow both educators and students to learn from each other's experiences through stories, lives in an authentic way.

In [21], the architecture of SELI shows the two main concepts. The first concept is Web Accessibility supported by “Web Content Accessibility Guidelines” (WCAG 1.0), in order to get accessibility for anyone; the second one refers to architectural design, the microsite. The concept of the microsite will provide to the DST the feature of a self-contained entity. In this way, the tool to carry-out the story is an activity inside the microsite.

## 5 SELI Platform Storytelling implementation

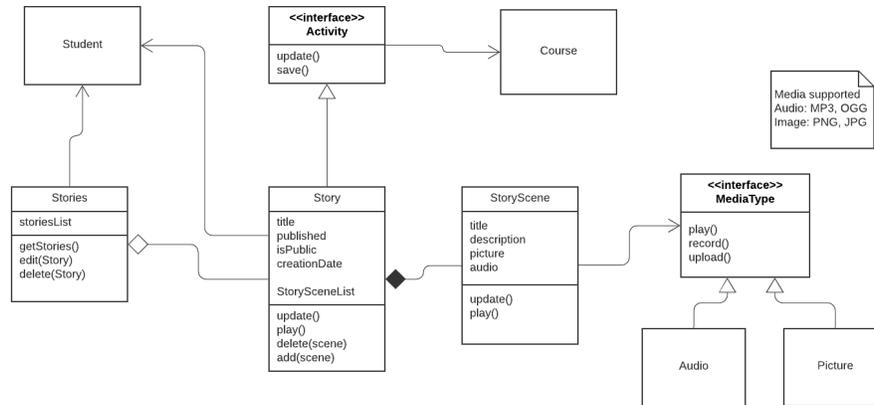
### 5.1 First implementation

The logical view for the Storytelling Component is simple and has only two components: The Story component in the client side, and the StoryTellingTool component in the server side. The client manage the actions related to the creation, editing, publishing, and play of a Story. The Server manage the persistent documents which represent a Story and the document communication with the client. Meteor.js manage DDP(Distributed Data Protocol) and API Rest(by HTTP request-response) for communications between Server and Client, the first one is useful for data related with MongoDB documents(in the case of study the documents are Stories or Scenes of a Story)



**Fig. 2.** Logical architecture view for first approach

The first approach for Digital Storytelling design shows a Story compound by a Scene sequence. The Scene has two media type resources and a text description to represent the author's socio-cultural expression in the story. The concrete



**Fig. 3.** Class Diagram for first approach

implementation is under Meteor.js framework using Material-IU and React.js as components for the client side. In the server side the Story and each Story-Scene is a javascript object made persistent as MongoDB compound document.

The classes observed in the Figure1 represents the design for the component StoryTellingTool in the server side Meteor.js implementation. The Story is an activity in the platform. As an activity is part of a Course.

This implementation does not support the upper story circle stages (Story circle, text, and in group screening). The three upper story circle are high collaborative activities usually taken face-to-face. Meanwhile the lower three circles (Voice recording, Images, Images and voice) can be done by only one student/editor. The recording voice, uploading image, linking of image-voice scenes and finally publishing the story is made by the tool implemented; the publishing action let other users (students and teachers) to view and play the story, the collaborative screening with feedback is missing in this naive approach for digital storytelling approach in the platform; but it not prohibits a face-to-face meeting to screening and feedback activities.

## 5.2 Alternate new approach for implementation

This is a logical architecture view of storytelling tool that considers three main aspects: A Client module, to manage requirements from storyicians. Requirements from storyicians like: Create new stories containing all new elements about: text, audio, video, voice (from voice device), image and user events (pause, timing, etc)

A Board Manager, to manage more complex requirements over set of stories: test, review, sharing and querying, like: reviewing syntax and semantics of story sequences, change or alter execution sequences of stories, merge or reuse part or entire stories to design a new one, share or broadcast to storyician community.

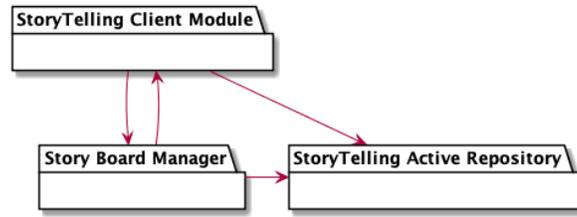


Fig. 4. Logical Architecture view for alternate approach

Allows to reuse and add stories by several storyicians designing story circles each one with an own contribution to the stories in a cooperative way or workshop style. An Active Repository, to manage Persistence and to implement some business behavior on persistent data.

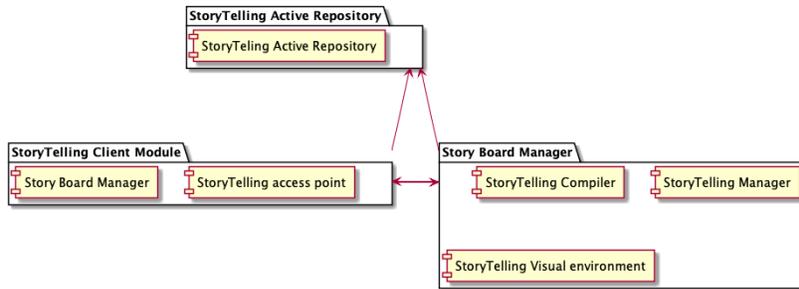


Fig. 5. Physical Architecture view for alternate approach

The physical architecture forecast some physical components in addition to the logical view, the Board manager can be implemented with a compiler, implementing a specific language to manage the stages of build stories with a controlled syntaxis, sequences and semantic of the elements that compose the stories.

Both architectures reflect the storytelling concepts. However there are some differences at time to answer some requirements from final users. The first model is the design of a quickly development thought out for a tool for rapid development of software. The second one is designed in terms of strongly instead velocity.

The first one, was implemented with Meteor (JavaScript) and MongoDB (database) persistence tool. And was developed in a rapid way from the developers community answering requirements in a visual and functional way notoriously quickly.

The second one, still in implementation stage, (although both start at the same time approximately) using several programming languages and technologies

like: Java (client app), Java Script (Web component) and PostgreSQL for active persistence.

The first one contains some gaps with the user requirements at time to re-sponse some requirements like:

- “Can I use some part of stories like part of the other stories”
- “Can I use some part of stories like part of the other stories?”
- “Can I reuse some primary elements of stories in others stories?”
- “Can I redesign the execution flow of stories?”

This basic requirements with no answers at the first approach, can be answered elegantly by the second approach due to the architectural basis and the conceptualization of stories like a more powerful elements.

The final evaluation of the second approach will be in another investigation about the conceptualization of stories and the technological approach chosen.

## 6 Conclusion

In conclusion, we discussed the use of DST in the educational context and the use of DST as both a pedagogical strategy and a research method for the training of teachers, who play a very important role in the education system.

The novelty we have added to the discussions in the field of literature on the training of prospective teachers is the creation of a story worlds provided through DST. First story world we call is Active Quality Life Research Guidance, which allows sharing the stories of teachers and learners regarding active life relevant as a learning area of physical education. Second story world is Discovering Roots with a digital storytelling resembling oral narrative. It will allow stories of Quechua people regarding their roots and cultures for promoting intercultural learning and going towards inclusion of his history and thoughts in the Bolivia state, and of course together with many other cultures wide in the world.

Secondly we share architectural view of DST to explain how we aim to handle digital aspect of DST process.

DST has many variants of conceptualization and many technological approaches. Someone’s conceptualizations points to reach different approaches.

The analysis for different approaches, architectures and situations shows that is important to define first the conceptualization and then works for design it.

Strong communication of architecture and highly contact between owner of conceptualization people with developers may be the key to build interesting tools of software in DST. The tool like a support tool only may be not interesting.

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