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Fishing Rods for Magic: Theatre Forum Tools to Support Primary School Students' Active Engagement in Computer-Supported Collaborative Storytelling

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Abstract

Due to the increasing conflict and complexity on a global level, our students, as future citizens, must develop a new life, soft and transversal skills and competences, and the 4Cs+D (creativity, communication, collaboration, critical thinking + digital skills) for formal and non-formal learning. Creative Storytelling supports students to externalize and communicate their thoughts, feelings, and experiences through their own stories. Stories narrative reframing sets them free from their real, stressful environment contributing to self-awareness, and self-esteem. Although there is rich research about storytelling, there are discrepancies in the ways a story can be structured and even evaluated for constructive feedback, especially to primary school students. In Computer-Supported Collaborative Storytelling (CSCS) students are usually invisible and reluctant to participate, especially if they belong to the SEN (Special Educational Needs) group. Thus, this article suggests pedagogical propositions to create an active, aware, and engaging learning community with the needed knowledge, skills, and competences to solve outer and inner problems. The first is the ASEMA Pyramid (Awareness, Sensitivity, Empathy, Motivation, and Activation) methodology which, together with the active participation eyeball and 4Cs+D skills building with message tagging, can advance students' engagement in active learning. These methods applied to the Hero's Journey and the Hero's Emotional Journey enable the teachers and their students to become more aware of students' processes and needs. Furthermore, these processes can visualise students' activities and choices with context-aware tools. Therefore, this article also proposes a set of Theatre Forum Tools to shed light on Primary School students' online learning activities and their discussion in creative storytelling.

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1. Creative Storytelling

The creation of educational innovative infrastructures is today a global necessity but also a challenge to integrate deliberate and conscious creative thinking and attitude in learning and its application in Primary Education. The development of specific teaching approaches, pedagogical methodologies, and computer-supported collaborative learning via storytelling (CSCS) best practices at an early age can support innovative, creative, educational experiences enhancing learning, collaboration, and self-expression aiming at developing and accelerating knowledge, skills, and competences regarding communication, collaboration, self-expression, and acceptance of all students as team members. Inclusive Education or Education of Non-Exclusion refers to education, which includes everyone, considering the needs and diversity of everyone (Mitchell, 2013). Inclusive Education is important for children with typical and non-typical development and is considered successful if it has considered the special needs of children with non-standard development, as they have potential that is promoted through the educational process.

In the Art of Thought, Graham Wallas (1925) proposed one of the first and most important as well as accurate creative process models formed as the stages: preparation, incubation, illumination, and verification. As this chapter proposal is anchored in the Eureka! Experience the creative process is therefore enhanced as follows:

1. Imagination: At this stage, the in situ boundaries or a problem are broken, thinking of infinite possibilities of what could hypothetically happen.
2. Research: In this stage of preparation and research, the problem is analytically investigated, described, and analyzed, looking for answers on how, what, who, when, and the causes of the problem.
3. Incubation: At this stage, there is no conscious activity but rather unconscious interrelations taking place to form the creative insight, the Eureka Moment. This unconscious internal procedure requires the person to be relaxed, going out for a walk, and most importantly, sleeping.
4. Eureka!: At this stage of inspiration, insight comes to the surface of consciousness. This recognition is followed by euphoria and excitement.
5. Evaluation: At this stage, evaluation and applicability of the previous ideas and insights are necessary for the validity, applicability, and reliability of the hunch.

Such creativity cycle can be directed to reinforce, intensify, reproduce, and stimulate imagination and creativity attributes for: (a) environments with all senses engagement; (b) change perception mechanisms and the different ways information is experienced; (c) integrating diverse technologies and new tools to stimulate cognitive functionalities including insight (Kounios & Beeman, 2015). As such, two main groups of associated creativity techniques can be identified depending on the amount of known information: (a) idea generation as insight when not all facts are present and (b) problem-solving when most information is at hand. These two creativity modes and associated techniques are in turn related to right-brain and left-brain functionalities and will be discussed later in this chapter connected to storytelling. Sequential or parallel

information as well as a suitable environment aid the creative user to control and enhance their creative insights and problem-solving in a personalized as well as a social group manner. Managing creativity is an essential human skill and the best ideas create a wide and visible impact changing the world around us.

Due to the increasing conflict and complexity on a global level, students, as future modern citizens, must develop new life, soft and transversal skills, and competences, and the 4Cs+D (creativity, communication, collaboration, critical thinking + digital skills) required for formal and non-formal learning. Furthermore, all students & students with special educational needs (e.g. neurodivergent students on the autistic spectrum and students with ADHD) can develop these essential skillset for their classroom integration.

CSCS can develop children's soft skills competences and pathways for a successful life in a globalised world through formal and non-formal learning and eLearning, towards their transformation. Storytelling can give visibility & voice to the underrepresented, especially with tools that can bring forward students' actions. The students will be able to identify, interpret, create, and communicate their own stories across a variety of visual, oral, corporal, musical and alphabetical forms of communication, via multimodal learning tools. More specifically, the students can: (a) create new stories utilising new models, archiving experiences in taxonomies within the stories, (b) form a transition from the individual to the common experience, (c) make sense of what they have written for someone else, (d) co-create common knowledge and experiences, (d) transform self-perception and identity by using the language for change within the storytelling safe and non-stressful environment, and (e) amplify their voices for Inclusive Education for all students (Lambropoulos & Plota, 2022).

The hero's inner and outer journey (Vogler, 1998) is structured here to match the Aristotelian 3-Acts structure (Aristotle, 1937). The protagonist goes through different stages, which are essential for their personal growth and transformation (catharsis). All narratives are variations of a single myth (monomyth) and they embody themes that go back to certain fundamental universal forms or fixed patterns that are found throughout time in all world cultures.

The Hero's journey describes the inner and outer journey of a person who commits himself to solving a major problem. There are 12 steps on average for such a journey:

Act I.

1. Introduction: Something happens to start the story.
2. Triggered Incident – Call to Adventure: Complication occurs, and something upsets the balance.
3. End of Act I. 1st turn in the story – dilemma: Protagonist decides to leave behind the world as he knows it

Act II.

4. The new world of the protagonist
5. Middle point. Everything changes/reverses
6. End of Act II. 2nd turn in the story – crisis: Action develops as the hero must choose between dilemmas.

ACT III.

7. Ally and Enemies: Betrayal of a Friend
8. Entering the danger zone. The hero goes through a crisis (the dark night of the soul)
9. Final Trial and Showdown: The hero chooses the action that culminates in the answer to the question/outcome of the crisis
10. The friend returns
11. The moment of commitment of the hero to the new conditions
12. Reward – return with the treasure. The hero's journey is a standard narrative for most storytellers and is successfully tested through the years.

In primary Education, the Hero's Journey can be depicted as the Hero's clock to facilitate the children in developing their own stories.

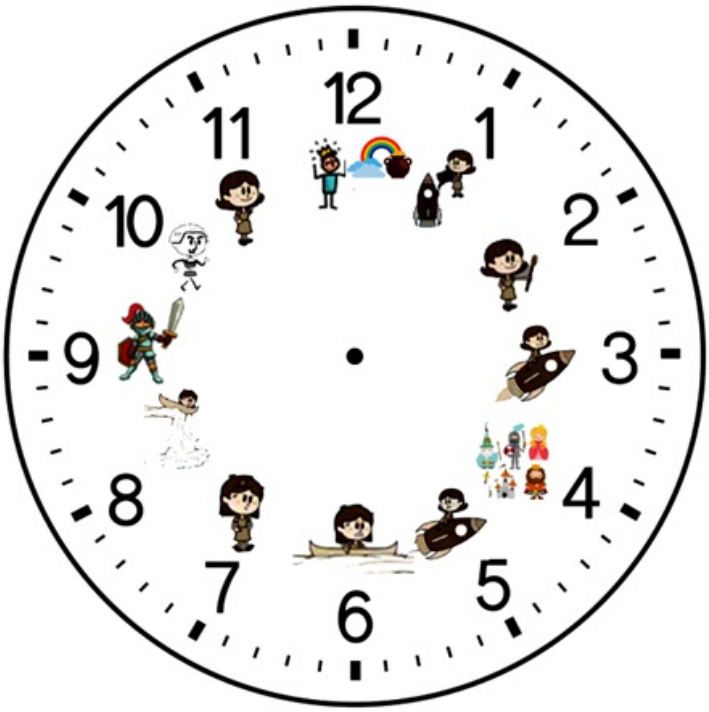


Figure 2. The Hero's Clock

Cinderella: Example of The Hero's Clock (Lambropoulos, 2021)

1. Cinderella is an orphan child who has been reduced to the role of a servant in her father's household. She depends on her evil stepmother for her survival. Even though her stepmother and sisters mistreat her, Cinderella does her job, because if she stopped, she would be homeless. Furthermore, Cinderella mistakenly believes that if she works hard enough, she will win her stepmother's love.

2. The Prince has a ball, and all the girls are invited, and Cinderella.
3. Cinderella remakes one of her mother's old dresses to go to the ball.
4. When her stepmother destroys the dress, Cinderella's fairy gives her a new, magical dress, so she can go to the ball.
5. Cinderella continues to dream of what it would be like to go to the ball and dance with the prince. After meeting the prince, she also dreams of marrying him.
6. Cinderella starts to think she has a right to go to the ball. And despite the extra work her home country piles up, she continues to work on her dress.
7. On the night of the ball Cinderella puts on her dress and waits to get there with her mother and sisters. When her stepmother discovers that Cinderella dared to dream that she was good enough for the ball, she gets furious and destroys the dress.
8. Cinderella is very upset.
9. But the fairy godmother arrives and tells her that she is entitled to a night at the dance. He redresses her and Cinderella returns to her secret world, dancing with the prince and dreaming that she could be the princess. Cinderella leaves at midnight when the magic runs out.
10. She returns to her stepmother's world but leaves one of her glass slippers behind. Impressed, the Prince searches the entire kingdom to find his true love. Cinderella momentarily accepts the fact that she will never get the chance to try on the glass slipper.
11. Cinderella defies her stepmother and gets a chance to try on the glass slipper. It fits.
12. The prince asks Cinderella to marry him and live in the castle. The wicked stepmother and her sisters must now live in a world where Cinderella is no longer a servant but a princess.

The Hero's Emotional Journey is based on the suggested model ASEMA Pyramid (Awareness, Sensitivity, Empathy, Motivation, and Activation), anchored in Tibbits (2017).

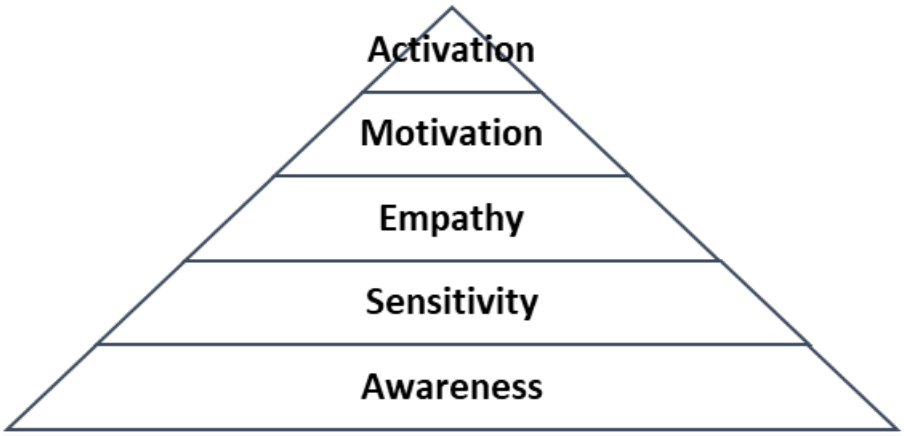


Figure 1. ASEMA Methodology

ASEMA is the skeleton for converging educational activities via the eyeball of participation model for collaborative storytelling. Creative storytelling triggers students' imagination and engages students both mentally and emotionally in

active, attractive learning to create their own meaning utilising available media.

For example, ASEMA creative storytelling can activate democratic discussions, dialogue, argumentation, voting, exchange of views, stories, solutions, and reflections in partner languages and English on short/long term as well as presenting and sharing the stories. Common themes in literature for the hero's emotional journey can be the following:

- Loss
- Moral Paradox: Good/Evil
- Social Dilemma: Justice/Injustice
- Love
- Personal Clash: Redemption, Revenge, Loyalty/Betrayal
- Courage and Perseverance
- Coming of Age
- The underdog
- From rugs to riches
- Warring Inner State: Sanity/Insanity
- Life/Death, Jeopardy/Security

In the 'race between technology and education' (OECD, 2019), the translation of the pedagogical methodologies into context-aware for CSCS can provide transformative skills as well as life competences to our students and future citizens.

2. Computer-Supported Collaborative Storytelling (CSCS)

The main scope of Computer-Supported Collaborative Learning (CSCL) is learners' collaborative production of new knowledge. However, participation in CSCL interactions has been found problematic due to many passive participants. If these e-learners were able to observe their behaviour in relation to themselves and their peers, they may be able to alter it. Based on this hypothesis and the fact that current Learning Management Systems lack social and cognitive interaction awareness levels indicators, the authors proposed 3 sets of interaction analysis tools that report upon participation, interaction, and argumentation in real-time. The process was anchored in Human-Computer Education Interaction Design for context-aware tools.

Computer-Supported Collaborative Storytelling (CSCS) educational designers need to consider not only the educational system but also the learners' dual persona as learners and as users and facilitate learning without any additional cognitive and physical struggles. Cognition is a complex social phenomenon that occurs within the individual's head; it refers to intermediate variables that describe social interactions and their relationships with the conditions that facilitate learning (Lave, 1988). Because the intermediate variables are invisible, their observation and study are difficult. Collaboration is an interactive practice that engages two or more participants working together to achieve outcomes they could not accomplish independently. The key to supporting collaboration is to find suitable models to describe and support collaborative interactions and their relationships with the conditions that facilitate them (Dillenbourg et al., 1996).

According to UNESCO (n.d.), collaborative learning occurs when learners work in groups on the same task simultaneously, thinking together for shared creation and/or discovery. Collaborative Learning has been found to enclose more advantages than other types of group learning. It empowers and enables learners to solve problems and understand subjects more easily since discussing ideas and constructing arguments through dialogue could shape in-depth learning. Accordingly, Computer-Supported Collaborative e-Learning can be a successful mode of learning without members being physically in the same location. Collaborative e-learning can be enhanced by making visible a collaborative learning structure. To accomplish this, tools for observing social and cognitive interactions, and tools for analysing them are required (Dillenbourg et al., 1996). Thus, the design of such tools can impact collaborative learning by modifying the socio-dynamics between the learning partners. Participation, interaction, and argumentation are the indicators to design context-aware CSCS tools.

Activity in the form of online discussion of shared experience has been considered an effective means of learning. Participation in such discussions can be active, where the student participates by posting; or passive, where the individual does not participate but merely observe others. Consequently, without active participation passive participation is not possible. If passive and active modes are acceptable, there should be some processes and pedagogical methodologies to create and maintain the transition between these to enhance learning. This may be feasible within CSCS and e-learning due to the possibility of manipulation of the learning environment. Thus, specific CSCS indicators can support e-learners' participation, interaction, and argumentation within discussions.

3. Theatre Forum Context-Aware Tools

Learning has been proposed to be a process of engagement; Lave and Wenger (1991) called this learning process Legitimate Peripheral Participation (LLP). Because it is centripetal, there are hierarchical levels of participation depending on the interaction (McDonald, 2003). This discussion on participation, interaction, and argumentation provided the context to develop requirements and measurements for the suggested Theatre Forum Tools. These tools were initially designed and tested with successful results (Lambropoulos, 2009). The tools were designed to suit the ASEMA methodology and Computer-Supported Collaborative Storytelling (CSCS). As such, and based on previous measurements, a centripetal process, the participation eyeball aims at ASEMA.

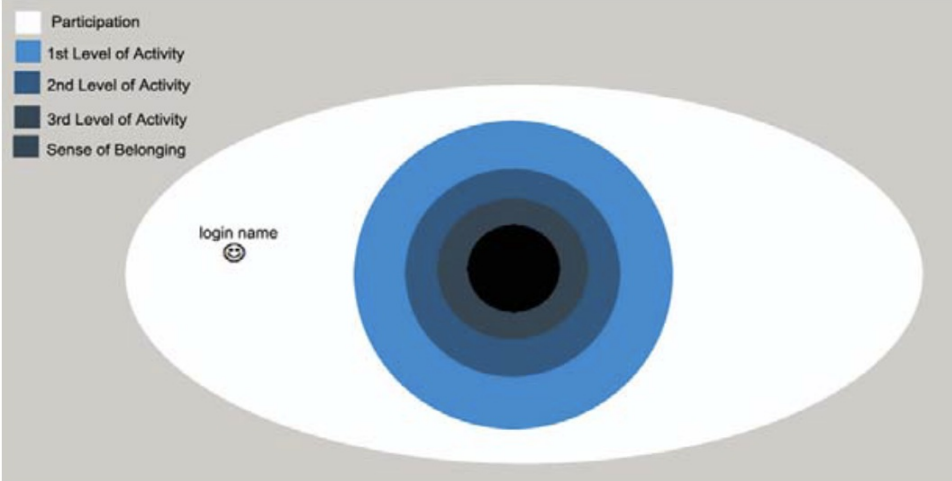


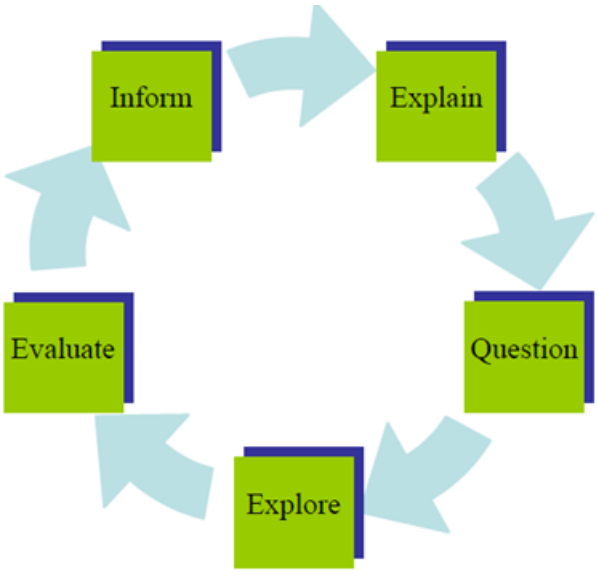
Figure 4. The Participation Eyeball

Lack of awareness about informal learning, different levels of understanding, and differences in e-learning targets were the main reasons for passive participation. This implies that e-learners were unaware of tools and techniques. Social reasons were identified as differences in goals, processes, engagement approaches, access to best practices, and organisational obstacles. In addition, Rafaeli and Sutton (1989) suggested that personal characteristics, such as being shy, information overload, organizational obstacles, inconvenient procedures, and security considerations increased passive participation. This means that appropriate community management can tackle these problems; however, there is nothing that can be done for the organisation obstacles, procedures, or security problems.

The above levels show the symmetry/asymmetry in participation and depict the grey zone between passive and active participation characterised by the sleeper effect; the latter is the white area where the participants decide to make the first step and make the least collaborative effort. Furthermore, there is an area outside the taxonomy and in the middle of the participation eye that refers to the sense of belonging to the community and does not depend on active participation. Active participation is initiated with the very first message and has three levels, low, medium, and high. If these levels can be displayed in real-time on a discussion topic level and a course level, then CSCS participants will be able to be proactive by managing and evaluating participation in real time. Real-time online community management and evaluation of participation provides immediate information delivery as needed for all stakeholders. It is cost-effective; it is iterative rather than one-off as results are concentrated on the process; it minimizes risk as decision-making depends on facts rather than assumptions; it is a catalyst for the stakeholders to accomplish their goals faster.

These facilitate the co-construction of a learner-generated dialogical context and have recently been studied by means of Social Network Analysis (SNA). The participants were located in four levels, based on the “numeric amount” of posting to the community (number of messages). With a direction from the periphery to the centre, lurkers were the participants who did not exhibit any activity. On the second level, there were the members who occasionally contributed to the community. The participants and key contributors were located on the third and fourth levels. The “eyeball of participation” provided a structure to better understand legitimate peripheral participation. McDonald and colleagues (2003) stressed the fact that the active members are the ones who “add value” and fill the gaps for all members in order to sustain the community.

Also, the CSCS dialogical context differentiated collaborative learning dialogue from other “simple” dialogues, providing a distinction between mere information and knowledge acquisition to advance students’ 4Cs+D. Such a tool can be built as a sequence with a starting point, a transition, and an endpoint (Lambropoulos, 2010, 2009).



Interaction	Pedagogical Value
Inform	Suggestion
Explain	Elaboration
Question	Reflection
Explore	Elaboration
Evaluate	Reflection

Figure 5. 4Cs+D Progressive Dialogue

As such, the Theatre Forum Tools are based on the previous theories and are translated to context-aware tools to:

- enable students’ awareness of active participation prerequisites
- raise possibilities in collaborative dialogue and argumentation
- structure data in CSCS
- measure the participation value
- identify e-learners’ type and thus posting value and quality
- provide an overall view of the CSCS process; and
- facilitate proactive decision-making.

If the students were able to observe their behaviour in relation to themselves and their peers they may be able to alter it as awareness of their interaction and cognitive levels is essential for ASEMA transformation.

4. Theatre Forum Tools Proposition

The CSCS context-aware tools to be developed are:

1. Theatre Forum SNA: Social network analysis real-time tool to position and present the discussion participants within the eyeball of participation: more active members are depicted in the centre and lurkers on the outer circular layer.
2. Participation Avatar: Participation Eyeball levels evaluation graph based on the highest number of students’ posts in

the specific discussion.

3. Students' Discussion Tagging for 4Cs+D: Message tags to structure critical thinking and themes in CSCS.

Theatre Forum Avatars		
Levels of Active participation		Measurement indicators on the highest poster's overall messages
4	High	76-100%
3	Medium	26-75%
2	Low	1-25%
1	Zero	Passive activity (e.g. vicarious learning)
Levels of Passive Participation		Measurement of viewing/downloading days (logs)
4	High	3/3 of the overall passive activities
3	Medium	2/3 of the overall passive activities
2	Low	1/3 of the overall passive activities
1	Zero	Registration only

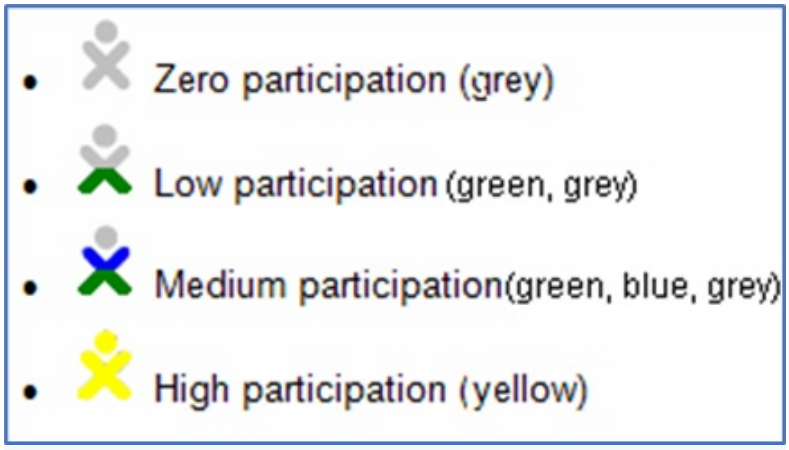


Figure 5. Theatre Forum Avatars (Lambropoulos, 2009)

Theatre Forum Social Network Analysis (SNA)

Interaction Awareness Requirements & Propositions.

Interaction Awareness Requirements		Propositions
1	Embodied self (presence) & group presentation (co-presence)	Textual and visual information e.g. names, avatars, group network representation
2	Self & co-presence presentation	Group nodes and networks
3	Social awareness & connectedness, interaction awareness	Enhanced discussion forums, group network representation
4	Depiction of the individual and group locality to indicate the spatio-temporal relationship	Group network representation
5	Integration of social objects	Links between people and objects in a network structure
6	Depiction of the individual and group interactive patterns	Individual, complementary, cooperative
7	Lightweightness & Interoperability	Sutiable Language
8	Simple to interpret and easy to learn & use	Pedagogical Usability guidelines

Interaction Awareness Requirements		Measurement Indicators
1	Interaction density	Nodes' weight
2	Reciprocity	Nodes' similarities
3	In- and out-degree centrality	Location
4	Interaction latency	Distances between the nodes

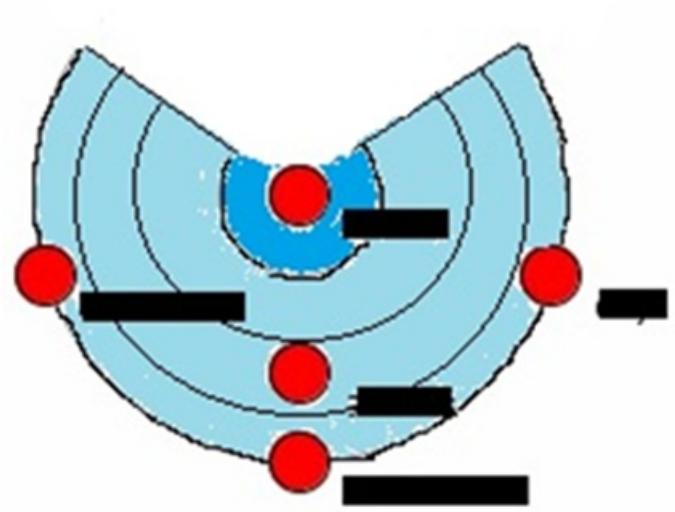


Figure 6. Theatre Forum SNA.

Theatre Forum 4Cs

The tags are (and not limited to): [-], Inform, Feel, Explore, Idea, Evaluate, Summarise, Other, and also the themes, Loss, Love, Moral Paradox etc.

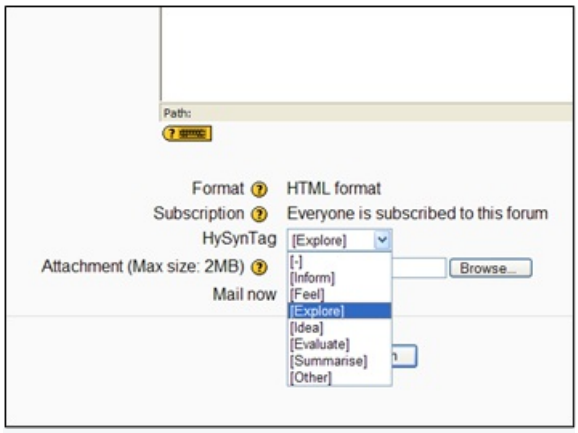


Figure 7. Theatre Forum 4Cs integrated into the 'Reply' forum function

From a technical viewpoint, several groups need to evaluate learning technologies and applications; these are novice, average and expert users; developers, and e-tutors. Also, there are interoperability problems indicating the need for new programming techniques. Another interesting point was that if such tools and evaluation techniques do not exist, it is difficult to observe that are missing.

5. Conclusions

The mission of education is not only to provide citizens with knowledge and skills but to develop citizens with abilities to express themselves, be creative, learn to collaborate in small groups, and adapt their learning according to the circumstances. The development of specific teaching approaches, pedagogical methodologies, and computer-supported collaborative learning via storytelling (CSCS) best practices for primary education can support innovative, creative, and memorable educational experiences CSCS of all students as team members.

There is a current issue in Inclusive Education about SEN (Special Educational Needs) group's visibility and voice. Accepting diversity is not enough without inclusion. Thus, this article suggests pedagogical propositions to create an active, aware, and engaging learning community with the needed knowledge, skills, and competences to solve outer and inner problems by providing a voice to underrepresented students;' groups. ASEMA Pyramid (Awareness, Sensitivity, Empathy, Motivation, and Activation) methodology with the active participation eyeball and 4Cs+D skills building with message tagging, can advance all students' engagement in the Hero's Journey and the Hero's Emotional Journey storytelling structures. Such a detailed description of the process steps can be visualised to depict students' activities and choices with context-aware tools. Consequently, this article proposes a set of Theatre Forum Tools to shed light on Primary School students' CSCS active and transformative learning.

Students' interactions and cognitive awareness are interrelated and thus their observation and analysis support social, cognitive as well as metacognitive awareness in CSCS. As for analysing interactions, tools could capture the social, cognitive, and metacognitive clues, for example exploring and verifying solutions, discriminating between social

communication and task, and identifying critical thinking levels. Different learning styles were also evident such as vicarious and instructional learning as well as collaborative learning. Based on the successful intervention, it appears that in such favourable circumstances and appropriate tasks and associated tools, passive participants can get engaged. Consequently, technologies need to be able to adapt to individuals' changing needs, learning, and interaction styles.

The proposed Theatre Forum Tools enable, develop, and enhance:

- Proactive relationship and trust building
- Consensus-based decision-making for all decisions
- Frequent input and feedback
- Building active, diverse, and empowered teams
- better understanding of peripheral and core participation
- help students to "add value" and fill the gaps
- activate mental & emotional engagement
- share ideas and stories, discuss, argue, and vote, also using the critical thinking levels tool and tagging their posts about the themes they negotiate
- identify their interest and thus, engage in the discussion or voting

As change and impact are incremental, activities can create students' critical mass, for wider change and transformation with the involvement of the second-level learning participants, such as teachers for students to become future active citizens and autonomous life-long learners.

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