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Social network enhancement for non-formal learning

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Abstract

Concern over student engagement has highlighted the inability of learning management systems (LMS) to accommodate the social side of learning. The emergence of social networks and their widespread adoption by students has opened new avenues for mediating different modes of learning. This work seeks to capitalise on the informal interactions of social networks, the structure of learning programmes and the multiple facets of collaborative approaches, in order to enhance student engagement. These are integrated into a framework which supports non-formal learning and facilitates knowledge creation and sharing through socialisation, externalisation and combination. A programme element - defined by a curriculum structure- and a collaborative element - identified by collaborative activities - are grafted onto the social fabric of Facebook. The aim of the framework is to promote engagement through a community of practice. Learners are encouraged to share tacit knowledge and co-construct explicit knowledge through social media and a dedicated collaborative tool.

Keywords: formal, informal learning, constructivism, tacit, explicit knowledge, community of practice

1. Introduction

With the increasing emphasis on student-centred learning and collaborative approaches, concern over student engagement in higher education has highlighted the limitations of the formal processes promoted by learning management systems (LMS). This has led to an interest in social networks as platforms for mediating learning. In contrast with the rigidity of an LMS the fluidity of a social network and its affinity with tacit knowledge offer a lot of scope for educational environments that integrate different modes of learning. The synergy between the potentially creative processes that underpin tacit knowledge and the structured processes that mediate explicit knowledge is driving initiatives aimed at integrating formal and less formal learning.

Most of the schemes for promoting engagement are underpinned by a constructivist approach [1]. Although wikis have been used as tools for investigating constructivist learning and collaborative learning [2], they have been incorporated mostly in formal contexts. Their effect on the improvement of learning outcomes has been the subject of numerous investigations [3].

A framework aimed at enhancing student engagement is proposed. It is designed to facilitate informal and non-formal learning and to foster knowledge creation and sharing through socialisation, externalisation and combination. The framework is implemented within Facebook and enhanced by a collaborative tool. It promotes a student-centred and community-based approach, where the learning process is unfettered by administrative constraints.

The remainder of the paper is organised as follows. Section 2 presents the theoretical context. Section 3 provides an introduction to knowledge management. Section 4 outlines the role of virtual environments in e-learning. Section 5 describes the proposed framework. Section 6 offers a comparison of three perspectives on learning, and Section 7 concludes the paper.

2. Theoretical foundations

The theoretical foundations that underpin this research include constructivism and mode of learning.

2.1 Learning approaches

Research into means of promoting learner engagement has focused on methods that seek to encourage learners to assume responsibility for their learning, and to take an active and autonomous role in collaborative activities. These activities are best supported by the formation of learning communities in traditional settings, and by virtual communities of practice. This type of community has been considered as an implementation of the constructivist approach to knowledge [4]. The constructivist theory postulates that learning is an active process where learners construct knowledge and meaning [1]. New knowledge is generated by building on previous knowledge, and learners are encouraged to explore new ideas and to reassess their learning. With collaborative learning a social dimension is added to

the constructivist approach. Knowledge is shared with other learners who are actively engaged in knowledge refinement. Proponents of collaborative learning argue that it fosters a higher engagement by students with their programme of study, and helps develop a sense of community among a group of learners. The implied higher level of interactivity promotes responsibility in learning, critical thinking and enhanced communications skills [5]. In particular, the interaction between teachers and peers can enhance the learners experience, understanding and reflection [6].

2.2 Modes of learning

Learning can be delivered and received in three main modes: formal, non-formal or informal. Formal learning takes place within an institutional environment, such as a university; the learning process is highly structured with specific objectives and adequate support, and is designed to lead to recognised certification. Learning is intentional and compliance with institutional regulations is compulsory.

Non-formal learning is often offered as part of community-based activities, for example, in youth and sport clubs. Although it is structured, it is flexible in its organisation and delivery; non-formal learning does not lead to any official qualification. Learning is intentional but participation is voluntary.

Informal learning occurs on a daily basis in non-educational settings such as home or workplace. The learning process is unstructured and does not lead to certification. This lifelong learning is predominantly unintentional and under the control of the learner [7,8].

One distinguishing feature of this classification, in a traditional setting, is the administrative context in which the learning takes place. This can be a university, a community organisation or a leisure centre. In virtual environments a more significant difference is expressed in terms of curriculum design: formal learning follows a top-down programme; non-formal learning favours a bottom-up or a negotiated structure, whereas informal learning is characterised by the absence of any curriculum. The non-formal mode strikes a balance between the structured but rigid formal learning and the conversational but potentially creative informal mode.

3. Knowledge management

Within the continuum of learning, two types of knowledge are exchanged: tacit knowledge and explicit knowledge. Tacit knowledge, designated as practical knowledge or 'know-how', is unstated and is embedded implicitly in the personal experience of individuals. Metaphors, stories or demonstrations are often used for sharing tacit knowledge. Open and unstructured relationships preside over the exchange of tacit knowledge; it is associated with divergent thinking. Spontaneous and improvised interactions are marked by flexibility and often lead to new insights and knowledge creation. Appropriate tools for supporting the tacit dimension should allow for a personal presence to be made and facilitate the conversion and the sharing of knowledge. In many organisations specific programmes were designed to facilitate the sharing of tacit knowledge through face to face, by email or video-conferencing.

Explicit knowledge, often referred to as academic knowledge or 'know-what', is usually expressed in a formal language. It can be transcribed onto physical or electronic media, and can be stored in and retrieved from public repositories. Explicit knowledge is mediated by a hierarchical relationship, where convergent thinking is the norm [9]. It is associated with orchestrated tasks in a managed environment; knowledge objects can be created and manipulated in workflow management systems and knowledge bases.

The interrelationship between tacit knowledge and explicit knowledge identifies four potentially overlapping patterns of knowledge creation [10]:

Socialisation: from tacit to tacit; learning takes place through observation, mentoring, peer relationships or practising. Mental models are created through an exchange of experience. Socialisation is key to knowledge exchange.

Externalisation: from tacit to explicit; knowledge is embedded in stories and conversations and recorded explicitly in presentations and emails. This pattern is helped by collective reflection so that knowledge can be shared and applied by others. This articulation stage is fundamental to the knowledge creation.

Combination: from explicit to explicit; this occurs when different sources of explicit knowledge are integrated into a coherent body which can be stored in repositories. This can be achieved through meetings and networking.

Internalisation: from explicit to tacit; this involves the interpretation and dissemination of explicit knowledge from an individual perspective. This is reinforced by participation and repetition, and is facilitated by cooperation and trust.

These four patterns underline the close relationship between formal learning and explicit knowledge on one hand, and informal learning and tacit knowledge on the other. Informal settings are considered more favourable to knowledge sharing than formal ones.

Knowledge can be considered from three main perspectives [11]. In the first perspective knowledge is seen as an object which is independent of human

agency. In the second perspective knowledge is considered as being embedded in a human agent. In contrast with the previous perspectives, where knowledge is seen as a private good, the third perspective promotes the view that knowledge is a public good and is embedded in a community. It is socially generated, maintained and exchanged within a community of practice [11].

Blogs and wikis have been promoted as effective mechanisms for transforming tacit knowledge into explicit knowledge and for sharing it [2, 12]. An LMS is mainly concerned with combination.

4. Virtual environments and learning

An outline of the main features of learning management systems and social networks is given in terms of the mode of learning they promote.

4.1 Learning management systems

Many educational institutions rely on learning management systems (LMS) to manage the learning process. An LMS contributes to the creation of a learning context by providing facilities for specifying syllabi, posting learning material, accessing resources, setting and assessing assignments, and for mediating discussions. The LMS determines the scope of the programme of study. The monitoring of student performance is another critical feature that contributes to a more focused and differentiated management of learning, within a relatively secure and reliable environment. An LMS is a good example of a system which supports formal learning.

An LMS ensures consistency in learning and provides focus and purpose. It is usually under the centralised control of an institution, which restricts access to enrolled members only. Learners have no control over their status as members of the institution; an LMS is no longer accessible to students once they leave the institution. This hierarchical mode of learning management has been criticised for confining students to subordinate roles, as mere consumers of learning material. An LMS promotes a knowledge-push model, where learners have no control over the learning process [13].

It has become common practice for an LMS to provide tools to support collaborative learning. In Moodle, for example, a variety of features such as e-mail, discussion forums and wikis are available. Although an LMS can satisfy a range of learning requirements, its inability to accommodate the social side of learning is viewed as a major drawback. Social interaction is seen as a key ingredient in motivating students; engaged students are more committed to their studies and tend to obtain higher grades [14].

The emergence of social networks (SN) has opened new avenues for mediating learning. The ubiquity of Facebook has been the main driving force behind many of the attempts aimed at tapping into its educational potential. A social network offers greater accessibility, underlined by the premise that it is jointly owned by its members.

4.2 Social networks

Social networks facilitate informal learning outside the formal constraints imposed by a strict conformance to syllabi and curricula. They foster autonomy and they also allow learners to have their personal space. Social networks promote the sharing of content, encourage discussion, and transcend the rigid structures imposed by hierarchical relationships. More fluidity is introduced by the ability to build social groups where curriculum-related issues can be freely discussed. The *ad hoc* and spontaneous exchange of information can be a valuable source of knowledge. The collaborative features that contribute to learning include walls, discussion and chat, tagging and multimedia. The underlying mode of collaboration is marked by an inherent overlap between content and interaction.

Facebook is being used by students for interacting with other students and with teachers outside the classroom, and for sharing knowledge. In a study conducted in 2007 it was reported that Facebook was used by more than 95% of undergraduate students in the UK [15]. Data collected and reported in 2010 by the EDUCAUSE Center for Applied Research (ECAR) from 126 US universities and 1 Canadian university, indicate that 90% of students were using social networking websites. It was also found that 97% of these students were actively using Facebook [16]. For many learners Facebook became an informal educational network [17]. Its popularity has led many universities to establish a presence on Facebook in an effort to maintain links with their students and to reach a wider audience [18].

Results from various studies confirm the significant shift towards collaborative work that social networks have mediated. This pedagogical trend is often marked by an emphasis on self-regulation [12]. Attempts at leveraging the educational potential of social networking have taken two main forms: developing new systems or using existing social networks.

In the first approach the social capital is generated by the creation of a private network to support social interactions. A social network is designed and implemented to meet the needs of a particular educational environment [13, 19]. The PhoenixConnect

at the University of Phoenix and Ewhaian at the Ewha Womans University in South Korea are examples of private social networks. These networks are well-integrated with the academic cyberspace and are designed to facilitate the creation and the sharing of knowledge. This type of network is under the control of an institution and is designed as a supplement to an LMS. Users can engage in social interactions in a trusted environment by using their real identity.

These networks were introduced with the aim of fostering a strong sense of community, encouraging a freer mode of interaction and promoting a high level of engagement. Some authors have pointed out however that unfamiliar technology can present a significant barrier in motivating students to use a new framework [19]. Furthermore, the institutional control over these networks may be another inhibiting factor.

The second approach seeks to exploit the features of existing social networks such as Facebook and use group formation as a basis for the setting up of an alternative LMS. The aim is to create a formal learning environment where teachers and learners can establish strong relationships, mediated by familiar technology [20, 21, 22]. Tools such as wall creation, discussion, multimedia and editing were re-purposed and integrated into an educational context. This will be explored further in Section 6.1.

5. A non-formal framework

A framework aimed at enhancing student engagement at university level is proposed. It is designed to meet a number of requirements. It should:
- support a social constructivist approach through the formation of communities of practice,
- promote a non-formal mode of learning and encourage learner-centred and community-based activities,
- enable the creation and sharing of knowledge through socialisation, externalisation and combination, and
- foster a symbiotic relationship between informal learning and non-formal learning.

From an architectural point of view the framework is made up of two parts: a given social network, Facebook, and an implemented application which includes the programme and the collaborative elements. Figure 1 presents an abstract model of the components of the framework and their interactions.

The programme element specifies the topics relevant to a particular course and identifies its students. It provides structure and focus in a programme of study. The collaborative element enables students to co-construct learning material, using a dedicated tool, under the potential moderation of a teacher, and to
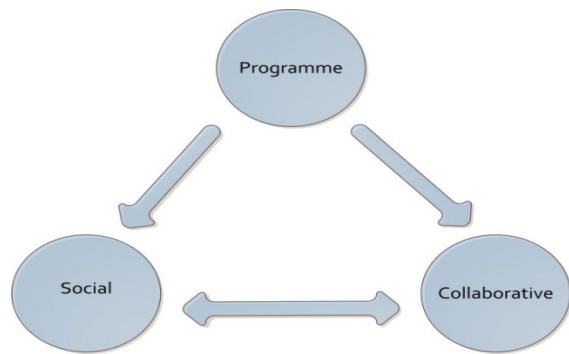

Figure 1. Non-formal framework

share it as explicit knowledge, through externalisation and combination. The social element enables students to tap into the tacit knowledge mediated by a social network, through socialisation. Curriculum-related matters can be discussed in an informal setting. The combination of structure and community-based activities is the distinguishing characteristic of the non-formal mode of learning.

One overriding concern in the design of the framework is the avoidance of the formalisation of the learning process while at the same time providing some direction for the social interactions. This approach fits in with the patterns of behaviour uncovered by an investigation in one British institution, which indicates that students use Facebook for social interactions and for informal learning. They consider, however, that it is not appropriate for formal teaching and definitely not for formal assessment [17]. In the framework, the role of the teacher is to facilitate and moderate the collaborative learning, by specifying the scope of the programme of study and by making relevant and didactic interventions. The presence of an instructor who is responsive to student queries is considered as one of the central tenets of engagement [23]. In one study it was found that a high level of mediated presence can lead to higher motivation [24].

The learning context is the result of the transition from the classroom space, represented by an LMS, to the social and personal space of the learners, created by the social network. Learning occurs in a social environment, demarcated by curriculum requirements, with the voluntary participation of learners, and facilitated by a dedicated collaborative tool.

It is through the combination of the programme element and the collaborative element that the framework mediates a non-formal mode of learning.

5.1 Programme element

In the framework the programme element stands for the organisational component of the non-formal mode of learning, and deals with the light management of
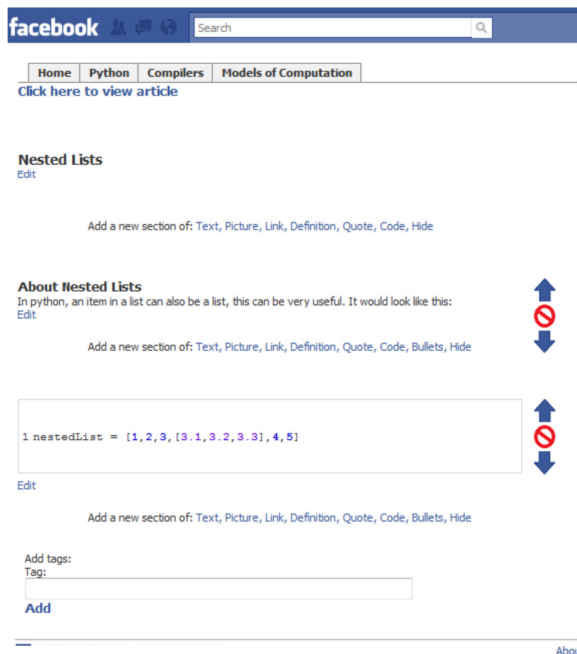
Figure 2. Article creation

courses, topics and students. It refers essentially to curriculum matters, without the compliance with institutional requirements. Teachers are able to access the application and create new courses and new topics. They can also moderate the learning content generated by students and contribute to a topic page. Within the programme element, students are able to view all relevant courses and related topics and any information added by a teacher and by fellow students. The programme element has also an impact on the collaborative element since it identifies the domains of investigation. Moreover, the programme element offers a gateway to the social domain by allowing students to meet and find each other through the course.

The overall function of the programme element is therefore to determine the scope of the collaboration and related social interactions, and to identify the potential actors that can take part in the collaborative activities. The programme element ensures that the tacit knowledge that permeates the social interactions can inform and qualify the explicit knowledge generated through collaboration.

5.2 Collaborative element

An intervention in the collaborative element may be motivated by student-centred interests and community-based concerns. In a student-centred perspective, students may take the initiative and post articles on topics that are of interest to them. An article is created, maintained and 'owned' by one student. An article is originally created on a specific topic and can be linked to other topics.   It can also be tagged with keywords in order to facilitate the search process. The collaborative tool offers a set of formatting features for structuring articles according to topics and preferences. An article may include a range of common formats such as Text, Pictures, Code Snippets and Links. An article consists of an arbitrary number of items, where each item can be presented in a specific format. Items can be added, deleted or moved to any position in an article. Figure 2 presents the interface to article creation.

Community-based interventions may be reactions to explicitly posted material or may be inspired by topics of discussion mediated by the social network. In the first case, a student may wish to combine existing articles, clarify points, expand on a specific theme or raise a related issue, through a combination process. Reactions to posted material may also manifest themselves in the social element. In the second case, students may wish to give expression, structure and cohesion to threads of discussion in the social element, through an externalisation process. This is an illustration of the symbiotic relationship between the social and the collaborative elements.

Collaborative learning at this level represents a more evident form of 'peer coaching' and unfolds in the form of a tree structure of arbitrary depth. Each node in the tree is an article maintained by the student who produced it. Links between the articles denote their semantic and temporal relationships, and the whole structure is similar to a threaded discussion. The original article is at the highest level, and the lowest levels hold more specific and related information. The tree structure acts as the repository for explicit knowledge. Figure 3 gives a snapshot of the collaborative activity as a tree structure.

Students can view whether an article was built on another article and whether it has been extended. If students consider that an article may be beneficial to students studying different topics, they can post it to these topics as well. Various interfaces are provided to support transitions between the different elements and the potential shifts between the different modes of learning.

The willingness of students to assume responsibility of their learning and to engage in collaborative activities postulates a critical attitude towards incremental knowledge creation; information is shared, knowledge is transmitted and comments made without inhibition or apprehension. This process can enhance reflexivity and is an illustration of the constructivist approach promoted by the framework.
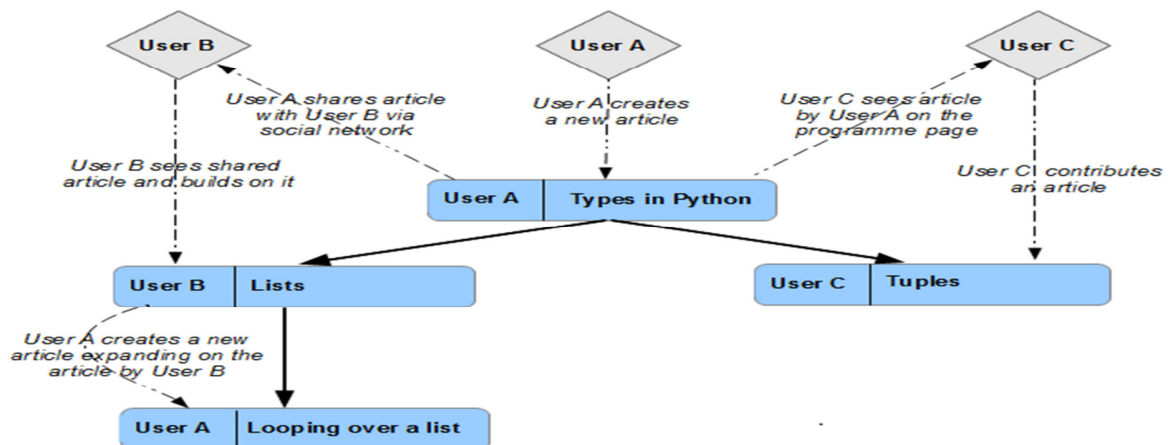
Figure 3. Collaborative interventions

5.3 Social element

As an integral part of the social network the framework inherits all its functionality, especially the social media tools and the networking/friend facility in particular. Students can add other students as friends if they are on their course, or if they had collaborated previously on similar articles. They may wish to alert each other to articles they have written or found on subjects they share an interest in. This facility also enables a learner to post information about an article to another friend's wall on the social network.

The social element enables learners to engage in informal learning and to exchange tacit knowledge through discussions and multi-media. Discussions are made available simultaneously to a wider audience besides the immediate protagonists. Another benefit of operating inside a social network is that it is an environment familiar to most learners; its ubiquity ensures minimal cognitive load. The wall of a user acts as the main manifestation of the social element, where references to the collaborative element underline their symbiotic relationship.

5.4 Interaction

The application supports an asynchronous mode of collaboration. Collaboration is a voluntary activity and is performed within a wider social context, which reduces the risk of isolation and de-motivation of students. A combination of social and collaborative interactions can lead to the formation of lasting relationships. Furthermore, students are more likely to exchange technical knowledge if they interact socially. All users are considered as interaction partners, and the teacher's intervention is kept to a minimum. Whilst the collaborative medium leads to a structured presentation of material, the social network provides another channel of communication where open discussions can take place in a trusted environment without inhibition. Studies have shown that students are more willing to express themselves on Facebook than in an LMS [25]. They tend to engage in complex and lengthy discussions, with useful feedback.

The information generated through the framework may be more persistent than the information held by an LMS. Students from previous classes can be invited to join assigned groups and to share their experience with other students. A varied set of students, potentially with mixed ability, can therefore take part in the social and collaborative activities. This helps create a learning environment where the informal and tacit knowledge mediated by the social interactions on Facebook can be channelled by collaborative activities towards the creation of explicit knowledge [26]. Figure 4 depicts a snapshot of the social and collaborative events that were triggered by the processing of articles, with a contextual reference to the programme element.

5.5 Deployment

The impact of the deployment of the collaborative framework can be expressed in terms of the level of engagement it generates. With greater engagement students are expected to achieve higher learning outcomes and higher grades. The appeal and relevance of the framework is presented in terms of a number of qualitative factors. The proposed approach manages to avoid many of the pitfalls that may hinder the adoption of socially-inspired schemes.

One key feature of the framework is that it fosters a fluid interrelationship between the social and the collaborative elements. It supports a community of practice, where participating learners can benefit from a wide pool of expertise. Evidence suggests that when knowledge is seen as a public good it is transmitted
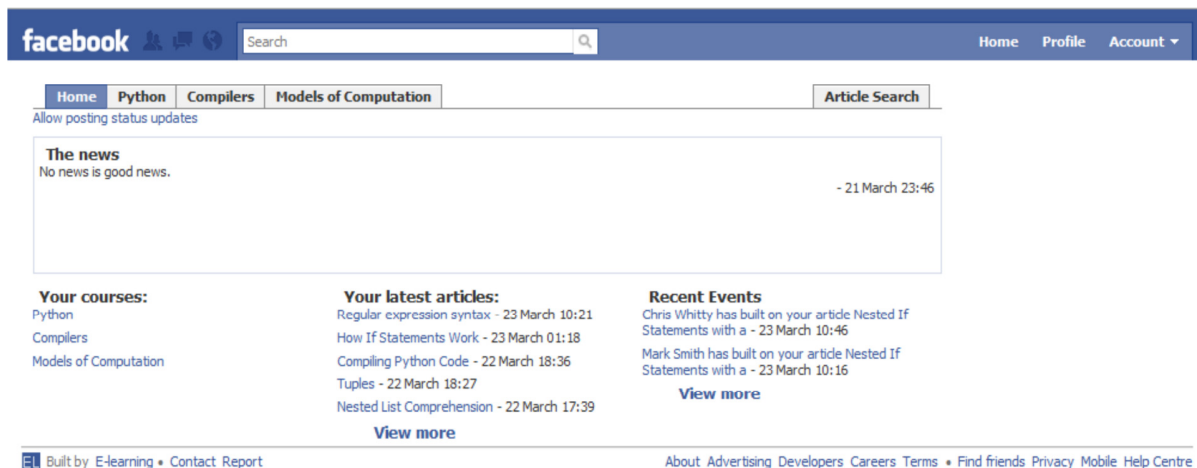
Figure 4. Collaborative events

easily and willingly [27]. Tacit knowledge and explicit knowledge can be shared through socialisation, externalisation and combination.

Despite the institutional endorsement the framework is outside the control of any authority. Teacher intervention is discreet and demand-driven. As there is no formal assessment or formal feedback, the issue of privacy or confidentiality does not arise. Learners can be identified by aliases.

The framework offers greater openness and more persistent membership. It does not encroach on the social space of the students; involvement is voluntary within an informal context. Contribution is seen as a moral obligation where the rewards are in terms of self-esteem and reputation [11].

Compared to a wiki the collaborative tool requires less coordination and offers more structure. In addition, the ownership of individual articles preserves the personal space of a learner within a social context. A final wiki document, on the other hand, is owned by a group.

6. Modes of learning on Facebook

This section is concerned with a qualitative evaluation of three schemes based on Facebook that implement respectively the formal, non-formal and informal modes of learning.

6.1 Facebook as alternative LMS

The formal mode is represented by the schemes where Facebook was used as an alternative LMS [21, 22]. The main functions include announcements, sharing resources, organising tutorial sessions and conducting online sessions. Results indicate that many learners were satisfied with the pedagogical, social and technological affordances of Facebook [21]. Reliance on a social network can enhance the quality of interaction between learners as peers, and between learners and teachers.

While the use of Facebook can fulfil most of the functionality of an LMS, the monitoring and the assessment tasks are particularly challenging. Many students were uncomfortable with the blurring of the private and the public spaces and with its implications on privacy. Other issues that have also emerged in social networks include unsolicited intrusions and power distance as a cultural dimension [22].

Moreover, the potential use of Facebook as an LMS brings to the fore issues such as technical support, responsibility and accountability, in particular with respect to student behaviour [28]. It has also been highlighted that the lack of privacy and confidentiality in assessment, the lack of ownership in the learning process, and the absence of features such as threaded discussions may be serious obstacles to the adoption of this type of scheme. These limitations have led some researchers to conclude that Facebook can be used more appropriately as a supplement to an LMS rather than as a substitute [21].

6.2 Proposed non-formal framework

The proposed framework is aimed at integrating seamlessly two critical aspects in learning: social interaction and collaborative work within a non-formal context. The potential clustering of learners around a tree of articles can enhance engagement, foster a culture of learning, and lead to social consolidation [20]. Furthermore, the scope for autonomy and structured interaction afforded by the application meets the desire of students to work collaboratively and to experience participatory learning. Many students are keen to join groups with mixed ability so that they can benefit from the knowledge of more experienced students. One study revealed that 50% of students organised group revision sessions via Facebook [17].

The proposed framework would provide a better structure for revision activities.

The framework is also in tune with the reluctance of many students to see a formal educational process transposed to a social network. It is not designed to replace the functions of an LMS but to provide students with a related non-formal learning environment. The collaborative framework offers a compromise between the course-centric approach of an LMS and the purely egocentric approach of a social network. Learners are able to contribute individually and voluntarily to the co-construction of learning content within a topic-generated context. The structure afforded by the collaborative tool contributes to the dissemination of knowledge [29].

Within this framework a community of learners can engage actively in the generation, transformation and transmission of knowledge; socialisation, externalisation and combination are specifically catered for by the social element and the collaborative element. To a large extent the behaviour and the characteristics of the learners conform to the three dimensions of a community of practice (CoP) [30]:

'Joint enterprise': the purpose of the community is to enhance learning and widen knowledge on a specific subject. This enterprise is enhanced by the intentional learning of the learners. As the CoP operates outside any formal control and setting, it is actively engaged in non-formal learning.

'How it functions': it is the programme element which enables initially a group of students (or a subset of the cohort) to act as a CoP. It provides a blueprint for a joint enterprise to which learners contribute voluntarily. The community spans a range of abilities and backgrounds and is formed across cohorts and friends boundaries. Learners can contribute at different levels either informally (social tools), or non-formally (the collaborative tool), beyond initial boundaries. The CoP is actively engaged in the generation, structuring and exchange of tacit and explicit knowledge, as a public good. The CoP reshapes communities along topics rather than being egocentric.

'What capability it has produced': the tree structure is the main artefact created by the community, and the CoP acts as a repository of knowledge. Even when the community activities conform to an external mandate, specified in the programme element, it is the community which produces the practice. The presence of an instructor ensures that a trusted environment is maintained, and contributions can be made without intimidation. Unlike an LMS cohort, a CoP on a social network can outlive a course; it can 'retain knowledge' in its members, provide focus for identities, and 'steward competences' by introducing relevant

material. This is helped by the mix of abilities of its members.

6.3 Personal learning environment

While the implementation of an LMS on Facebook presents an institutional perspective and the proposed framework offers a communal perspective, a personal learning environment (PLE) is concerned with an individual perspective. A PLE can be defined as the set of social media tools that enable a learner to direct their learning to meet educational goals [12]. It is designed by a learner who selects appropriate tools to meet specific needs. Tools such as email and blogs can enhance learning. A PLE can be a vehicle for collaborative interaction. The learning processes promoted by a PLE are informal and involve interplay between tacit and explicit knowledge. With its focus on personalisation a PLE is inherently associated with informal learning. It can also be seen as a mechanism for integrating informal and formal learning, and for facilitating socialisation and externalisation. However, it is an essentially egocentric framework.

6.4 Schemes comparison

The schemes discussed earlier represent three different perspectives on learning, and provide a basis for a qualitative comparison of the three modes of learning. Figure 5 presents an outline of the characteristics of the different modes of learning and of their overlap. The classification builds on previous work on formal and informal learning [9]. It differs in the inclusion of the three modes of learning, the wider set of attributes under consideration, and in its application to a social network.

In contrast with a physical and traditional setting all the three forms of learning occur in the same virtual environment. This collapse of the spatial disparities in Facebook implies that learners can experience different modes of learning intermittently by using the same tools without the need for a spatial transition. This comparison points also to the potential transitions between the different modes of learning. It is indeed the case that within the framework a learner can be involved with the creation of the tree structure (non-formal learning), with the collaborative tool, and engage intermittently in social interaction and informal exchange of information with other learners, using social tools. This overlap reflects what has been noted as the inability of Facebook to allow a separation between formal and informal learning [31]. This is due to the close integration between identities, communities and content, and also to the use of the

Formal	Non-formal	Informal
- SN tools - based	- Collaborative tool - based	- SN tools - based
- Structured program	- Structured content	- Unstructured interactions
- Curriculum-based	- Curriculum-focused	- Conversational
- Intentional engagement	- Intentional engagement	- Unintentional engagement
- Explicit knowledge	- Explicit knowledge	- Tacit/explicit knowledge
- Compulsory participation	- Voluntary participation	- Social interaction
- Identity-based	- Identity/ pseudonym	- Personal/pseudonym
- Push model	- Push/pull model	- Push/pull model
- Teacher-initiated interventions	- Context-based interventions	- Ad hoc interventions
- Cohort-based	- Community-based	- Egocentric
- Individual/collective learning	- Collective learning	- Individual learning
- Centralised	- Group-regulated	- Decentralised
- Policy-driven	- Practice-driven	- Interaction-driven
- Hierarchical structure	- Network structure	- No structure
- Restricted access	- Relatively open access	- Open access
- Time-bound	- Time constraints	- No time restrictions
- *Monitoring/assessment*	- No measured outcomes	- No learning outcomes
- *Certification*	- No certification	- No certification
- *Security/privacy enforcement*	- Code of behaviour	- Social etiquette

Figure 5. Learning modes characteristics

same tools for different modes of learning within the same environment. It follows that the inherent informality of Facebook is bound to overspill onto the other modes of learning. From a pedagogic perspective the interrelationship between these modes lends credibility to the contention that formal and informal learning 'ranges along a continuum of learning' [12, 32].

Both the formal and non-formal modes involve structured programmes and intentional engagement; they differ markedly in the administrative processes imposed by certification and privacy requirements. It is, however, the relative openness of the non-formal mode and its latitude for negotiated programmes, which offer greater scope for a complementary integration with informal learning.

The list of attributes and the corresponding perspectives reveal that each mode has its own core issue. In formal mode the issue is how to safeguard privacy and confidentiality and ensure that cultural norms are not violated in a virtual environment. In non-formal mode the issue is how to ensure that students embrace the new technology, and that they engage actively in the use of the collaborative tool, as members of a CoP. In informal mode the issue is how to ensure that learners are motivated and are not completely engaged in purely social and leisure activities.

These core issues underline in particular the barriers that need to be overcome for a successful implementation of formal learning on Facebook. At a sociological level some researchers have argued that it would be unwise to subject Facebook activities to some institutional and formal control. They contend that part of the wider student experience is the ability and freedom of students to experiment with roles and identities in their own space [33].

Conceptually there is a greater distance between formal and informal modes than between the informal and the non-formal modes. Non-formal learning eschews privacy issues and strikes a balance between informal and formal requirements. Thanks to its support for a community of practice, this multi-faceted framework provides an adequate environment for promoting learning on a social network. It can also act as a bridge between formal and informal learning [34].

7. Conclusion

A framework for enhancing student engagement through a non-formal learning mode was implemented in a social network. It is aimed at facilitating the integration of social interactions and collaborative activities, within curriculum defined boundaries, so that learners can engage in self-learning and can explore topics, outside the constraints of an LMS. The co-construction of knowledge is underpinned by a dedicated collaborative tool.

Comparative evaluations with schemes which promote formal modes of learning indicate that the non-formal framework has higher affinity with a social network. The design of the framework has been informed by learning approaches, learning technologies and knowledge management. It supports the formation of a community of practice as an implementation of a constructivist approach. The framework is proposed as a supplement to an LMS rather than as a substitute.

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