Abstract

This paper introduces the background of learning communities and simulation and gaming. Both topics are explored from their origin after defining characteristics and giving examples of learning communities and simulation and gaming, establishing between the two concepts the principles of interaction, complementation, enrichment, motivation, effectiveness and self-stimulus. The cognitive transformation which occurs in individuals involved in instructional processes using simulation and gaming methodology and in carrying out tasks in a learning community mode is also described. In short, the natural, unaffected environment that simulation and gaming generates produces learning communities spontaneously.

Introduction

The current sense of learning community can be traced back to ancient civilisations. Primitive humans, from the time they were born until they died, lived in communities, which were the reference point for any action undertaken by the members of the group. Individuals grew up in a learning community model that brought together all individual cognitive systems in a social cognitive system. Fundamental human needs, as well as the transmission of knowledge, were provided for within communities, in such a way that this system of coexistence drew together individuals' interests naturally.

Primitive civilisations lived in a community system, which was like the concept of family, and in an intellectual system, in which individual growth was conducted through community tasks, such as the planning of hunting strategies and food preservation. Festive, afflicitive and affective moments were shared as a group and all members of the community had strong social bonds within the group.
Later on, early modern humans lived in mobile groups and established extensive social networks to trade goods and exchange gifts. For these early modern humans, an increased reliance on social alliances and creativity was key to their survival. With their elaborate rituals, artwork and highly advanced tools, these humans possessed virtually the entire array of behaviors that characterize a learning community in modern educational and professional environments today. Thus, the importance of the sense of community to educational effectiveness in different fields comes from ancient roots.

The notion that is key to learning communities is sharing. According to Tinto (2003) "nearly all learning communities have three things in common: shared knowledge around a theme, shared knowing (each other socially and intellectually), and shared responsibility (to each other)"; as a consequence, sharing implies a “collective effort of understanding” (Bielaczyc and Collins, 1999:271). These three main features could be also projected into simulation and gaming, where collective immersion and sharing processes take place.

The first reference to the use of a game in the classroom is 1957 with the TOP MANAGEMENT DECISION GAME at the University of Washington (Watson, 1981). The modern era of simulation and gaming was then ushered in, in spite of the fact that hundreds of years B.C. games had been used. Duke and Kemeny affirm (1989: 166) “gaming, in its many forms, may reasonably be regarded as the world's second oldest profession”. Historical remains attest to its educational character and the applicability of the methodology of simulation and gaming, which foretell increasing use. Duke (1974) christensed this practice “the future's language”, a new form of communication, of rising importance and impact in many places and in many problematic situations. This new form of communication represents man’s effort to formulate a language oriented to the future; although "gaming/simulation is a hybrid communication form. It is not new, not well understood, poorly used, and in its infancy" as Duke asserts. Nevertheless, simulation and gaming has undergone such development in recent years that it has come to be widely recognised as a valuable means of learning about a whole range of phenomena and fields. It is a methodology that presents no risk in reality; if simulation and gaming is regarded, and treated, as a reality in its own terms, then the experiences of the participants become real by encouraging them to use patterns used in other real situations. Simulation and gaming, as learning communities do, implies immersion. But, how are simulation and gaming and learning communities alike?. Both present real
situations in which participants become personally involved, instructed in common, and collectively assessed.

Many current educational concepts go back to the sophists of Ancient Greece, where the learning process was limited to reciting opinions on topics by means of theory. Socrates, in fourth century B.C., commenced the first educational revolution through questions instead of reciting answers. For the first time, individuals' participation became important. Aristotle started a greater revolution in learning. The saying "their using the language of knowledge is no proof that they possess it" is attributed to him. By this statement, Aristotle is stating that theory is not assimilated until a person has the ability to apply it.

A pressing concern in education in recent years has been over learning process in opposition to content, which has been the almost exclusive objective of traditional learning. The instructional process has become the key concept in meaningful learning, thanks to the effort of a series of specialists who have based their theories and discoveries not only on the wisdom of the masters of Ancient Greece, the rationalists or Kant, but also on names that are classical in medieval and later philosophy, such as Luis Vives (1492-1540), Comenius (1592-1670), Locke (1632-1704), Rousseau (1712-1778), Pestalozzi (1746-1822), Froebel (1782-1852), Herbart (1776-1841) or the Americans, James (1842-1912) and Dewey (1859-1952), among others.

Ausubel et al. (1983) point out that, above all, learning must be significant, and they recall the differences between mechanical learning, in which learning tasks contain purely arbitrary associations, and significant learning, in which the tasks are related congruently. The central idea of their theory revolves around the notion of new input and how it comes to form a part of the cognitive structure of a learner. Similarly, Beltrán (1993: 30-32) describes how subjects learn significant material by generating and building relationships between the input and knowledge stored in long-term memory. In a like manner, he suggests that the concepts and knowledge become abstract so that they can be used in classifying more situations. He further points out that learning is only produced on a higher level when lower levels are mastered.

Bruner (1988) states that for learning to take place satisfactorily, active participation of the student is essential; the best way to achieve that is to favour learning by discovery. Discovering something turns the learner into an autonomous being who is satisfied by his discovery, thus developing intrinsic motivation. Beltrán (1993: 31) says that learning cannot be considered separately from the personality of the learners. The
most important thing in learning something is not what is going to be learned but rather what has already been learned, so that the learner can incorporate new knowledge into his cognitive structures. This stance accentuates to a certain degree the line indicated by Ausubel et al. (1983) and Coop and White (1980) when they speak of how the information is stored in the form of units or nodules of knowledge; and that each nodule can, in turn, contain other nodules or cognitive structures that should be studied in order to understand learning. According to Coop and White (1980: 10), there are three ways to learn: through accumulation, specialisation or restructuring. The third way assumes a new view within the structure of the material, the material can be restructured by way of analogy, metaphors or inferences that act over existing nodules; perhaps this last form represents a more up-to-date approach.

Piaget (1985) conceived human knowledge as a specific type of biological adaptation of a complex organism to a complex environment. The cognitive system that he postulated is highly active. That is, the learner actively selects and interprets information arising from the medium to construct his own knowledge instead of passively copying the information as it comes before his senses. On paying attention to the structure of the environment and taking it into account in his search for knowledge, the human mind as conceived by Piaget is always reconstructing and reinterpreting the medium to make it fit into a framework of intellectual reference (Flavell 1993: 15). Therefore, the mind never copies reality, adapting it passively as something given beforehand, nor does it ignore that reality, autistically creating a particular intellectual conception. On the contrary, the mind constructs its knowledge structures taking data from the outside world, interpreting, transforming and reorganising the data. This means that there is an authentic encounter with outside reality in the process of construction of knowledge and, in consequence, that knowledge is, to a certain degree, realistic for the person. In any case, Piaget places much emphasis on the fact that the mind encounters the environment in a highly active, self-directed way, an idea shared similarly by Mayor et al. (1993); Coop and White (1980) Bruner (1988) or Beltrán (1993), among others.

These authors stress the importance of constant interaction or collaboration of the internal cognitive factors and the external conditions in the construction and expansion of knowledge, both types of factors’ being vital to that construction and expansion. Still, it is important to remember that what is already known will determine and constrain the measure of environmental information that can be perceived and processed, in the same way that what can be perceived and processed is a fundamental
factor for the activation of the knowledge already possessed and for the acquisition of new knowledge. The essence is, then, that the cognitive system adapts reality to its own structure (assimilation) at the same time as it adapts itself to the structure of the medium or environment (accommodation).

In short, we could ask ourselves if there is any psychological process that could not be described as cognitive or that does not imply knowledge at a significant level. A human being seems to be a series of unrelated, scrambled cognitive components. However, he is a complex organised system in which the components act amongst themselves. A learning community and simulation and gaming partake of principles that build and reorganise the above-mentioned complex system, by way of different steps fully related to experiential learning and the philosophy of the learning cycle.

In the following sections we will set out the sense of learning community and principles of simulation and gaming, as well as the parallelism with experiential learning assumptions.

**Sense of learning community**

Through ancient civilisations we see that a learning community could be basically defined as "an ensemble of agents sharing a language and values, and pursuing common interests", to use the words of Rheingold (1993) and Amstrong and Hagel (1996). They insist on common language, world, and values in terms of pedagogical approach and pursuing a common learning goal. Lave and Wenger (1991, cited in Rovai, 2000) defend that any learning process takes place in a participation framework, not in an individual mind. For them, learning necessarily occurs in a socio-cultural context, and learning communities are *communities of practice*, where "learning takes place through the sharing of purposeful, patterned activity". A community of practice is a group of learners with a common objective; "... they solve problems, discuss insights, share information, talk about their lives, ambitions, mentor and coach each other, plan activities, and develop tools and frameworks that become part of the common knowledge of that community" (O'Regan et al. 2004). Thus, the main tenets of a community of practice, as Wenger (1998) sustains, are the "attributes of mutual engagement, joint enterprise and shared repertoire".

Berieter and Scardamalia (1993, cited in Ferry et al., 2000) describe a learning community or a community of practice as a *knowledge building community* (KBC),
where a group of people investigate problems together. They insist that "members of a KBC work as groups and not as individuals and are engaged in progressive discourse in an iterative process of knowledge building".

Many other approaches to the sense of community can be presented[1]. Attention is paid to the concept of community in the field of business as well as in instructional technology, although it is in the field of education where the characterisations of learning communities are evident in the literature. In this field an essential characteristic is that responsibility for learning is shared among group members. Rogers (2000) says that some researchers (Roth and Bowen, 1995; Roth, 1996; Squire and Johnson, 2000) have observed that when learners are no longer required to regard knowledge as a static entity and rather as something which is dynamic and negotiable, they build their own representation of knowledge and help each other understand important domain concepts and processes. This viewpoint is among the most relevant in the literature on learning community. An important aspect that Barab and Duffy (2000) point out concerning this perspective is that knowledge is gained through experience, which immediately suggests the idea that simulation and gaming produces learning communities spontaneously. Since the main claim in simulation and gaming is that learning/knowledge acquisition is through experience where participants practise real situations, the connection between the two concepts becomes evident.

Practice produces coherence in a community, as it is through practice that members in the community form relationships with each other. Practice also produces coherence in their task-based activities. Practice makes instructional process learner centred and potentially collaborative, a view that emphasises total collaboration, in which members engage in developing a practice based on their joint learning activities.

In short, the distinctive features of learning communities are:

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<tr>
<th>Affective/Emotions</th>
<th>social and intellectual interdependence; shared responsibility; co-operation, collaboration, and competition; personal enrichment.</th>
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</thead>
<tbody>
<tr>
<td>Learning</td>
<td>active learning -learning by doing-, shared knowledge, autonomy, co-operation, collaboration, interaction and reflective thinking.</td>
</tr>
<tr>
<td>Methodology</td>
<td>inter-/intra- groups interaction -discussion and decision making; autonomous educational environment; goal-based learning and task-based activities -shared practices-.</td>
</tr>
<tr>
<td>Assessment</td>
<td>collective and individual assessment on participation, product, process and rating criteria.</td>
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Simulation and gaming can both challenge and support learners, challenging them to look at issues from multiple perspectives and to think critically, and supporting them by creating the social networks to encourage risk-taking, which is necessary for learning to occur (Evans, 2004). Learning communities do the same. Learning communities and simulation and gaming are built on the principle of learner sharing, although it will be postulated that learning communities are inherent to simulation and gaming.

**Simulation and Gaming**

Simulation and gaming methodology rests on the basic principles of experiential learning. Craig (1997) holds that experiential learning is "knowledge, skills, and abilities attained through observation, simulation, and/or participation that provides depth and meaning to learning by engaging the mind through activity, reflection, and application". Formal training that is conducive to experiential learning must translate objectives into programs. Wilson and Heiemann (1991) identified the three learning objectives of work-experience programs as 1) academic objectives - relating theory to practice and strengthening and developing such cognitive skills as problem solving, decision making, critical thinking, application, analysis, and synthesis; 2) career objectives - determining and testing career options, developing job acquisition skills, developing career planning skills, and understanding the world of work; 3) personal growth objectives - developing self-confidence, self-understanding, communications skills, personal and ethical values, social interaction skills, and a sense of professionalism. These work-experience programs meet the objectives in simulation and gaming stated by Greenblat (1989:16), which include increasing motivation and interest, conveying information or reinforcing information already given in another format, skill development, attitude change and self/collective-evaluation.

The umbrella of experiential, co-operative education and training also has many other advantages related to achieving personal growth by developing practical and intra-/inter-personal skills, as well as enhancing and reinforcing academic learning by bridging theory and practice. This type of education and training also helps to gain a realistic view of employment and understand the expectations of the workforce.
In order to be successful in meeting objectives, experiential learning purposes have to reflect the learner needs, and settings have to be considered realistic by the learner. Emphasis on a balance of action, reflection, and application is required in order to provide learning experiences that are sequential, but at the same time these learning experiences should provide opportunities for unplanned learning from new experiences. Instructors act only as facilitators of the experience and try to get the learners to claim responsibility for action. Learners have active roles in the planning and carrying out of activities interacting with the social and physical environment. Progress is monitored and assessed; feedback is given to the learner, who considers outcomes real and important.

In conclusion, simulation and gaming methodology produces broad-minded individuals, "those who are able to make an action out of knowledge, use knowledge to think, judge, decide, discover, interact, and create" (Loacke, 1986, cited in Craig 2004). Indeed, simulation and gaming offers global horizons for education and training because it stands on intercultural and affective values and facilitates interdisciplinary environments. It is a current, innovative, motivating methodology, centered on the learner and oriented to the process and to the product.

Learning communities, simulation and gaming and experiential learning

Learning through experience as put forth in the work of John Dewey has been valued as an important tenet in formal educational settings. Dewey challenged educators to develop educational programs that would not be isolated from real life experience. Dewey (1938) felt experience was “a cycle of trying”, in which one senses a concern, gets an idea, experiments with it, undergoes or experiences the consequences, and confirms or reinterprets theory taking into consideration the consequences. “In the best case, this process results in a reconstruction of experience, a re-codifying of habits, and an ongoing active questioning through further experimentation”.

David Kolb[2] has stated that learning is a multi-dimensional process. Kolb's experiential learning model begins with: 1) a concrete experience - the tangible qualities of the immediate experience and the grasping of the knowledge that takes place. 2) reflective observation - a collection of data through observation and critical thought regarding the experience. 3) abstract conceptualisation - the process of analysing the data received and the internal process of developing concepts and theory from the
experience. 4) active experimentation - a modification of behaviour and knowledge occurs, while the implications of the future are considered. The completion of this cycle puts into practice the concepts and theories that have been developed through the reflection and conceptualisation processes which in turn should create an environment for future experiences (cited in Craig 2004).

This model is reproduced in simulation and gaming through its three phases. First, a preparation, information or briefing phase; second, the simulation proper, in which the conflict or confrontation takes place, with discussion and negotiation; and third, a follow-up or debriefing phase in which what has happened is discussed in order to extract maximum learning from the experience. Simulation and gaming reproduces the learning cycle, characteristic of experiential learning, and in turn integrates the learning community principles of shared knowledge and responsibility.

Conclusion

The passage of time in different civilisations shows that the sense of learning communities and the methodology of simulation and gaming have coexisted for centuries. The characteristic principles of a learning community or a community of practice are meshed together in simulation and gaming as part of its own principles. In fact, the principles are common to both and in the intersection accomplishes a focus on experiential learning. Throughout this paper the concept of sharing has been the fundamental principle underlying learning community, simulation and gaming and experiential learning. Research in educational and professional environments demonstrates that a sharing philosophy benefits the results obtained. Sharing develops shared cognitive schemes, skills and abilities valid for facing real processes and from the psychological point of view; sharing nurtures the variables that constitute the affective level of a learner.


[2] There are many critiques of his theory. From an informal education perspective (Jeffs and Smith, 1999); from an adult education and ESL perspective (Rogers, 1999); from a psychological and philosophical perspective (John Heron, 1992); from an experiential education perspective (Chris Loynes, 2000) and (Tracey Dickson, 2000); from a lifelong education perspective (Beard and Wilson, 2002); from a management education perspective (Reynolds, M 1997) and (Holman, D, Pavlica, K and Thorpe, R 1997); from a pedagogical perspective (Atherton J S, 2002); from a human potential perspective, Dictionary of Personal Development by Paul Tosey and Josie Gregory. In
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