Aiming at the Affective Process of Learning:
Social Web and UDL Integrated Strategies to Promote School Attainment

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ABSTRACT

Special Education Needs refers to more than just students with learning disabilities that impair their access to and participation in education. Many others struggle each day just to stay in school, focus on lessons or make sense about what is taught. Several students face underachievement and dropout because they feel that school is outdated, uninteresting and does not fulfill their learning needs. In this paper, the authors offer a proposal, often talked about but rarely put into action to bring back struggling students to school: to use multiple forms of presenting information and expression in order to attract students that need more dynamic and broader learning strategies.

Keywords: *Education, Inclusion, Networks, Social Web, Special Educational Needs*

1. INTRODUCTION

There are numerous students referred to as having learning problems, because they evidence greater difficulty in learning than most other students of a similar age or because they have a disability that constitutes a barrier, preventing or delaying access to active participation in learning. Others still, without unveiled limitations and even with skills above average, tend to be prone to academic failure. Students in today's classrooms present a wide combination of abilities and learning needs, with differing degrees of readiness and background knowledge, varied educational and cultural experiences, differing rates, styles and deepness of skill acquisition, and broad diversity in the ability to maximize learning through traditional educational strategies and materials.

Inclusive policies as well as technological developments have allowed for many more pupils with learning differences and difficulties to attend schools today. Their needs are demanding, varied and complex pressuring profession-

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als to find appropriate ways to enhance their learning. Therefore, it is of utter importance to create an environment where learners become confident, autonomous learners, increasingly able to use their creativity and to take safe risks.

One way of looking at this problem, analyzing it and seeking a solution may be by considering the perspective of Universal Design for Learning (UDL). Universal Design for Learning is a concept introduced by David Rose in 1984 who has worked at the Center for Applied Special Technology (CAST) since then. His work and that of his fellows at CAST, provides a vision that ruptures the "one-size-fits-all" model of education for the masses that dilutes the vast individual differences and, therefore, expands the opportunities for learning for all students with diverse learning characteristics. For UDL, diversity is the keyword: the diversity of students in schools demands diverse enabling strategies so that no one is excluded and every one can benefit from equal opportunities.

The UDL framework is grounded in cognitive and neural perspectives of learning. It embodies a set of principles based on research that constitutes a practical model to maximize learning opportunities for all students. Learning takes place through changes made at a neurological level where complex functional networks are interconnected. For learning to happen through the processing of information, via the interpretation of stimuli, the manipulation of concepts, the involvement and activity in the surrounding environment, which then leads to the accommodation of knowledge, it is necessary that the individual's recognition, strategic and affective networks be fed adaptively. The three principles of UDL, which consist of (i) Providing Multiple Means of Representation; (ii) Providing Multiple Means of Action and Expression and (iii) Providing Multiple Means of Engagement, are described in detail ahead in this article.

These principles should be applied to all students in a classroom, because there is a fundamental incompatibility between them and the standardized curriculum and pedagogical practices that are still pervasive in today's schools. UDL principles focus on the adjustment of the learning and teaching process, through differentiated instruction and the implementation of curricular adaptations, rather than on retrofitting for the student.

Such notions are in line with current perspectives on the support of students with adverse learning paths, advocated by major international institutions like UNESCO (1994) and the World Health Organization (2004). They sustain that environment plays a crucial role on rising and/or aggravating constraints to the individual's performance and that, subsequently, it should adapt to the individual and not otherwise. They aim at promoting access and participation by acknowledging student diversity as an added value and at eliminating and/or reducing barriers in order to allow any student to fulfill his/her potential and thus obtaining the best academic results possible in the least possible restrictive environment.

Web-based environments for communicating, networking and collaborating, often referred to as Web 2.0 or social Web have been heralded as flexible contexts that can easily be adapted to individual needs. Understanding how such technologies can be used for educational purposes has become a focus of research in various fields of Education. Research suggests that the use of communication technologies (CT) fosters students' development and enhancement on a number of aspects, including collaboration (Schellens & Valcke, 2005; Persico Pozzi, & Sarti, 2009; Forment, De Pedro, Casañ, Piguillem, & Galanis, 2010); knowledge construction (Yap & Chia, 2010; Lucas & Moreira, 2010; Deed & Edwards, 2010) critical thinking (Garrison, Anderson, & Archer, 2001); socialization (Richardson & Swan 2003); satisfaction (Hostetter & Busch, 2006), or inclusion (Walker & Logan, 2009; Ware, 2002).

Students' inclusion has been one of the major challenges for school systems in the past decades. It is safeguarded by the Inclusive Education Framework (IEF) (UNESCO, 1994) which poses that inclusion rejects exclusion and that Education is for all "regardless of their physical, intellectual, emotional, social,

linguistic or other conditions" (UNESCO, 1994). But inclusive education is not the mere implementation of policies. In order for inclusive practices to be achieved, teachers and other educational agents should receive adequate training, so that the different circumstances and needs of all learners can be addressed and an inclusive education through inclusive schools/environments can be set.

Inclusive education may comprehend a variety of initiatives, including the ones with students with disabilities, living in poor conditions, belonging to ethnic or linguistic minorities, experiencing exploitation, discrimination or segregation, among others. In the case of the present article, it relates only to students with special educational needs (SEN). More specifically, to those who, due to a series of reasons, experience academic underachievement, drop out or leave school with no appropriate qualifications. These may include children that either because of behavioural or social problems, feel detached from the school's environment, neglected or rejected by their peers or excluded from mainstream educational experiences. These students often possess interests and abilities that remain unveiled merely because conventional pedagogical practices and strategies do not fulfill or address their interests.

In Portugal, guidelines for Special Education are covered by the IEF and although the framework dates back to 1994, what has been done does not seem innovative or inclusive enough to attract those who do not "fit" the traditional educational setting. Within the European Union, Portugal continues to present one of the highest dropout rates (OECD, 2010). Though the number of students finishing basic, secondary and higher education has increased in the past few years, the country's dropout rate still doubles European average rates, suggesting that there is still a long way to be covered.

In the present work, we suggest that the use of CT, namely the ones that belong to the so called social Web era, can help meet the challenges posed by academic underachievement and leveraging inclusive policies and practices in education.

2. SOME CONSIDERATIONS ABOUT UNDERACHIEVEMENT

Academic underachievement may be caused by various factors. SEN related to sensory, motor and cognitive impairments usually appear at the top of the array of causes that lead limitations on learning. Many others may be mentioned, though they are usually given less visibility and are often misinterpreted. For example, contrary to popular belief, gifted children are amongst those who tend to underachieve (Emerick, 1992). Also, children from disadvantaged or marginalized areas or groups are likely to do so due to a variety of characteristics that may range from functional limitations to social misfit and inconsistent school performance (Westminster Institute of Education, 2006).

By definition, underachievement is a discrepancy between intellectual potential or ability and academic achievement. It is primarily caused by a combination of personal attributes and environmental factors. Personal attributes can include an undetermined learning disability, an individual's lack of self-confidence to successfully accomplish a task or goal or a limited ability to self-regulate behaviour. Environmental variables may involve factors such as social and family related issues, and a mismatch between students' learning styles, the peers' learning styles or a teacher's instructional style.

The inadequacy of educational conditions is probably the most referred issue related to the underachievement of high ability students, often associated with lack of motivation to undertake school activities that do not fulfill the learner's potential. Monotony, routine, wasting time with irrelevant subjects may contribute to underperform, diluting any interest once held (Rimm, 2009).

Variables may also be related to a conjuncture of problems and limitations of a typical classroom and of the educational system itself. Some students may be disruptive to other students and teachers may not be able to dedicate the necessary time to them due to a high number of students per class, the need to

comply with the lesson plan or even the time ascribed to each lesson.

Often students that underperform may be highly creative or have special abilities that lead them to lose interest in traditional text-based instruction, rote memory learning tasks, or teacher-directed activities (Worrel, 2007). When combined with uninteresting, undifferentiated and disengaging curriculum, these factors often lead to underachievement and the development of adverse feelings towards school (Rimm, 2009; Bottino, Ott, & Tavella, 2011), which may result in further reluctance to pursue academic success and even rejection behaviours. It must be noted, however, that the fact that the school environment does not meet the needs of students who need special support, is not the sole factor for school failure, but it is one that can be addressed through innovative strategies that appeal to the current interests of young people today.

The disenchantment and adverse feelings towards school may lead to further reluctance to pursue academic success and even opposing behaviors.

In this matter, we believe emerging technologies can play an important role. Web based tools and environments have brought about new ways to access and manipulate information and have redesigned interaction dynamics. A multiple nation survey undertaken by Twining (2007), reinforces that besides many differences encountered, there is an agreement that ICT should be used in order to prepare people for living in a society permeated with technologies. When merged with appropriate pedagogical strategies these technologies and environments can have a significant impact in the way students exchange knowledge, engage and learn.

3. THE AFFECTIVE NETWORK OF LEARNING: THE UDL UNDERSTANDING

UDL represents a change in our perspective of learner differences. Its principles have emerged from the research and development of new learning environments. Derived from Universal Design in architecture and the extensiveness of individual differences, the UDL educational approach aims to respond at student diversity seeking to accommodate all needs and particularly in the case here discussed the emotional side of learning. Grounded also on the potential of new media and of a shift on the teaching and learning paradigm, it provides a framework for creating more flexible and prevailing learning opportunities for all students. The ever-new educational technologies characterized by flexibility and user adaptability can support new approaches to teaching and learning meeting different learner rhythms, styles and strategies (Meyer & Rose, 2005).

UDL builds on the provision of responses that fit the requirements necessary to operate a prolific learning at a neurological point of view. Complex learning typically involves multiple highly distributed neural networks, consisting of hundreds of thousands, or even millions, of neurons. The brain is a vast, interconnected network, within which many smaller networks are specialized in performing particular types of processing and managing particular learning tasks.

Based on the work of Vygotsky and other cognitive neuroscientists, David Rose and Anne Meyer developed the principles that sustain the UDL model and its interconnection with the three brain networks. These brain networks are functionally mapped and consist of the ones enunciated (Rose & Meyer, 2006).

- **Recognition networks (the "what" of learning):** specialized in gathering and analyzing information;
- **Strategic Networks (the "how" of learning):** specialized in the planning, coordinating, self-monitoring and executing motor and cognitive actions; and
- **Affective Networks (the "why" of learning):** specialized in evaluating and setting priorities.

Collectively, these functional mapped brain networks coordinate how we interact with the

surrounding environment and therefore learn. Following this, based on Vygotskian research, the three UDL principles were idealized to meet the aforementioned primary neural networks related to the process of learning and to meet the needs of the students by providing an equal opportunity for learning and improving access to content (CAST, 2008; Meyer & Rose, 2002). Such principles recommend to:

- **Provide multiple and flexible methods of presentation:** give students with diverse learning styles various ways of acquiring information and knowledge;
- **Provide multiple and flexible means of expression:** provide diverse students with suitable alternatives for demonstrating what they have learned; and
- **Provide multiple and flexible means of engagement:** tap into the diverse learners' interests, challenge them appropriately and motivate them to learn.

Multisensory (by multimedia) input and variable forms of dealing and manipulating information (trough interactivity), as well the emotional aspects (such as levels of stress and enjoyment involved) is frequently referred to as essential to promote learners engagement and attainment in learning.

Although digital technologies and their associated tools can address each of the three principles, we will dwell more deeply on the third principle (that due the influence of the emotional factor in any learning should be the first in our perspective). Engagement is the keyword and, as we have seen, is directly related with the Affective Networks, the emotional component of learning, i.e., with what makes us continue and pursue learning.

Affective Networks are related with the limbic system which, in turn, is related with the emotional, behavior and memory functions in our brain. These functions play an important role in how we learn and on how we engage and with learning motivation. It is specialized in manipulating patterns by assigning significance and values to each piece of information that we are in contact with, as well as with setting priorities and respond appropriately to divergent stimuli. Affective networks essentially act as an emotional filter, influencing our actions and decision-making processes based on emotion, motivation, and biological drives. Their importance comes up when we need to prioritize and be persistent despite difficulties, or when we give up when we are faced with a challenge that is more demanding than we can handle. As we can easily access, affect effectively plays an important role on learning and knowing and it is intrinsically involved in students' success due to levels of motivation and engagement (Rose & Strangman, 2007).

Coping with the diversity of affective networks is of great importance, as student attainment is directly related with interest and engagement in school activities. Multiple means of engagement are necessary to motivate learners with diverse affective networks, and thus varying interests. Frequently, students don't get to choose what they learn, since learning choices are already determined by national standards, by the curriculum or by the teacher. However, if they are given different options and more individualized ways to engage with that mandatory material, it is more likely that some of the curriculum content will challenge learners appropriately and motivate them to learn (Rose & Meyer, 2002, as cited in Coyne, Ganley, Hall, Meo, Murray, & Gordon).

What we can draw from this, is that we can use more motivating ways of distributing, presenting and displaying the same content. Some subjects can be less interesting, but their holding may be attractive, encouraging the involvement and subsequent success in learning. When demotivation prevails, even with high potential learners, there is a higher risk of failure and, therefore, alternative ways of involvement should be safeguarded, by providing multiple means of engagement as it is stated in the third principle.

UDL provides learning opportunities for all students, guiding educators in finding innovative ways to make the curriculum accessible and appropriate for students with different

learning paths, styles and learning abilities and disabilities, in different learning settings (Rose & Meyer, 2002).

4. THE SOCIAL WEB AS AN INCLUSIVE PLATFORM

Many agree that technology can be an equalizer of opportunities for interaction and thus learning. The social web, as we know it today, relies heavily on user-generated content, communities, networking and social interaction. It offers innumerable free-easy-to-use tools and applications that give users a high level of control to sort, manage, use and recreate knowledge in many different ways and for many different purposes. The great force beyond the surface of the social web is driven by people's attitudes towards wanting to know, participate and engage in sharing, creating and interacting.

Several authors refer to "this new web" as a social platform where individuals can interact, (re)create, share and redefine ways of learning (Selwyn, 2007; Klamma et al., 2007). Social web tools, such as wikis, blogs, social networking or sharing sites, enable users to explore different paths, connect to others and learn through the exploration of knowledge areas, on the basis of individual choices. Users are prompted to engage, interact and participate and, at the same time, develop the necessary competences required to actively participate and interact with others. As such, social web tools provide multiple means of engagement, representation and expression. They enable students to "stumble across" content that can be used as learning opportunities and teachers to experiment the practice of embedding flexible and diversified strategies into the curriculum. Facilitating genuine access, participation and progress at school by diverse and frequently unattached learners requires much more than the physical inclusion at a classroom. When integrated into teaching practices and explored as an extension of the classroom, social web tools can become a means to distribute different learning environments and contexts, in which students' interests or particular abilities can be brought into play. Students are given new opportunities that afford them the power to be knowledge producers and transmitters, form learning networks, jump outside classroom walls and look for relevant aspects related to their lives (Ribeiro, Casanova, Nogueira, Moreira, & Almeida, 2011). When applied as pedagogical tools, they can also foster the transfer of responsibility to students, autonomous learning, real life problem based learning and collaborative work. Students benefit from developing adequate attitudes to participate in the tools and benefit from a more equitable environment, in which one becomes "uno inter pares" as hierarchies and individual differences tend to dilute (Lucas & Moreira, 2009).

Assumptions made so far are in line with conclusions gathered by Walker and Logan (2009). They state that students with SEN can "benefit from social interactions with people of all backgrounds" in at least three different areas: i) learning, ii) emotional and iii) behavioural. Benefits reported include: "enhanced skill acquisition and generalization", "greater academic outcomes", "sense of belonging", "peer role models for academic, social and behavioural skills", "increased inclusion in future environments" or "increased appreciation and acceptance of individual differences and diversity" (Ware, 2002).

According to the same authors, when extending learning environments into the web, students cultivate feelings of belonging, improve motivation, self-confidence, behaviour, attitudes to learning, attendance, and achievement. Achievement is fostered when students experience support and sense that their opinions and insights are trusted and valued by others. Moreover, it benefits from the development of student centred approaches and individualized education paths that these tools afford.

It is also interesting to mention that the American National Center for Technology Innovation (NCTI) sees these technologies as great equalizers as it states that youths with disabilities, already at risk for being left on the educational and social sidelines, can through

social media and these emerging communications technologies, connect with the world in ways that have not been possible before (ACOT, 2008).

The integration of social web tools into teaching practices also gives teachers new opportunities to rethink their teaching and learning practices. As change driven agents, educators and teachers, are demanded new roles and skills that can facilitate learning and make it more meaningful to all of their students. Without proper training or without practical examples through trial and error, inclusive practices may be hard to accomplish.

5. THE PORTUGUESE CASE

Although the education of students with SEN has been assured as a right and a duty under European and Portuguese law for a long time, effective action to move educational policies and practices towards a more inclusive direction is only now starting to take its course. Nevertheless, recent legislation has somehow left a void and narrowed the possibilities for some students with special education needs, especially for those who cannot make proof of a diagnosed need. Furthermore, it has diminished the number of teachers for these students and the number of hours per week assigned to them. This has resulted in students with SEN being taught in regular classes according to regular standards or being relegated to professional courses in order to receive certification of compulsory education.

Including these students in regular classes may increase rates of inclusion, but it implies that all teachers are prepared to work with them in their regular classes and this is not often the case. During the last year, due to the implementation of the Technological Plan for Education (TPE) more attention has been given to the training of teachers in SEN, namely in the use of CT as promoters of inclusion and facilitators of learning for students with special needs. Although results of the TPE initiative are not yet available, studies being conducted in the field of SEN highlight various requirements in initial and continuous training programs. For instance, a study conducted in a Master's degree course in Special Education (Ribeiro & Moreira, 2010) reveals that the majority of students agree that CT offers significant educational benefits and that it can help students with SEN to overcome some of the obstacles imposed by their needs. They also agree that it is a factor of increased motivation and participation for students with learning problems. However, further research indicates that in the specific case of using CT with children with SEN, most teachers refer that they were never offered or attended any training in the area and that their knowledge about it is reduced and outdated (Ribeiro & Moreira, 2010; Ribeiro, Moreira, & Almeida, 2010).

Studies on the use of the social web as a platform for the inclusion of students with special needs in Portugal are inexistent and when initiatives of such use occur, they are usually the result of individual initiatives rather than institutional ones.

Students with learning problems want to learn, but their constraints pose significant barriers to such endeavour and to positive results in academic settings. This may also fuel a sense of personal failure with the emergence of feelings of anger, frustration and disillusionment with the education system. Progressive withdrawal from classes, underachievement, periods of disaffection, reluctance to engage positively with the learning process, emotional outbursts or episodes of inappropriate behaviour are all symptoms that, generally, remain unattended and unaddressed.

6. FINAL CONSIDERATIONS

It is a known fact that learning occurs through social interaction. The social Web can afford unimagined possibilities to motivate and encourage students with SEN. Apart from the aforementioned benefits, it is considered to promote the increase of students' self-esteem, the overcoming of feelings related to failure, inadequacy and isolation. For students that face learning problems and underachievement, these

aspects are of critical importance, as emotional well-being is often the difference between being or not being predisposed to learn.

Universally designed, multimedia and social web based learning environments extend the abilities to reach individual learners, something that printed textbooks alone cannot do, as they do not keep pace with today's learners demands and needs. It is presumptuous to state that Technology and web 2.0 tools are the only option to promote school attainment, however they offer extraordinary ways to customize learning, that fulfill the needs of those that don't cope with, sometimes outdated and disenchanting ways of dealing with information and subsequently learning.

Emotional involvement in learning is probably the scale that balances achievement and under achievement. School disenchantment is one of the most known reasons for unsuccessful learning and consequently one of the most frequent causes for school drop-out. Taking into consideration the affective side of learning, providing stimulating ways of engagement and thus captivating the interest of the learner even for the dullest of subjects, is a matter of the uttermost importance.

In the present work we suggest that social web tools and other CT can be used and explored as a means to meet students' diverse needs and motivate them to the learning process. The integration of such tools with innovative and appealing pedagogical strategies may result in more equitable learning environments where knowledge can be shared and collaboratively constructed and where limitations or specific needs are diluted.

Nevertheless, we concur with the idea that change in traditional practices is never a matter of simply using new tools – it is a matter of using them with particular purposes and attitudes. Therefore, much needs to be done, especially nationwide, to encourage the use of the social Web at all levels of education in order to promote a learning environment that meets the needs of students that simply do not cope with traditional teaching and learning methods.

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