INNOVATION IN EDUCATION

Dr.Richa Mishra

Assistant Professor, Department of Commerce, LPCPS

INTRODUCTION

"Being innovative is about looking beyond what we currently do well, identifying the great ideas of tomorrow and putting them into practice"

Innovation is a new idea, device or process.[1] Innovation can be viewed as the application of better solutions that meet new requirements, inarticulated needs, or existing market needs.[2] This is accomplished through more effective products, processes, services, technologies, or ideas that are readily available to markets, governments andsociety. The term innovation can be defined as something original and more effective and, as a consequence, new, that "breaks into" the market or society

In business and economics, innovation is the catalyst to growth. With rapid advancements in transportation and communications over the past few decades, the old world concepts of factor endowments and comparative advantage which focused on an area's unique inputs are outmoded for today's global economy. Economist Joseph Schumpeter, who contributed greatly to the study of innovation, argued that industries must incessantly revolutionize the economic structure from within, that is innovate with better or more effective processes and products, such as the connection from the craft shop to factory. He famously asserted that "creative destruction is the essential fact aboutcapitalism".[4]

SOURCES OF INNOVATION

There are several sources of innovation. It can occur as a result of a focus effort by a range of different agents, by chance, or as a result of a major system failure.

According to Peter F. Drucker the general sources of innovations are different changes in industry structure, in market structure, in local and global demographics, in human perception, mood and meaning, in the amount of already available scientific knowledge, etc.

In the simplest linear model of innovation the traditionally recognized source is manufacturer innovation. This is where an agent (person or business) innovates in order to sell the innovation.

Another source of innovation, only now becoming widely recognized, is end-user innovation. This is where an agent (person or company) develops an innovation for their own (personal or in-house) use because existing products do not meet their needs. MIT economist Eric von Hippel has identified end-user innovation as, by far, the most important and critical in his classic book on the subject, Sources of Innovation.[5]

The robotics engineer Joseph F. Engelberger asserts that innovations require only three things:

1. A recognized need,
2. Competent people with relevant technology, and
3. Financial support.[6]

Original model of three phases of the process of Technological Change

Innovation involves deliberate application of information, imagination and initiative in deriving greater or different values from resources, and includes all processes by which new ideas are generated and converted into useful products

Innovations are divided into two broad categories:

- Evolutionary innovations(continuous ordynamicevolutionary innovation) that are brought about by many incrementaladvancesin technology or processes and
- Revolutionary innovations (also calleddiscontinuous innovations) which are often disruptive and new.

INNOVATION IN EDUCATION: THE CONCEPT

Creativity and innovation are becoming increasingly important for the development of the 21st century knowledge society. They contribute to economic prosperity as well as to social and individual wellbeing and are essential factors for a more competitive and dynamic Europe. Education is seen as central in fostering creative and innovative skills.

If individuals are to be equipped with the capacity both to innovate and to adapt to innovation, it is important to better understand how education systems can become more innovative themselves in order to quickly and better respond to new knowledge and social demands. What kinds of skills, education and training systems are needed to maximise innovation in the education sector itself?

INNOVATION IN EDUCATION…WHY?

Creativity and innovation in education are not just an opportunity, but a necessity. First, several emerging trends entail an alteration in the way young people learn and understand (Redecker, 2008). Teachers have to attract students' interest and attention in a new way, and as a result the development of creative approaches is called for (Simplicio, 2000). Secondly, the current and forthcoming cohorts of learners are growing up surrounded by video-games, mobile phones, and other digital media. This overwhelming spread of technologies brings a new understanding of communication, information retrieval and meaning-making. The gap between the school and home digital environment is thus affecting learners' expectations (Pedró, 2006), building up a perception of the current educational framework and format's inadequacy (Selinger, Stewart-Weeks, Wynn, & Cevenini, 2008). Third, creativity has been seen as a form of knowledge creation (Craft, 2005). For all these reasons, it seems clear that creativity and innovation are unavoidable conditions for the present and future of education

MEASURES TO FACILITATE INNOVATION IN EDUCATION

Deregulation of the education sector as an engine for innovation. Another aspect will lie in the political management of risk, as innovation involves failure that is less easily handled in education than in some other sectors. The governance mechanisms are also very different in the private than in the public sector. Other aspects will relate to the investment in educational R&D, to the quality of this R&D and its

evidence-based character, to knowledge management, to the incentives or motivation of teachers to adopt innovative practices in certain institutional settings, to teacher training, to the school climate, organisation, and management, to the existence of a demand for innovative private developers of educational innovations, etc

DIFFICULTIES & HURDLES

One well-known difficulty of innovation in education lies in mainstreaming and sustaining successful innovations. Another difficulty sometimes lies in the lack of incentives for public and private innovators. Finally, the implications of innovation in terms of equity and social cohesion will also be addressed, as innovations do not always reach the less advantage groups or nations as easily and can help widen the inequity gap

THE QUESTIONS UNANSWERED

Here are some questions to ponder in applying innovation to enable access to education:

1. What processes are needed to provide electricity and broadband access for all educational institutions (e.g. schools, colleges, universities);
2. What processes are needed to provide broadband access to all lifelong learners (adults who can pay reasonable rates for access);
3. What alternatives do institutions have if they are unlikely to be connected to a reliable electricity service in the foreseeable future;
4. What alternatives are there for introducing computers or increasing their numbers in schools and institutions of higher learning; and
5. If computers are to be installed in institutions, what processes are under way to ensure full training and support for teachers and learners to effectively integrate these into the teaching, learning and school management processes?
6. What are the innovations in education that can help meet the three-billion people challenge?

INNOVATIVE TEACHING = INNOVATION + TEACHING

The creative experience is seen as opposite to the reproductive experience. Innovation is the application of such a process or product in order to benefit a domain or field - in this case, teaching. Therefore, innovative teaching is the process leading to creative learning, the implementation of new methods, tools and contents which could benefit learners and their creative potential.

Thus, something cannot be considered innovative unless it is transformational. Second, innovation does not occur by accident. It is driven by a system of principles and practices which support and encourage the coupling of systems and creativity to solve problems.

HOW TO EMBED INNOVATION IN EDUCATION AND TEACHING

Innovative teaching is both the practice of teaching for creativity and of applying innovation to teaching. Both aspects call for an educational culture which values creativity and sees it as an asset in the classroom. Teachers are key figures in constructing a creative climate, but they need support from both policymakers and institutions. In particular, curricula and assessment are key areas to be addressed in order to allow creativity in the classroom. Curricula should undergo a skilful and thorough development, giving the same importance to every subject, taking creativity into consideration and defining it coherently throughout the curriculum, allowing freedom and time for discovery, and taking learners'

interests into account. Assessment should also allow creativity to flourish by valuing it, both at micro, everyday level and at macro, exam level. The three functions of assessment (diagnostic, formative and summative) must contribute to the development of both knowledge acquisition and skills development for learning and creating.

ROLE OF TECHNOLOGY IN INNOVATIVE TEACHING

Innovative teaching is both the practice of teaching for creativity and of applying innovation to teaching. Both aspects call for an educational culture which values creativity and sees it as an asset in the classroom. Teachers are key figures in constructing a creative climate, but they need support from both policymakers and institutions. In particular, curricula and assessment are key areas to be addressed in order to allow creativity in the classroom. Curricula should undergo a skilful and thorough development, giving the same importance to every subject, taking creativity into consideration and defining it coherently throughout the curriculum, allowing freedom and time for discovery, and taking learners' interests into account. Assessment should also allow creativity to flourish by valuing it, both at micro, everyday level and at macro, exam level. The three functions of assessment (diagnostic, formative and summative) must contribute to the development of both knowledge acquisition and skills development for learning and creating.

FACTORS RELEVANT IN INNOVATIVE TEACHING

Factors relevant in innovative teaching includes: assessment; culture; curriculum; individual skills; teaching and learning format; teachers; technology, tools. The co-existence of several of these factors would give rise to an enabling environment where innovative teaching could blossom

FIVE ELEMENTS TO BRING THE CHANGE

The five elements which can bring the change includes: Vision, Skills, Incentive, Resources, and an Action Plan.

INNOVATION IN EDUCATION: A PARADIGM SHIFT.. a few thoughts

There is a growing desire for a holistic transformation of educational systems (Selinger et al.,2008). Creativity allows for the possibility of making connections across different areas of knowledge; there is thus a need for innovative spaces that allow for this cross-cultural and multi-disciplinary approach, which can also include informal knowledge. This approach will thus challenge the actual, traditional configuration of school space, time and structure (Burke, 2007) Institutions are generally considered to be resistant to change. As Williamson and Payton (2009) point out, any kind of educational change is challenging, messy and slow. Schools, in particular, face an enormous challenge, as there is a pressure to achieve in different areas and as new requirements do not shade or substitute old ones (Christensen et al., 2008; Punie,Cabrera, Bogdanowicz, Zinnbauer, & Navajas, 2005)[14]. Moreover, it is quite unlikely that an institution can provide disruptive change. By disruptive innovation, Christensen et al. mean a kind of innovation that is not only preoccupied with the improvement of an existing product (which is called incremental innovation); but which radically changes the paradigms and principles of the product. A good example of the concept is the case of the personal computer. Up until the time of its creation, computers were big, expensive machines that only experts could use. Sustainable innovation made newer, faster, bigger computers. The advent of the personal computer changed the market, as the product was not as "good" or as sophisticated as big computers were, but it targeted another type of

client (a previous "non-consumer"). So the introduction of personal computers is a disruptive innovation because it changes the "idea", market and target of computers, even though its base level was not as powerful as the big traditional computers (Christensen et al., 2008). Hargreaves (2003) maintains that the idea that lies behind disruptive innovation is the opposite to that of sustainable innovation. Schools do not seem to possess the characteristics of innovative organisations, which are generally flexible, welcome ideas, are empowering, tolerate risk, celebrate success, foster synergy and encourage fun (Craft, 2005). Even the implementation of technology in education has not made the foreseen change: ICT has not had the transformative impact it could have had and which was expected (Ala-Mutka, Punie, & Redecker, 2008b)[15]. According to Christensen et al.(2008), this is because teachers have used computers to sustain their existing practices, as displacing them would require a kind of disruptive innovation that is not yet feasible. If there is a desire to change education, all educational actors should be involved and must work towards the same goals. Moreover, it is necessary to promote creativity at all levels, as creativity can contribute to both sustainable and disruptive innovation. Innovation cannot happen without creativity. True innovation in education will require, first of all, a paradigm shift in format and methodology (Simplicio, 2000)[9]. This will entail a constant and total renovation, regardless of previous effectiveness. The main actors of change are teachers (Redecker, 2008)[8], but without institutional support they could not only kindle but also kill creativity and innovation. They are the first and most effective source of creativity for learners (Esquivel, 1995)[16,] therefore they need both the support and the resources to innovate. Teachers tend to settle in and become comfortable in their profession (Simplicio, 2000) [9]. However, teaching careers can last for forty years, and it seems unthinkable to expect that several generations of students would benefit from the same approach (Pedró, 2006)[17]. Teachers who wish to be creative have to be willing to change their approach and method (Simplicio, 2000) [9]. Teaching creatively and for creativity is not about adding a few pictures to a handout or a presentation, or making studentslisten to music.16 Educators run the risk of falling into the originality pitfall, believing that creativity is a synonym of originality (Beghetto, 2007a)[18]. Innovating education involves a complete change in the content and method of teaching, and also in assessment (Simplicio, 2000[9]). There are already pockets of creativity and innovation in several schools around Europe, these "best practices" must become standards for education. Technology can help to bring about change (Christensen et al., 2008) [14]. The development and implementation of student-centric technology will bring a need to shift to student-centred pedagogy and the ownership of learning by learners, a quality that is indispensable for fostering creativity (Woods, 2002)[19]. Students could learn with software that is developed for their kind of intelligence and learning style (Christensen et al., 2008) [14]. In this way, teachers will not be instructors anymore but rather facilitators (Burke, 2007).

Another path to innovation in education would be the establishment of a network of teachers to disseminate good practice (Hargreaves, 2003)[20]. Schools are a good repository of expertise and variety; teachers have therefore to be encouraged to share their expertise through the observation of other teachers within and outside their school (Simplicio, 2000) [9]. Another option could be the establishment of an institutional virtual network of expertise, where teachers could exchange resources and tips (Hargreaves, 2003) [20]. Again, technologies are fundamental for this kind of transformation, as ICT can be an effective and affordable means of peer-to-peer exchange and networking. The Higher Education sector in particular is seen as the fuel for that journey, driving research and new knowledge and producing the graduates equipped with the skills and working from the mindset to lead this new phase of Ireland's economic and social development.

ROLE OF TEACHERS IN INNOVATION

Teachers need to modify their teaching methods to accommodate the changed interaction patterns. The

effective use of new technologies requires innovative teaching skills. When students are not provided with adequate understanding of the affordances of technologies, there is a high probability that they will replicate familiar forms and ideas using the new tools, as opposed to using the new tools to explore new connections and different ways of fashioning (Loveless, 2008)[21]. Teachers, who are not conversant with the technologies they use in their teaching, may not feel comfortable with showing their lack of expertise in front of their students. Innovation comes more from evolution, revolution, radical and disruptive forces being applied.

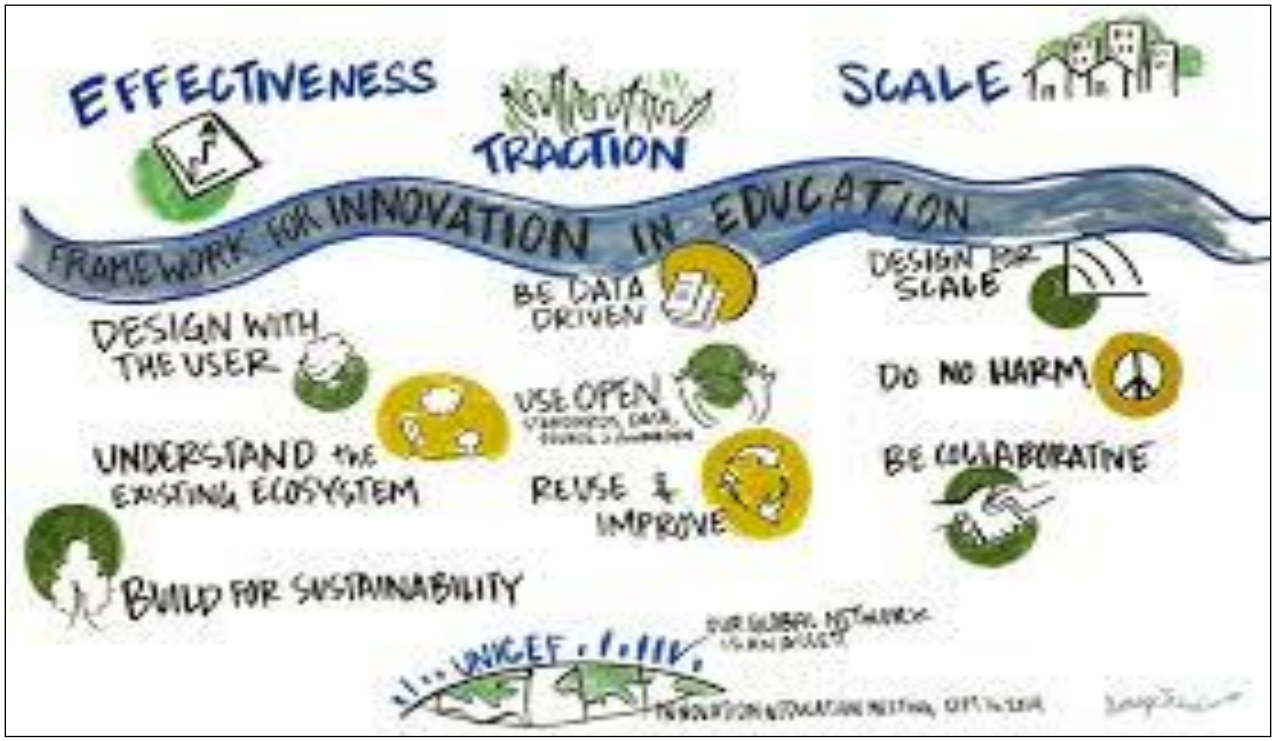

Fig 01

Fig 01 shows the framework for Innovation in Education which comprises a few relevant features like building for sustainability, constant improvisation, collaborations, understanding the ecosystem, effectiveness, traction, scaling etc.

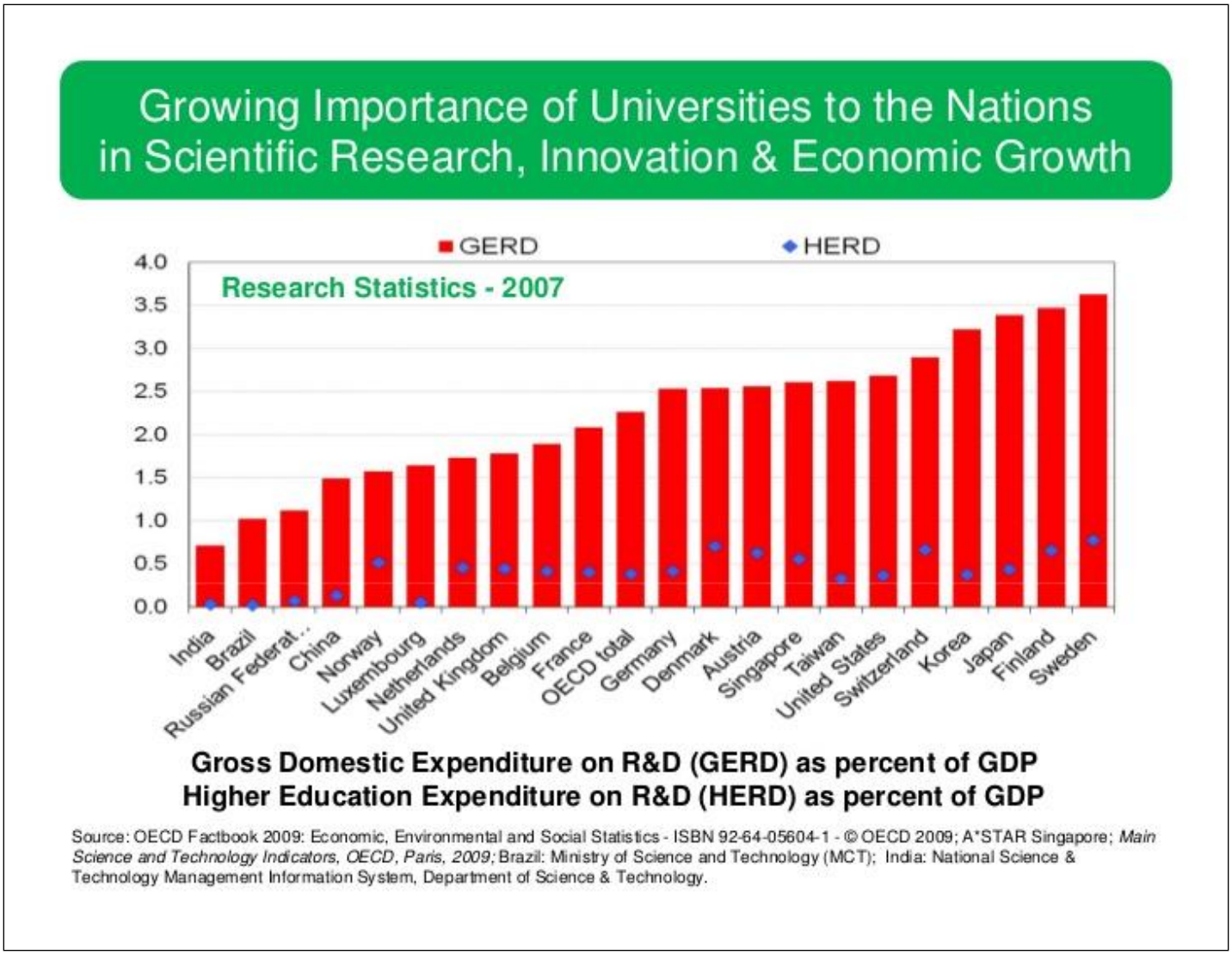

Fig 02

The figure 02 above shows the growing importance of Universities to the Nations in scientific research, Innovations and Economic growth as all are deeply and positively correlated to each other.

CONCLUSION

Talking honestly, ironically, the very same factors that produce the need for change present barriers for the achievement of that change. If to enlist them, school culture, stake holders perceptions, societal effects, organisational structure and the nature of change itself are together creating both the need for, and method of, continuous improvement to education and its outcomes.

Whilst Fullan (1993, 46)[22] notes that societal problems beyond the control of schools frequently prevent educational reform, these cannot be wholly held responsible for the failure of educational reform. There are even other factors like, lack of supporting structures, a deficit in the consultative process, an inadequacy in holistic approach, and the absence of ongoing evaluation and amendment contribute greatly to the impairment of implementing innovative practices.

If to analyze the present scenario, present practices are inadequate to meet changes in work, knowledge, and citizenship (Schuyler, 1997)[23] while serving a greater number of students with diverse backgrounds and educational objectives. Today, a paradigm shift from instruction to learning is required to adequately serve the clients of educational institutions, which in turn requires an alteration in procedures for improved outcomes. Educational practices, and the structures that support them, must change in order to ensure that the citizens of the future - our school children of the present - can exist and grow in a world characterised by change, unpredictability and enterprise.

REFERENCES:

1. http://www.merriam-webster.com/dictionary/innovation
2. **Jump up^** Maranville, S (1992), Entrepreneurship in the Business Curriculum, *Journal of Education for Business*, Vol. 68 No. 1, pp.27-31.
3. Based on Frankelius, P. (2009), Questioning two myths in innovation literature, *Journal of High Technology Management Research*, Vol. 20, No. 1, pp. 40–51
4. Schumpeter, J. A. (1943). *Capitalism, Socialism, and Democracy* (6 ed.). Routledge. pp. 81–84. ISBN 0-415-10762-8.
5. Von Hippel, E. (1988). Sources of Innovation. Oxford University Press. The Sources of Innovation
6. Engelberger, J. F. (1982). Robotics in practice: Future capabilities. Electronic Servicing & Technology magazine.
7. Michela Ott, a senior researcher at the Institute for Educational Technology of the Italian National Research Council who took part in our scoping workshop, pointed out that this is the perception of creativity held by many teachers she interviewed
8. Redecker, C. (2008). Review of Learning 2.0 Practices: JRC-IPTS http://ftp.jrc.es/EURdoc/JRC49108.pdf
9. Simplicio, J. S. C. (2000). Teaching classroom educators how to be more effective and creative teachers. Education, 120(4), 675-680
10. Pedró, F. (2006). The new Millennium Learners: Challenging our Views on ICT and Learning: OECD-CERI http://www.oecd.org/dataoecd/1/1/38358359.pdf
11. Selinger, M., Stewart-Weeks, M., Wynn, J., & Cevenini, P. (2008). The Future of School: Cisco Internet Business Solutions Group (IBSG)
12. Craft, A. (2005). Creativity in schools : tensions and dilemmas. London: Routledge.
13. Burke, C. (2007). Inspiring spaces: creating creative classrooms. Curriculum Briefing, 5(2), 35-39
14. Christensen, C., Johnson, C. W., & Horn, M. B. (2008). Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns. New York: McGraw Hill.
15. Ala-Mutka, K., Punie, Y., & Redecker, C. (2008b). ICT for Learning, Innovation and Creativity, http://ftp.jrc.es/EURdoc/JRC48707.TN.pdf
16. Esquivel, G. B. (1995). Teacher behaviours that foster creativity. Educational Psychology Review, 7(2), 185-202
17. Pedró, F. (2006). The new Millennium Learners: Challenging our Views on ICT and Learning: OECD-CERI http://www.oecd.org/dataoecd/1/1/38358359.pdf
18. Beghetto, R. A. (2007b). Does creativity have a place in classroom discussion? Prospective teachers' response preferences. Thinking Skills and Creativity, 2, 1-9.
19. Woods, P. (2002). Teaching and learning in the new millennium. In C. Sugrue & C. Day (Eds.), Developing Teachers and Teaching

Practice (pp. 73-91). London: Routledge & Falmer

20. Hargreaves, D. (2003). Working Laterally: how Innovation Networks make an Education Epidemic: DfES: http://www.innovation-unit.co.uk/images/stories/files/pdf/working_laterally.pdf
21. Loveless, A. M. (2008). Creative learning and new technology? a provocation paper. In J. Sefton-Green (Ed.), Creative Learning (pp. 61-72). London: Creative Partnerships.
22. Fullan, M.G. (1993). The school as a learning organisation. In Changing forces: Probing the depths of educational reform. London: Falmer Press. 42 – 83
23. Schuyler, G. (1997). A paradigm shift from instruction to learning. ERIC Digest. ED 41496. Online. Accessed September 21, 1999.