Athens Institute for Education and Research
ATINER

ATINER's Conference Paper Series
EDU2013-0598

Phenomenon Called Learning

Merja Meriläinen
University Lecturer, Ph.D., ME
Kokkola University Consortium Chydenius
Finland

Maarika Piispanen
University Teacher, Ed.D.
Kokkola University Consortium Chydenius
Finland

An Introduction to
ATINER's Conference Paper Series

ATINER started to publish this conference papers series in 2012. It includes only the papers submitted for publication after they were presented at one of the conferences organized by our Institute every year. The papers published in the series have not been refereed and are published as they were submitted by the author. The series serves two purposes. First, we want to disseminate the information as fast as possible. Second, by doing so, the authors can receive comments useful to revise their papers before they are considered for publication in one of ATINER's books, following our standard procedures of a blind review.

Dr. Gregory T. Papanikos
President
Athens Institute for Education and Research

This paper should be cited as follows:

Meriläinen, M. and Piispanen, M. (2013) **"Phenomenon Called Learning"**
Athens: ATINER'S Conference Paper Series, No: EDU2013-0598.

Phenomenon Called Learning

Merja Meriläinen
University Lecturer, Ph.D., ME
Kokkola University Consortium Chydenius
Finland

Maarika Piispanen
University Teacher, Ed.D.
Kokkola University Consortium Chydenius
Finland

Abstract

Everyone has an idea of traditional learning. We usually associate it with behaviouristic point of wives' i.e. teacher as a source of knowledge and students as passive receivers of ready-made knowledge. Conventional teaching emphasizes curriculum as a starting point in all learning situations. Teaching and learning is tied around books, textbooks and teacher guide books made by someone else and used as tools to be appropriate to everyone despite of individual needs and skills.

This article examines pedagogical changes in different learning contexts with the help of the model of Contextual pedagogical approach towards learning (Meriläinen & Piispanen 2012; Meriläinen, Piispanen & Valli 2013). When working in learning environments based on Contextual pedagogical approach towards learning, the teacher will emphasize transdisciplinary approach to curriculum, enhance student's individuality and creativity in different learning situations and support both content knowledge as well as 21st Century civil skills knowledge to develop hand in hand.

The 21st Century Civil Skills Pedagogical Content Knowledge - framework, introduced in this article, will help teachers to create learning environments where 21st century civil skills will meet the modern pedagogy and core curriculum standards. With the help of this framework together with the model of Contextual pedagogical approach towards learning, one is able to build a strong pedagogical foundation to transformational 21st century learning environment.

It is not only spaces, places and tools you have to take account in the educational changing process. Understanding the 21st century pedagogic, knowledge and skills connected to the process are in a central part of teachers' professional development.

Keywords:

Corresponding Author:

Towards Authentic and Creative Learning Environments

In recent years, educators and policy makers have been focused on student achievement and well-being. After the great Pisa -success and glory, Finnish researchers have risen up discussion about future skills, school activity and motivation – fields where Finnish students haven't indicated so well. The problem in Finnish school, according to Välijärvi (2011), is that despite the knowledge and skills Finnish students have, they don´t trust to their know-how and their attitude towards learning is poor. It is worth asking, could you find any answers by looking deeper our pedagogical choices, operation culture as well as learning environments in Finnish education system?

Quickly changing 21st century challenges teachers to see life outside the school and recognize not only the core subjects but also the key skills needed outside there. The report *Learning for the* 21st *Century* identifies nine types of learning skills, which are divided into three different key areas as follows in Table 1. In different learning contexts, in society which develops fast, the school should stay along in this development and should help students to learn not only the contents which arise from the curriculum, but also the skills and matters that one needs in today´s and future society. (cf. Levin 2011, 4; Zhao 2011, 4). More important than a huge amount of detailed information, should according to Meriläinen & Piispanen (2012) be the multidimensional education, which comprises the know-how of different skills to make a good use of curriculum general information. If you look at students born in late 90s and early 2000, you can see a huge gap between the knowledge and skills students learn in school and the knowledge and skills they need in typical 21^{s} century communities and working places. Today´s education system faces irrelevance unless we bridge the gap between how students live and how they learn. Moving from content knowledge to learning and life skills is essential when training students to be successful in their lives after school.

Table 1. *21st Century Learning Skills*

| 21st **Century Learning Skills**		
INFORMATION AND COMMUNICATION SKILLS	**THINKING AND PROBLEM SOLVING SKILLS**	**INTERPERSONAL AND SELF-DIRECTIONAL SKILLS**
Information and Media Literacy Skills • Accessing and managing information. • Integrating and creating information. • Evaluating and analyzing information. Communication Skills	Critical Thinking and Systems Thinking • Exercising sound reasoning. • Making complex choices. • Understanding the interconnections among systems. Problem Identification, Formulation & Solution Ability to	Interpersonal and Collaborative Skills • Demonstrating teamwork and working productively with others. • Demonstrating and the ability to adapt to varied roles and responsibilities. • Exercise empathy

| Understanding, managing, and creating effective communications
• orally
• written
• using multimedia | • frame
• analyze
• solve problems.
Creativity and Intellectual Curiosity
Develop
• implement
• communicate
• new ideas to others. | and respecting diverse perspectives.
Self-Direction
Monitoring one's own understanding and learning needs
• Locating resources
• Transferring learning from one domain to another.
Accountability and Adaptability
• Exercising personal responsibility and flexibility in personal, workplace and community contexts.
• Setting and meeting high standards and goals for one's self and others.
Social Responsibility

• Acting responsibly with the interests of the larger community in mind.
• Demonstrating ethical behavior in personal, workplace and community contexts. |

Expanding the Knowledge

The teacher's challenge in today's education is to strengthen the students' natural ways to learn and produce information in new learning environments. Learning is thus seen as something happening in connection with an individual and his or her environment. Norrena, Kankaanranta and Nieminen (2011) argue that there has to be a significant pedagogical change in school routines and pedagogical operations to move from teaching to learning and towards 21st century requirements. How will this change become true in school contexts – what are those pedagogical changes in the field of curriculum, planning and implementing as well as the roles of teachers and students? The Figure of 21st

Century Civil Skills Pedagogical Content Knowledge (21st Century CSPCK) (Fig. 1) attempts to identify the nature of vast pedagogical knowledge required when turning learning from traditional to transformational i.e. blending the 21st century civil skills in to the authentic learning contexts and the curriculum.

Figure 1. *The 21st Century Civil Skills Pedagogical Content Knowledge (21st Century CSPCK). (Follows Mishra & Koehler 2006, 2009)*
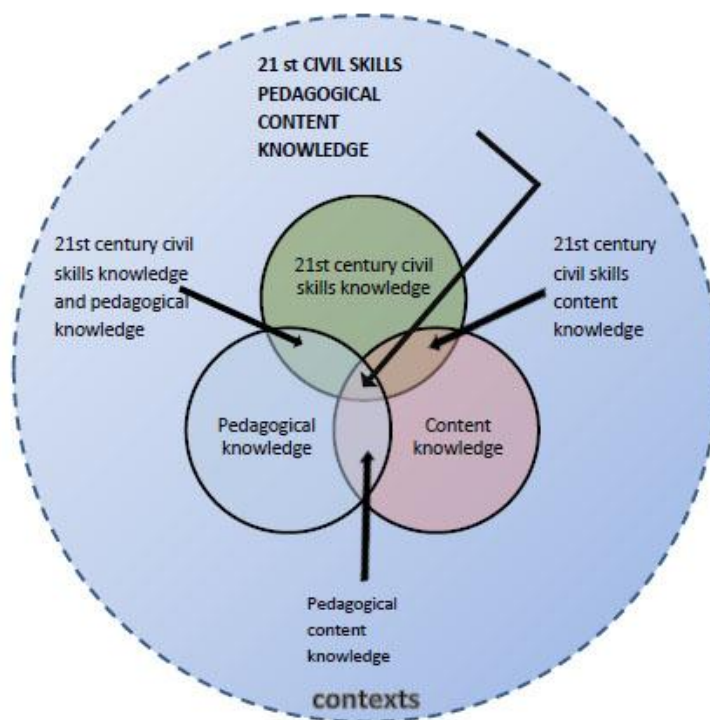
The basis of the framework is the understanding that teaching itself is a highly complex activity that draws on many kinds of knowledge. This knowledge, as Ashe and Bibi (2011) highlights, is diverse and includes both content and pedagogical knowledge. In recent years the new type of knowledge has been raised to attention that of 21st century skills or 21st century civil skills as Finnish National Board of Education has named that knowledge in curriculum renewing process. The 21st Century CSPCK –figure articulates the role of 21st century civil skills in the process of teaching and learning in a really blended manner. In 21st Century CSPCK –model the emphasis is put on competency, performance and capabilities and the key question in learning situations is rather how the information will be used than what the information is.

At the heart of the 21st Century Civil Skills Pedagogical Content Knowledge framework, is the complex interplay of three primary forms of knowledge: 21st Century Civil Skills Knowledge (21st Century CSK), Pedagogical Knowledge (PK), and Curriculum Content Knowledge (CCK). It is essential to find the 21st Century Civil Skills Pedagogical Content

Knowledge point of intersect, where the three primary forms of knowledge meets each other and use that essence as a starting point when creating innovative and enthusiastic learning situations. (cf. Mishra & Koehler 2006, 2009) As Meriläinen & Piispanen (2012) highlights, the planning process is to be viewed from at least three different angles as pictured in Fig.1. What do we mean by that is that the emphasis of learning should not lie on curriculum contents (subject contents) themselves, but these contents should act as tools for accomplishing 21st century civil skills by arranging learning situations and environments as authentic as possible to support vast and deep understanding of every day phenomena. The 21st century civil skills should also not be seen as isolated skills or learning targets, but they should be examined as visible parts of a learning context. Together all the three knowledge areas will create a successful and pedagogically meaningful learning process produced by students and supported by teachers.

Comparing and Contrasting –From Traditional to Transformational

When transferring from traditional education to transformational, one has to imagine new ways to think about teaching and learning. According to Chaltain (2011) traditional schools assume the student bears the primary responsibility for learning while transformational schools shares that via a learning team that includes, and extends beyond the teacher and student. In terms of student achievement, a traditional school emphasizes test results instead of students' aspirations and life options which transformational school focuses on. In transformational school, the target will be in working to build passion for learning in all students.

Student achievement is a primary focus in all teaching and learning situations. Learning experiences should accord to Drake and Burns (2004) be relevant to student's interests. When students are engaged in learning, as the writers highlight (2004), students will manage well in multiple academic areas.

When moving from traditional pedagogy towards transformational education the use of 21st Century CSPCK –framework as a ground of learning will expand the learning process to include the 21st century civil skills knowledge as one of the three key elements in all planning, teaching and learning.

The difference between traditional pedagogy (subject or theme based learning) and transformational pedagogy (contextual pedagogical approach to learning) lies all the way from planning to implementing on the roles of the curriculum, teacher and student as well as learning tasks and learning environments as Meriläinen & Piispanen (2012) states.

Traditional, subject centered or multidisciplinary integration, which is commonly known as theme-teaching, focuses primary on the disciplines. The curriculum contents are integrated around a theme raised commonly from the curriculum. In this traditional pedagogical model one can recognize different disciplines and the working methods and the operation culture is often based on

the use of text books, traditional learning tasks and concentrating on the content rather than skills. Learning outcomes are usually similar and learning situations are teacher centered. The assessment happens mainly in the end of the learning unit and the common way to collect relevant evaluation material is tests. The Table 2. collects together essential features of traditional teaching and learning from the teachers and students point of wives from the beginning of the planning process till the end of the process.

Table 2. From planning to assessment in traditional pedgogical model.

From planning to assessment	Teachers role	Students role
BASIS FOR PLANNING	Core curriculum, text books, teacher handbooks	Not involved
TOOLS FOR PLANNING	Different subject contents Learning materials (books, text books, learning games, etc.) Teacher handbooks Schedule External structures Multidisciplinary approach	Not involved
LEARNING SITUATIONS in the beginning of the process during the process in the end of the process	Teacher driven, group instructions Teacher has the knowledge – knows what is meant to learn and how Teacher presents the learning case Teacher centered The interaction in the classroom from teacher to student, from student the teacher Testing the knowledge with self-made or ready make tests. Gives feedback with test numbers.	Receiving information Acting according to teacher driven instructions Using material given by the teacher Working with text books and materials made by someone else Everyone working according the instructions approximately at the same time Talented students will have additional tasks Weak students will do less or leave tasks unfinished Everyone has done well-nigh the same tasks in the end of the process
ASSESSMENT	Teacher knows the assessment criteria Teacher provides feedback The final assessment is based on activity, outcomes and test Teacher emphasis the assessment of learning	Students don´t know the assessment criteria Students will get the information about learning by doing tests Students are divided to weak and good learners according to success in different tests

Highly structured and disciplined schooling systems do not necessarily prepare students well for the challenges of the future. The transformational pedagogy, as Meriläinen and Piispanen (2012) highlights, will contribute significantly to the preparation of a future workforce.

Transformational, transdisciplinary integration, which Meriläinen and Piispanen (2012) calls Contextual Pedagogical approach to learning (Fig. 2), focuses on the three different knowledge areas as presented in Figure 1. In the transdisciplinary approach to integration, according to Drake & Burns (2004), a teacher will organize curriculum around the student questions and as Meriläinen and Piispanen (2012) adds, around the real life phenomena and operation cultures that rises from there. Instead of one discipline the examination is directed to the phenomenon at a transdisciplinary point of view. With the dialog between the curriculum and surrounding real life, one will look for answers by thinking, by concluding and by examining, which will support the development of 21st century civil skills simultaneously with the content knowledge.

Figure 2. *Contextual – pedagogical approach to learning (Meriläinen & Piispanen, 2012.)*

The contextual pedagogical approach, based on real life phenomena, is a way to examine the curriculum in the relation with the surrounding society. The curriculum and different subject contents will be examined transdisciplinary and one can understand the connections between the curriculum and surrounding society. As a result you can recognize and see the operation culture of the school reflecting the operation culture of the external world. (Meriläinen, Piispanen & Valli 2013.) The curriculum will come alive as authentic as possible with real life tasks, roles and environments as mentioned earlier. In transformational model of pedagogy, students will naturally develop life skills as a norm. The learning tasks are similar to real life tasks. For example one will learn by planning guided tours around the city with the city guides. The emphasis is rather on the skills than on the content –both skills knowledge and content knowledge are to be learned and assessed. In the model of transformational learning the content will act as a tool for learning 21st century civil skills. The assessment for knowing and understanding in transformational pedagogy is performance-based. Instead of testing the memory and seeking for one right answer, the assessment focuses on interdisciplinary concepts and skills and the culminating activity will reflect this. The assessment criteria are presented to students in the beginning of the project so that each student can and will do well on it.

Table 3. presents the typical features of transformational teaching and learning from the teachers and students point of wives, from the beginning of the planning process till the end of the process.

Table 3. *From planning to assessment in transformational pedgogical model*

From planning to assessment	Teachers role	Students role
BASIS FOR PLANNING	Students interests, surrounding society , real life habits and skills	Strengths, students profiles
TOOLS FOR PLANNING	21st Century CKPCK Transdiciplinary approach Real life experts	Strengths, students profiles
LEARNING SITUATIONS In the beginning of the process During the process In the end of the process	Teacher as a motivator Presenting the project, mission, aims and assessment criteria. Leader of the learning community Feedback by discussing with learners Supporting when needed Aware of each child´s strengths and weaknesses, willing and able to support during the learning process	Personalized learning plans Students themselves set the goals Students working collaboratively as a team Multiple ways to show learning Multiple use of ICT Learning by working with real life task in real life roles with real life experts

	Support towards the goals Discussion of learning Assessment as learning	Students build exhibitions, festivals, workshops etc. to show what they have done during the learning process
ASSESSMENT	The assessment criteria will be visible and presented to students in the beginning with the process Assessment as learning – towards life options The assessment is an integral part of the learning process	Students are aware of the assessment criteria from the beginning of the process Students will get the information about learning discussing with the teacher and peer students Students are aware that they learn differently and that every child can learn
From planning to assessment	Teachers role	Students role
BASIS FOR PLANNING	Students interests, surrounding society , real life habits and skills	Strengths, students profiles
TOOLS FOR PLANNING	21st Century CKPCK Transdiciplinary approach Real life experts	Strengths, students profiles
LEARNING SITUATIONS In the beginning of the process During the process In the end of the process	Teacher as a motivator Presenting the project, mission, aims and assessment criteria. Leader of the learning community Feedback by discussing with learners Supporting when needed Aware of each child´s strengths and weaknesses, willing and able to support during the learning process Support towards the goals Discussion of learning Assessment as learning	Personalized learning plans Students themselves set the goals Students working collaboratively as a team Multiple ways to show learning Multiple use of ICT Learning by working with real life task in real life roles with real life experts Students build exhibitions, festivals, workshops etc. to show what they have done during the learning process
ASSESSMENT	The assessment criteria will be visible and presented to students in the beginning with the process Assessment as learning –	Students are aware of the assessment criteria from the beginning of the process Students will get the information about learning

	towards life options	discussing with the teacher
	The assessment is an	and peer students
	integral part of the	Students are aware that
	learning process	they learn differently and
		that every child can learn

At the Heart of the Knowledge Acquisition

In a Contextual-pedagogical approach towards learning, a special attention is paid to the growht of 21st Century CSPCK knowledge. The skills, context and pedagogic will have a crucial significance in all learning situations. Where traditional pedagogic and multidisciplinary approach to integration emphasizes pedagogy and curriculum as tools for creating learning situations, the transformational pedagogic connects the three knowledge areas together. The learning situations will be discovered in the heart of the expanded knowledge acquisition as you can see in Fig. 2.

The child, the pedagogical expert (the teacher), the content expertise from the real life contexts, the society and the curriculum will settle in the heart of the Contextual – pedagogical approach towards learning –model. The planning begins from the premise of individual student and his/ her skills, knowledge, interests and enthusiasm (comparison to traditional planning where the planning is made to fit to the school constructions; timing, text books, classrooms, etc.). In this model, the teacher mirrors the curriculum contents with surrounding world and connects the curriculum contents with the real life phenomena. The real life phenomena studied at school will help students to understand and link the curriculum contents with the life outside of the school and develop 21st century civil skills blended to authentic learning situations.

The teacher's role, as Meriläinen and Piispanen (2012) states, is to be a pedagogical expert, who creates learning situations based on the 21st Century CSPCK framework i.e. identifies the individual needs of each student, designs creative, authentic learning tasks and supports the of multiple civil skills needed in real life. (Meriläinen, Piispanen & Valli 2013.)

Learning as an Adventure (middle circle)

In the Contextual-pedagogical approach towards learning, the essential change comparing with the traditional pedagogy concerns the students' role as knowledge constructors: the culture of working largely alone with individual learning tasks is transferred to a culture of collaboration, high levels of collegiality, team work, and dialogue as a way of action. (Meriläinen, Piispanen & Valli 2013.)

Instead of just accomplishing the learning tasks, the students are directed to be active and self-piloting collaborative learners. This means a huge change in the traditional teacher –student –roles: the teacher will no more be the know-it-all -person, instead her/his role is to help students to address with information, to operate among the information and before anything, lighting the learning enthusiasm among the students. In this model, the teacher will see student´s best potential and take risks to make that visible.

It is essential to activate the students to work together so that the given tasks will support the 21st century civil skills to develop. (Kostiainen & Rautiainen, 2011, 190). As Meriläinen, Piispanen and Valli (2013) highlights, the learning tasks should be closely connected to student's real lives, interesting, challenging and enable student´s natural creativity and know-how to develop. It is outstandingly important that students have a possibility to act in roles, natural to learning tasks. That will motivate and help them to accomplish the tasks in the expected manner, similar to that in the authentic context.

In the contextual – pedagogical model of learning, the 21st century civil skills are not necessary the key objects of teaching, but their presence and use in different learning tasks will lay a solid foundation to deeper understanding, learning, knowing and creativity. (Hargreaves 2007, 223-224; Kumpulainen, Krokfors, Lipponen, Tissari, Hilppö, & Rajala.2011, 46; Sahlberg 2011, 4; Zhao 2011, 2-3). When planning a learning process and paying attention to the development of these skills with other two knowledge acquisition areas (CCK and PK) will make it possible to create learning environments and learning situations that will support the 21st century civil skills content knowledge to develop in a school context.

Unique learning paths and multiple choices (outer circle)
It is a central matter to pay attention to the students' individual needs in a Contextual- pedagogical approach towards learning. Transformational learning process enables diverse students to learn according to one´s own best ability and to bring one´s individual know-how visible. The paths toward set learning goals will be as unique as your students –the beforehand given goals and assessment criteria will guide students step by step towards the set goals. The paths will naturally become differentiated, never the less the learning has become true.

When the curriculum contents are learned and experienced transdisciplinary in authentic learning conditions, students have possibilities to consider the given tasks multiple and visualize these in versatile ways. This gives an opportunity to emphasize individual learning styles and unique temperaments which are mostly seen as problems in our school system.

The versatile examination of phenomena and the multiple choices of individual learning paths will create the possibility to learn and understand phenomena from student´s individual premise in collaboration with others.

Role Play as a Convention

What does this all, described above, mean in practice from the teacher´s point of view? Let´s look at the planning process closer. Where to begin, how to put emphasis on needed skills, what is the connection between subject contents and real life in practice, what means authentic learning environment? These are some of the questions that you as a teacher will have to pay attention

to when moving from traditional pedagogic towards transformational pedagogical settings. Flipping the sight from society to curriculum puts emphasis of teaching curriculum contents to emphasis of learning real life phenomena and skills that we need in authentic learning environments and learning situations. The planning begins from the premise of individual student and his/ her skills, knowledge, interests and enthusiasm (Comparison to traditional planning where the planning is made to fit to the school constructions; timing, text books, classrooms, etc.) as you can see in Tables 2. and 3.Blending 21st Century civil skills to study plan becomes natural when the school tasks begin to remain real life tasks as you can see in Table 4.

Table 4. *Contextual-pedagogical study plan in a nutshell (5th grade)*

Phenomenon (authentic/ outside the curriculum/ learning environment)	Students role (authentic – rises from the phenomenon)	Task (authentic –supports 21st Century civil Skills to develop)
To plan a Summer Camp in a Ranch	Ranch owner / Camp director	To create an enthusiastic camp program, marketing plan, web & mobile pages and radio/ television commercial.

In this model, as Meriläinen and Piispanen (2012) states, the teacher holds the curriculum contents up to the surrounding world and connects the curriculum contents to real life phenomena. This will help students to understand and link the curriculum contents with the life outside of the school. The curriculum contents act as tools for developing 21st century civil skills as explained in Figure 1. The 21st Century CSPCK-framework will focus on a variety of different knowledge areas to develop both skills and content understanding. The pedagogical knowledge has to meet the 21st century skills as well as the curriculum contents to be able to create learning situations, task and environments that will develop 21st century civil skills pedagogical content knowledge in a school context.

Table 5. presents an example of a learning task, which will fit into the 21st century CSPCK-framework and illustrates the Contextual pedagogical approach towards learning concretely. The task is planned for 5th grade students and the curriculum contents meet the 5th grade standards (Finnish National Core Curriculum for Basic Education 2004).

Assessment

According to Finnish National Core Curriculum for Basic Education (2004, 260): *The task of assessment during the course of studies are to guide and encourage studying and to depict how well the student has met the objectives established for growth and learning. It is the task of assessment to help the student form a realistic image of his/her learning and development, and thus to support the student´s personality growth, too.*

Table 5. *5th grade curriculum contents related to given phenomenon and tasks*

PHENOMENON: To plan a Summer Camp on the Ranch				
TASK: To create an enthusiastic camp program, marketing plan, web & mobile pages and radio/ television commercial				
CROSS CURRICULAR THEMES Media skills and communication, Participatory Citizenship and Entrepreneurship and Technology and the individual				
Mother tongue and literature: INTERACTION SKILLS The pupil will learn skills of active listening and communication in various communication situations; they will feel encouraged to take part in discussions and will try to consider the recipients in their own communication. The pupil will learn to work with text environments in which words, illustrations, and sounds interact SKILLS IN PRODUCING TEXT The pupil will learn to create a variety of texts, both orally and in writing RELATIONSHIP WITH LANGUAGE, LITERATURE, AND OTHER CULTURE The pupil will gain a basic knowledge of the media and utilize communications media purposefully.	*Biology and Geography* The pupil will learn to move about in the natural environment and observe and investigate nature outdoors The pupil will learn to draw and interpret maps, and use statistics, diagrams, pictures, and electronic messages as source of geographic information	*Music* The pupil will build his/her creative relationship with music and its expressive possibilities, by means of composing	*Arts* The pupil will learn to evaluate their own and other´s visual expression and working approaches, such as visual, content, and technical solutions, and to employ the key concepts of art. The pupil will work independently and as a community member in art projects	*Mathematics* The pupil will learn to understand that concepts form structures

In transformational pedagogical settings the assessment will be seen as learning itself contrary to traditional pedagogic where assessment is seen as information of learning. In the model of Contextual-pedagogical approach towards learning the assessing criteria will be visible and well known already in the beginning of the learning process. Assessing will act as a tool for guiding students through the learning path –the learning aims will come true through the learning tasks based on assessing criteria. This is, as Meriläinen & Piispanen (2012) states, particularly important in order that students will understand and recognize what are the learning expectations and how will the assessment come true.

Conclusion

The life of 21st century students outside the school context looks totally different when comparing it to the habits and environments we still have in 21st century schools. Almost every student today have an instant access to information through technology and the web, manage their own acquisition of knowledge through informal learning, and have progressed beyond consumers of content to become producers and publishers. As a result of that quick change, traditional teaching and learning methods and environments are becoming less effective at engaging students and motivating them to study and learn.

References

Ashe, D. & Bibi, S. 2011. Unpacking TPACK and students' approaches to learning: Applying knowledge in pieces to Higher Education teaching and learning. In G. Williams, P. Statham, N. Brown, B. Cleland (Eds.) Changing Demands, Changing Directions. Proceedings ascilite Hobart 2011. (pp.128–132). Arponen A. 2007. Miten nuo pienet ossaa ajatella nuin fiksusti? Lasten mielipiteitä arkiympäristöstään. Lapsiasiavaltuutetun toimiston selvityksiä 1:2007.

Chaltain, S. 2011. http://www.samchaltain.com/blog 3.5.2012.

Collanus, M. 2009. Integraatio: uhkasta mahdollisuudeksi. http://www.konstit.fi/ koti/mcollanus/

Drake, S. & Burns, R. 2004. Meeting Standards Through Integrated Curriculum. ASCD. Alexandria. Virginia USA.

Hargreaves, A. 2007. Sustainable leadership and development in education: Creating the future, conserving the past. European Journal of Education, Col. 42, 2, 223 - 233.

Koehler, M. J. & Mishra, P. 2009. What is technological pedagogical content knowledge?

Contemporary Issues in Technology and Teacher Education, 9(1), 60-70. http://www.citejournal.org/articles/v9i1general1.pdf

Kostiainen, E. & Rautiainen, M. 2011. Teoksessa: Pohjola, K. (toim.). Uusi koulu. Oppiminen mediakulttuurin aikakaudella. Jyväskylän yliopisto.

Kumpulainen, K., Krokfors, L., Lipponen, L., Tissari, V., Hilppö, J. & Rajala, A. 2011. Oppimisen sillat vievät koulun kaikkialle. Teoksessa: Kumpulainen, K. (toim.). Uusi koulu. Oppiminen mediakulttuurin aikakaudella. Jyväskylän yliopisto.

Learning for the 21st century. A report and mile guide for 21st century skills. Partnership for 21st century skills. 2003.

Levin, B. 2011. Q & A with Ben Levin. Lead the change series. Aera educational change special interest group. Issue no. 1 | July 2011.

Meriläinen, M. & Piispanen, M. 2012. Learning as a phenomenon –Manuscript of phenomenon based learning. Teoksessa: L. Gómez Chova, A. López Martínez & I. Candel Torres (toim.) International Association of Technology, Education and Development Proceedings of EDULEARN12 Conference, 5447-5454.

Meriläinen, M., Piispanen, M. & Valli, P. 2013. The voyage of the dawn treader – turning learning to m – era. Teoksessa: P. Kommers & P. Isasías (toim.). International association for development of the information society. E-society conference. 437-442.

Mishra & Koehler 2006. Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108* (6), 1017-1054.

Noddings, N. 1997. *A morally defensible mission for schools in the* 21st *century.* Retrieved Jan. 10, 2005, from http://edweb.sdsu.edu/people/Dkitchen/TE652/noddings.htm

OECD 2011. Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education. OECD Publishing.

Oliver, R. 2002. The role of ICT in higher education for the 21st century: ICT as a change agent for education. Retrieved 5.4.2013 from http://bhs-ict.pbworks.com /f/role%20of%20ict.pdf.

Sahlberg, P. 2011. Q & A with Pasi Sahlberg. Lead the change series. Aera educational change special interest group. Issue no. 5| September 2011.

Tapscott, D. 2009. Grown up digital. How the net generation is changing your world? New York: McGrawHill.

Unicef 2007. Child poverty in perspective: An overview of child well-being in rich countries. A comprehensive assessment of the lives and well-being of children and adolescents in the economically advanced nations. Innocental research centre reportcard 7.

Välijärvi, J. 2011. Peruskoulu ei uudistu tuntijaon muutoksilla. Helsingin Sanomat 31.10.2011

Zhao, Y. 2011. Q & A with Yong Zhao. Lead the change series. Aera educational change special interest group. Issue no. 4 | august 2011.