

# Digital Humanities Approaches to Design of Blended Learning Communication\*

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## Abstract

The purpose of this research is studying of contemporary trends of blended learning at classical university on the case of Saint-Petersburg State University educational practice. First of them is research of modern university learning environment which is heterogeneous and includes multimedia resources divide to corporate and open resources, books, experience of individuals etc. The second is development of students' motivation to Life Long Learning. According the authors, factor which integrates aforementioned trends is growth of communication in virtual space. To study the issues of learning application of web resources the authors use theoretical, experimental and empirical methods. The theory based on interdisciplinary approaches namely information sciences, pedagogy, and museum studies in digital humanities context. Theoretical aspects and the hypothesis are verified by experimental data. The empirical part presents ways of pedagogical adaptation the open resources to learning process. The result of presented work can be applied to development of electronic learning environment and learning methods at classical university.

**Keywords:** *Digital Humanities, Life Long Learning, Blended Learning, eLearning, Digital Pedagogics, Digital Competences, Technological Pedagogical Content Knowledge, Learning Design, ARCS Model*

## 1 Introduction

The current situation is characterized by constant growth of information resources which challenge person to expand innovative communicative competencies. Dynamics of the first two decades of the 21st century this is characterized by the increasing of web 2.0 technologies impact, which are associated with active participation of Internet users in the process of web content generation. Social networks, open educational platforms, blogosphere, portals of museum and cultural heritage open databases etc. provide Internet clients with possibilities to generate web content independently and popularity of this activity is growing.

These kinds of resources motivate students to master at least two innovative communication competencies: independent development of Internet materials and assessment of Web publications reliability.

Analysis of the aforementioned activities are based on knowledge and skills in the fields of cognitive sciences, pedagogy, computer science, and subject knowledge of a wide range of other scientific disciplines. Development of these communicative competencies is an urgent task, which decision is based on development of the Digital Humanities theory and practice and it is proved by the results of the presented study.

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## 2 Problem of Research

In presented case, the pedagogical design of the course is based on blend of open and corporate resources, so the course is an entry point into the digital educational space interdisciplinary analysis of the text is significant factor for making decisions about possibilities of their inclusion into learning context. In this case, museum studies and computer science present knowledge fields are pedagogically implemented within the framework of the course (see Figure 2). The field of pedagogy is represented by the course design and the teaching methods development.

We believe, that these facts reflect modern trends of eLearning development; however, they do not show a whole picture of development of this form of education. In our opinion, in order to create such picture, it is necessary to find an analogue of the current situation in the educational market, cultural practices and social institution, then to identify niches of aforementioned facts and finally to predict whenever possible trends in their development. The aim can be achieved at an intersection of the following theories (1) Media Ecology by Herbert Marshall McLuhan (1962)[[McLuhan, 1962](#)], (2) Technological Pedagogical Content Knowledge (TPACK) by Lee Shulman (1986)[[Shulman, 1986](#)], Punya Mishra and Matthew J. Koehler (2006)[[Mishra & Koehler, 2006](#)], (3) Theories of Learning Design, ARCS Concept of John Keller (2012)[[Keller, 2010](#)].

## 3 Review of Literature

### 3.1 Media Ecology by Herbert Marshall McLuhan (1961-1965)

The scholar submitted the evolution of the changes in education caused by development of typography in Europe [[McLuhan, 1962](#)]. It involves the following stages:

- (1) the development of printing industry,
- (2) the use of books in a learning process,
- (3) the development of teaching methods related to the use of books,
- (4) creation of specialized books for training,
- (5) change of educational paradigm: didactics (XVI–XX cc.) replaced scholasticism (IX–XV cc.).

The scientist shows that this process took quite long period (the XV–XVII centuries), and use of the book did not lead to refusal of lecture and the discussion developed in the scholastic paradigm.

We consider that the modifications in contemporary education connected with use of the electronic network proceeds according to the pattern described by McLuhan. In our view, now learning process is moving in the direction from the second to the third stage: educators are creating and using various electronic resources and are developing the training methods adequate to them. Issues of design of specialized electronic manuals and development of eLearning theory can be considered in predictive approaches.

### 3.2 Technological Pedagogical Content Knowledge theory (TPACK)

The theory reflects the pedagogical aspects of the educational paradigm of the information society. Technological Pedagogical Content Knowledge theory (TPACK) was introduced by Matthew J. Koehler and Punya Mishra [[Mishra & Koehler, 2006](#)]. Scholars, teachers and the learning resources' designers support ideas of the researchers. According to this theory, eLearning develops as the intersection of three areas (1) content knowledge, (2) pedagogical knowledge and (3) technological knowledge (see Figure 1).

So, “perfect electronic resources” consists the following types of knowledge

- (1) Content Knowledge (CK),
- (2) Pedagogical Knowledge (PK),
- (3) Technology Knowledge (TK),

- (4) Pedagogical Content Knowledge (PCK),
- (5) Technological Content Knowledge (TCK),
- (6) Technological Pedagogical Knowledge (TPK),
- (7) Technological Pedagogical Content Knowledge (TPACK).

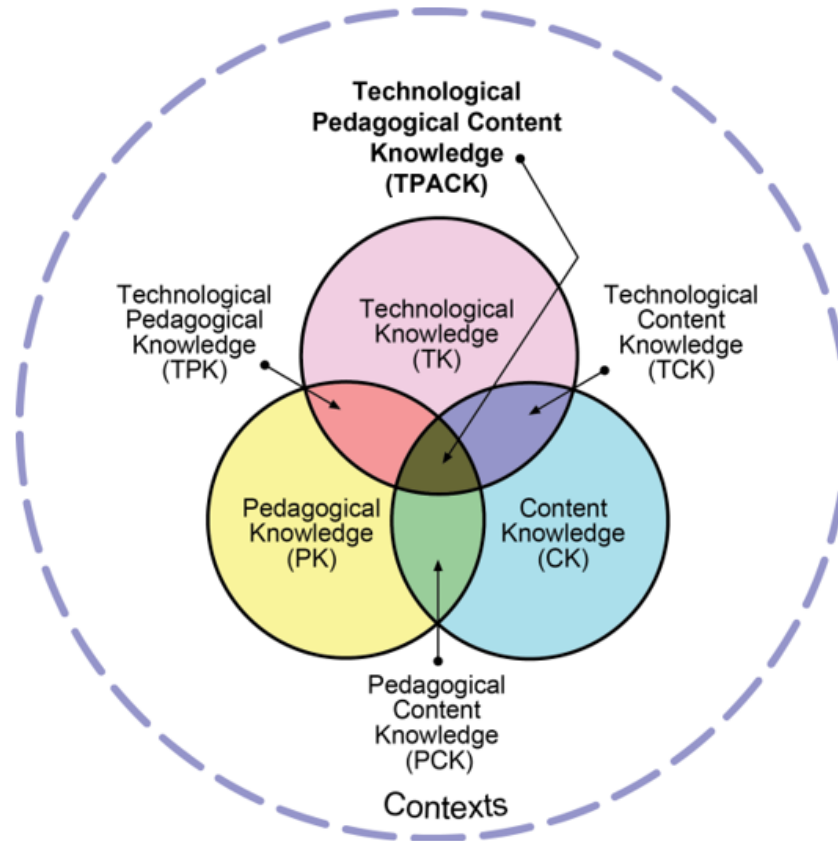


Figure 1: Main Components of Technological Pedagogical Content Knowledge theory (TPACK)

There are three levels of knowledge here. The first level is presented by “disjoint” knowledge fields, namely Content knowledge which includes knowledge of concepts, theories, and conceptual frameworks as well as knowledge about methods of developing knowledge of scientific discipline. The second is Pedagogical Knowledge (PK) which includes generic knowledge about how students learn, teaching approaches, ways of assessment and knowledge of different theories about learning. The third is Technology Knowledge (TK), and it refers to an understanding of the way that technologies are used in a specific content domain. This type of knowledge depends on the resource content, so the resource developer sometimes should have knowledge in a technology enhanced, but sometimes he/she needs only a computer literacy.

The second level of knowledge occurs at the intersection of two areas of expertise, namely (4) Pedagogical Content Knowledge (PCK) (5) Technological Content Knowledge (TCK) and (6) Technological Pedagogical Knowledge (TPK).

Pedagogical content knowledge is knowledge about how to combine pedagogy and content effectively. This is knowledge about how to make a subject understandable to learners. Technological content knowledge refers to information about how technology may be used to provide new ways of teaching content. Technological pedagogical knowledge refers to the affordances and constraints of technology as an enabler of different teaching approaches.

The highest level of knowledge is (7) Technological Pedagogical Content Knowledge (TPCK). It address to the knowledge and understanding of the interplay between CK, PK and TK when using technology for teaching and learning. It includes an understanding of the complexity of relationships between students, teachers, content, practices and technologies [Archambault et al., 2009].

In our view, the theory gives a whole picture of the education development in information society. It allows solving aforementioned problems. The TPCK provides an idea, that the Content Knowledge is component, which determines technological design and pedagogical methods of e-learning resources. It is obvious, that a course of Mathematics or Fine Arts needs sets of different technological solution and pedagogical activities. Thus, we can see path how wide range of trendy and disparate methods gradually turn into a methodology of information society education.

### 3.3 The concept of learning design. ARCS Model of John Keller

The concept of learning design occurs in the literature of technology for education with the idea that “designers and instructors need to choose for themselves the best mixture of behaviorist and constructivist learning experiences for their online courses” [Koper, 2006].

The theory includes a number of widely known ideas, which reflects cognitive, needs, and motivation theories, as well as social elements of learning to address to management of learning process or learners motivation. We would subdivide them into two directions. The first path is focused on modelling of learning actions and careful control of their performance. The second one is concentrated on a learner motivation. There are following concepts among the first direction ADDIE Model [Branson et al., 1975], Dick and Carey Systems Approach Model [Dick et al., 2005], Guaranteed Learning [Esseff et al., 1970].

The center of the second way is a learner motivation. There are ARCS Model [Keller, 2010] by John Keller, and Network Educational Communication by T. Noskova [Noskova et al., 2018] are in this group. The motivations theories explain why and how human behavior is activated and directed. There are two kinds of the motivation: intrinsic and extrinsic. Intrinsic motivation reflects the desire to do something because it is enjoyable. Extrinsic motivation reflects the desire to do something because of external rewards such as awards, money and praise. The theories incorporate cognitive, needs, and affective concepts as well as social elements of learning to address a learner motivation.

The ARCS model was created by John Keller in 1980th and it breaks learner motivation down into four components, namely attention, relevance, confidence and satisfaction [Keller, 2010]. Basically, the model is correspond with Edward Tolman opinion, which presumes that people are motivated to learn if there is value in the knowledge presented (i.e. it fulfills personal needs) and if there is an optimistic expectation for success[Ely et al., 1983]. We tend to follow the ARCS concept in our theoretical and practical approaches.

Attention and Relevance according to John Keller’s theory are essential to learning and, we would say, it is “a strategic part” of the ARCS Model. The Attention concern to the interest of learners in taking in the subjects being taught. This component is split into three categories: perceptual arousal, using surprise or uncertain situations. Inquiry arousal, offering challenging questions and/or problems to answer/solve; and variability, using a variety of resources and methods of teaching. Within each of these categories, John Keller has provided further sub-divisions of types of stimuli to grab attention. Grabbing attention is the most important part of the model because it initiates the motivation for the learners.

Relevance, according to Keller, must be produced by using language and examples that the learners are familiar with. There are three major strategies here: goal oriented, motive matching, and familiarity. Like the Attention category, the researcher divided the three major strategies into subcategories, which provide examples of how to make a lesson plan relevant to the learner. Learners will throw concepts to the wayside if their attention cannot be grabbed and sustained and if relevance is not conveyed.

Confidence and Satisfaction are tactical, operational components and reflects how to design learner-oriented environment and promote students to achieve results. The confidence aspect of the ARCS model focuses on establishing positive expectations for achieving success among learners. The Confidence level of learners is often correlated with the amount of effort put forth in reaching a performance objective. For this reason, learning design should provide students with a method for estimating their progress.

It can be obtained through such pedagogical tools and methods as a syllabus and grading policy, rubrics, or a time estimate to complete tasks. Timely, relevant feedback is extremely important part of confidence for supporting positive reinforcement for personal achievements. Satisfaction is based upon motivation, which can be intrinsic or extrinsic. Learners must obtain some type of satisfaction or reward from a learning experience. This satisfaction can be from a sense of achievement, praise from a higher-up, or mere entertainment. Feedback and reinforcement are also important elements for satisfaction. To keep learners satisfied, learning environment should be designed to allow them to use their newly learned skills as soon as possible in as authentic a setting as possible.

### 3.4 Methodology of Research

Significant characteristics of actual learning context are expansion of time and space. Training time includes almost the entire conscious life of person, and the space is transformed into an electronic environment which contains a huge amount of multimedia resources. These factors encourage to modification teaching methods and learning environment design. Dramatically important part of the methods is focused on the development of motivation for learning, and learning environment is developed based on a combination of corporate and open resources.

Actual task of the present time is the development of electronic resources and pedagogical techniques of effective interaction of students with different resources. As for educational resources, they should be based on a combination of books, electronic and network materials and contain varied possibilities for interaction of all participants of educational process. In turn, electronic and network-learning resources are subdivided on internal and external files [Gaevsкая, 2015], [Gaevsкая, 2012a], [Gaevsкая, 2012b], [Gaevsкая & Babina, 2017]. The internal resources are materials of the university where students train; external materials are Internet and other electronic resources (see Figure 2). Concept of the internal resources is presented by Digital Humanities Concept.

For example, network educational resources “Digital Heritage” and “Information Technology in Museums” have been included into the curriculum of Faculty of Arts of Saint-Petersburg State University. They focus on active use of digital media, which contains the sites of artists, museums, galleries, auction houses, commercial and open source repositories of electronic files, massive open online courses, mobile guides, books etc.

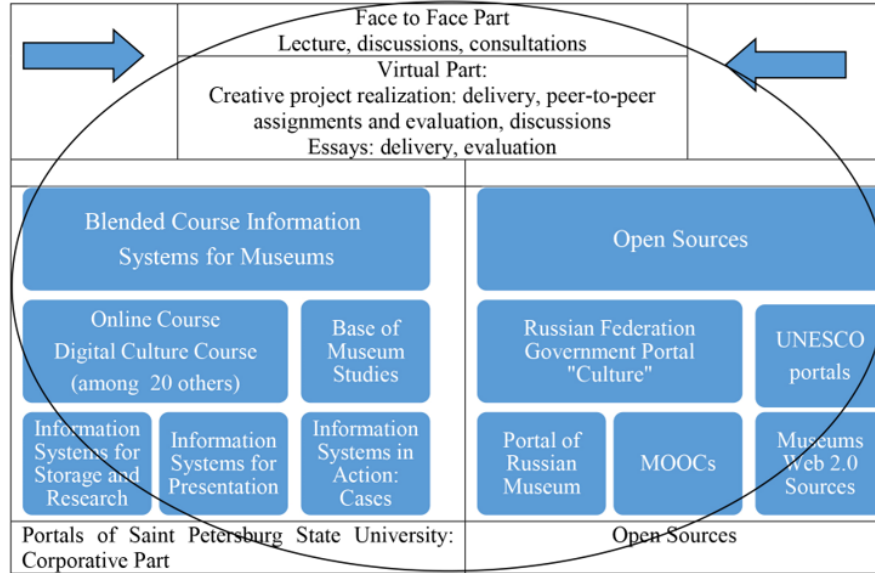


Figure 2: Example of Blended Learning Environment for course Information Systems for Museums, SPSU, 2015

## 4 Results of Research and Discussion

Experience shows, that combination of open and corporate resources within the framework of blended course is an object of scientific reflection. In terms of pedagogy this phenomena is manifested in the fact that in performing similar assignments, learning adapted resources are analyzed more deeply than scientific and popular science materials. The hypothesis is that students need for educational maintenance to develop competencies aimed at the effective use of open sources for cognitive purposes. Results of the hypothesis research data is in the Table 1.

For example, as part of the “Museum Information Systems” course, students are offered assignments for which completed it is necessary to select publications are presented on the following portals: Saint-Petersburg State University (Black Board), massive open online courses “Coursera” and the UNESCO World Heritage Center. For the assignments performing, students give preference to materials are developed by the teacher and published on BB Portal. The source of the data is in the Table 1 columns 3, 5, 7.

According interview and survey in order to develop students’ motivation to work with open resources (Massive Open Online Courses Portal Coursera and UNESCO World Heritage Center (UNESCO WHC), pedagogical adaptation of the multimedia materials is necessary. It consists in designing system of assignments aimed to develop competencies of web source application to academic purposes and includes the virtual and face to face parts. There are following assignments take place in virtual space: creative project realization (delivery, peer-to-peer evaluation, discussion) and weekly essays delivery and evaluation by teacher. The face to face part is intended for ordinary classroom activities, namely lecture, seminars, discussions, consultations (see Figure 2).

There are following assignments take place in virtual space: creative project realization and weekly essays. Creative project includes the following stages:

- design of virtual museum,
- presentation museum to students and teacher via Learning Management System Black Board,

- online and offline discussions
- peer-to-peer evaluation of each museum
- summary of the teacher regarding each museum and quality of evaluation.

The virtual museum design is carried out in accordance with the teacher recommendations and includes the following steps:

- concept development,
- the museum implementation to virtual space,
- the museum presentation
- the museum evaluation.

The museum concept development focuses on the following aspects

- identifying of an issue is solved by the museum, for example, cognitive, social, artistic, etc.,
- distinguish of the museum' target audience,
- selection of 10-20 exhibits for the museum' collection,
- choice of the resource technological solution,
- formulation of the project theme.

Weekly essays are delivered through Learning Management System Black Board and are evaluated by teacher.

The face to face part is intended for ordinary classroom activities, namely lecture, seminars, discussions, consultations. The source of the data is in the Table 1.

The experiment is conducted via this pedagogical navigator obtained showed that students began to use more actively Coursera, but appeal to UNESCO portal materials remained practically unchanged the source of the data is in the Table 1 columns 4, 6, 8.

This result allows to make following conclusion. It is necessary to use different methods of pedagogical design, in particular of the assignment types, so that, based on the data obtained, carry out pedagogical measures aimed at increasing students motivation for working with such materials.

Table 1: Electronic resources application by students in frame of Blended learning process

Motivational Concept	Motivational Strategies	Resources					
		SPbSU Portal		Coursera		UNESCO WHC	
1	2	3	4	5	6	7	8
		Ex1	Ex 2	Ex1	Ex 2	Ex1	Ex 2
Attention	Concreteness	53	53	28	47	12	16
	Variability	53	53	12	50	9	8
	Inquiry	53	53	3	18	10	12
	Participation	53	53	12	46	1	3
Relevance	Experience	53	53	9	50	53	53
	Present worth	53	53	4	48	7	14
	Future usefulness	48	53	0	36	8	12
Confidence	Learning requirements	53	53	53	53	53	53
	Difficulty	15	49	14	36	27	25
	Expectations	53	53	12	44	31	36
Satisfaction	Unexpected rewards	3	8	3	45	7	9
	Positive outcomes	53	53	9	51	36	43

The experiment was conducted in 2017/18, 2018/2019, 2019/2020 terms at the Saint Petersburg State University, Chair of Information Systems in Art and Humanities of the Faculty of Arts. Fifty three undergraduate students of the third year took part in the experiment. Data of ascertaining stage of the experiment are indicated as Example 1: the source of the data is in the Table 1 columns 3, 5, 7. Data on the subsequent stage of the experiment are indicated as Example 2: the source of the data is in the Table 1 columns 4, 6, 8.

There are following indicators were taken into account: (1) number of students who used aforementioned multimedia resources and (2) students motivation for the resource accessing.

According interview and discussions with students, motivational stimulus relevant for them were identified. Then these indicators were divided into three groups: 1) mandatory assignments: participation, present worth, learning requirements, positive outcomes, scheduling, (2) positive / neutral expectations of the students: concreteness, inquiry, experience, future usefulness, expectations, unexpected rewards, and (3) negative expectations: variability, difficulty.

The results of the “mandatory assignments” group showed that almost 100% of students made attempts to use all materials in their work. Such qualities of resources as their variability and difficulty forced the students to abandon applying of open resources their tasks before pedagogical adaptation of these materials. However, after developing a system of assignments the attractiveness of the “Coursera” materials were increased. The same dynamics are observed in the group of positive and neutral motivation on regarding of the “Coursera” files.



## Conclusions

The results of this study provide comprehension into contemporary issues of eLearning theory and practice. Comprehension of theoretical aspects of web-era pedagogic and application those in practices of universities allow to make training more effective and entertaining.

The experiment shows that a blended course can be designed as an access point to open web resources. There are two kinds of resources considered: which provides the students with the possibility of feedback (the Coursera) and which does not provide this opportunity (UNESCO WHC). The Blended course design was focusing on system of assignments which motivate students to apply both kinds of resources to their projects. The experiment shows that the students are more motivated to work with resources which based on feedback methods.

Analysis of open resources in Digital Humanities aspects is a significant stage in the pedagogical design of blended learning materials for following reason. Web resources develop according to particular cognitive patterns and neglect of them can neutralize educational possibilities of information source vital important for future professionals. Interest to understanding of specifics of digital competences and role of students' motivation in this process is increasing. We are sure that the theory of eLearning is developing and we consider our article as a contribution to this subject.

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