Application and Exploration of Interactive Teaching Theory in College English in Multimedia Environment

Pan Yong

School of Foreign languages, Taizhou University, Taizhou, 225300, China

Email: tzuwork@126.com

Keywords: Multimedia, Interactive teaching theory, University English

Abstract: With the implementation of college English teaching reform in China, multimedia network teaching is being gradually tried out and promoted in various universities. People have high hopes for this new teaching model and believe that it is a good way to solve various problems in current college English teaching. However, multimedia networked teaching requires high standards for hardware, software, teachers, and learners. This paper proposes solutions to the problems based on the analysis of the problems existing in college English courses involving the largest number of students and the most influential college English courses.

1. Introduction

With the advent of the information age, our country's education is facing new challenges and opportunities. Traditional education can no longer meet the needs of information, digital, and networking societies. A major educational change that is bound to involve teaching content, teaching methods, teaching methods, education structures, and the entire education system is taking place. In China, the promotion of college English multimedia teaching began in 1999. With the emergence of several college English textbooks and the investment in computer multimedia hardware by universities, a variety of multimedia teaching forms have emerged in just a few years. Some colleges and universities in our country immediately set off the climax of college English multimedia network-assisted teaching (Balbach & Zeugmann, 2005). At present, even colleges and universities that have not participated in the trials have tried every means to create conditions for joining the ranks. College English multimedia network-assisted teaching in colleges and universities can be described as in full swing. However, behind this phenomenon, there are many issues that we need to calmly ponder and resolve as soon as possible. It is overestimated the role of multimedia network-assisted teaching. Every high-tech innovation can set off an application boom in education. Just like the prevalence of TV teaching in China in the late 1970s and early 1980s, the continuous maturation and application of computer network technology in the 1990s also made some people feel as if they saw a new dawn in education reform. No matter the school or the teacher, they regard network teaching as the only pursuit of teaching quality (Bamberger, 1993). There is a phenomenon that focuses on hardware and software, and emphasizes on the importance of teaching and learning. It blindly exaggerates the role of multimedia networks and neglects the exertion of teachers' subjective initiative. The second is a complete denial of multimedia network teaching. Due to the underestimation of the use of new technology in the teaching of multimedia networks, there is a disappointment, and even a complete negative attitude towards it.

Many educators are resisting new technologies. Teachers generally do not like to use complex technical means in the teaching process (Ong & Mannan, 2002). On the one hand, teachers are worried that people's work will be replaced by machines, and they will lose control of the classroom and initiative, and the use of multimedia will pose a threat to the academic autonomy they enjoy. The theoretical basis of multimedia network teaching is constructivist learning theory. This theory is the further development of modern learning theory after behaviorism. It has a great influence on the teaching of modern network support. Its basic point of view is to emphasize student-centeredness, not only requiring students to be transformed from passive recipients of external

  DOI: 10.25236/etmhs.2019.127

stimuli and indoctrinating objects of knowledge to the subject of information processing, and active constructors of the meaning of knowledge. The multimedia network teaching has certain requirements for the equipment. The school cannot carry out network teaching activities without a certain number of computers, without Internet and campus LAN access. In terms of a classroom, multimedia network teaching must include at least servers, teachers' computers, student computers, and network equipment (Krouk & Zhuravleva, 2009). For the editorial center, it should include video capture cards, video recorders, digital cameras, scanners, multimedia editing. The new teaching model requires the use of multimedia for teaching, which requires the school to solve the relevant teaching conditions. To fully implement college English multimedia network teaching, only at least one million per school must be invested in the equipment. However, the common problems in these projects are heavy investment in hardware construction, light software development and teacher training. According to the experience of EU countries, one-time investment in education information projects accounts for about one-third of hardware, software and training.

2. Multimedia teaching environment

2.1. Sampling methods

The application of multimedia technology in teaching has also changed the definition of traditional teaching elements. From the perspective of information dissemination, teaching is a two-way or multi-directional dynamic process in which information sources transmit teaching content to a trustee through a carrier. The media is both the carrier of teaching information and the source of teaching information. It can be seen that the teaching elements in the multimedia environment are information sources, trustees and information carriers. Electronic media further developed multimedia. Early multimedia refers to traditional media such as languages and scripts, and various electronic modern media. Today's multimedia tends to be miniaturized, intelligent, and networked. Multimedia information systems mainly process, edit, store, and present two or more different types of information at the same time through human-computer interaction (Walker, 2014). It carries out unified digital processing and integrated management of various kinds of information such as texts, graphics, animations, and images, making multimedia in a certain sense an organic combination of information transmission and information sources. This multi-dimensional information approach can provide learners with multiple sensory stimuli and stimulate their interest in learning. It can also enable students to choose perceptive methods based on learning needs and learning styles. At the same time, they can be encouraged to participate in teaching activities, explore learning tasks and solve specific problems. Teachers play a leading role in the teaching process. They should formulate the teaching plan as a whole, select and determine relatively appropriate teaching methods, implement teaching plans based on the actual situation, evaluate teaching effectiveness, and take remedial measures.

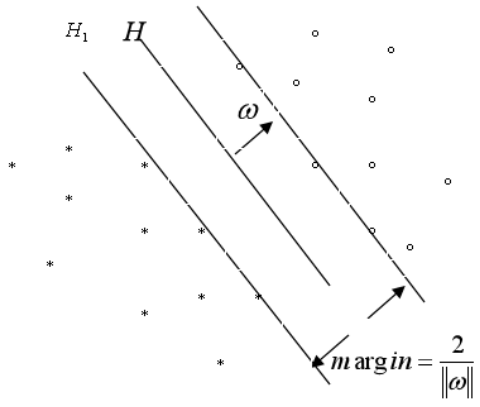

Figure 1. Optimal classification plane

2.2. Designing teaching strategies from the perspective of teachers

Assimilation means that people use their known knowledge to interpret the construction of external things based on their own thinking, and that they will combine the new information agreement with the original knowledge system. Complying means that people are aware of the structural features of the external things themselves and amend the original knowledge to accommodate new information. Therefore, in order to enable students to adapt to new knowledge as soon as possible, teachers should adopt strategies for operational planning so that the teaching plan is in line with the rules of cognitive development and the principle of gradual and orderly progress. The operational strategy is divided into macro plans and micro plans. It is a guide and a blueprint for teaching activities. The micro-planning strategy refers to the design of specific lesson plans, that is, the purpose of each lesson, contingency measures, and expected results. For example, when teaching a writing class, teachers can design the overall teaching plan and specific teaching steps of the course from the macro and micro perspectives, and publish them on related web pages so that students can form an overall concept for the course. Also understand the specific requirements, content, methods, and steps of the writing course. The evaluation strategy emphasizes the diversity of the evaluation subject, content and nature. Among them, the evaluation subjects include teacher-students, students themselves, students, and teachers themselves. The evaluation includes learning outcomes, learning processes and methods. The nature of evaluation includes self-evaluation and evaluation by others.

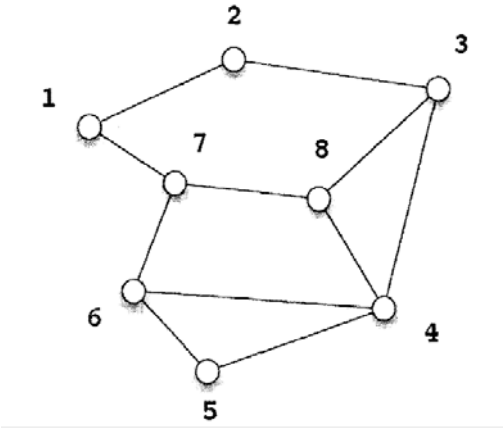

Figure 2. Electronic interaction strategy

3. The definition and selection of teaching strategies

3.1. Collaborative inquiry strategy

Strengthened remedial strategies can be combined with evaluation strategies and applied flexibly. Teachers can take corrective measures on the basis of the students, take targeted remedial measures to ensure the successful completion of teaching goals. The development and application of multimedia technology has created an open teaching environment for foreign language teaching, breaking the boundaries of traditional teaching, and allowing students to perceive and use the target language in a relatively real language environment. To this end, we should give full play to the multidimensional, non-linear and interactive advantages of media information presentation, and design and corresponding strategies so that foreign language teaching can be transformed from one-way knowledge transmission to multi-directional information transmission.

Any culture or society has its own specific cultural knowledge system. Mastering this knowledge system is essential for cross-cultural communication. In teaching activities, teachers should give full play to the main role of students. The subjectivity of students is mainly self-development and active learning. The development of students reflects the realization of teaching goals, and their active learning is the basis for ensuring that the teaching goals are achieved. For this reason, how to stimulate learning motivation and make it important for students to learn in inquiry.

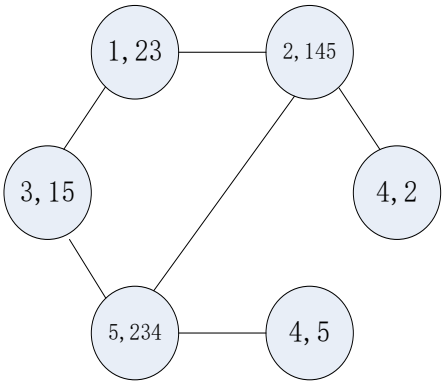

Figure 3. Multidimensional information input strategy

Weights will converge during the N2 online training process:

$$\hat{\delta}_{\mathrm{j}}(n)=\frac{\partial \hat{E}(n)}{\partial n\hat{e}t_j(n)}=\sum_{k=3}^{4}\frac{\partial \hat{E}(n)}{\partial n\hat{e}t_k(n)}\cdot\frac{\partial n\hat{e}t_k(n)}{\partial \hat{O}_j(n)}\cdot\frac{\partial \hat{O}_j(n)}{\partial n\hat{e}t_j(n)}=\sum_{k=3}^{4}\hat{\delta}_k(n)\cdot\hat{W}_{kj}(n)\cdot\frac{\partial f\left(n\hat{e}t_k(n)\right)}{\partial n\hat{e}t_j(n)} \tag{1}$$

Then using it as a matrix column, the matrix p is an invertible matrix:

$$\begin{bmatrix}x_n\\x_{n-1}\\x_{n-2}\end{bmatrix}=A\begin{bmatrix}x_{n-1}\\x_{n-2}\\x_{n-3}\end{bmatrix}=A^2\begin{bmatrix}x_{n-2}\\x_{n-3}\\x_{n-4}\end{bmatrix}=\cdots=A^{n-3}\begin{bmatrix}x_3\\x_2\\x_1\end{bmatrix} \tag{2}$$

After pushing it:

$$\begin{vmatrix}\lambda-2 & -1 & 2\\ -1 & \lambda & 0\\ 0 & -1 & \lambda\end{vmatrix}=\lambda^3-2\lambda^2+2-\lambda=0 \tag{3}$$

Then by the characteristic equation of the matrix, the resulting eigenvector is:

$$\Lambda^{n-3}=P\begin{bmatrix}1 & 0 & 0\\0 & -1 & 0\\0 & 0 & 2\end{bmatrix}^{n-3}P^{-1}=\frac{1}{6}\begin{bmatrix}-3+(-1)^{n-3}+2^n & 3-3(-1)^{n-3} & 6+2(-1)^{n-3}-2^n\\-3+(-1)^{n-2}+2^{n-1} & 3-3(-1)^{n-2} & 6+2(-1)^{n-2}-2^{n-1}\\-3+(-1)^{n-3}+2^{n-2} & 3-3(-1)^{n-1} & 6+2(-1)^{n-3}-2^{n-2}\end{bmatrix} \tag{4}$$

The application of eigenvalues and eigenvectors in physics:

$$\begin{aligned}-\frac{k_1+k_2}{m}x_1+\frac{k_2}{m}x_2&=\ddot{x}_1\\\frac{k_2}{m}x_1-\frac{k_1+k_2}{m}x_2&=\ddot{x}_2\end{aligned} \tag{5}$$

Rewrite the above equation of motion into the form of a matrix, as follows:

$$\begin{bmatrix}-\frac{k_1+k_2}{m} & \frac{k_2}{m}\\ \frac{k_2}{m} & -\frac{k_1+k_2}{m}\end{bmatrix}\begin{bmatrix}x_1\\x_2\end{bmatrix}=\begin{bmatrix}\ddot{x}_1\\\ddot{x}_2\end{bmatrix} \tag{6}$$

Now a simple physical vibration problem turns into a matrix problem:

$$\beta = \frac{k_1 + k_2}{m},\ \alpha = \frac{k_2}{m},\ x = \left[x_1, x_2\right]^T,\ \ddot{x} = \left[\ddot{x}_1, \ddot{x}_2\right]^T \tag{7}$$

After the discussion of solving the problem of eigenvalue eigenvectors in the previous section, we can obtain:

$$\left|A + \omega^2 I\right| = \begin{vmatrix} \omega^2 - \beta & \alpha \\ \alpha & \omega^2 - \beta \end{vmatrix} = 0 \tag{8}$$

This is an initial condition that applies to any location:

$$x(0) = \begin{bmatrix} x_1(0) \\ x_2(0) \end{bmatrix}, \dot{x}(0) = \begin{bmatrix} 0 \\ 0 \end{bmatrix} \tag{9}$$

1) Exaggerate the effectiveness of multimedia network teaching: first, the widespread use of modern information technology in college English teaching will help students to develop their own initiative in learning and stimulate their enthusiasm for learning. Second, learning on computers and traditional classroom teaching are complementary and mutually reinforcing relationships. At the same time, it was noticed that students think that the multimedia assistant mode helps improve the ability of independent learning. Through interviews, it is found that, to be precise, it should be this model that awakens students' awareness of autonomous learning. The software's monitoring of learning time and unit tests ensured that the students completed the on-board tasks according to the plan and cultivated a habit of self-learning.

2) Possibility of teaching English in a multimedia environment: in theory, multimedia video and audio can provide students with a more realistic and lively language environment, which is more conducive to English teaching. However, in practical applications, due to the limited level of students' English and knowledge, teachers often have to explain more about multimedia corpora, plus the limited time in class. The result is either multimedia streaming in the form or the student can only be half-baked and unable to achieve the desired effect. One of the reasons is the lack of students' ability to study independently. Students need a certain linguistic situation, but they need more effective communication in this context. If the use of multimedia only provides information or language scenarios that cannot be fully understood by students, it will hinder the interaction between teachers, students and students, and it is not conducive to the construction of student knowledge.

3.2. Research tools and methods

With students as research subjects, this survey provided empirical evidence on the status of multimedia-assisted mode, classroom teaching and student self-learning, and also provided a basis for more effective multimedia application in English teaching in the future. With the rapid development of the Internet and multimedia technologies, the traditional education model is undergoing changes, and multimedia teaching has gradually begun to develop internationally. At present, all colleges and universities in China are exploring, researching and practicing the English classroom teaching mode under the multimedia environment and have shown unprecedented vitality. The multimedia network teaching is not only very helpful to improve the comprehensive benefits of the English classroom, but also breaks the traditional teaching philosophy and teaching ideas in all directions. It also changes the relationship between teaching and learning, and promotes independent learning and research learning. This article discusses the interactive English classroom model under multimedia environment from various aspects and perspectives, and puts forward thinking about the transformation of teacher-student role. The new teaching model should embody the principle of combining practicality, knowledge, and interest in English teaching. Both teachers and students should be fully motivated. In particular, it is necessary to establish the main position of students in the teaching process. The new teaching mode should be technically interactive, realizable and easy to operate.

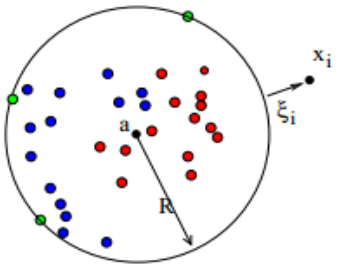

Figure 4. Interaction between learners and learning content

3.3. The concept of media environment

The interaction between the learner and the learning content refers to the fact that when a student reads a text, if he encounters a word or has other problems in his understanding, he can immediately click on a word or a phrase to find the correct explanation. If there is difficulty in translating a sentence into Chinese, he can click on the corresponding Chinese translation. This click is interactive. After the realization of multimedia and online teaching, the role of teachers has changed. In the past, in traditional classrooms, teachers were mainly teaching on the blackboard in the classroom. Now the teacher not only has to lecture, but also the designer of the lesson. Teachers control the teaching process and progress. For students who are more difficult to learn, teachers can continue to encourage, and evaluate the teaching results, and the teaching effects can also be continuously studied. Therefore, the function of the teacher has changed from the past teacher to the designer of the course, the controller of the progress of the course, the evaluator of the teaching achievement and the researcher of the teaching effect. Students become active explorers of knowledge, active practitioners of skills, learners who overcome difficulties in the process of learning the problems or learning process.

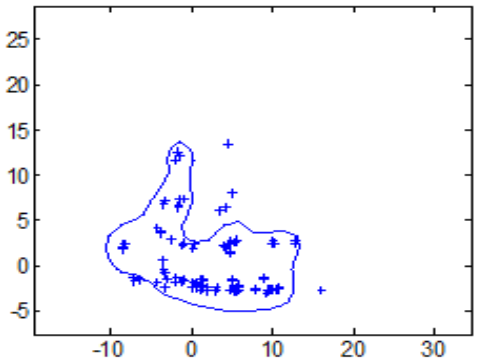

Figure 5. Teaching activity statistics

4. Empirical analysis

4.1. Interactive English teaching mode in multimedia environment

The rich resources and convenient learning environment provided by multimedia technology make it possible for most of the content previously explained by teachers to be completed by students outside of class. This allows teachers to have more time and energy to implement communicative teaching. There are two ways to communicate: online and face to face. With the improvement of foreign language proficiency, the Internet, and the application of modern information technology, students can be exposed to a more realistic foreign language environment and thus have the same rich information resources as teachers. The English multimedia teaching model based on computer and classroom is a new type of English teaching model designed to help college students meet the requirements of college English teaching. This model emphasizes personalized teaching, interactive and autonomous learning. Enable students to select suiTable learning content according to their own characteristics, level and time under the guidance of their teachers.

Table 1. The leading role of teachers

N	X				y	y*	y-y*	Y
	x1	x2	x3	x4				
1	37.2	40.4	3820	74.6	4.666	4.8253	-0.1593	-3.41%
2	35.3	38.2	3380	76.1	5.06	4.8336	0.2264	4.47%
3	30.3	34.3	3200	62.6	3.78	3.7105	0.0695	1.84%
4	15.8	18.2	1700	37.2	1.69	1.5074	0.1826	10.81%
5	17.9	20.3	1720	36.1	1.75	1.5693	0.1807	10.32%
6	28.1	29.2	2610	63.2	4.04	3.5293	0.5107	12.64%
7	34.1	38.4	3300	68.5	3.99	4.3794	-0.3894	-9.76%
8	12.2	15.3	7000	15.6	0.46	0.6525	-0.1925	-41.85%
9	22.1	21.3	1380	20.1	1.87	1.0671	0.8029	42.94%
10	28.1	29.3	1200	40.2	3.33	2.1338	1.1962	35.92%
11	35.6	30.2	1980	41.4	2.21	2.6676	-0.4576	-20.71%
12	42.3	40.3	2300	60.4	4.1	4.4251	-0.3251	-7.93%
13	51.1	51.2	3080	40.4	4.39	4.1056	0.2844	6.48%
14	54.4	49.8	3500	50.6	5.41	4.8303	0.5797	10.71%
15	63.7	60.8	2800	42.4	5.52	5.0157	0.5043	9.14%
16	58.6	56.8	3950	48.8	5.4	5.2987	0.1013	1.88%
17	47.8	50.6	2560	56.7	4.39	4.9071	-0.5171	-11.78%
18	40.3	41.4	2880	80.3	5.82	5.6255	0.1945	3.34%

4.2. Traditional teaching methods combined with multimedia teaching methods

The comprehensive application of multimedia teaching model in college English helps to improve the teaching effect and provides new opportunities for exploring new teaching methods. There is a great difference between the traditional teaching mode and the multimedia teaching mode. How to make use of the multimedia technology in the college English teaching reasonably and improve the teaching quality is the center of this article. Before introducing multimedia technology into foreign language teaching classrooms, foreign language teaching relied mainly on classroom teaching, and classroom teaching relied mainly on teachers' explanation. Using multimedia courseware, the course content that was previously required to be copied on the blackboard can be made into courseware in advance, and the contents of the lecture can be displayed on the screen by the projector. The students can see clearly, and at the same time, the time for writing a book can be saved and the content of the lecture can be increased.

Table 2. Application results of interactive teaching theory

N	a	b	c	d	e	f	g	h
1	30.4	29.1	2080	46.4	2.31	2.7191	-0.4091	-17.71%
2	26.8	24.4	1100	30.3	1.55	1.5313	0.0187	1.21%
3	20.6	20.2	1280	22.2	1.12	1.0611	0.0589	5.26%
4	18.1	20.1	1360	4.3	0.7	0.5640	0.1360	19.43%
5	28.2	25.8	2080	6.8	0.881	1.0545	-0.1735	-19.70%
6	38.8	37.1	2400	13.1	2.13	1.7461	0.3839	18.02%
7	68.7	66.6	5610	19.2	4.62	4.7852	-0.1652	-3.58%
8	77.7	59.3	3990	12.3	3.38	3.3456	0.0344	1.02%
9	89.9	90.8	4500	11.8	4.68	4.4834	0.1966	4.20%
10	44.3	35.3	2380	14.9	1.69	1.8775	-0.1875	-11.09%
11	50.2	40.1	2500	6.8	1.81	1.7614	0.0486	2.69%
12	56.6	60.8	2870	18.1	2.93	3.1226	-0.1926	-6.57%
13	120.8	120.6	6800	20.6	7.31	7.4996	-0.1896	-2.59%
14	148	11.2	6060	29.8	5.16	4.9686	0.1914	3.71%
15	169	40.4	6160	40.6	7.11	7.3003	-0.1903	-2.68%
16	180.8	69.8	7330	33.4	8.12	7.9330	0.1870	2.30%
17	190.3	130.2	7320	31.6	9.96	9.7789	0.1811	1.82%
18	44.6	46.5	5220	12.6	2.4	3.1146	-0.7146	-29.78%

4.3. Problems that should be noted in multimedia teaching

The essence of multimedia network teaching is to realize teaching through the transmission and sharing of online education information resources. In the multimedia network environment, teachers can use advanced multimedia technology to prepare lessons. Not only can they share teaching resources, but they can also improve teacher preparation efficiency. This greatly improves the diversity and real-time nature of teaching. In online teaching, a large number of advanced teaching resources can be shared, avoiding a lot of repetitive labor and investment, and facilitating the reuse of lesson plans and exchanges between teachers. Teachers can supplement a large amount of relevant information for students to understand and review after class. With the help of computers, students can quickly improve their comprehensive English application skills and achieve optimal learning results.

5. Conclusion

To implement multimedia-assisted teaching, it is first required to produce courseware suiTable for teaching requirements. In order to enable multimedia teaching to meet the needs of teaching and avoid the repetitive tasks of the English teachers in the production of multimedia courseware, schools should plan the construction of information resources. Including text-based information base for multimedia courseware production, picture information database, animation and audio information database, so that the majority of English teachers in the production of multimedia courseware can easily call a variety of information resources. As a result, the workload of collecting information is greatly reduced. They have more time and space to learn multimedia courseware production software. The application of multi-media teaching model in college English teaching opens up a new way for college English teaching. It is in line with the law of language learning and provides an ideal language education environment for the real implementation of foreign language education. It not only changed the teaching methods, but also had a profound influence on the teaching mode, teaching content, and teaching methods.

Acknowledgement

Project of Philosophy and Social Science Research in Colleges and Universities of Jiangsu Province: Research on the construction of blended teaching mode of College English (2018SJA1882).

References

[1] Balbach, F. J., & Zeugmann, T. (2005). “Teaching learners with restricted mind changes“. Lecture Notes in Computer Science, 3734, 474-489.

[2] Bamberger, R. H. (1993). “Interactive tools for signal processing education: the signal processing instructional facility (spif lab) at Washington state university“. Computer Applications in Engineering Education, 1(6), 517-531.

[3] Elsherbeni, A. Z., Kajfez, D., & Hawkes, J. A. (1993). “Interactive display of vector fields inside waveguides“. IEEE Transactions on Education,36(2), 283-286.

[4] Gottlieb, H. P. W. (1983). “Group theory and physics teaching“. European Journal of Physics, volume 4(1), 54-54(1).

[5] Huelsman, L. P. (2001). “Em wave simulation: an animated electromagnetic wave teaching package“. Computer Applications in Engineering Education, 18(6), 3-4.

[6] Janda, & Laura. (2010). “How theory informs teaching and how teaching informs theory: cognitive linguistics in action from theory to application and back“. Organometallics, 3(12), 1777-1785.

[7] Krouk, B. I., & Zhuravleva, O. B. (2009). “Dynamic training elements in a circuit theory course to implement a self-directed learning process“. IEEE Transactions on Education, 52(3), 394-399.

[8] Ong, S. K., & Mannan, M. A. (2002). “Development of an interactive multimedia teaching package for a course on metalworking“. Computer Applications in Engineering Education, 10(4), 215-228.

[9] Trlep, M., Hamler, A., Jesenik, M., & Stumberger, B. (2006). “Interactive teaching of electromagnetic field by simultaneous fem analysis“. IEEE Transactions on Magnetics, 42(4), 1479-1482.

[10] Trueman, C. W. (2002). “Interactive transmission line computer program for undergraduate teaching“. IEEE Transactions on Education, 43(1), 1-14.

[11] Walker, H. M. (2014). “Some strategies when teaching theory courses.Acm Inroads, 5(3), 32-34.