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An Integration of Internet IPR Synchronous Teaching on Learning Outcomes

Chich-Jen SHIEH¹, Qiang-Jun QI²

Abstract

Intellectual property rights encourage people to facilitate the advance of industry and culture and drive the development of economic activity through creation. For this reason, the issue of intellectual property, under the environment, has become the basic knowledge in people's life. With the protection of law, people are willing to contribute the intelligence and creation to the society for the innovation and advance of the country. With experimental design, total 98 students in two classes of a university in Guangxi are selected for the experimental research. Internet synchronous teaching is utilized for the 16-week (3 hours per week for total 48 hours) experimental teaching. The research results reveal positive relationship between 1. Internet synchronous teaching and learning motivation, 2. learning motivation and learning outcome, and 3. Internet synchronous teaching and learning outcome. According to the results to proposed suggestions, it is expected to have learners acquire the basic knowledge and idea of intellectual property rights as well as learn the information related to intellectual property rights or precede exchange and discussion through Internet synchronous teaching to enhance students' impression and further achieve the digital learning of intellectual property rights.

Keywords: Internet synchronous teaching, intellectual property rights, learning motivation, learning outcome.

Introduction

In traditional economic society, people would maintain the secret of the developed product technological core for the competitiveness in the market so that a business could compete with other businesses in the same trade, keep the success of the products in the market, and further acquire the best economic profits. In other words, people in traditional society tended to maintain the secret of the

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intelligence, rather than contributing to the society. In this case, when people keep the intelligence in secret, the industry would not smoothly and rapidly develop to affect the overall advance and lose the international competitiveness of a nation. Intellectual property rights aim to encourage people's creation to facilitate the advance of industry and culture as well as to drive the development of people's economic activity. Under such an environment, the issue of intellectual property has become the basic knowledge in the public life, where intellectual property is the product in the knowledge-based economic era. Simply speaking, intellectual property is the intelligence created by human brains; such intelligence could create the property value and form the right being protected by the law. With the protection of law, people would be willing to contribute the intelligence and creation to the society to result in innovation and advance of the nation. Nevertheless, ordinary people do not really understand the idea of intellectual property rights. The lack of relevant information and inadequate teaching in schools are regarded as the major factors. Furthermore, the accusation of infringement of patent rights and trademark often appears on newspaper, magazine, or multimedia, revealing the public being lack of the knowledge and literacy of intellectual property rights. However, along with the rapid development of networking industry, the Internet becomes more convenient. In the network communication era, it is a worth discussing issue to present basic knowledge related intellectual property with active and systematic patterns through Internet synchronous teaching. Knowledge related to intellectual property with abstract concepts is re-interpreted in this study, and Internet synchronous teaching is utilized for making such knowledge into lively multimedia digital materials for learners getting on the Internet at any time to promptly learn the material contents planned in the Internet synchronous teaching. It provides learners for systematically acquiring intellectual property related knowledge and realizing the importance of respecting others and protecting personal creation in order to assist in the education promotion of intellectual property rights.

Literature review

Internet synchronous teaching

Park, Choi, & Jang (2015) mentioned that the synchronous courses for lecturers and learners, through the support of network teaching platforms and teaching media could provide didactic teaching as well as lead learners to discussions. Dong *et al.* (2014) explained Internet synchronous teaching that lecturers and learners at different places could see the images with video conferencing technology for course lecturing and problem discussion to break through the spatial restriction and achieve the "face-to-face" teaching effect. Michaelsen, Davidson, & Major (2014) regarded Internet synchronous teaching as lecturers lecturing learners

at different places on the online classroom through high-speed communication network and other audiovisual media as well as real-time preceding interaction, communication, and discussion. Arfstrom, Bergmann, & Lazzaro (2014) stated that Internet synchronous teaching, similar to traditional face-to-face learning, was the online learning led by a lecturer and all learners learned and mutually communicated online at regulated time; and, the lecturer had to keep the overall management of the classroom. The interaction was generally preceded through virtual classroom, video conferencing, voice over Internet protocols, chatroom, streaming media, or two-way broadcast systems. Sheorey (2014) revealed Internet synchronous teaching as the real-time teaching and learning activity with the application of computers and network technology; and, lecturers and learners from different places preceded synchronous two-way communication through the connection with the network and synchronous teaching systems at the same time.

Referring to Wang (2015), synchronous online learning model in this study is discussed from role (instructors, learners), participation method (individuals, groups), participation location (designated place, any places), interaction method (one-way, two-way), and course delivery method (playing course records, real-time instruction, mixed methods) (Hwang, Kongcharoen, & Ghinea, 2014): (1) Role: The role in synchronous online learning contains instructors and learners, and the sole request is that teachers and students have to get on the virtual classroom at the same time; (2) Participation method: The participation method for synchronous online learning includes individuals and groups. In other words, students could precede individual learning as well as discuss and cooperatively learn with a group of people; (3) Participation location: In synchronous online learning, the course participation place could be designated or anywhere. Teachers and students, according to personal needs, precede online teaching and learning at difference places so that teachers and students could have more individual and flexible learning space and environment. It should be noticed that external interference and interruption, e.g. phone calls or others' interference, might appear in the learning process (Topalaa & Tomozia, 2014); (4) Interaction method: The interaction method for synchronous online learning could be one-way transmission, e.g. real-time multicast, or two-way interaction, e.g. online real-time discussion, between teachers and students and among students; (5) Delivery method: The synchronous online learning course could be played course video files, real-time online instruction, or mixed.

Intellectual property rights

Face *et al.* (2014) mentioned that intellectual property rights (IPR) were also called intangible property rights or intellectual property (IP). The general concept referred to patent, trademark, and copyrights protected by the law. The contents of intellectual property rights actually contained broad and narrow meanings. Intellectual property rights narrowly referred to the rights regulated in the

law. Intellectual property rights currently approved in domestic laws including copyright, trademark right, patent right, integrated circuit layout, plant variety and seed act rights. Peterson (2015) broadly explained intellectual property rights as the rights to protect business name, trade secret, business mark, and unfair competition as well as other spiritual activities. In short, intellectual property rights did not simply protect spiritual creation, but also contained trademark and unfair competition. The protection rights covered personal rights (moral right, the right of having inventors' name shown); and, it was not restricted to exclusive rights to property rights, e.g. protection of trade secret or unfair competition. Auliyanti, Sekartini, & Mangunatmadja (2015) regarded intellectual property rights as "the outcome and relevant rights generated from human spiritual activities or the identification of industrial activities protected by the law". Long, Logan, & Waugh (2016) indicated that, in the field of intellectual property, the protection of intellectual property in various countries was not identical; the citizens in a country therefore would encounter various obstacles to protect the creations in other countries. International treaties set relevant standards for the members, who had to obey international treaties and would apply such standards as the principles of domestic regulations. Jensen, Kummer, & Godoy (2015) pointed out the following characteristics of intellectual property rights: (1) Intangible property rights: The object protected by intellectual property rights did not show specific forms; it was the abstract idea legally; (2) International commodity: The protection of intellectual property rights was the system of territorial law; therefore, the establishment of international organizations and the signature of international treaties would have the protection standards among various countries move towards the consistency; (3) Territoriality: The protection of intellectual property rights was merely valid in the applied country.

Learning motivation

Shyu (2014) proposed that learning motivation was the psychological factor in encouraging students for learning activity, the inner power to directly promote students' learning, as well as the start and awakening of learning behavior. Hidekazu, Shin, & Hiroshi (2014) considered that learning motivation could guide individual learning goal, induce learning behavior and continuous efforts, reinforce cognition process, as well as strengthen and improve learning results. Mok (2014) indicated that learning motivation could guide individual learning goal, induce learning behavior and continuous efforts, reinforce cognition process, as well as strengthen and improve learning results. Joo, Sohng, & Kim (2015) regarded learning motivation as students' willingness or desire to participate in and make efforts on learning, which presented on students' selection of specific learning activity and the strength on continuously making efforts on the activity. Accordingly, learning motivation is defined in this study as the motive tendency to guide students preceding continuous learning, in the activity learning process,

and making efforts on the learning goal set by the teachers. Richards & Rodgers (2014) revealed that learning motivation was students' inner psychological process to induce the learning activity, maintain the learning activity, and have the learning activity approach the goal set by the teachers in order to achieve the teaching goal and the teachers' effective teaching. Referring to Chen, Yang, & Hsiao (2016), motivation in "Expectations-Value Theory" contains work value, expected success, and ability belief: (1) Work value: referring to students' evaluation of the learning; (2) Ability belief: referring to students' perceived self-ability in the learning; (3) Expected success: referring to students' expectation of future performance in the learning.

Learning outcome

Learning outcome is generally regarded as various evaluations of learners' learning activity after a period of time and the learning activity achieving the expected effect (Simonson, 2014). In other words, learners would change the knowledge, skills and behaviors, and attitudes after the end of the teaching (Huang *et al.*, 2014). Touchton (2015) regarded the consistent ideas of academic performance, learning outcome, academic achievement, or learning achievement, i.e. students' subject learning results or the persistent results through learning history. Obonyo & Leh (2015) indicated that the indicators to evaluate students' learning outcome were the items to evaluate teaching quality; learning outcome would be affected by course design, teaching methods, and learning behaviors; students' learning objectives were to monitor and control self-learning, reflect the learned knowledge, and learn how to learn; accordingly, learning outcome was the direct performance on learning results. Learning outcome also aimed to test the achievement of learning or teaching goals and to make revision or feedback for the reference or guidance of next course improvement. Wongse-ek, Wills, & Gilbert (2014) regarded it as students' affirmation of self-learning ability in teachers' teaching process. Shadiev *et al.* (2015) pointed out learning outcome as the cognition of knowledge, skills, and reasoning, through a period of practice and learning, to change behaviors or behavior models, apply and solve problems, enhance working ability, and improve life.

Referring to Chou, Lunsford, & Thomson (2015), learning outcome contains learning effect and learning gain for the measurement in this study: (1) Learning effect: including test record, time for schedule completion, and term performance; (2) Learning gain: containing learning satisfaction, achievement, and preference.

Research hypothesis

Sheorey (2014) mentioned that synchronous teaching, by delivering images and utilizing the interaction function of a multimedia platform, could provide more authentic teaching situations, allowing learners better understanding the lecturers'

explanation or directly asking questions to lecturers for immediate responses. Besides, most multimedia platforms presented the recording function that learners could repeatedly view the teaching process, as non-synchronous teaching. In certain situations, learners in synchronous teaching showed more profound comprehension on courses and could better promote the learning motivation and learning outcome than those in non-synchronous teaching (Michaelsen, Davidson, & Major, 2014). Wallace *et al.* (2014) indicated that, in comparison with traditional classes, learners participating in synchronous teaching could more clearly hear the lecturers' voice and tone through headsets and microphones, the learning motivation was more proactive, and a sense of community could be easily generated to present high learning cooperation; lecturers, on the other hand, could precede teaching through more extra materials (Mok, 2014). From above literatures, the following hypothesis is further proposed in this study.

H1: Internet synchronous teaching presents positive relationship with learning motivation.

Chen, Yang, & Hsiao (2016) proposed the model of motivation affecting outcome to understand students' learning motivation; it explained the relationship between motivation and outcome that learners' learning motivation would affect the learning outcome and learning strategies. Joo, Sohng, & Kim (2015) mentioned that students with inadequate motivation would present bad learning outcome even though learning with sufficient cognition (Huang *et al.*, 2014). Lee & Chung (2014) revealed the higher learning motivation, the higher learning outcome, i.e. positive correlations between learning motivation and learning outcome. Learning motivation would have students prepare for learning and enhance the attention and absorption of new knowledge; students with strong learning motivation showed better preparation for learning than ones with weak motivation. For the maximal effectiveness of learning, Wang (2015) revealed the higher learning motivation, the higher learning outcome, i.e. positive correlations between learning motivation and learning outcome. To understand students' learning motivation, Obonyo & Leh (2015) proposed the model of motivation affecting outcome to explain the relationship between motivation and outcome. Accordingly, the following hypothesis is inferred in this study.

H2: Learning motivation shows positive relationship with learning outcome.

Chou, Lunsford, & Thomson (2015) indicated that, with above-mentioned advantages, synchronous teaching could maintain learners' learning motivation, enhance learners' participation, and even effectively promote learners' learning outcome. Xu, Huang, & Tsai (2014) mentioned that synchronous teaching with recording tools could record the interaction between teachers and students and among classmates so that learners could simply focus on the class activity and discussion issues, without making notes; lecturers, on the other hand,

could understand learners' learning conditions and timely provide support and encouragement through learners' text or voice discussions. Synchronous teaching with recording function could benefit learners in concentrating on lessons as well as learners in after-class review so that learners could control the learning schedule with the learning steps to avoid over cognition load (Hwang, Kongcharoen, & Ghinea, 2014). Dong *et al.* (2014) stated that lecturers could utilize the functions of multimedia platforms (e.g. text blocks, sound effect) to remind learners' attention and avoid learners' distraction in the synchronous teaching process. In this case, synchronous teaching could largely enhance learners' learning outcome. According to above literatures, the following hypothesis is then inferred.

H3: Internet synchronous teaching reveals positive relationship with learning outcome.

Methodology

Research sample and object

With experimental research, 98 students in two classes of a university in Guangxi are studied. Internet synchronous teaching is utilized for the 16-week (3 hours per week for total 48 hours) experimental teaching. The collected data are analyzed with computer statistics software and various hypotheses are tested.

Reliability and validity test

Validity is a measuring tool to really measure what a researcher would like to measure. Validity is generally divided into content validity, criterion-related validity, and construct validity. The questionnaire items in this study are referred to domestic and international studies, and a pretest is preceded before the formal questionnaire that the questionnaire presents certain content validity. The dimensions of Internet synchronous teaching, learning motivation, and learning outcome in this study are tested the overall structural causal relationship with linear structural relations model; the data entry is based on the correlation coefficient matrix of above observation variables. The analysis results with the linear structural relation model reveal the reasonable range of the overall model fit that it shows favorable convergent validity and predictive validity. Item-to-total correlation coefficients are used for testing the construct validity of the questionnaire content, i.e. reliability analysis. The calculated item-to-total correlation coefficients are applied to judge the questionnaire content. The item-to-total correlation coefficients of the dimensions in this study are higher than 0.7, revealing certain construct validity of the dimensions.

To further understand the reliability and validity, reliability and validity are further analyzed. The higher Cronbach's α shows the better reliability. The formal questionnaire in this study is developed based on the standard, and the measured Cronbach's α appears in 0.73~0.88, apparently conforming to the reliability range.

Results

LISREL model evaluation indicator

LISREL (linear structural relation) model, combining factor analysis and path analysis in traditional statistics and adding simultaneous equation in econometrics, could simultaneously calculate multiple factors and multiple causal paths. The model fit could be evaluated with preliminary fit criteria, overall model fit, and fit of internal structure of model.

The data results in this study are organized in Table 1. The preliminary fit criteria, internal fit, and overall fit of the model are explained as followings. Table 1 shows that five dimensions of Internet synchronous teaching (role, participation method, participation location, interaction method, delivery method) could significantly explain Internet synchronous teaching ($t > 1.96$, $p < 0.05$); three dimensions of learning motivation (work value, ability belief, expected success) could remarkably explain learning motivation ($t > 1.96$, $p < 0.05$); and, two dimensions of learning outcome (learning effect, learning gain) could notably explain learning outcome ($t > 1.96$, $p < 0.05$). Apparently, the overall model presents good preliminary fit criteria.

In regard to internal fit, Internet synchronous teaching appears positive and significant correlations with learning motivation (0.882, $p < 0.01$), learning motivation presents positive and remarkable correlations with learning outcome (0.871, $p < 0.01$), and Internet synchronous teaching shows positive and notable correlations with learning outcome (0.857, $p < 0.01$). H1, H2, and H3 are therefore supported.

In term of overall model fit, the overall model fit standards $\chi^2/DF=1.288$, smaller than the standard 3, and RMR=0.005 reveal good χ^2/DF and RMR results. Furthermore, chi-square is not suitable for directly judging the fit due to the sensitivity to sample size. However, the overall model fit standards GFI=0.974 and AGFI=0.913 are higher than the standard 0.9 (the closer GFI and AGFI to 1, showing the better model fit). The model therefore presents favorable goodness-of-fit.

Table 1. Overall linear structural model analysis

evaluation item	parameter/evaluation standard		result	t
preliminary fit	Internet synchronous teaching	role	0.655	8.54**
		participation method	0.673	9.87**
		participation location	0.661	9.16**
		interaction method	0.682	10.13**
		delivery method	0.691	10.69**
	learning motivation	work value	0.733	14.66**
		ability belief	0.725	13.51**
		expected success	0.746	15.18**
	learning outcome	learning effect	0.759	16.28**
		learning gain	0.766	17.36**
internal fit	Internet synchronous teaching→learning motivation		0.878	31.17**
	learning motivation→learning outcome		0.864	28.34**
	Internet synchronous teaching→learning outcome		0.845	26.51**
overall fit	X2/Df		1.491	
	GFI		0.988	
	AGFI		0.923	
	RMR		0.006	

Note: * stands for $p < 0.05$, ** for $p < 0.01$, and *** for $p < 0.001$.

Table 2. Hypothesis test

research hypothesis	correlation	empirical result	P	result
H1	+	0.878	$P < 0.01$	supported
H2	+	0.864	$P < 0.01$	supported
H3	+	0.845	$P < 0.01$	supported

Conclusion

The research results reveal that the rapid development of networking industry changes the information and knowledge acquisition of modern people. The use of tools, the establishment of Internet environment, the development of Internet material contents, and the design of Internet activity could construct the basic structure of Internet synchronous learning. For this reason, when the mentioned items are integrated, the overall Internet synchronous teaching effectiveness could be enhanced to effectively promote students' learning motivation and outcome. Using multimedia for designing learning materials and establishing Internet synchronous learning platforms, the distribution of relevant multimedia materials could facilitate people' learning anytime and anywhere. The abstract, difficult, and intangible intellectual property concepts could be included in lively living concepts to benefit the learning. It is expected to have learners acquire the basic knowledge and concepts of intellectual property rights and learn information related to intellectual property rights through Internet synchronous teaching to enhance students' impression and achieve the Internet synchronous teaching of intellectual property rights.

Recommendations

By organizing the research results and findings in this study, practical suggestions are proposed as below.

1) Intellectual property rights are closely related to the knowledge of law, and texts and articles in the regulations should be obeyed. The material design therefore should be friendly and reinforce the design or select suitable Internet synchronous teaching materials to satisfy student needs. Particularly, the Internet synchronous teaching material making talents should be further trained to combine theories and practice so that the Internet synchronous teaching materials related to intellectual property rights could conform to actual needs.

2) In physical courses, teachers could explain the instruction which learners do not understand, while it would not be the situation for online courses. Nevertheless, when clear explanations or easily understandable materials are provided to reduce the complexity in the beginning, learners could immediately follow the instruction to achieve the teachers' expectations. It would benefit online courses to save time and avoid students losing the concentration in the long interpretation to further enhance the learning motivation and outcome.

3) In addition to the basic knowledge about intellectual property rights, the Internet synchronous teaching materials could cover relevant website data, webpage games, and large amount of class activity practice. Different from past teaching presentation, which is full of texts and grammars, large amount of pictures could be used in the presentation for students more easily concentrating on the course to further effectively promote students' learning motivation and outcome.

References

- Arfstrom, K., Bergmann, K., & Lazzaro, H. (2014). *What is Flipped Learning?* Flipped Learning Network.
- Auliyanti, F., Sekartini, R., & Mangunatmadja, I., (2015). Academic achievement of junior high school students with sleep disorders. *Paediatrica Indonesiana*, 55(1), 55-58. DOI: 10.14238/pi55.1.2015.50-8
- Chen, S., Yang, S.J.H., & Hsiao, C. (2016). Exploring Student Perceptions, Learning Outcome and Gender Differences in a Flipped Mathematics Course. *British Journal of Educational Technology*, 47(6), 1096-1112. DOI; 10.1111/bjet.12278
- Chou, T.S., Lunsford, P. J., & Thomson, K. (2015). Design of Simulation-Based Laboratories for Teaching Wireless Network Technologies.
- Dong, Y., Zhang, X., Dai, J., & Guan, H. (2014). HYVI: a hybrid virtualization solution balancing performance and manageability. *IEEE Transactions on Parallel and Distributed Systems*, 25(9), 2332-2341.
- Face, K., Joiner, R., Stanton, D., Reid, J., Hull, R., & Kirk, D. (2014). Savannah: Mobile gaming and learning? *Journal of Computer Assisted Learning*, 20(6), 399-409.
- Hidekazu, O., Shin, M., & Hiroshi, N. (2014). Feature-aware regularization for sparse online learning. *Science China (Information Sciences)*, 05, 65-85.
- Huang, T.-Y., Jeyakumar, V., Lantz, B., Feamster, N., Winstein, K., & Sivaraman, A. (2014). *Teaching computer networking with mininet*. Paper presented at the ACM SIGCOMM.
- Hwang, W.-Y., Kongcharoen, C., & Ghinea, G. (2014). To enhance collaborative learning and practice network knowledge with a virtualization laboratory and online synchronous discussion. *The International Review of Research in Open and Distributed Learning*, 15(4). <http://www.irrodl.org/index.php/irrodl/article/view/1805/3002>
- Jensen, J., Kummer, T., & Godoy, P. (2015). Improvements from flipped classroom may simply be the fruits of active learning. *CBE – Life Sciences Education*, 14(1), 1-12. DOI: 10.1187/cbe.14-08-0129
- Joo, G. E., Sohng, K. Y., & Kim, H. J. (2015). Effects of a Standardized Patient Simulation Program for Nursing Students on Nursing Competence, Communication Skill, Self-efficacy and Critical Thinking Ability for Blood Transfusion. *Journal of Korean Academy of Fundamentals of Nursing*. 22(1), 49-58. DOI; 10.7739/jkafn.2015.22.1.49
- Lee, S.H., & Chung, S. (2014). Influencing Factors of Critical Thinking Disposition and Self-esteem on Communication Competence among Nursing Students. *The Journal of the Korea Contents Association*, 14(12), 340-349.
- Long, T., Logan, J., & Waugh, M. (2016). Students' Perceptions of the Value of Using Videos as a Pre-class Learning Experience in the Flipped Classroom. *TechTrends: Linking Research and Practice to Improve Learning*, 60 (3), 245-252.
- Michaelsen, L.K., Davidson, N., & Major, C.H.(2014). Team-based learning practices and principles in comparison with cooperative learning and problem-based learning. *Journal on Excellence in College Teaching*, 25(3), 57-84
- Mok, H.N. (2014). Teaching Tip: The Flipped Classroom. *Journal of Information Systems Education*, 25(1), 7-11.
- Obonyo, C., & Leh, A.S.C. (2015). Facilitating Action Research in Higher Education using Flipped Classroom Approach. In: D. Rutledge & D. Slykhuis (Eds.), *Proceedings of*

- Society for Information Technology & Teacher Education International Conference 2015* (pp. 1011-1014). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).
- Park, J.S., Choi, M.J., & Jang, S.Y. (2015). The Effects of Preclinical Clinical Performance Examination on Nursing Students' Confidence in Nursing Skills and Critical Thinking Competence. *Journal of Korean Academic Society of Nursing Education*, 21(1), 75-85.
- Peterson, D. (2015). The Flipped Classroom Improves Student Achievement and Course Satisfaction in a Statistics Course. *Teaching of Psychology*, 43(1), 10-15. DOI: 10.1177/0098628315620063
- Richards, J. C., & Rodgers, T. S. (2014). *Approaches and Methods in Language Teaching*. Cambridge University Press.
- Shadiev, R., Hwang, W.-Y., Huang, Y.-M., & Liu, T.-Y. (2015). The Impact of Supported and Annotated Mobile Learning on Achievement and Cognitive Load. *Educational Technology & Society*, 18(4), 53-69.
- Sheorey, T. (2014). Empirical evidence of relationship between virtual lab development and students learning through field trials on vlab on mechatronics. *International Journal of Information and Education Technology*, 4(1), 97. DOI: 10.7763/IJNET.2014.V4.377
- Shyu, H.Y. (2014). *Implementing the Flipped Classroom Strategy into In-service Education*. In: T. Bastiaens (Ed.). *Proceedings of E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2014* (pp. 1819-1823). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).
- Simonson, S.R. (2014). Making students do the thinking: team-based learning in a laboratory course. *Advances in Physiology Education*, 38.49-55.
- Topalaa, I., & Tomozia, S. (2014). Learning Satisfaction: Validity and Reliability Testing for Students' Learning Satisfaction Questionnaire (SLSQ). *Procedia-Social and Behavioral Sciences*, 128 (2014), 380-386.
- Touchton, M. (2015). Flipping the Classroom and Student Performance in Advanced Statistics: Evidence from a Quasi-Experiment. *Journal of Political Science Education*, 11(1), 28-44. DOI: 10.1080/15512169.2014.985105
- Wallace, M.L., Walker, J.D., Braseby, A.M., & Sweet, M.S. (2014). Now, what happens during class? Using team-based learning to optimize the role of expertise within the flipped classroom. *Journal on Excellence in College Teaching*, 25(3), 253-273.
- Wang, J. (2015). Application of Blogs in Teaching Computer Graphics. *World Transactions on Engineering and Technology Education*, 13(3), 427-431.
- Wongse-ek, W., Wills, G., & Gilbert, L. (2014). Calculating Trustworthiness based on Learning Outcome. In: T. Bastiaens (Ed.), *Proceedings of E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*, (pp. 2085-2090). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).
- Xu, L., Huang, D., & Tsai, W.-T. (2014). Cloud-based virtual laboratory for network security education. *IEEE Transactions on Education*, 57(3), 145-150. DOI: 10.1109/TE.2013.2282285