

# THE IMPACT OF USING FLIPPED LEARNING STRATEGY ON STUDENTS' MOTIVATION FOR LEARNING

Atef Abuhmaid

*Hashemite University (JORDAN)*

## Abstract

The current study aimed at investigating the effect of using flipped learning strategy on improving students' motivation for learning. The study utilized a quasi-experimental research design. Two sections from the faculty of educational sciences at Hashemite University were selected during the second semester of the academic year 2016/2017. The first section consisted (82) students and the second consisted (71) students. The first section was selected as a control group which was taught in a traditional method while the second as an experimental group and taught with a flipped learning strategy. A learning motivation test was developed and its validity and reliability were tested.

The results of the study showed significant differences at the level of ( $\alpha = 0.05$ ) in students' motivation for learning in favour of the experimental group which was taught with the flipped learning strategy. Moreover, the study revealed that two domains which were affected positively by the flipped learning strategy were: "Enjoying learning" and "Discussion in the classroom."

Keywords: Flipped learning, teaching methods, higher education, blended learning.

## 1 INTRODUCTION

Millennial students are living in unprecedented era. The rapid technological developments have offered them tools and services which were not within the imagination of earlier generations. Mobile devices and the internet can be two of the main aspects of the daily life of this generation which make them attached to the technology and constantly connected to the world. Nevertheless, despite the opportunities offered, the new technologies have caused serious concern (1).

In learning, the digital tools have offered unprecedented learning opportunities for students. Students have better opportunities to move on their own pace in learning (2), they can communicate with each other and with the teacher, they can access massive online resources, and they can easily create and reproduce information in many forms (e.g. multimedia, blogs, and wikis). However, this has been accompanied with unprecedented pressure on students' motivation to learning as the temptation of new technologies, according to (3), has caused problems in the form of lapses in self-control and time management among students.

Students' learning is increasingly more challenging and complex (4). Various issues and factors are becoming involved in students' learning in the digital era including information overload, digital literacy, the excessive time students spend on social media, and the pressure associated with the digital culture. In addition, university students, especially in the conservative contexts, may find it difficult to adjust to the profound changes as they move from the highly structured and supervised learning environment in school to a relatively unsupervised and unstructured environment in universities (3). Such issues and factors can impede students' desire to dedicate time and efforts to learning. Therefore, (5) argue that students' ability and intellect influence what they can do, however, it is the level of motivation is what decides how much effort and time they dedicate to a learning activities and tasks. Hence, there is concern over the possibility that time spent on the digital media may be substituting for time spent on school-related activities (3, 6).

Students' motivation is crucial to learning. Regardless of students' level of intelligence, learning might be affected because their lack of motivation (7). Therefore, significant body of research has

focused on how to motivate students for learning (6-9). Teachers can rely on the digital tools in order to differentiate teaching strategies and methods to become more suitable to the millennials. For instance, flipped learning strategy relies on the potentials of technology to create more suitable and engaging learning processes and environments (10). Therefore, it might be helpful to explore the impact of flipped learning strategy as it attempts to redesign the learning environment relying on the potentials of technology on improving students' motivation to learn.

## **1.1 The context: Hashemite University**

Educational organizations are increasingly recognizing the potentials of Information and Communication Technologies (ICT) in order to improve their performance for its, approximately, 30 thousand students. Thus, they are increasingly considering the utilization of new technologies, and the Hashemite University in Jordan is no exception. The University is considering e-learning as part of its development programs so it is digitizing its services. For instance, the "National Education" course has been fully digitized and an e-learning management system (LMS) is available for all faculty and students.

The Faculty of Educational Sciences at the university requires students to undertake the "Computer use in education" as a compulsory course. The course is aimed at providing students with deep understanding of the role of computers in creativity, encouraging learning and developing higher order thinking skills such as problem-solving and critical thinking. In addition, the course is expected to improve students' computer skills and its implementation in teaching in the future.

## **1.2 Motivation to Learn**

People need motivation in order to do things (11-13) or to switch on some pattern of behavior (14). Motivation energizes and guides behavior toward reaching a particular goal (15).

Motivation has been defined, according to (5), as students' "willingness to attend and learn material in a development program" (p.67). (16) stressed motivation as a necessary precondition for student involvement in any type of learning activity. According to (12) and (13), motivation is one of the essential factors for learning as it can predict students' benefit from what the learning environment can offer (11). Furthermore, students' motivation to learn has been linked to their academic achievement (17, 18) and to their learning (19). However, Bruner (20) earlier criticized the schooling system where curriculum is set and students must follow a certain path in a rigid situation with minimum attention paid to the "will" or motivation for learning. Therefore, education institutions must pay close attention to students' motivation to learn (21).

According to (22), learning environments affect students' motivation for learning. Thus, teachers' role as designers for learning environments in the digital era needs to deal with students' motivation issue carefully taking into account the various sorts of distractors they are exposed to. Despite the fact that students vary in both their levels of motivation and their attitudes and goals (23), teachers should strive to keep students motivated by adopting new teaching methods and strategies (7).

There are two types of motivation: intrinsic and extrinsic. Intrinsic motivation refers to actions we are engaged in because they are inherently enjoyable, while extrinsic motivation is concerned with engaging in actions because they lead to outcomes (24, 25). Students need intrinsic motivation in order to maintain their desire to learn and complete tasks. In the extrinsic motivation the learner is more concerned with the reward or avoiding punishment with less concern with the learning itself. The increasing reliance on online learning typically relies on students' curiosity and self-regulation to keep them engaged (26), especially in the digital era where students are bombarded with all sorts of distractors.

Students are tempted to spend excessive time on social media browsing and communicating. While this can be rationalized in some cases, it might be still at the cost of learning tasks in other cases. (27) revealed positive correlation between the amount of Internet usage and deficiencies in self-regulation. Digital tools, especially social media, have intervened even with learning in the

classroom. In the face of this onslaught, stressing the external factors for motivating students to learn (e.g. avoiding punishment, securing job, or achieving high grades), can be a less effective strategy (16). Therefore, a shift must be made toward the intrinsic motivation encouraging students to learn despite the absence of external rewards or punishment, which might be impossible when students are disengaged from learning experiences.

### 1.3 Flipped Learning

It's importance to create learning experiences which replicate reality (28). Nevertheless, this could not be achieved in light of the "get through all the slides before the end of class" mentality (28, p.43). Therefore, the flipped learning strategy has gained increasing attention since the inception of the term around 2011 (29). The basis for this strategy is that students come to the classroom ready for the learning experiences (28).

weaving students' digital tools into learning can increase their motivation to learn. Traditional learning might contradict the pace and life style of today's students which might decrease their motivation to learn. According to (2), teachers using the flipped learning strategy observed an increase of students' achievement, interest, and engagement. Flipped learning uses various means of technology in order to enhance learning outside of the classroom (30). The technology can play valuable role in transmitting information (31) which can be done outside the classroom. In addition, according to (2), this approach enables students to move on their own pace relying on the flexibility of technology.

In-class time activities are specifically designed to enable students to use the knowledge they gained prior to the class. Thus, students are required to deal with a more realistic situation than merely listening and understanding knowledge presented in the traditional classroom. Accordingly, students have a better chance to link their knowledge to prior knowledge in order to deal effectively with tasks and activities designed in the learning experience (28). The in-class time is freed from lecturing and information transmission in flipped classroom in order to achieve higher order and deeper levels of learning (32). That is, students become engaged in higher order activities in classroom time such as problem-solving, analyzing, discussion, and debates (33) under the guidance of the teacher (29). In addition, students complete homework in classroom (34) which enables teachers to have better insight into students' learning. Therefore, instead of lecturing and being the sole provider of knowledge, according to Butt (35), teachers may use the classroom time to apply the concepts and knowledge making them more engaged and responsible. The teacher guides students' learning in the classroom instead of transferring lecture notes to the notebooks of the students without passing through their brains (36), as students become more involved and engaged because they have prior knowledge of the subject.

## 2 METHODOLOGY

The current study utilized a quasi-experimental methodology as two sections (groups) were involved in the study as one control group and the other as experimental group. The research design implemented was symbolically as follows:

Experimental group    O1 x O2

Control group            O1 - O2

O: Student Motivation Test, X: Teaching with flipped learning strategy, - : Traditional teaching.

### 2.1 Participants

Two sections from the faculty of educational sciences at Hashemite University were selected during the second semester of the academic year 2016/2017. The first section consisted (82) students and the second consisted (71) students. The first section was assigned as a control group while the second as an experimental group. The control group was taught in a traditional strategy and the flipped learning strategy was used in teaching the experimental group.

Female students comprise the vast majority of students at the faculty of educational sciences, therefore, participants in the study were mostly female students (89.5%). Table (1) represents the demographic characteristics of participants in the study.

Table 1. Demographic Characteristics of Respondents.

variable	Group	Frequency	percent
Section	Control	82	53.6
	Experimental	71	46.4
Gender	Male	16	10.5
	Female	137	89.5
Level	1 <sup>st</sup>	8	5.2
	2 <sup>nd</sup>	64	41.8
	3 <sup>rd</sup>	60	39.2
	4 <sup>th</sup>	18	11.8
	other	3	2.0
Major	Class teacher	69	45.1
	Counseling	84	54.9

## 2.2 Instrument of the study

Based on the literature review, the “Student Motivation Test” was developed. The test was divided into three domains: Striving to achieve learning objectives, enjoying learning, and discussion in the classroom. For the validity of the test, experts in the fields of psychology, testing and measurement, and educational technology were consulted. Accordingly, the final version of the test was modified to consist 30 items. In addition, the reliability of the test was calculated and the Cronbach’s Alpha was found to be (0.921).

## 2.3 Procedure

Two sections of the "use of computer in education" course were selected during the second semester of the academic year 2016/2017. One section was selected as a control group while the other was the experimental group. The course was “flipped” for the experimental group—students viewed online lectures and instructional videos at their own pace prior to class, allowing classroom time to be reserved for discussion and exercises designed to improve students’ engagement and deepen their understanding of concepts and facts presented in the videos. Therefore, a closed group was created on Facebook for students in the experimental group and the lecturer uploaded the required videos at least one day prior to each lecture. On the other hand, students in the control group were taught in a traditional way.

Students undertook the “Student Motivation Test” at the beginning of the semester. Teaching plans were developed for “teaching methods and computers” to guide teaching in the two teaching strategies. Students will be taught during two months according to the strategy assigned to their group. At the end of the two months, students in both groups were post-tested.

### 3 RESULTS

In order to answer the research question and find the impact of teaching strategy (Flipped /traditional) on students' motivation for learning, means and standard deviations were calculated for students' answers on the motivation test, differences between the mean of the experimental group and the control group in both pre and post-tests are presented in Table (2).

*Table (2): Means and Standard Deviations of the student's answers on the pre-post motivation tests*

Groups	Administration	Mean	Std. Deviation
Control group (n=82)	Pretest	3.76	0.405
	Posttest	3.72	0.457
Experimental group (n=71)	Pretest	3.80	0.409
	Posttest	3.90	0.461

Table (2) shows differences between the two means of the students' answers in the post-test due to the teaching strategy. To investigate the significance of the observed difference, ANCOVA was used for the students' answers in the post-test due to the teaching strategy after excluding the pretest answers as shown in Table (3).

*Table (3): The results of ANCOVA of the students' motivation on the post test*

Source	Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	0.83	1.00	0.83	3.99	0.048	0.027
Teaching strategy	1.15	1.00	1.15	5.55	0.02	0.037
Error	30	145.00	0.21			
Corrected total	32	147.00				

Table (3) shows significant differences at the level ( $\alpha = 0.05$ ) in the motivation test as the value of "F" was (5.55) which means rejecting the null hypothesis "There is no statistically significant influence at the level ( $\alpha = 0.05$ ) of teaching strategy (Flipped/traditional) on students' motivation for learning." Furthermore, the adjusted means and the standard error on the post test were also calculated for the experimental group as shown in Table (4).

*Table (4): The adjusted means and standard error for the performance on the post test*

Group	Adj. Mean	Std. Error
Control	3.72	0.052
Experimental	3.90	0.054

Table (4) shows that the adjusted means for the experimental group was 3.90 with a standard error of 0.054, but the adjusted means of the control group was 3.72 with a standard error of 0.052, indicating that the significant differences was in favor of using flipped learning strategy. The practical significance for the teaching strategy with the students' answers in the test was 3.7 % as shown earlier in the table (3).

Means and standard deviations of the pre and post tests in the three domains of the motivation test (Striving to achieve learning objectives, Enjoying learning, and Discussion in the classroom) are shown in Table (5).

*Table (5): Means and Standard Deviations in the Pre and Post tests between the control and experimental groups on the motivation test*

Dependent Variable	group	N	Pre-Test		post-Test	
			Mean	Std. Deviation	Mean	Std. Deviation
Striving to achieve learning objectives	Control	82	3.94	0.355	3.92	0.363
	Experimental	71	3.91	0.370	4.00	0.402
Enjoying learning	Control	82	3.54	0.623	3.47	0.713
	Experimental	71	3.66	0.576	3.74	0.606
Discussion in the classroom	Control	82	3.81	0.534	3.74	0.594
	Experimental	71	3.82	0.527	3.95	0.551

Table (5) shows differences in Means and Standard Deviations in the Pre and Post tests between the control and experimental groups on the motivation test in the three domains. MANCOVA was conducted in order to investigate the differences in the post-test due to the teaching strategy after excluding the effect of students' answers in the pretest in the three domains as shown in Table (6).

*Table (6): Results of MANCOVA for students' answers in the pretest in the three categories Due to the Teaching Strategy*

Source of Variance	Dependent variable	Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared
Striving to achieve learning objectives	Striving to achieve learning	0.00	1	0.00	0.00	0.967	0.000
	Enjoying learning	0.45	1	0.45	1.01	0.317	0.007
	Discussion in the classroom	0.41	1	0.41	1.24	0.267	0.009
Enjoying learning	Striving to achieve learning	0.12	1	0.12	0.81	0.371	0.006
	Enjoying learning	0.04	1	0.04	0.09	0.771	0.001
	Discussion in the classroom	0.02	1	0.02	0.07	0.797	0.000
Discussion in the	Striving to achieve learning	0.01	1	0.01	0.09	0.765	0.001
	Enjoying learning	0.28	1	0.28	0.63	0.428	0.004

classroom	Discussion in the classroom	0.40	1	0.40	1.21	0.273	0.008
Section	Striving to achieve learning objectives	0.18	1	0.18	1.22	0.270	0.008
	Enjoying learning	3.01	1	3.01	6.79	0.010*	0.045
	Discussion in the classroom	1.45	1	1.45	4.44	0.037*	0.030
Error	Striving to achieve learning	21.45	143	0.15			
	Enjoying learning	63.46	143	0.44			
	Discussion in the classroom	46.62	143	0.33			
Corrected total	Striving to achieve learning	22.03	147				
	Enjoying learning	67.50	147				
	Discussion in the classroom	50.18	147				

Table (6) shows significant differences at the level ( $\alpha = 0.05$ ) between the control and experimental groups in two domains: Enjoying learning and Discussion in the classroom only on the post-test due to the teaching strategy. In addition, the adjusted means and the standard error in the domains of the posttest were also calculated for the experimental group, as shown in Table (7).

*Table (7): The adjusted means and standard error for the performance of the members of the study sample on the domains of motivation post test*

Domain	Group	Adi. Mean	Std. Error
Striving to achieve learning objectives	Control	3.922	0.044
	Experimental	3.993	0.046
Enjoying learning	Control	3.457	0.076
	Experimental	3.746	0.080
Discussion in the classroom	Control	3.751	0.065
	Experimental	3.951	0.680

Table (7) shows significant differences at the level ( $\alpha = 0.05$ ) between the two adjusted means of students' answers in the domains on the post-test (Enjoying learning, Discussion in the classroom) due to the teaching strategy, in favor of the experimental group.

## 4 DISCUSSION

The aim of the current study was investigating the impact of teaching strategy (Flipped /traditional) on students' motivation for learning. The result of the study mainly pointed to significant effect of flipped learning strategy on "Enjoying learning" and "Discussion in the classroom" domains on the "Student Motivation Test".

The literature has pointed to a strong relation between motivational factors and students' learning. Motivational factors, according (37, 38), can mediate learning by increasing or decreasing cognitive engagement. In addition, motivation has the power to energize and guide students toward reaching a particular goal (15). Therefore, when students are engaged in their learning, they are more likely to enjoy learning and feel more responsible and in charge (36). Apparently, flipped learning puts the focus on moving learning activities and tasks in space and time, in order to increase students' engagement and autonomy (29). Furthermore, students in the current study are considered "Net Generation" so, they prefer a teaching method which utilizes what they already use in their daily lives. Therefore, the utilization of Facebook and other contemporary media (videos and multimedia) is expected to attract their attention and make them more engaged by "speaking their language." In addition, according to Abeysekera and Dawson (29), flipped learning can entice greater levels of extrinsic motivation as the in-class time is used to encourage students to be active participants which reflects positively on their autonomy and competence.

In addition, the results of the study pointed to the effect of flipped learning strategy on the "Discussion in the classroom" domain which might be due to the dynamic and interactive environment created by the flipped learning strategy. The result might also point to the major shift in the strategy which requires students to become active in learning as they are required to watch videos and come prepared to the class. This shift puts students in the responsible seat making them more aware of what they are required to achieve and do better to achieve that.

Students in the current study were noticed sharing their comments and devices even before the class as they were preparing themselves for discussion which created a more interactive and social learning environment. The flipped learning can result in a greater level of extrinsic motivation for students due the learning environment created which satisfies students' needs for autonomy (29). In addition, when students come to the class with clear ideas about what is going to be discussed in the classroom they might become more engaged and involved in learning activities and discussion.

## 5 CONCLUSIONS

Teachers can rely on technology to free classroom time in order to leverage, improve and create interest in learning. The current study has indicated that the flipped learning strategy can utilize technology to free the classroom time which can reflect positively on students' motivation to learn. Apparently, flipped learning puts the focus on moving learning activities and tasks in space and time, in order to increase students' engagement, autonomy.

## REFERENCES

- [1] Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: definition, rationale and a call for research. *Higher Education Research & Development*, 34(1), 1-14.
- [2] Al-Jarrah, A., Muflih, M., Al-Rabee, F., & Ghawanmeh, M. (2014). The Effect of Teaching by Instructional Software on Improving Maths Learning Motivation among 2nd Basic Graders in Jordan. *The Jordanian Journal of Educational Sciences*, 10(3), 261-274.
- [3] Alderman, M. K. (2004). *Motivation for Achievement: Possibilities for Teaching and Learning* (2nd ed.). London: Lawrence Erlbaum.
- [4] Baeten, M., Dochy, F., & Struyven, K. (2013). The effects of different learning environments on students' motivation for learning and their achievement. *British Journal of Educational Psychology*, 83(3), 484-501.
- [5] Bergmann, J., Overmyer, J., & Wilie, B. (2012). *The Flipped Class: Myths vs. Reality*. Retrieved from <http://www.thedailyriff.com/articles/the-flipped-class-conversation-689.php>

- [6] Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education*, 58(2015), 843–855.
- [7] Bristol, T. J. (2014). Flipping the Classroom. *Teaching and Learning in Nursing*, 9(1), 43–46.
- [8] Bruner, J. S. (1966). *Toward a Theory of Instruction*. Cambridge: Harvard University Press.
- [9] Butt, A. (2014). Student views on the use of a flipped classroom approach: evidence from Australia. *BUSINESS EDUCATION & ACCREDITATION*, 6(1), 33-43.
- [10] Ciampa, K. (2013). Learning in a mobile age: an investigation of student motivation. *Journal of Computer Assisted Learning*, 30(1), 82-96.
- [11] Ciani, K., Ferguson, Y., Bergin, D., & Hilpert, J. (2010). Motivational Influences on School-Prompted Interest. *Educational Psychology*, 30(4), 377-393.
- [12] Cole, M. s., Feild, H. S., & harris, s. g. (2004). Student learning motivation and psychological hardiness: Interactive effects on students' reactions to a management class. *Academy of Management Learning and Education*, 3(1), 64–85.
- [13] Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macro theory of human motivation, development, and health. *Canadian Psychology*, 49(3), 182–185.
- [14] Fulton, K. (2012). Upside Down and Inside Out: Flip Your Classroom to Improve Student Learning. *Learning & Leading with Technology*, 39(8), 12-17.
- [15] Garavan, T. N., Carbery, R., O'Malley, G., & O'Donnell, D. (2010). Understanding participation in e-learning in organizations: a largescale empirical study of employees. *International Journal of Training and Development*, 14(3), 155-168.
- [16] Harandi, S. R. (2015). Effects of e-learning on students' motivation. *Procedia - Social and Behavioral Sciences*, 181, 423 – 430. doi:10.1016/j.sbspro.2015.04.905
- [17] Hartnett, M. (2016). *Motivation in Online Education*. Singapore: Springer.
- [18] Herreid, C. F., & Schiller, N. A. (2013). Case Studies and the Flipped Classroom. *Journal of College Science Teaching*, 42(5), 62-66.
- [19] Ifenthaler, D. (2010). Learning and Instruction in the Digital Age. In J. M. Spector, D. Ifenthaler, P. Isaias, Kinshuk, & D. Sampson (Eds.), *Learning and Instruction in the Digital Age* (pp. 3-10).
- [20] James, A. J., Chin, C. K. H., & Williams, B. R. (2014). Flipped classroom use to improve and prepare maritime graduates. *Journal of Maritime Affairs*, 13(2), 331-343.
- [21] Johnson, L., Becker, S. A., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 Higher Education Edition*. Retrieved from Austin, Texas: <http://www.nmc.org/pdf/2014-nmc-horizon-report-he-EN.pdf>
- [22] Kim, K.-J., & Frick, T. W. (2011). Changes In Student Motivation During Online Learning. *Journal Educational Computing Research*, 44(1), 1-23.
- [23] Klatzky, R. L., Giudice, N. A., Bennett, C. R., & Loomis, J. M. (2014). Touch-Screen Technology for the Dynamic Display of 2D Spatial Information Without Vision: Promise and Progress. *Multisensory Research*, 27(5-6), 359-378.
- [24] Laming, D. (2004). *Understanding human Motivation: what makes people tick?* Oxford: Blackwell Publishing.
- [25] LaRose, R., Lin, C. A., & Eastin, M. S. (2003). Unregulated Internet Usage: Addiction, Habit, or Deficient Self-Regulation? *Media Psychology*, 5(2), 225–253.

- [26] Mackey, T. P., & Jacobson, T. (2016). How can we learn to reject fake news in the digital world? *The Conversation*. Retrieved from <http://theconversation.com/how-can-we-learn-to-reject-fake-news-in-the-digital-world-69706>
- [27] Malone, T. W., & Lepper, M. R. (1987). Making learning fun: A taxonomy of intrinsic motivations for learning. In R. E. Snow & M. J. Farr (Eds.), *Aptitude, learning, and instruction: Conative and affective process analyses* (Vol. 3, pp. 223-253). Hillsdale: Lawrence Erlbaum.
- [28] Mayer, R. E. (2014). Incorporating motivation into multimedia learning. *Learning and Instruction*, 29, 171-173.
- [29] Mazur, E. (2009). Farewell, Lecture? *SCIENCE Magazine*, 323, 50-51.
- [30] Moreno, R., & Mayer, R. (2007). Interactive Multimodal Learning Environments. *Educational Psychology Review*, 19(3), 309–326.
- [31] Panek, E. (2014). Left to Their Own Devices: College Students' "Guilty Pleasure" Media Use and Time Management. *Communication Research*, 41(4), 561–577.
- [32] Putman, M., & Walker, C. (2010). Motivating Children to Read and Write: Using informal learning environments as contexts for literacy instruction. *Journal of Research in Childhood Education*, 24(2), 140-151.
- [33] Richardson, M., & Abraham, C. (2009). Conscientiousness and Achievement Motivation Predict Performance. *European Journal of Personality*, 23(7), 589–605.
- [34] Richardson, M., & Abraham, C. (2012). Psychological Correlates of University Students' Academic Performance: A Systematic Review and Meta-Analysis. *Psychological Bulletin*, 138(2), 353–387.
- [35] Ryan, R. M., & Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*, 54, 54–67.
- [36] Sansone, C., & Harackiewicz, J. M. (2000). Looking beyond Rewards: The Problem and Promise of Intrinsic Motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and Extrinsic Motivation: The Search for Optimal Motivation and Performance* (pp. 1-48). San Diego: Academic Press.
- [37] Torff, B., & Tirota, R. (2010). Interactive whiteboards produce small gains in elementary students' self-reported motivation in mathematics. *Computers & Education*, 54(2010), 379-383.
- [38] Wentzel, K. R., & Feld, A. W. (2009). Introduction. In K. R. Wentzel & A. W. Feld (Eds.), *Handbook of Motivation at School* (pp. 1-8). New York: Routledge.
- [39] White, C., McCollum, M., Bradley, E., Roy, P., Yoon, M., Martindale, J., & Worden, M. K. (2015). Challenges to Engaging Medical Students in a Flipped Classroom Model. *Medical Science Educator*, 25(3), 219–222.
- [40] Wigfield, A., Eccles, J. S., & Rodriguez, D. (1998). The development of children's motivation in school contexts. *Review of Research in Education*, 23(1), 73-118.