

# The Improving of Junior High School Student In Learning Motivation Through Implementation Constructivistic Biology Learning Model Based On Information And Communication Technology

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## Abstract

This study aims to see an increase in student motivation through the implementation of learning-based model MPBK ICT. Subjects were VIIIA and VIIIB grade students of SMP State 6 Makassar. Sampling was done by purposive random sampling. Total number of students by 60 people. The design study is a pretest and posttest group design. Data was collected using a questionnaire motivation to study models of ARCS (*attention, relevance, confidence, and satisfaction*). Data were analyzed descriptively in the form of average and percentage. To see an increase in motivation to use the analysis <g> normalized gain. The results showed that the implementation of the model-based MPBK ICT can increase students' motivation with an average index <g> normalized gain of 0.7 for the motivation to learn. This means that the model-based MPBK ICT can increase students' motivation with high category.

**Keywords:** *Model-based MPBK ICT, motivation, constructivist*

## 1. Introduction

Updates constructivist paradigm of learning through sight and the shifts that occur due to the advancement of ICT are two things that are very consistent and mutually reinforcing. Constructivism and technology, separately or jointly offer new opportunities in the learning process, both in the classroom, distance learning and independent study (Wakden, 2009). So the four pillars of UNESCO's educational version, namely *learning to know, learning to do, learning its live together* and *learning to be* not just a slogan.

The application and development of Information and Communication Technology (ICT) in education became one of the policies the Ministry of Education, but have not found any model or strategy in learning how to integrate ICT in the pedagogical context. Biology-Based Learning Model Constructivist ICT (MPBK-based ICT) is a constructivist learning model that integrates conventional teaching face to face (*face to face*) with ICT in the form of learning management system (LMS) which are *online* and using approaches designed *Blended Learning* (BL). MPBK ICT-based learning combines face-to-face with online learning in order to improve access and quality of services to students. One of the aims of the model-based MPBK ICT is to increase students' motivation.

MPBK developed ICT-based constructivist learning paradigm based and ICT-based learning. Constructivist learning principles consist of: (1) *learning personalization*, (2) *reflective thinking*, (3) *problem-solving and investigation*, (4) *relevance to daily-life*, (5) *collaborative learning*, (6) *discussion*, and (7) *teacher scaffolding* (Haruthaithanasan, 2010: 24). MPBK the principle-based ICT as *learning resources*, ICT as a learning tool (*multimedia*), ICT as a forum for active learning (*learning activity*), and ICT as the possibility of transformation or self-regulation in learning (*learning self-regulation*).

As a learning model is designed by using a *blended approach learning*, MPBK-Based ICT consists of two main elements, namely face to face learning and online learning. MPBK syntax-based ICT on learning face-to-face consists of 6 phases, namely (1) Motivation and Delivery Objectives, (2) Information Learning, (3) Organizing Students, (4) Construction of Knowledge / skills, (5) evaluation and award ( 6) Establishment of training and follow-up (Figure 1)

In face-to-face activities, students are equipped with the student book and student worksheet (LKS) is designed based on the constructivist learning paradigm, and teachers equipped with books containing guidance teacher learning. In phase 6 is continued through *online* learning outside of face-to use e-learning in the form of LMS. In LMS there are a number of activities in the form of assignment, quiz and glossary are done individually, and forums, wikis and chat done in groups.

Constructivist learning theory believes that knowledge is actively constructed by the learner rather than received by teachers, learners actively construct knowledge rather than passively receiving information (Wang, 2008., Hamat & Embi, 2010., Bower et al., 2010). Cognitive constructivism, the view that knowledge is constructed by individual learners based on new information and previous experience. Knowledge is the result of the internalization of external reality and reconstruction takes place accurately. Social constructivism, the view that knowledge is socially constructed in a socio-cultural context (Wang, 2008: 413., Bay, 2011). The learning environment supports collaborative learning through social interaction, and this will increase learning how to analyze problems from different viewpoints and produce many solutions (Bay, 2011)

Vygotsky (1978 in Ormrod, 2008) suggests that the mental processes of the complex began as social activities; Vygotsky further argued that knowledge is constructed by the child through social interaction in the zone of proximal development or ZPP (Clement & Rea-Ramirez, 2008). ZPP is the distance between the actual developmental level marked with the child's ability to solve the problem without the help of others and the level of potential development that is characterized by a child's ability to solve the problem with the help of a teacher or in collaboration with more capable peers (Clement & Rea-Ramirez, 2008., Ormrod, 2008., Woolfolk, 2008., and Santrock, 2004). Vygotsky emphasized the importance of social influence, especially the influence of learning on the cognitive development of children (Hasse, 2001 in Santrock, 2004). The provision will increase the challenge to the child's cognitive development. Challenging tasks that provide many benefits, whereas tasks that can not be solved with the help of the children though others are not useful at all. Therefore, teachers should provide some tasks that can only be resolved through the help of another person child (Ormrod, 2008).

Model-based ICT MPBK provide special portion is balanced between individual learning and social learning both in face-to-face learning and online learning and allow students to accommodate varied learning styles. Merger-face and online learning through the integration of ICT is expected to increase student motivation.

Motivation is a concept complex psychological to explain the behavior and painstaking efforts in various activities (Cavas, 2011; Watters & Ginns, 2000 in Sevinc, 2011). Motivation associated with various properties such as curiosity, perseverance, learning and performance (Barlia & Beeth, 1999; Vallerand, Pelletier, Blais, Briere, Senecal & Vallieres, 1992). Brophy (2004), motivation is the concept of theoretical used to explain starters, direction, strength and insistence behavior goal-oriented. Palmer (2005) stated that motivation can applied to each process that activates and maintain learning behavior. Barlia (1999) stated that motivation is the variable important education that encourages new learning and performance skills, strategies and previously learned behavior.

According to Frith, (1997) components of motivation is curiosity (*curiosity*), self-efficacy (*self-efficacy*), Attitude (*attitude*), needs (*needs*), competence (*competence*), motivator external (*external motivators*). Research on achievement motivation (*achievement motivation*) is the main thing in education and teaching. Achievement motivation refers to the effort to become competent in the activities of a struggle (Elliot & Church, 1997 in Schunk, 2012). Motivation and learning can influence each other. Student motivation can affect what and how they learn, and then when the students learn and assume that they have more skilled, they are motivated to continue learning (Schunk, 2012). According to Ormrod (2008) motivational influence on students' learning and behavior, and therefore the school and the learning environment should receive special attention in order to raise the motivation to learn certain things and behave in certain ways. By Paris & Turner, 1994; Rueda & Moll, 1994 (in Ormrod, 2008) termed the *situated motivation*.

Keller suggests that the motivation to learn is influenced by perceptions of four components, namely attention (*attention*), relevance (*relevance*), confidence (*confidence*), and satisfaction (*satisfaction*). Each component plays an important role in motivating the students during the learning process. ARCS model is widely used to produce learning materials because it is related to the theories of learning motivation, learning design and development process (Huang et al, 2004).

ARCS model is a form of problem-solving approach to design aspects of motivation and learning environment in promoting and sustaining learning motivation SSWA to learn (in Humaraon Keller, 2010). This learning model is developed based on expected value theory (*expectancy value theory*) which contains two components, namely the value (value) and goals or expectations will be achieved (*expectancy*) in order to successfully achieve these goals.

According to Keller and Kopp (1987 in Huett, 2006), attention (*attention*) is the action to obtain and retain the curiosity and interest of students. According Margueratt (2007) Attention refers to whether the arousal of curiosity student inflame and whether passion The appropriate sustainable from time to time. Keller (1987 in Huett, 2006) defines relevance as "things that are considered to play a role in meeting the needs and satisfy personal desires, including the achievement of personal goals. Relevance connect the subject matter to be taught and the needs of the students to find material that is personally meaningful . Keller (1987 in Huett, 2006) defines trust as "Helping learners believe / feel that they will succeed and control their success. satisfaction, last

component of the model ARCS, serves to increase motivation of learners by creating a learning experience where learners can feel positive and "includes affirmation of teaching students that the content is relevant and that they have the ability to learn the material" (Gabrielle, 2003, in the Huett, 2006).

Based on the above, the proposed general formulation of the problem, namely: Is MPBK-based model implementation of ICT can enhance student motivation? . In particular formulation of research problems are:

1. Is MPBK-based model of ICT can enhance student motivation based on aspects of attention to the lesson?
2. Is MPBK-based model of ICT can increase students' motivation by relevance aspect of the lesson?
3. Is MPBK-based model of ICT can increase students' motivation is based on the belief in the success of the aspects of a lesson?
4. Is MPBK-based model of ICT can enhance student motivation based on aspects of satisfaction with the lesson?

## 2. Methods

This research was conducted in SMP 6 Makassar in February-April 2013. Samples were students of class VIII A and B Junior High School 6 Makassar. Determination of the sample was done in purposive random sampling. The number of students in the sample of 60 people. This study is designed in the form of pre-test and post-test group design. The research instrument used was a questionnaire designed student motivation to follow the ARCS model of Keller. Data was collected using a questionnaire motivation and done twice, ie before the implementation of the model (data pre-test) and after the implementation of the model-based MPBK ICT (data post-test). The data were analyzed using descriptive statistics in the form of average and percentage. To see the magnitude of the increase in student motivation, the data were analyzed using the normalized gain (Hake, 1999).

## 3. Result and Discussion

### 3.1 Results

The average value of student motivation prior to learning with a model-based ICT MPBK at 3:39 0.21 or category quite well, and the value of students' motivation after learning model-based ICT MPBK of 4.45 0:27. The results of the analysis of the gain normalized student motivation in science learning biology before and after model-based ICT MPBK shown in Table 1.

Based on the data in Table 1 show that in general learning-based model MPBK ICT can enhance student motivation in science subjects Biology. Average gain  $\langle g \rangle$  index of 0.7. This means that the magnitude of the increase in student motivation is high. When the students' motivation to be observed by each perceptual indicators that affect student motivation, namely attention, relevance, confidence, and satisfaction the average increase in student motivation varies. The results of the study are shown in Figure 1.

Average index  $\langle g \rangle$  to gain the attention of 0.70, 0.70 for confidence, and satisfaction was 0.70. This means that all three perceptual indicators that affect student motivation increased with higher categories after MPBK-based model of ICT applied, but for relevance, relatively moderate increase in the average gain  $\langle g \rangle$  normalized index of 0.6.

Attention students can be seen in four categories, namely (1) the pleasure of the subjects, with an average index of 0.70  $\langle g \rangle$  gain, (2) attention to the task, with an average index of 0.70  $\langle g \rangle$  gain (3) timeliness in completing the task, with an average index of 0.70 and a gain  $\langle g \rangle$  (4) serenity in the classroom when learning takes place with an average index of 0.6  $\langle g \rangle$  gain.

Relevance is viewed as cases or things are considered instrumental in meeting the needs and satisfy personal desires of students, including the achievement of personal goals. Research was categorized relevance into three aspects, namely (1) understand what is learned in the study, with an average  $\langle g \rangle$  gain index of 0.60 (2) the relationship of the material presented with what has been learned, with an average index of 0.60  $\langle g \rangle$  gain and (3) relate the lessons to everyday life, with an average gain index  $\langle g \rangle$  of 0.60.

Confidence (*Confidence*) is the belief that "help learners believe / feel that they will succeed and control their success. Indices with an average gain of 0.70  $\langle g \rangle$ . While satisfaction (*satisfaction*) serves to increase motivation by creating a learning experience where learners can feel positively with learning. In this study, satisfaction is categorized into two, namely (1) the satisfaction of the subjects, with an average index of 0.60  $\langle g \rangle$  gain and (2) the willingness to help a friend who has not been successful, with an average index of 0.70  $\langle g \rangle$  gain.

### 3.2 Discussion

The average value of learning motivation (Table 1) showed an increase after MPBK-based model of ICT applied. When viewed from the aspect of attention, relevance, confidence and satisfaction as perceptual

factors that affect motivation also increased. In general, an increase in students' motivation after participating in learning with the model-based ICT MPBK greatly influenced by various factors, including the syntax, a social system, the principle of reaction, and support systems in a model-based ICT MPBK.

Syntax-based model of ICT MPBK make room for the growth and development of students' motivation. This is elaborated throughout MPBK syntax-based models of learning ICT. By the time the teacher gives video stimulus in the form of learning or other biological objects directly, in fact the project was to arouse students' initial motivation in learning. By the time students are asked to provide a response in the form of comments, opinions, to predict the learning objectives, the real teacher of student learning behavior has been directed toward the topic of discussion. By the time students are involved in the processing worksheet that goes along with individual and group *scaffolding* process is basically the teacher has tried to maintain the students' learning behavior.

According to Keller and Kopp (1987 in Huett, 2006), attention is attention or action to obtain and retain the curiosity and interest of students. In the model-based MPBK ICT, efforts to get students' attention to the lesson conducted by four descriptors, namely the sense of fun to the lesson, attention to task, timeliness in completing the task, and tranquility in the classroom. Keller (1987 in Huett, 2006) noted three subcategories for attention, namely: perception passion, passion investigation, and variability. passion perception related to capture the interest students. passion investigation focuses on stimulate curiosity students. Variability learning strengthen the perception and passion investigation by maintaining attention, stimulate inquiry, curiosity, vitality new, and decrease boredom (Keller & Suzuki, 2004 in Huett, 2006). This takes place in the learning process with a model-based ICT MPBK through the completion of tasks in face-to-face and *online* activities that stimulate students to apply higher order thinking skills along with the pattern of *scaffolding* by the teacher in the learning management.

Learning with ICT-based models MPBK-implement motivational strategies such as the division of responsibilities for each member of the group to complete the group tasks, give assignments in the form of *online* learning that provide access to every student to check his understanding directly through the quiz. This is in line with the opinion Arends (2012) that there are some practices that support student motivation, namely: giving responsibility to students, provide appropriate homework, and checking students' understanding. This will give you confidence in the success and satisfaction in learning.

Other instructional practices that support students' learning motivation can be a positive classroom environment, have clear goals and expectations, using cooperative learning, has a difficult task which can be done by students, monitor student work, giving a boost positive, provide teaching on strategies, students appreciate and stimulate cognitive thinking (Arends, 2012). The instructional practices encountered during the learning-based model MPBK ICT, eg structuring the learning environment *be set* in an atmosphere of cooperative, LKS tasks that require higher order thinking skills, such as implementing the concept, doing complex inference, discovery learning, formulate hypotheses, make inferences, applying *posing problems*, distinguish an object, examine, critique, summarize, create a concept map to create.

Overall the tasks contained in the worksheet is done at the time of face-to-face or *online* tasks make face to face learning and *online* learning is multidimensional. This is in line with the characteristics that indicate the class of dimensionality as there are different tasks, student autonomy, grouping patterns and prominence of performance evaluations is a characteristic of the constructivist classroom (Schunk, 2011) and these realities can be found throughout the course of study with the model MPBK ICT-based.

These results are in line with the opinion above Elliot & Church, (1997 in Schunk, 2012). that achievement motivation refers to the effort to become competent in the activities of a struggle. Motivation and learning can influence each other. Student motivation can affect what and how they learn, and then when the students learn and assume that they have more skilled, they are motivated to continue learning (Schunk, 2012). According to Ormrod (2008) motivational influence on students' learning and behavior. Therefore, the school and the learning environment should receive special attention in order to raise the motivation to learn certain things and behave in certain ways. By Paris & Turner, 1994; Rueda & Moll, 1994 (in Ormrod, 2008) termed the *situated motivation*.

Learning with ICT-based models MPBK- situated creates motivation for students through learning syntax, the reaction principle, the social system and support system through the application of constructivist learning paradigm and technology-based learning. Building a productive learning community and motivate students to engage in meaningful learning activities is the main goal of learning with a model-based ICT MPBK. Success depends on the motivational strategies that can help students to develop into a productive learning community. The statement in line with the opinion Arends, (2012), about strategies for motivating students, namely (1) believe in the capabilities of students and focus on factors that can be changed, (2) avoid excessive emphasis on extrinsic motivation, (3) creating a situation learning that has *feeling Positive Tone*, (4) reliance on

self-interest and the intrinsic values of the students, (5) structuring of learning to get a flow experience, (6) using the knowledge of the results and do not make excuses for failure, (7) is focusing on the needs of students, including the need for *self-determination*, (8) focusing on the structure of the learning objectives and difficulty level instructional tasks, (9) using multidimensional tasks, (10) to facilitate the development and cohesion group. These strategies are very closely related to the constructivist learning model-based MPBK ICT, both in face-to-face learning and *online* learning.

The effort sparked the attention of students in learning with the model-based ICT MPBK done from the beginning to the end of learning. Referring to learn Gagne nine events, categorized into three general phases, namely (1) the preparation of learning, (2) acquisition and performance is the core event in the study of new capabilities, and (3) transfer of learning that provide new capabilities in applications for the new context (Gredler, 2011:185). Stages of preparation is analogous to the phase I study, acquisition and performance stages analogous to phase II, III, IV, and transfer of learning is analogous to the phase V and VI of the model MPBK-based on ICT.

Gredler, (2011:185) argues that the purpose of the preparation of learning are preparing to study, for example, pay attention to the stimuli to learn, build up expectations toward learning objectives and retrieve relevant information, or the skills of long-term memory to be inserted into the working memory. Thus the students' attention to the lesson optimized from the start. The same thing took place in the subsequent phases. According Margueratt (2007) attention refers to whether the arousal of curiosity student inflame and whether passion The appropriate sustainable from time to time.

#### 4. Conclusion

Based on the research and discussion that has been done, it can be concluded that the model MPBK based ICT can enhance student motivation. The magnitude of the increase in student motivation were high. Conclusion in particular are:

- 1) Model MPBK-based ICT can improve student motivation based on aspects of attention to the lesson. Increased motivation were high.
- 2) Model MPBK-based ICT can increase students' motivation by relevancy aspect of the lesson. Increased motivation moderate category.
- 3) Model MPBK-based ICT can improve student motivation based on the belief aspect of success. Increased motivation were high.
- 4) Model MPBK-based ICT can improve student motivation based on aspects of satisfaction with the lesson. Increased motivation were high.

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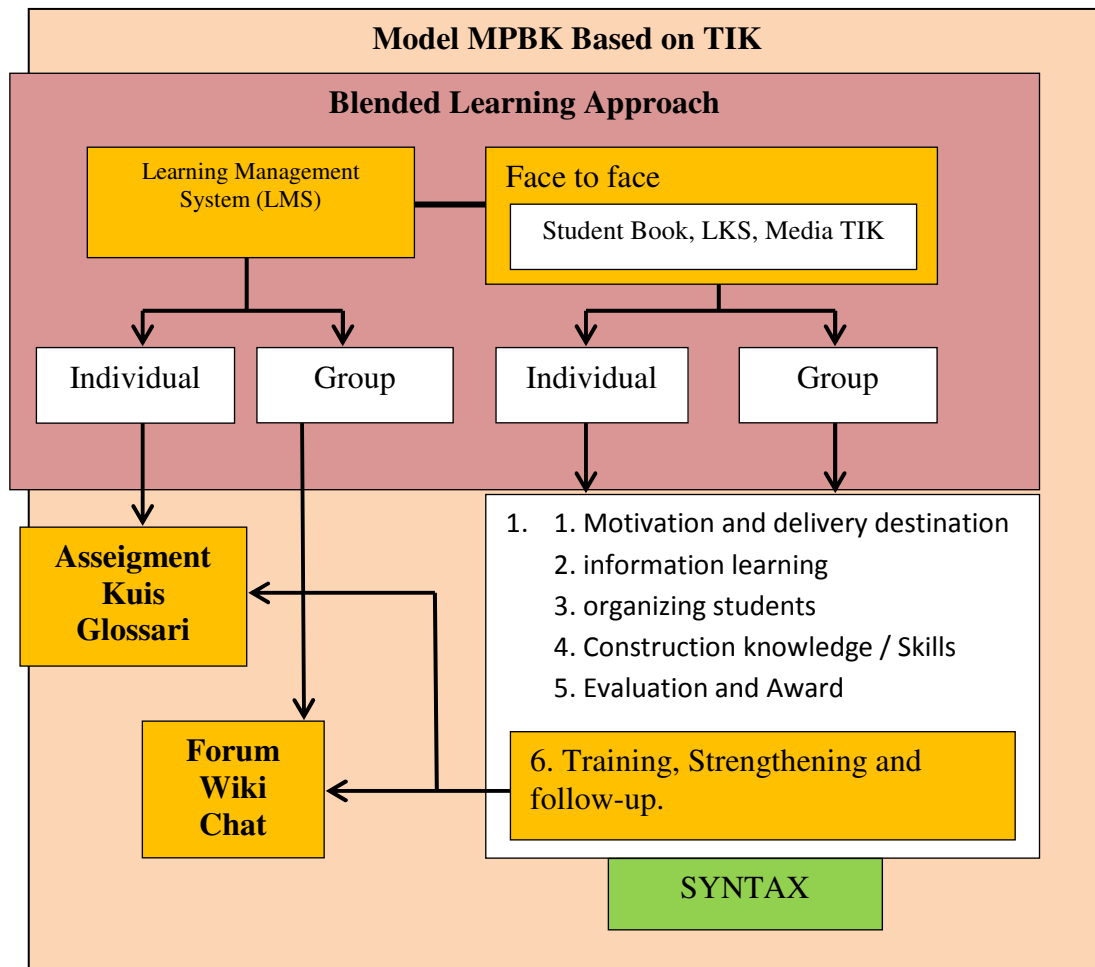


Figure 1. Model MPBK Based ICT

Table 1. Analysis of the normalized gain motivation to learn biology students before and after the learning-based model MPBK ICT.

No.	Motivation	Average		Average		Gain Motivation	Index gain
		Pre	Ket	Post	Ket		
	MOTIVATION	3:39	CB	4:45	B	1.06/1.61	0.70 (Height)
I	Attention	3:47	CB	4:50	B	1.04/1.53	0.70 (Height)
	Pleasure to lessons	3:19	CB	4:51	B	1.31/1.81	0.70 (Height)
	Attention to task	3:41	CB	4:49	B	1.09/1.59	0.70 (Height)
	Timeliness of completing the task	3:53	CB	4:51	B	0.99/1.47	0.70 (Height)
	Tranquility in the classroom	3:74	CB	4:50	B	1.76/1.26	0.60 (Medium)
II	Relevance	3:15	CB	4:28	B	1.13/1.85	0.60 (Medium)
	Understanding what is learned in the learning	3:31	CB	4:30	B	0.97/1.69	0.60 (Medium)
	Linkage material presented with what has been learned	3:16	CB	4:30	B	1.13/1.84	0.60 (Medium)
	Linking learning with everyday life	2:98	CB	4:25	B	1.27/2.02	0.60 (Medium)
III	Confidence	3:34	CB	4:49	B	1.15/1.60	0.70 (Height)
	Confidence in the success in the learning	3:34	CB	4:49	B	1.15/1.60	0.70 (Height)
IV	Satisfaction	3:60	B	4:51	B	0.91/1.40	0.70 (Height)
	Satisfaction with learning	3:64	B	4:49	B	0.84/1.36	0.60 (Medium)
	Willingness to help a friend who has not successfully	3:55	B	4:53	SB	0.98/1.45	0.70 (Height)



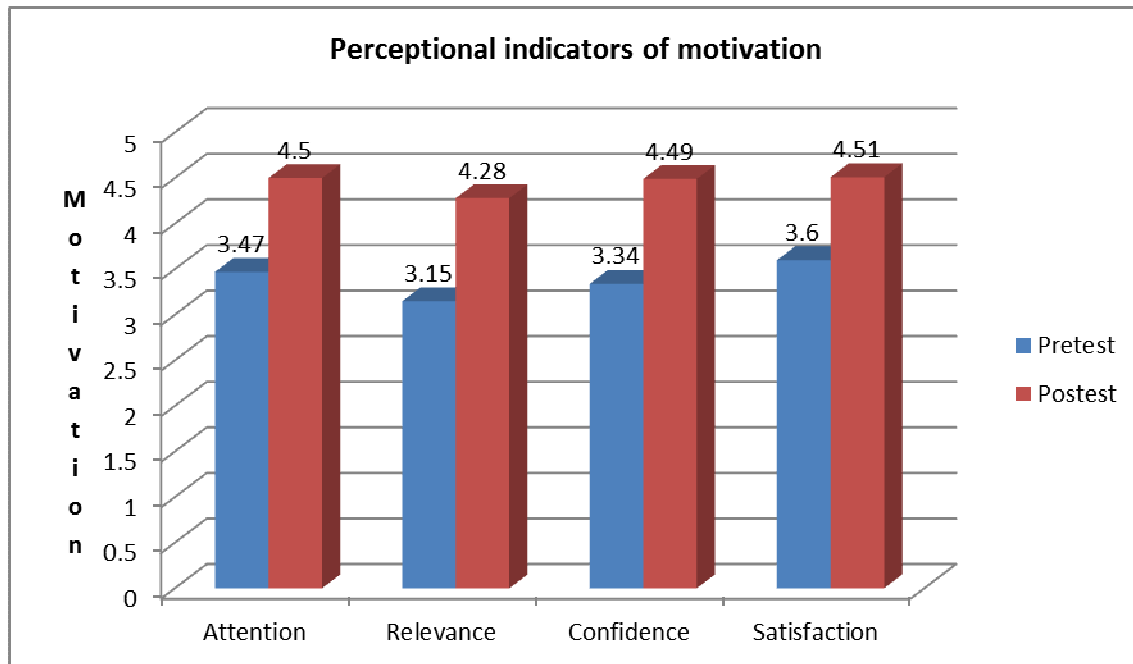


Figure 2. Students' motivation before and after learning with ICT-based models MPBK-based perceptual indicators of student motivation.