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Problems of preparation of pedagogical shots in realization of profile training in the 12th summer school level

In article formation at school students of the personal relation to future profession, understanding of its importance, development of labor skills and their further professional improvement is considered problems. Authors did the theoretical analysis scientifically-pedagogical literature. The social importance of training of the teacher to the organization of a problem of profile training and teoretiko-practical development of a problem of diagnostics of professional interests and tendencies of pupils to activity in innovative educational society is revealed.

References

- 1 Kul-Muhammed. *M. Al-Farabi: history, personality, time*, Alma-Ata: Aruana, 2006, 95 p.
- 2 Adikarimuly B. *Pedagogika of Zh.Balasaguni*, Karaganda: Publ. KSU, 2008, 86 p.
- 3 Aymauly Zh. *Chosen works*, Almaty: Atamura, 2005, 265 p.
- 4 Kunanbaev A. *Verses — the padishah of words*, Alma-Ata: Daur, 2006, 565 p.
- 5 Kaliev S. *Etnopedagogika: Textbook*, Astana: Foliand, 2007, 397 p.

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Improving student motivation and achievement in Biology

In the article student-oriented environment and reciprocal approach in teaching biology are considered. The authors maintain in order to help students feel safe and comfortable in learning, the classroom needs to be student-centered. To show students what they know and feel proud of what they know, reciprocal teaching can be a powerful tool to become their own teachers. While preparing and delivering lessons, the following are improvements anticipated in students: ability to select useful and meaningful information from different sources, reading and analyzing information, organizing and highlighting relevant information to learn a topic, and oral and written communication of their learning.

Key words: Student-centered classroom, Reciprocal teaching, Student Motivation, Improvement, Constructivist Model, Biology Teaching, Classroom Teaching, Classroom Activities.

What is the problem? Perhaps, the many unhealthy experiences in the classroom, the school, and the community have led students to feel helpless and unmotivated to give science a chance. Science seems to be a difficult subject for many students. Apparently, many students drop out of school and university because of the difficulty and fear they experience in these classes. It is for this reason this theme was chosen to answer the following question in this action research: will a student-centered classroom and reciprocal teaching improve student *motivation* to learn and *achieve* in Biology?

We would like our students to communicate their knowledge and ideas efficiently, seek, analyze, and use information on their own, take initiative to solve problems, help others, work together, realize that the knowledge they gain cannot be taken away from them, understand how they learn, and use what they know to make a positive change in their lives and their community. It would be wonderful for students to understand and see the beauty of science all around them and in them. Our primary goal was to motivate students to learn biology. This in turn should have lead to students' desire to learn on their own, and not just about biology. Once that happened, student learning and achievement should have improved greatly. Students need to be empowered and take responsibility and ownership of their learning to be successful learners. To help students feel safe and comfortable learning, the classroom needs to be student-centered. For students to show

what they know and feel proud of what they know, reciprocal teaching can be a powerful tool to become their own teachers. Students need to be guided and supported to prepare and deliver lessons to their peers. While preparing and delivering lessons, the following are improvements anticipated in students: ability to select useful and meaningful information from different sources, reading and analyzing information, organizing and highlighting relevant information to teach a topic, and oral and written communication of their learning.

Learning is a process of knowledge construction, based on the constructivist model. For meaningful learning to occur, connections need to be clear between what is being taught and what one already knows. Piaget suggests that learning occurs through a process of assimilating and accommodating new information into existing organized knowledge [1]. Prior knowledge is the foundation and framework for successful learning and application of new material. Prior knowledge is the cognitive structure a learner possesses at any given time. This cognitive structure is explained as the set of facts, concepts, propositions, theories, and raw perceptual data that learners have available to them at any point in time and the manner in which it is arranged. According to the Schema Theory, prior knowledge is an organized and elaborate network of abstract mental structures that represent one's understanding of the world [2]. So learning is successful if prior knowledge exists. To access prior knowledge, teachers need to know their students' culture, language, and previous academic and life experiences to bring them to able to build onto what they already know. Learning is meaningful when students see connections between what they know and the applications they can make to new experiences. When students realize how much they know and how new information can be relevant to their lives, they can become motivated to set their own academic goals. Learning is successful in environments in which students are at the center and in which what students know is valued; it is for this reason that the major themes in this literature review are student/learner centered classroom environments and reciprocal teaching.

According to the National Research Council there are four lenses that can be used to evaluate the effectiveness of teaching and learning environments [3]. These are learner-centered, knowledge-centered, assessment-centered, and community-centered. The learner-centered lens focuses on the students' prior knowledge, skills, attitudes, and beliefs they bring with them to the classroom. The knowledge-centered lens focuses on what needs to be taught, why, how and to what mastery it needs to be taught. The assessment-centered lens concentrates on how to assess/monitor student learning. The community-centered lens encourages a culture where students feel safe and comfortable asking questions and taking risks. The NRC shows an overlap of all three lenses under the community centered lens. We would like to combine the knowledge-centered and the assessment-centered lenses as they both deal with knowledge. If learning is assessed, then it was definitely taught. We would also combine the community-centered and student-centered lenses to see my classroom as a community of learners. Because every semester I have a new group of students, I revise and update classroom norms and procedures based on the students' behavior. I also modify my curriculum plan based on students' prior knowledge and pace of learning.

It is better to concentrate on the student-centered lens as the umbrella for the other three lenses because students are at the center of the classroom and we determine what happens in that classroom based on what they bring to it and what they are capable of getting out of it in terms of academic and life experiences. An efficient teacher who provides a student-centered classroom values students and their cultures; finds out what students already know so that they can build on that knowledge, wants to know how students feel and think about certain topics, especially in science, and enriches the classroom environment with students' skills and talents. This brings us to discuss a research we read about what a student wants, even those who do not care about school.

What do Students Really Want? In our experience in teaching and according to Daniels and Araposthathis, there are a number of students who have the skills and abilities to succeed academically, but choose not to succeed. These are the «disengaged and reluctant teenage learners» who usually show good test scores but have low GPA [4]. In this research, these learners' voices were heard. Three factors that contribute to these students' failures and success were found, and as a consequence ways to create encouraging learning environments for these students were developed. The first factor is the relationships students build with their teachers. If students feel a genuine interest teachers have for them, they see teachers as their allies and advocates. That influence teachers have in students can raise the level of intrinsic motivation and effort towards academics. A motivating teacher has the following qualities flexibility, ability to understand situations from a student's point of view, experimentation, discussions, and encouragement. If students feel supported and cared for, they engage. The second factor is the interest students have in the assignment because of relevance and connection they see of their academic success with their future. If the assignments relate to them, these students engage in learning. For example a student read «the Outsiders» because it related to him. Another student read computer books because they helped him help his dad and another student read art books because they gave him ideas for his art work. And yet another student liked home economics because they made «muffins and pancakes in class». The last factor that contributes to students' success or failure is

the feeling of competency they have to complete a task. Students are successful if their skills are matched to the challenge at hand while at the same time being pushed to a slightly higher level. In short, ways to motivate disengaged and reluctant learners include educators building trusting relationships with their students, alignment of the curriculum with student interest, and decreased use of extrinsic motivation. These three ways to motivate students ultimately come from placing the students at the center of the classroom and identifying what knowledge and skills they have as well as which of them, they can build on.

A Student-Centered Approach, the Constructivist Model

In a study conducted by Burrowes [5], traditional science teaching through lectures for 100 students and the student-centered approach for 104 students was used in Biology classes at a large urban university. In the student-centered approach, she used active teaching and cooperative groups to help students achieve better grades on standard exams, develop higher level thinking skills, and spark more interest in biology. According to Burrowes' data [1], more students in the student-centered group earned As and Bs in the final exam, only 4 dropped the class compared to 12 in the traditional group, the discussions in the student-centered group were a lot more engaging and alive in the portion of the final exam. In addition, at the end of the year more students in the student-centered group (70 % vs. 50 %) expressed that their interest in biology was high. Burrowes used the Constructivist Learning Model described as the «5 E» (Engage, Explore, Explain, Elaborate, Evaluate) and cooperative learning to accomplish her goals. She *engaged* her student through short lectures (10–15 minutes) to introduce new material. To allow student to *explore*, Burrowes placed students in groups to solve problems or work on exercises immediately after the lecture. To *explain*, students in the group wrote their consensus answers on a sheet that was turned in at the end of the period. Students usually explained their answers to the rest of the class as well. To *elaborate*, misconceptions were addressed based on student responses or new material was introduced. Mutual feedback between Burrowes and her student was immediate, which allowed for opportunities to *evaluate* her teaching approach, her students' academic progress, and the students themselves. The groups in this research included four students who worked closely together, that eventually felt comfortable having one member of the group taking quizzes and earning points for the group. They became comfortable with each other to solve problems together, develop excellence by practicing, and develop high order thinking skills. Higher order thinking skills were developed through multi-answer questions, concept maps, discussion scenarios, graph interpretation, graphing data. Student attendance improved as well.

Burrows experienced success in three areas, better test scores, more student interest in biology, and improvements in attendance. We project similar results at the end of my action research. Many students claim to attend school because of their friends. Providing a classroom where students feel comfortable sharing who they are and working together will definitely encourage friendships, which should improve attendance. If students experience success in learning biology, most likely their interest in it will improve.

Small-group peer teaching was used in an introductory biology course with 70–75 students aspiring to be elementary school teachers [6]. The goal was to help those preservice teachers learn basic biology concepts and help them become comfortable enough with biology to share it frequently with their future students. Tessier provided students with questions in advance. Students took the responsibility to find correct and appropriate answers. They also solidified their understanding of their material before teaching to avoid misinforming their peers. According to Tessier, small-group peer teaching improved student learning and promoted active engagement in learning biology. At the end of the semester, students earned B+/A- on tests taught by peers and only B/C on material taught through lectures by the professor. Students reported not having to study the peer-taught material as much as the lecture taught material when it came to study for tests. They showed better retention of material as well as ownership of the material they taught. They said they enjoyed teaching their peers.

Reciprocal Teaching

According to a literature review conducted by Slater and Horstman, reciprocal teaching is a successful cognitive strategy used to help struggling readers and writers [7]. Its main purpose is to convince all students to become actively involved in using strategies to be successful learners and take responsibility for their own learning. According to Bransford, cognitive perspectives focuses on making learners aware of their prior knowledge, monitor their learning as they accomplish tasks and solve problems, and acquire a number of strategies that they can apply to their learning. At the beginning reciprocal teaching is teacher directed as strategies are modeled for students. Students are quickly encouraged to take leadership in their reading groups. The teacher plays the role of facilitator as he monitors group activity in the classroom. The teacher provides assistance when necessary by prompting questions and even providing extra modeling to individual

groups. Slater and Horstman claim that reciprocal teaching has four supporting strategies, questioning, clarifying, summarizing and predicting.

When using this strategy for reading, students are placed in groups in which every member gets to be the leader. The leader begins by reading aloud a paragraph or two then follows the four steps of reciprocal teaching. *Questioning* helps students to focus on the main ideas and understanding what they are reading. They accomplish this by the leader or other group members generate questions and answer them based on the paragraphs read. *Clarifying* actively engages students as they read and unpack ambiguous portions of text. This is accomplished by members clarifying any problems or misunderstandings brought about when reading or questioning. *Summarizing* is the real cognitive step of reciprocal teaching. It requires students to focus on the major content of the reading and determine what is important and what is not. In this step, the leader summarizes the text read. In the *predicting* step, students rehearse what they learned in the reading and express expectations of the next portion of the reading. In teaching writing, the same steps are followed with the addition of actually writing the questions, answers, and summaries. The authors claim that with daily practice of this cycle students improve their reading and writing skills [8].

Methods and Materials

For clarity of this action research, our question was, will a student-centered classroom and reciprocal teaching improve student *motivation* and *achievement* in Biology?

A student-centered classroom environment was used to improve students' motivation to learn biology. Reciprocal teaching was the strategy used to improve student learning and achievement. To measure student motivation, surveys were given at the beginning and end of the semester. Checklist and rubrics for presentations and multiple choice tests and essays were used to measure student learning and achievement. Students were encouraged and guided to actively learn through reciprocal teaching and within it differentiated instruction and scaffolding strategies.

Videotapes and field notes were used to reflect and examine student progress in motivation and achievement. Table lists data collecting tools, rationale, and data coding.

T a b l e

Data Collecting Strategies:	Data Coding
Surveys — given at the beginning of the term to see student attitude towards science Survey — given at the end of the term to see student attitude towards science – presented in tables and graphs	Responses were categorized into: Negative experience with science (-ES) Positive experience with science (+ES) Unaware of everyday science (-AS) Aware of everyday science (+AS) Interested in science related careers (+IS) Not interested in science related careers (-IS)
Presentation Checklist/Rubrics (assess comprehension and predicts test scores)	Areas to assess: Knows facts about the topic (+ KT) Comprehends the topic (+CT) Able to apply the topic by giving examples (+AT) Presents material in an organized way (+OT) Uses academic language (+AL) Communicates clearly — voice and eye contact (+CL) Engages the audience (+EA) Shows confidence (+C)
Student Journals to see their attitude towards science (assess motivation and attitude towards science and their learning)	Same or similar as survey
Field Notes — reflections on lessons and student improvement	Notes on how students achieved: Students' responsibility to learn Students' ability to connect what they are learning to their life outside of the classroom, prior knowledge, and life experiences Students' communication Students' interest in exploring topics more deeply
Test Scores — presented in graphs – shows student achievement	
Passing Rate at the end of the semester (assessing achievement)	

As it was explained in the introduction, many of students struggle to learn concepts in biology. Reciprocal teaching seems to be a powerful tool to improve their learning. In our research project we are using this version of reciprocal teaching with a few modifications and scaffolding strategies. We are also using the «5 E» of the constructivist model: Engage, Explore, Explain, Elaborate, and Evaluate. To encourage maximum student competency to learn a student-centered classroom was also created.

References

- 1 *Burrowes P.* A Student-Centered Approach to Teaching General Biology that Really Works: Lord's Constructivist Model Put to a Test. *The American Biology Teacher*, 65 (7), 2003. — P. 491–501.
- 2 *Daniels E., Arapostathis M.* What Do They Really Want? Student Voices and Motivation Research. *Urban Education*, 40 (1), 2005. — P. 34–59.
- 3 *Davis P.M.* Cognition and Learning: A Review of the literature with reference to ethnolinguistic minorities. Dalla, TX: Summer Institute of Linguistics, 2008. — P. 66–75.
- 4 *Gijbels, D., van de Watering G., Dochy F., van den Bossche P.* (2006) New Learning Environments and Constructivism: The Students' Perspective. *Instructional Science: An Instructional Journal of Learning and Cognition*, 34 (3), 2006. — P. 213–226.
- 5 National Research Council. *How Students Learn Science in the Classroom*. Washington, DC: The National Academies Press, 2005. — P. 14–21.
- 6 *Tessier J.* Small-Group Peer Teaching in an Introductory Biology Classroom. *Journal of College Science Teaching*, 36 (4), 2007. — P. 64–70.
- 7 *Slater W.H., Horstman F.R.* Teaching Reading and Writing to Struggling Middle School and High School Students: The Case for Reciprocal Teaching. *Preventing School Failure*, 46 (4), 2007. — P. 163–166.
- 8 *Taber K.* The Mismatch between Assumed Prior Knowledge and the Lerner's Conceptions: a typology of learning impediments, *Educational Studies*, 27 (2), 2009. — P. 159–171.

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Биология пәнін ағылшын тілінде оқу бойынша студенттердің ынтасын дамыту

Мақалада студент-бейімдік орта және биологияны ағылшын тілінде оқытуда оқушылар мен оқытушылардың өзара қарым-қатынас әдістері қарастырылған. Авторлардың пайымдауынша, оқу барысында студенттердің өздерін емін-еркін сезіну үшін аудиторияда студент-бейімдік ортаның жағдайларын орнату керек. Студенттердің пәнді оқу ынтасын дамыту мақсатында студенттердің тақырып бойынша бар біліміне, олардың жеткен жетістіктеріне назар аударудың маңыздылығы өзара қарым-қатынас орнатуға итермелейді. Осы әдісті қолданудың нәтижесінде студенттер сабақ барысында әр түрлі қайнар көздерден өздеріне маңызды және пайдалы ақпаратты ала алады және алынған ақпаратты оқуға, сараптауға, дұрыс ақпаратты табуға, тақырып бойынша ауызша және жазбаша талқылауға көмектеседі.

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Развитие мотивации студентов к изучению биологии на английском языке

В статье рассмотрены подходы студенто-ориентированной среды и взаимный процесс обучающихся и преподавателя в обучении биологии на английском языке. Авторами отмечено, что, для того чтобы обучающиеся чувствовали себя уверенно на занятии, необходимо создать условия студенто-ориентированной среды в аудитории. Определено, что с целью развития мотивации студентов к изучению дисциплины возникает важность обращения к имеющимся у студентов знаниям по теме, акцентирования внимания на достигнутых ими успехах, что способствует высокой заинтересованности темой. Выделено, что в результате применения данного подхода на занятиях студенты должны быть способны отбирать полезную и значимую информацию из разных источников, читать и анализировать, правильно распределять и выделять соответствующую информацию по изучаемой теме, быть готовыми к устному и письменному общению по теме.