Innovative Higher Education – Opportunities for Applying Hybrid Curriculum in an Academic Course of Study

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- INNOVATIVE CURRICULA THAT ENHANCE LEARNING
- A HYBRID STEM-BPL MODEL FOR MEDICAL AND SCIENCE EDUCATION
- IT IMPROVES TRAINING EFFECTIVENESS AND PROFESSIONAL READINESS.

Project-based learning

- It is a learner-centered educational strategy that incorporates a dynamic approach.
- It combines several teaching strategies and PBL

Materials

- The STEM-PBL model consists of a hybrid curriculum
- It was applied to first-year Medicine students at the Faculty of Medicine of Sofia University "St. Kliment Ohridski"
- The Human Biology course is a mandatory 2 semester course, including various topics, crucial to clinical practice

Methods

- Traditional learning: focuses on structured knowledge transmission through lectures and materials,
- Constructivist Learning (PBL): encourages active learning through discussion, negotiation and real-world problems – solving, gaining deeper understanding



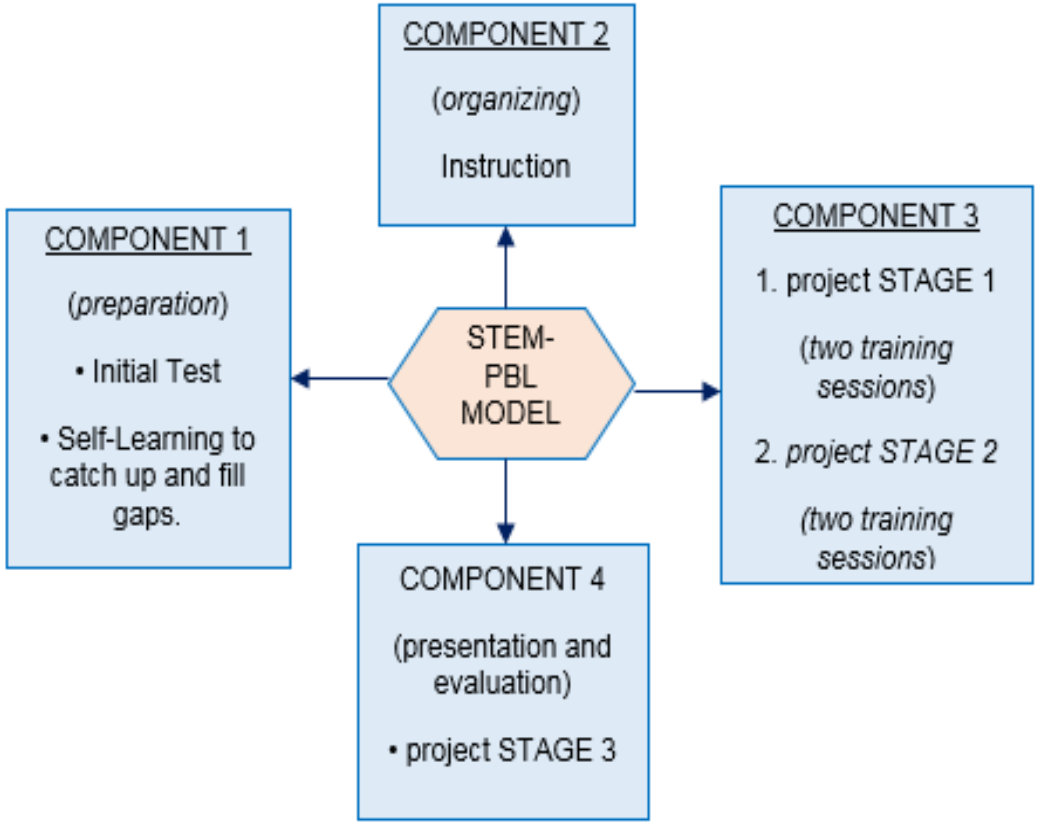
Methods

- Constructivist Foundations
- Constructive Alignment
- Key Benefits

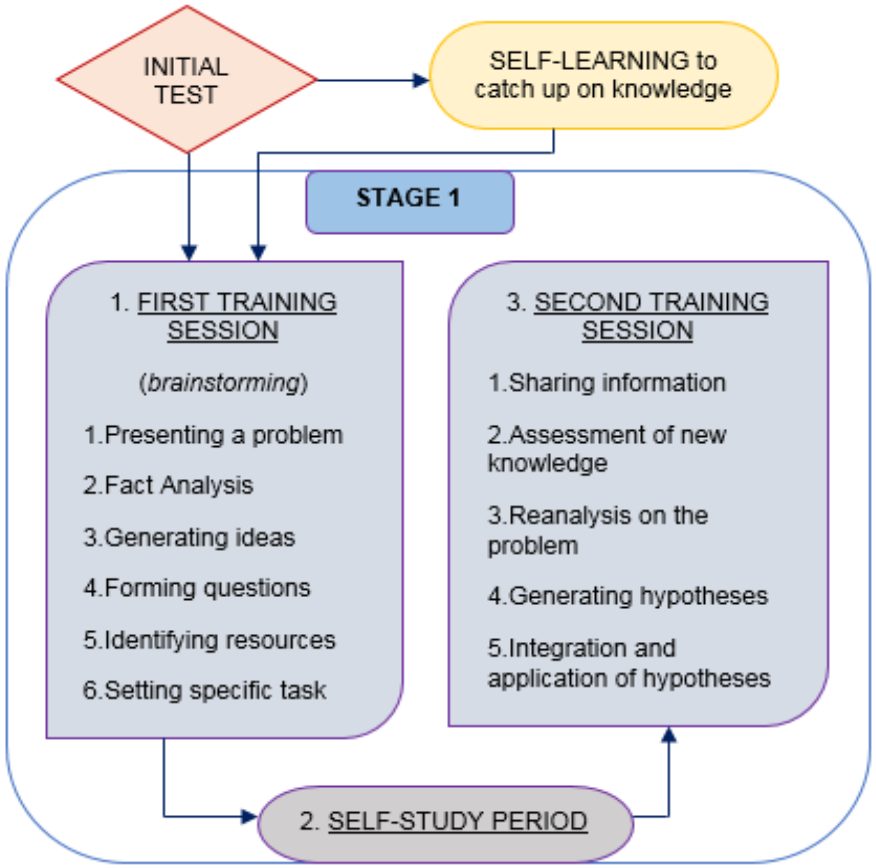
Elements of experimental design and relationship between them

- From week 1 to 6 students are trained by the program provided by the curriculum. In week 6 the teacher presents the STEM-PBL model.
- The design allows to create a training model integrating activities for the development of subject knowledge

Components in the structure of STEM-PBL experimental model



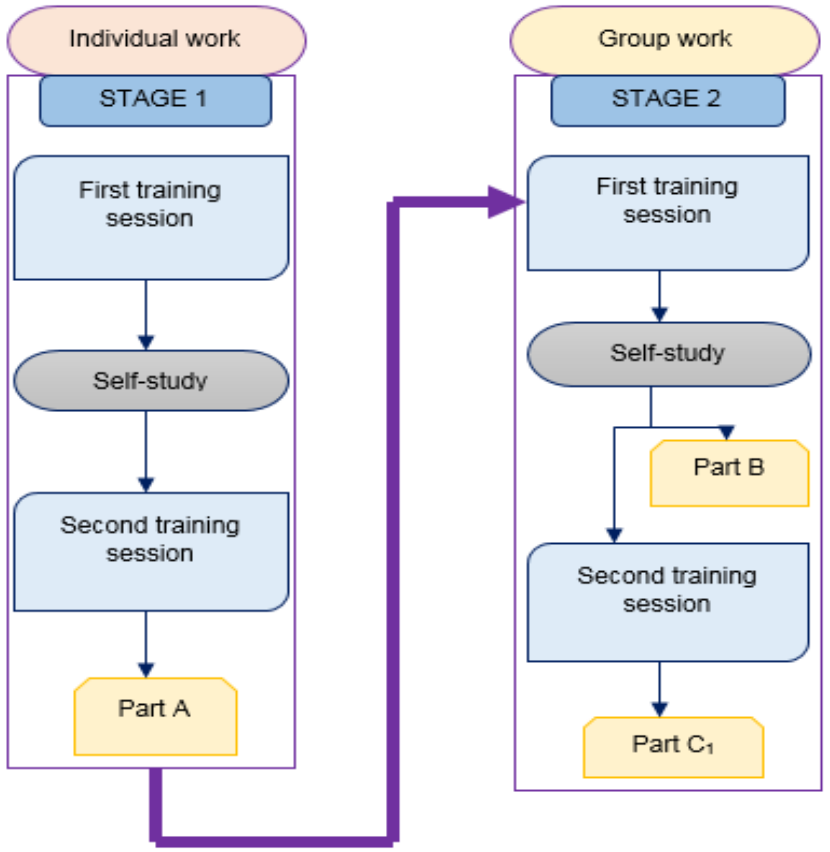
Structure of the experimental model



- The groups are meant to encourage student engagement.
- Small groups in the PBL design are a critical mechanism for monitoring the development of key skills.
- The teacher encourages the students to observe their own learning styles.

Assessment of the Project Work

- For the assessment of PBL: (1)testing method with 2 types of tests and (2) a three-part questionnaire: part A "self-assessment, part B "PBL performance assessment" and part C "peer evaluation".



Hybrid Learning Model and PBL approach

- Self-assessment and peer-assessment
- Cooperative Learning
- Student Feedback
- Goal

Assessment Methods and Results

- Assessment types:
- Initial test
- Exit test
- Colloquium
- Practical part
- Results

Data Analysis

Results of students with traditional training only – K1 and the results of the study group with PBL – K2

Grade	Initial Test	Colloquium	Final Exam
(2)	12,57%	-	-
(3)	11,74%	-	17,09%
(4)	23,83%	22,43%	36%
(5)	28,63%	41,54%	22,60%
(6)	23,23%	36,03%	12,99%
Average grade	Good (4,05)	Very good (5,13)	Very good (4,66)

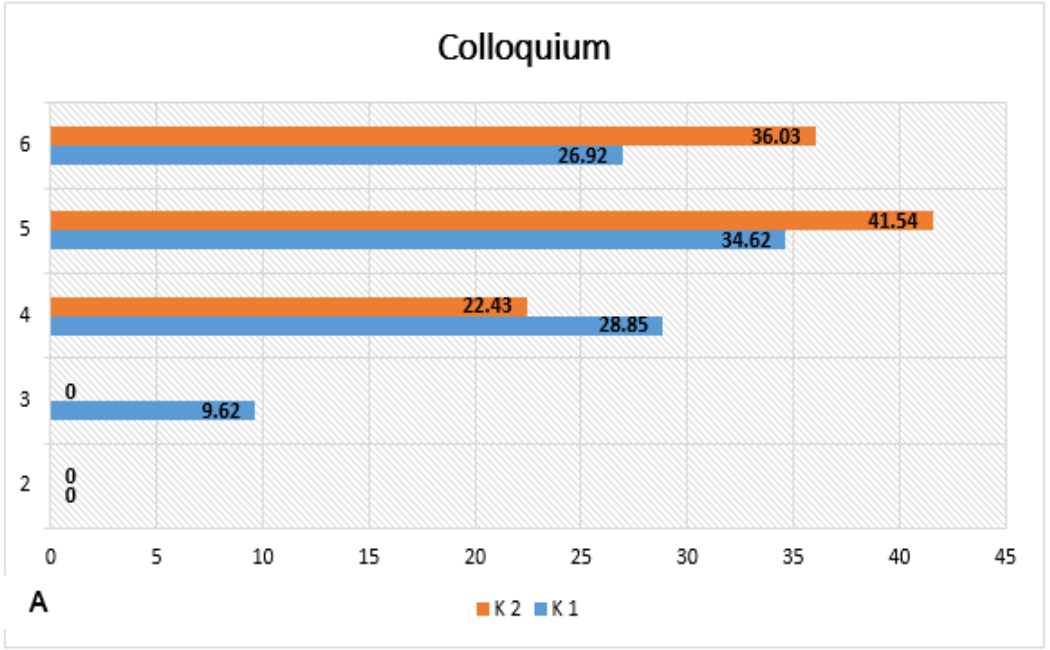
Table 1 – results of students who applied PBL

This table shows the average success of the researched and the control group of medical students

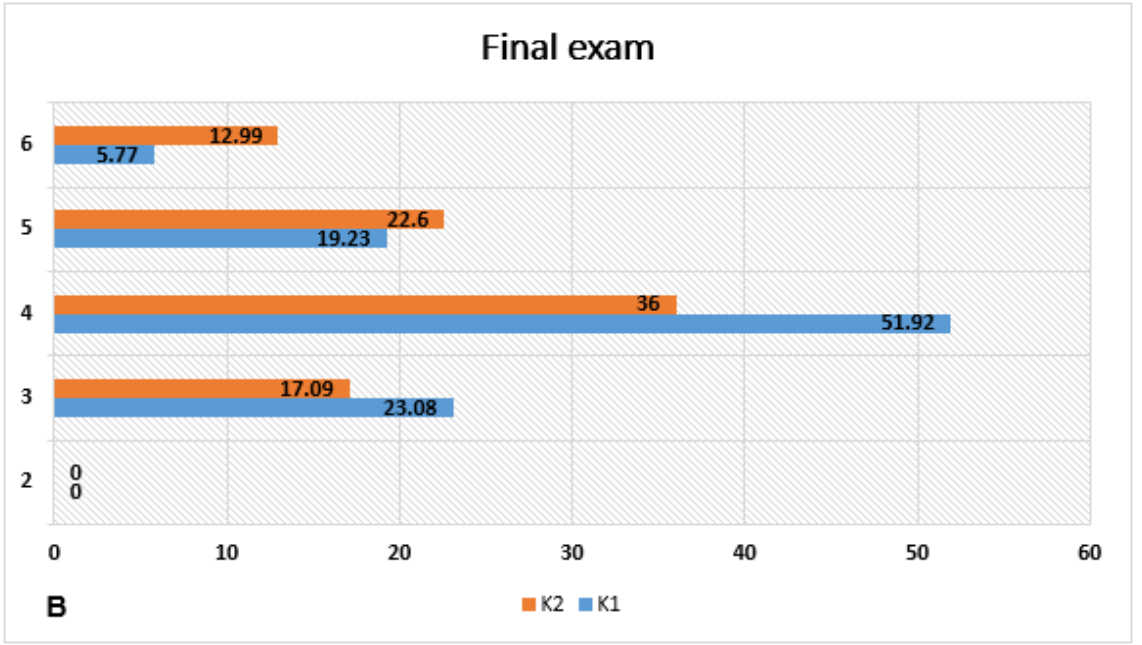
Average grade	Studied group with applied PBL (K_2)	Control group (K_1)
Colloquium	Very good (5,13)	Very good (4,79)
Final Exam	Very good (4,66)	Good (4,07)

Comparison and analysis of the results

Colloquium



Final exam



The obtained results show that the hybrid method can be defined as an integrated system in which the PBL environment helps students achieve the desired learning outcomes, as well as good results

Conclusion

- Student satisfaction:
- Positive feedback
- Support, assessment and workload in the PBL environment
- High appreciation for acquired skills
- STEM-PBL Model:
- Developed a personality-oriented STEM-PBL in medicine and biotechnology engineering
- Enhances the efficiency and quality of professional training for future doctors and biotechnology engineers.