KINESTHETIC ACTIVITIES BASED ON BEBRAS TASKS

TEACHING COMPUTER SCIENCE UNPLUGGED – THROUGH MOVEMENT

CONTENT

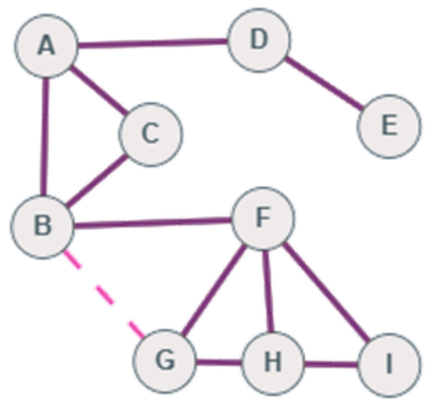
Informatics lessons are often confined to computers, but many concepts can be grasped through **physical experience**. We designed **five kinesthetic, computer-free activities** for students aged 14–16, based on tasks from the Bebras Challenge (iBobor). Each activity is a short printable card for the teacher, with a **story, task, discussion, and extensions.** A separate teacher guide supports them.

KEY OBJECTIVES

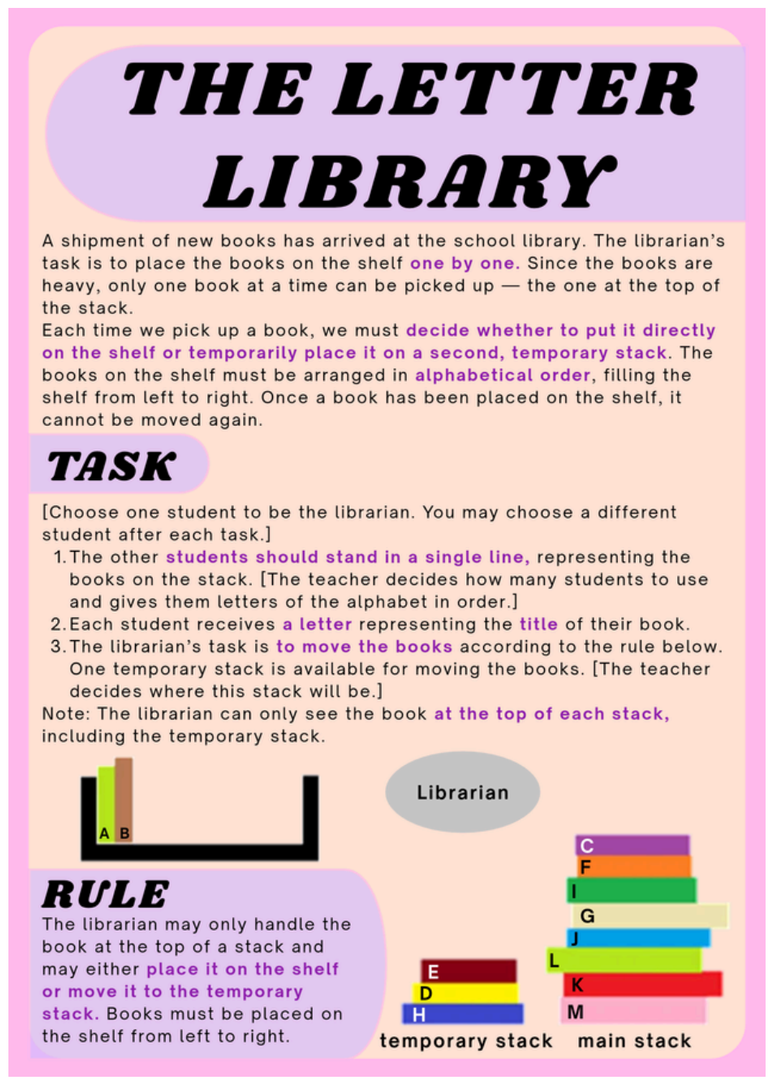
- To **design, create and verify a set of kinesthetic activities** for secondary school students.
- To **make the activities usable in an ordinary classroom,** with no computers or special equipment.

VERIFICATION SETUP

1. Pilot test in two lessons at a vocational secondary school.
2. A student questionnaire (1–5 scale) on movement, watching classmates, discussion, task clarity, and overall impression.
3. Review by four informatics teachers from the Bratislava region.



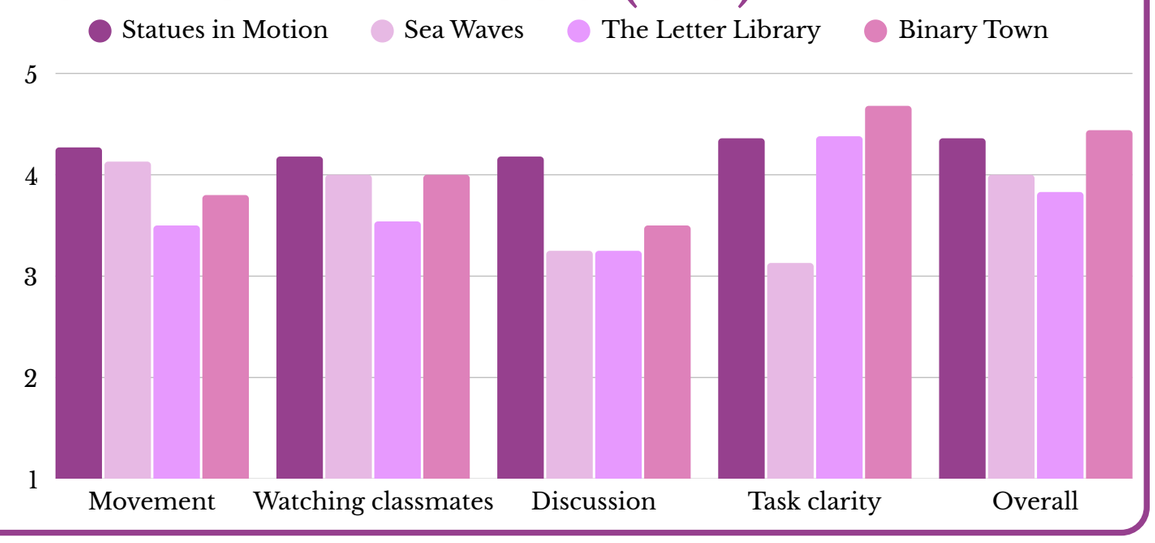
#	ACTIVITY	CONCEPT	GAME LOGIC
1	Statues in Motion Bebras: Colouring Houses	Graph colouring, backtracking	Pose = colour; statues joined by a path must differ
2	Sea Waves Bebras: Flipping Coins	Efficient algorithms	Captain flips one wave; its neighbors waves flip too
3	The Letter Library Bebras: Letter Necklaces	Stack (LIFO)	Move only the top book: to shelf or temporary stack
4	Binary Town Bebras: Cuckoos	Binary search tree	Smaller house numbers go left, larger go right.
5	Art Exhibition Bebras: Black-and-White Pictures	XOR operation	Black and white cards used to create new picture based on rules.



KEY FINDINGS

- All activities were rated **positively:** overall 3.83–4.44 out of 5 (the highest rating).
- Task clarity scored highest (up to 4.68); discussion scored lowest in every activity, so discussion prompts were reworked.
- **Teachers welcomed the idea**, praising *Binary Town* and *Statues in Motion* the most.
- Teachers asked for clearer plans, sample setups, and solutions, which are now part of the separate teacher guide.

STUDENT RATINGS (1–5)



CONCLUSION

Five ready-to-use **kinesthetic cards bring movement into informatics lessons without computers** or special equipment; students rated them positively. Next steps include more testing with different teachers and schools, and expanding the repertoire of Bebras-inspired activities.

Based on the bachelor's thesis "Kinesthetic activities based on tasks from the Bebras Challenge", Comenius University in Bratislava, 2026.

MATFYZ CONNECTIONS

FAKULTA MATEMATIKY, FYZIKY A INFORMATIKY
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