New Perspectives in Science Education
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NEW PERSPECTIVES in SCIENCE EDUCATION

A systematic review of the use of BBC micro:bit in primary school

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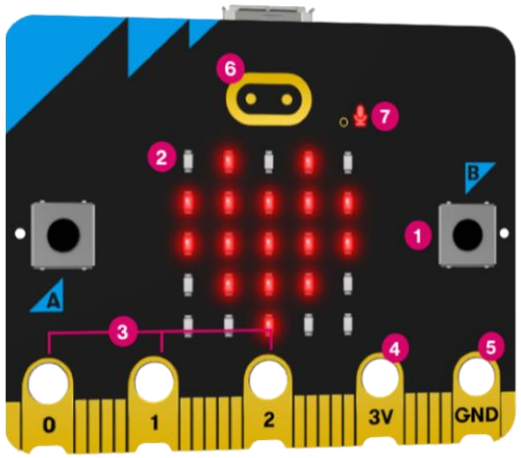
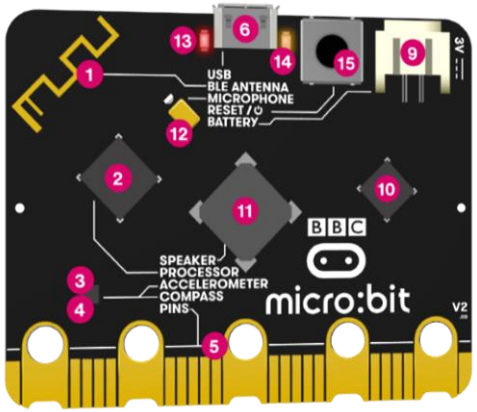




BBC micro:bit

- Small
- Programmable
- Low cost
- Innovative and promising tool

https://microbit.org/get-started/user-guide/overview/)

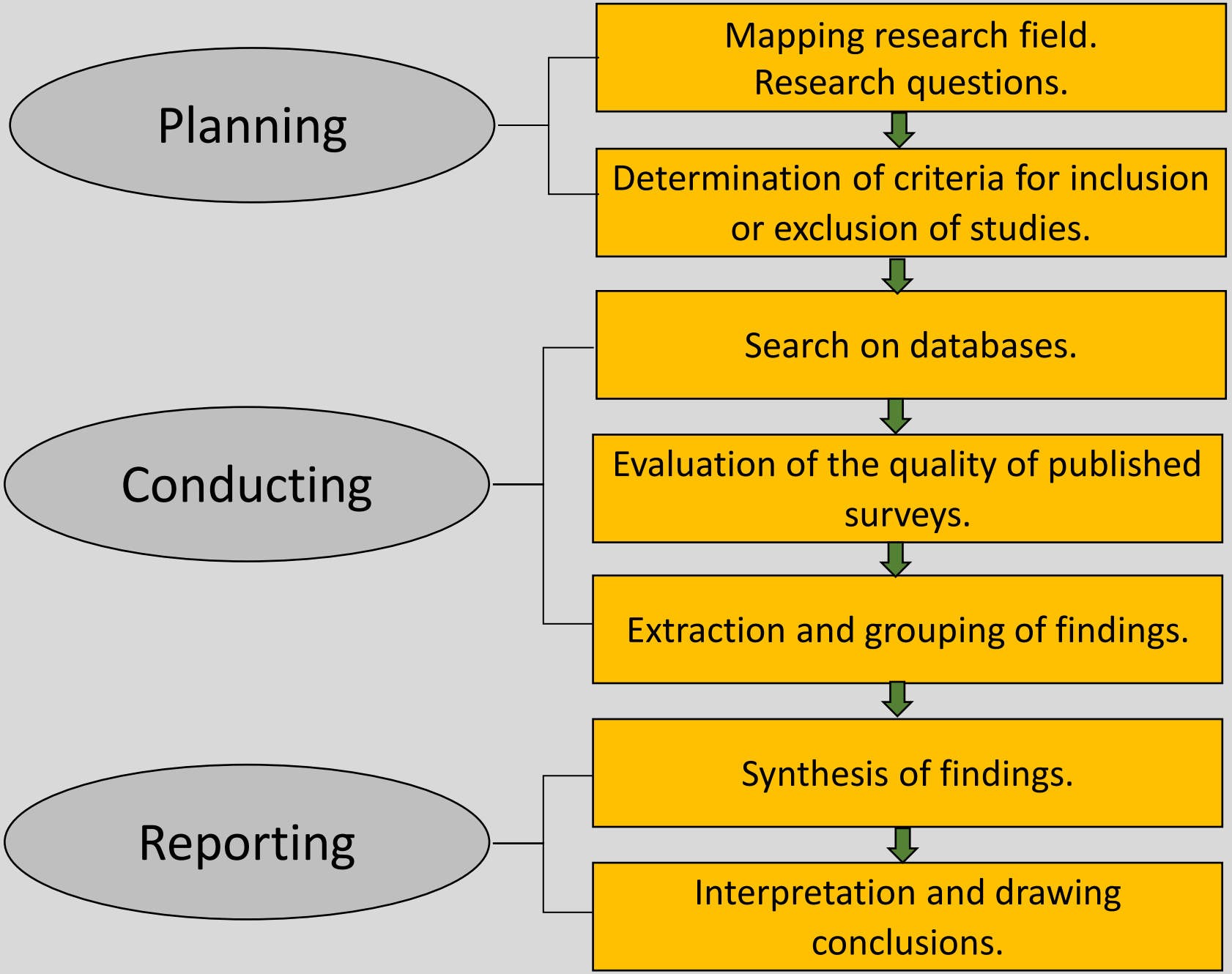
Goal – Research questions - Strategy

In this review we try to do a deeper investigation of the use of micro: bit in primary school.

The following research questions guided the review:

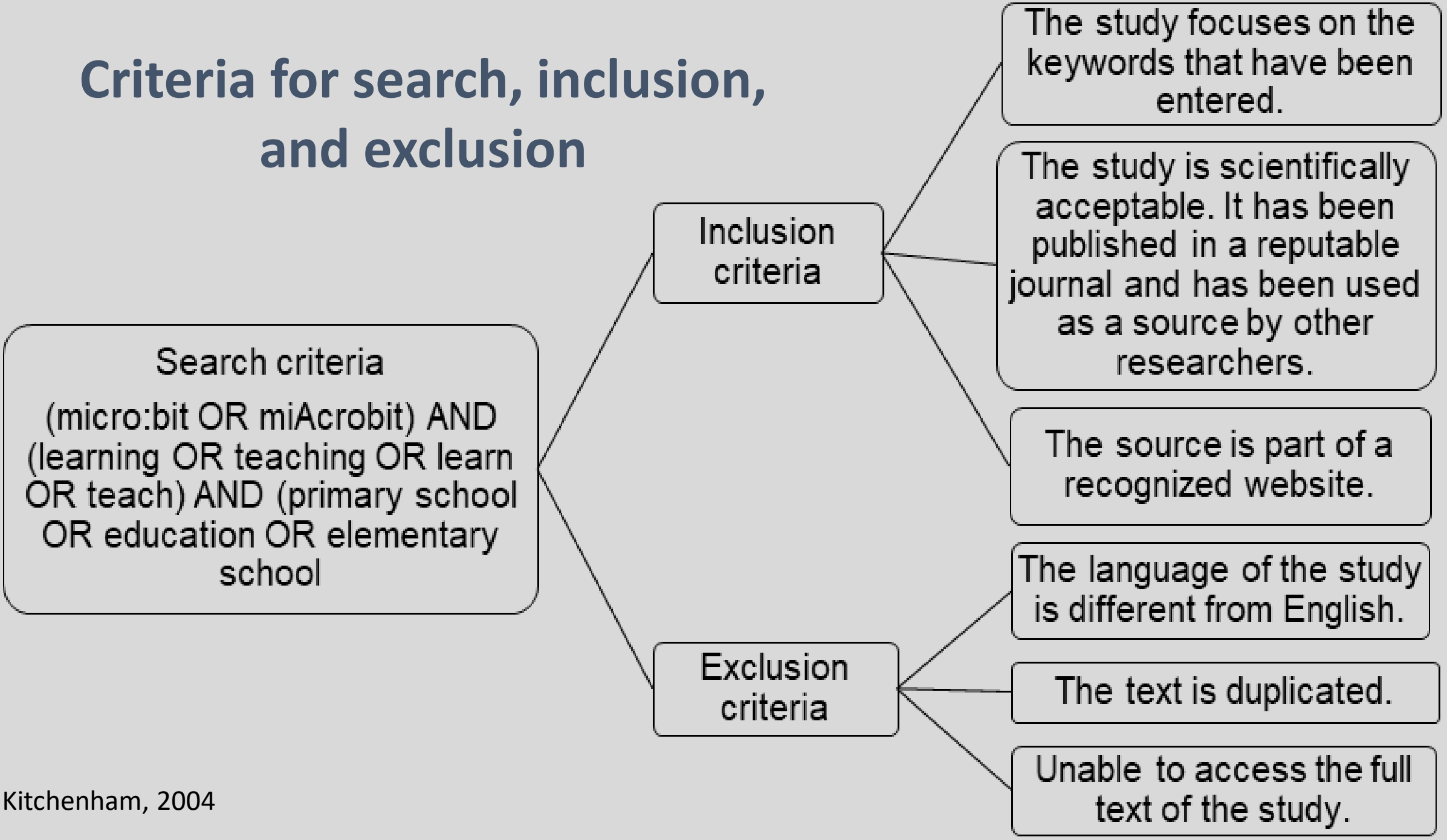
- **What experiences have been recorded regarding the use of the micro: bit by primary school students?**
- **What experiences have been recorded regarding the use of micro: bit by primary school teachers?**
- **What capabilities of the micro:bit can be exploited in primary school and what obstacles have been observed during its implementation in practice?**

Stages of the review



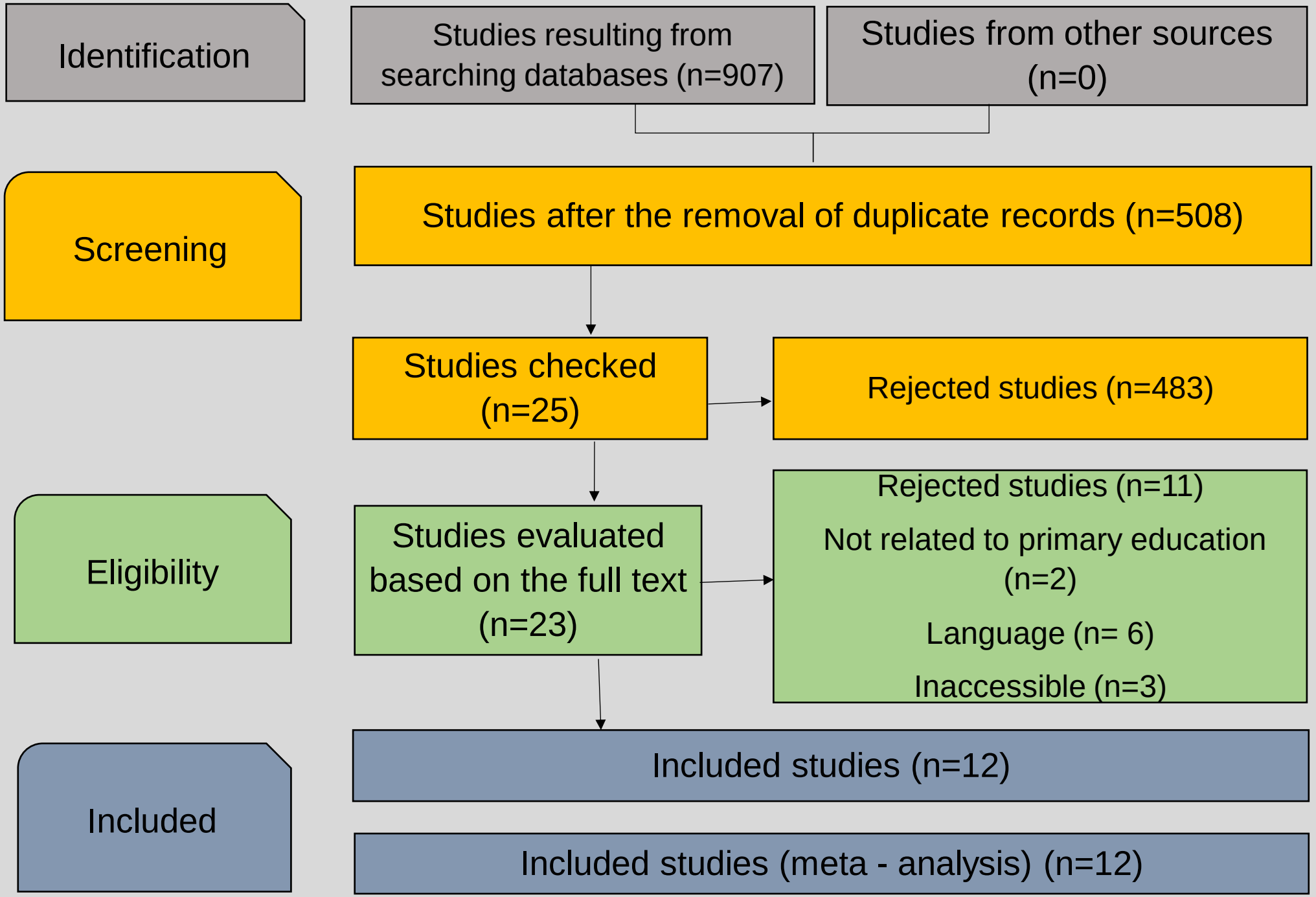
Kitchenham & Charters, 2007

Criteria for search, inclusion, and exclusion



Kitchenham, 2004

Study selection phases



Moher et al., 2009

Results
Student's experience

- ✓ Micro:bit was described as particularly interesting and **easy to use** by students
- ✓ Students are **actively involved** in learning, have **fun** using micro:bit, and feel **satisfied** coding.
- ✓ By starting with simple tasks and **gradually increasing** the required level of knowledge, advanced concepts and skills can be taught.

Cederqvist, 2020a; Sentence et al., 2017; Vlahu-Gjorgievska et al., 2018; Carlborg & Tyrén. 2017

Results

Student's experience

- ✓ Students approach micro:bit in various ways according their abilities.
- ✓ Students seem to associate the use of micro:bit with STEM lessons.
- ✓ From their participation in activities with micro:bit, opposed views of students emerge.

Results
Teacher’s experience

- Teachers are experimenting with the implementation of various activities by using micro:bit.
- They consider it essential to connect small programmable devices such as this one with everyday life to highlight their usefulness, contribution to learning and strengthen students' motivation.
- Many teachers show great interest in further engaging with more advanced designs through micro:bit related to various topics and courses.

Gibson & Bradley, 2017; Sentence et al., 2017

Results

Impact on skills development and motivation in coding

- Students report that micro:bit allowed them to collaborate or work individually.
- Gamification elements facilitate the learning process.
- Micro:bit can be used as tool for developing problem-solving and programming skills and creativity and a pedagogical approach to STEM education.
- The Micro: bit is described as an excellent motivation tool.
- Micro:bit's integration in teaching seems to depend on the confidence and the level of knowledge of the teacher.

Voštinár & Knežník, 2020a; Voštinár & Knežník, 2020b; Cederqvist, 2020b

Conclusion

Positive attitude of students.

Understanding of programmed technological solutions in everyday life.

Encouraging physical computing in classrooms.

Interdisciplinary approach to STEM courses, language learning, art, demonstrating the potential impact in the curriculum.

Develop adequate skills to study and analyze existing programmable technological solutions (PTS) and design new ones.

Teachers facing this curriculum change need extra guidance.

Thank you for your attention!