# Floor Robots: A child's insight into using robotics during Aistear
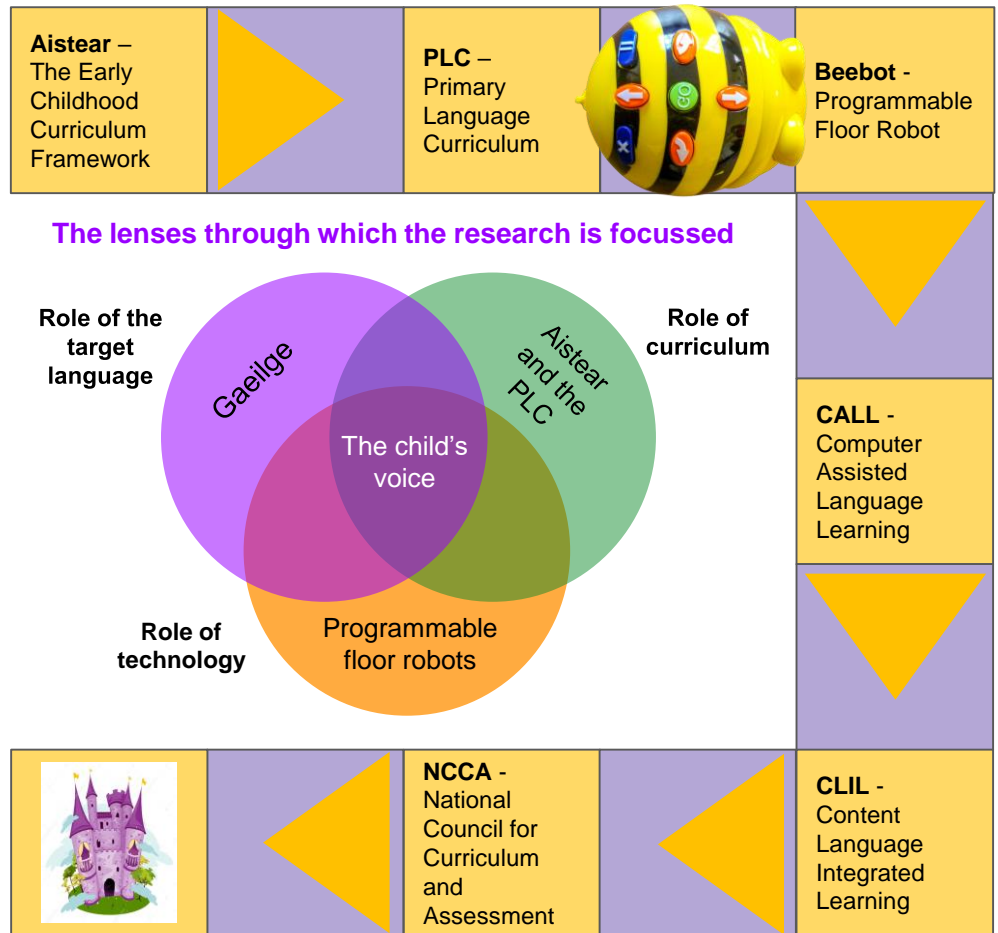
Tabhair Beebot go dtí caisleán an Bhanríon…

**Bee-bot** is a small bee-shaped floor robot that can be programmed to move forwards, backwards, right and left. Linking the floor robot to the language lesson is done through the use of a floor mat that includes images and words from the language lesson.

Through collaboration with, and guidance from the teacher, the children will be able to programme the robot to move around the mat. During this activity, children are linking the practical movement of the robot with the target language they are learning. The research looks through three lenses, with the child's voice as the central lens into the research.

## Research Questions
The research will address the following questions:
1. Do robots motivate children to learn a new language?
2. Can robots facilitate language learning in the early years?
3. How can educators effectively integrate robotics into a lesson?

**Aistear** – The Early Childhood Curriculum Framework

**PLC** – Primary Language Curriculum

**Beebot** - Programmable Floor Robot

**CALL** - Computer Assisted Language Learning

**CLIL** - Content Language Integrated Learning

**NCCA** - National Council for Curriculum and Assessment

### The lenses through which the research is focussed

Role of the target language

Role of curriculum

Role of technology

Gaeilge

Aistear and the PLC

The child's voice

Programmable floor robots

## Methodology
Mixed methods approach; design-based research, qualitative analysis and quantitative questionnaire. There is an empahasis on the child's rights within research and the child's assent will be sought before the research commences. Children will engage in a questionnaire around their enjoyment in using the robot and how useful they thought it was for learning a new language. The children will be captured on camera as they engage in the activity and afterward, there will be a focus group for further clarification and feedback. A post-intervention interview will also take place with the teacher to gather their perspective on the process of design-based research and the robotics activity.

## Theoretical framework
The theoretical framework for this research is grounded in and Papert's (1980) *constructionism* which is rooted in Piaget's (1954) *constructivism.* This theory conveys that children actively build knowledge through experience or "learn-by-doing". This constructionist teaching approach gives children the freedom to explore their own interests using technology while investigating domain-specific content learning (Bers et al, 2014). This theoretical framework is supported by the Primary Language Curriculum in *integrating Irish across the curriculum in an active and meaningful way* (NCCA, 2015).

## Implications
This research may point to the possible effects of using robots across other subject areas and how it can be integrated into a play setting.

## Research Design
Two pilot cycles will take place in Spring 2019 with senior infants in two different schools. Through collaboration with the classroom teacher, a topic will be chosen for the discrete language lesson, e.g. shopping or the weather. After the language lesson, children will engage in the robotics activity alongside other Aistear activities which focus on the target language learned in the lesson.

Following the pilot cycles, the intervention design will be altered based on feedback from the teacher and the children. A further cycle of six weeks will take place in Autumn 2019. Each child will have the opportunity to engage in a daily robotics activity focussed on the target language learned in their Irish lessons. The classroom teacher will document their perspectives and progress through a reflective journal, photographs and recordings.

## References
Bers, M.U., Flannery, L., Kazakoff, E.R. and Sullivan, A., 2014. Computational thinking and tinkering: Exploration of an early childhood robotics curriculum. *Computers & Education*, *72*, pp.145-157.

Dockett, S., Perry, B. and Kearney, E., 2013. Promoting children's informed assent in research participation. *International Journal of Qualitative Studies in Education*, *26*(7), pp.802-828.

Papert, S., 1980. *Mindstorms: Children, computers, and powerful ideas.* Basic Books, Inc..

Piaget, J., 1954. The construction of reality in the child (M. Cook, Trans.). New York, NY, US.

National Council for Curriculum and Assessment., 2015. Primary Language Curriculum, Dublin, Ireland

Susan Nic Réamoinn, PhD Candidate
nicramos@tcd.ie

Dr. Ann Devitt, Supervisor
devittan@tcd.ie

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin