

The ADAPT All Ireland Linguistics Olympiad (AILO)



A Case Study

Established in 2009, the All Ireland Linguistics Olympiad (AILO) is Ireland's largest Science Olympiad. It challenges Second Level students to develop their own strategies for solving complex problems in unfamiliar languages from around the globe. More than 30,000 students have participated in the Olympiad to date. AILO is helping to foster the next generation of STEM problem solvers for Ireland. Evaluation findings consistently reveal enhanced problem-solving skills and confidence among participants, as well as a greater propensity to study Computing, Linguistics or related fields at Third Level. AILO is a key element of the nationwide Problem-Solving Initiative delivered by the SFI ADAPT Research Centre for Digital Content Technology.

Background

Problem solving is a key skillset to leverage digital media innovations and to enhance how we interact with future digital media and information. Collaborative and creative problem-solving underpins not just future digital engagement, but also the core disciplines of ADAPT Centre research, which include computer science, language technology, engineering, artificial intelligence, human-computer interaction, and machine learning. However, international studies including, most recently, the OECD's 'PISA' study, state that Ireland's teens possess only mediocre problem-solving skills.¹

To help address this STEM skills deficit, ADAPT established the All Ireland Linguistics Olympiad in 2009. AILO is "The Problem Solvers' Challenge". The Olympiad introduces Second Level students to the application of logic to problems of language understanding and translation. No prior knowledge of linguistics is required; even the hardest problems require only logical ability, patient work and a willingness to think around corners.

The aims of AILO are to: help students to hone their problem-solving skills; to increase students' confidence in tackling complex problems; and to inspire students to consider the fascinating range of careers at the intersection of computing, language and linguistics. AILO is an All-Ireland competition and has sent a team of four students to represent Ireland at the International Linguistics Olympiad (IOL) since 2009. While open to all secondary schools on the island of Ireland, AILO takes special measures to ensure inclusion of schools with "DEIS" disadvantaged status, counties with low STEM-uptake, and border communities.

Approach

AILO runs annually, starting in September with all schools receiving an information pack via the post. Schools that register receive monthly sample puzzles up until January and they are invited to host and/or attend one of approximately 30 AILO problem-solving workshops around the country. Workshop content is designed, developed and formatively evaluated before October. Approximately 20 ADAPT tutors, along with former international-level contestants, are trained to deliver the workshops between November and January. ADAPT partners on some of these workshops with public

¹ OECD, PISA 2015 Results (Volume V), *Collaborative Problem Solving*

libraries and the Northern Ireland Centre for Information on Language Teaching & Research at Queen's University Belfast. Students take the preliminary round in their own schools at the end of January. The top 100 performers progress to the National Final in March at an ADAPT partner institution. This event consists of individual and team rounds. The top four students then go on to represent Ireland at the International Linguistics Olympiad (IOL) in July each year. These students receive specialist training from ADAPT at a 3-day training camp ahead of their participation in the international competition. Members of Team Ireland have won Bronze Medals and Honourable Mention Awards at IOL.

Outputs

More than 30,000 students from all 32 counties of Ireland have participated in AILO since 2009. In addition to running the annual AILO preliminary round, problem-solving workshops and national final, ADAPT hosted the International Linguistics Olympiad in 2017 at DCU. 'IOL 2017' brought the world's 220 top young problem solvers from 30 nations to Dublin for a weeklong festival of individual and team competitions, as well as a packed social and cultural programme. The event generated substantial media coverage, including a feature on the RTÉ TV main evening news.

More than 4,000 students participated in the 2019 season of AILO, meaning that one in six schools on the island of Ireland participated in the Olympiad. Among the participants were 650 students from 31 designated-disadvantaged schools. All participating students and their 133 teachers received sample puzzle packs, and 908 students attended problem-solving workshops run by ADAPT. A total of 34 teachers attended these workshops with a view towards establishing a new AILO train-the-trainer model. 1,350 students contested the preliminary round of the Olympiad in January 2019, and the top 100 students progressed to the national final in March 2019 at DCU. The top four performers progressed to represent Ireland at the International Linguistics Olympiad 2019 in Yongin, Korea. Additionally, more than 2,000 people downloaded AILO puzzle packs from the Olympiad website during 2019. Of these, more than 800 people self-identified as "general public" (i.e. not a teacher / student). AILO generates significant media coverage in local and national print, online and broadcast media.

Evaluation

ADAPT adopts a best-practice mixed-methods approach to evaluation of AILO. Detailed evaluation of each element of the Olympiad – by way of questionnaires, focus groups and interviews with students and teachers – includes evaluation of the effectiveness of the workshops, and the outcomes for students at the preliminary round and national final in terms of impact on problem-solving skills, on students' awareness of the importance and relevance of problem solving to STEM, and on students' propensity to consider STEM careers. Social-emotional outcomes are also assessed, including students' self-confidence, satisfaction and self-efficacy relating to problem solving.

In order to facilitate a more in-depth assessment and evaluation, in 2018 ADAPT mapped the learning outcomes of AILO to the Key Skills and Statements of Learning of the Irish Junior Certificate Curriculum. In 2019, for the first time, ADAPT evaluated AILO participants' performance against these learning outcomes, thereby facilitating evaluation of actual learning of participants rather than just their self-reported learning.

Impact

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Lessons Learned

AILO is a key element of the Education and Public Engagement programme of the ADAPT Centre. ADAPT reviews and adapts the Olympiad on a frequent basis, in line with emerging challenges and opportunities.

The principal challenge encountered with AILO 2019, for example, was the resource-intensive nature of marking 1,350 five-question papers of preliminary round participants. ADAPT therefore began exploring the possibility of facilitating online participation in AILO 2020. The Centre hired two undergraduate interns (one a former AILO student studying Computer Science and Language at TCD) to create a pilot system, working with a small number of teachers from participating schools and international olympiads. Following a successful trial in October 2019, the Preliminary Round of AILO 2020 was conducted online with automated marking. Responding to the COVID-19 pandemic, ADAPT adapted the 2020 National Final round within two days to hold it remotely in schools under teacher supervision for the first time.

Melissa Peate Sorensen, Software Application Engineer at Workday (BSc in Computing, Linguistics & Language, TCD)
"After competing in AILO, my enthusiasm for languages and linguistics expanded greatly. The experience had a huge effect on my choice of course in university and I was delighted when I was given the opportunity to become an AILO tutor"

Robert Devereux, Systems Engineer at Amazon Web Services (BSc in Computer Applications, DCU)

"The Linguistics Olympiad is a great way to hone problem-solving skills. Being involved in AILO helped teach me some of the necessary problem-solving skills used in software programming. Some of the AILO questions have even been used by my lecturers to demonstrate how to approach problems you have never seen before."

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