Library of Inspiration: Engaging Young Minds

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Abstract

This demo showcases the Library of Inspiration, an initiative making STEM learning more accessible, engaging, and inclusive, particularly for underrepresented children. Freely available, take-home technology kits distributed via school libraries, enable young learners to explore coding, robotics, audio, and VR. Co-designed with children, teachers, and librarians, the kits are tailored to be relevant and engaging. Attendees will participate in a live demonstration, aligning with themes of equity, diversity, inclusion, and social justice.

Our demo highlights hands-on STEM engagement, child-centered co-design, scalability, and community impact. It contributes to IDC's key themes by emphasizing socially-just technology design, participatory research with children, and scalable educational initiatives. By transforming school libraries into digital inclusion hubs, this initiative ensures children can develop future-ready skills. Attendees can explore, discuss, and reflect on how co-designed, playful, self-directed STEM learning fosters innovation. We hope to inspire educators, researchers, and designers to create more inclusive, child-centered technology education.

CCS CONCEPTS • Human-centered computing (HCI) • Applied computing • Education

Additional Keywords and Phrases: STEM learning, libraries, co-design, schools, interactive kits, adolescents, girls, young carers

1 INTRODUCTION AND BACKGROUND

1.1 The Library of Inspiration

The Library of Inspiration (LOI) is an initiative designed to ignite curiosity and enthusiasm for STEM subjects among school pupils aged 12 and 13, particularly those from underrepresented backgrounds. The project provides a collection of hands-on technology kits that can be borrowed from libraries, much like books. These kits allow students to explore emerging technologies, develop problem-solving skills, and gain confidence in STEM-related activities. Each kit is self-contained, including hardware, software (if applicable), guided activities, and online support. A key feature of the project is the inclusion of profiles of inspiring individuals, which helps challenge stereotypes and encourage a diverse range of learners to see themselves as future innovators.

1.2 Challenges

The underrepresentation of certain groups in STEM education and careers is a well-documented issue, with research highlighting persistent gender imbalances, socioeconomic barriers, and challenges faced zotero Gender disparities in STEM engagement often emerge early in education, influenced by societal stereotypes and a lack of diverse role models [4]. Similarly, students from low-income backgrounds often face systemic barriers, including limited access to resources and extracurricular opportunities [5]. Young carers, who often balance significant responsibilities at home, face additional challenges in participating in structured STEM activities outside of school [6].

Take-home STEM kits have been identified as a valuable tool for widening participation by enabling flexible, self-paced learning that accommodates diverse student needs [7]. Research on informal STEM learning environments suggests that hands-on, exploratory activities can foster engagement, confidence, and long-term interest in STEM [8]. Moreover, co-designed learning materials—developed in collaboration with children, educators, and librarians—have been shown to enhance accessibility and relevance, ensuring that educational resources resonate with learners from diverse backgrounds [9]. By integrating these elements, the Library of Inspiration seeks to break down participation barriers and provide meaningful learning experiences.

1.2.1 Equity, Inclusion, and Social Justice

The digital divide continues to create disparities in access to technology and STEM education. The Library of Inspiration directly addresses this challenge by placing interactive learning resources in school libraries, a trusted community space that is freely accessible to all children. Unlike traditional STEM outreach programs that require attendance at specific events or institutions, our model enables children to engage with technology at their own pace, in familiar environments such as homes or schools, and with the support of both educators and families. This structure is particularly beneficial for children who face barriers to participation in extracurricular STEM activities due to financial constraints, caring responsibilities, or geographic isolation.

Additionally, each kit is designed to celebrate diversity in STEM by featuring profiles of women and underrepresented groups in technology and engineering, helping to counter stereotypes and provide relatable role models. The profiles are embedded within both the activity booklets and digital content, showcasing diverse experiences and career paths to help learners who may not typically see themselves represented in STEM feel a stronger sense of belonging. The inclusion of

culturally relevant storytelling and interdisciplinary applications (such as social robots and audio production) ensures that a broad range of children see themselves reflected in the activities. By involving learners in the design process and highlighting diverse experiences in STEM, the Library of Inspiration aims to foster more inclusive and engaging opportunities for exploration, drawing inspiration from participatory design approaches for co-creative STEM enrichment activities that are contextually and culturally aware [10].

2 CO-DESIGNING THE LOI

The Library of Inspiration was not just designed for children but with them. A core aspect of the initiative was its participatory design process, where school pupils, teachers, and librarians collaborated in selecting and refining the kits. Through workshops and feedback sessions, children contributed to decisions about which technologies to include, how instructions were structured, and what support materials were needed to enhance accessibility. This iterative process ensured that the kits were engaging, easy to use, and met the needs of a diverse range of learners.

Co-design involves collaboration between pupils, teachers, and librarians, allowing them to contribute insights that shape the development of the kits. Research suggests that participatory design in education enhances learner engagement and ensures that materials are tailored to diverse needs [11], [12].

The co-design process for the Library of Inspiration follows these key steps:

- **Needs Assessment** – this involved running launch events at each of the five High Schools with pupils and educators to identify gaps in STEM learning and areas of interest.

- **Prototype Development** – Undergraduate and PhD students worked with members of staff within the institution to create initial versions of the kits based on feedback, ensuring that activities are accessible and engaging.

- **User Testing** – the kits were taken back to the schools for piloting in real-world settings, gathering feedback on usability, clarity, and enjoyment.

- **Iteration and Refinement** – Adjusting the design based on pupil and teacher feedback, ensuring continuous improvement.

- **Implementation and Evaluation** – Deploying the kits in libraries and assessing their long-term impact on STEM engagement.

By leveraging a co-design approach, the Library of Inspiration ensures that the kits reflect the needs and interests of young learners. Similar initiatives, such as the FabLearn Labs [13] and the Scratch programming community [14], have demonstrated the effectiveness of co-designed educational resources in fostering digital literacy and problem-solving skills.

2.1 The 10 Library of Inspiration Kits

Figure 1: The ten Library of Inspiration kits, featuring tools such as robots, VR headsets, graphic tablets, and 3D printers, enable playful, hands-on engagement with STEM concepts. Co-designed with young learners and educators, they promote creativity and confidence in accessible, everyday settings.

By making these kits widely available through libraries and schools, the Library of Inspiration provides an accessible, engaging way for students to develop STEM skills while fostering curiosity and confidence in their abilities.

Table 1. *Overview of the ten Library of Inspiration kits, including key components, focus areas, and their connections to STEM.*

Kit Name	Key Components	Focus Area	STEM Connection
Emo Robot	Programmable robot, sensors, guide	Robotics, AI, Emotional design	Robotics, coding, sensors
Foley	Audio recorder, sound recipe cards	Sound Design, audio storytelling	Audio technology, creative expression
Graphic Novel	Graphic tablet, drawing pen, software	Digital storytelling, visual design	Digital media, design tools

Sphero robot	Sphero Robot, charger, coding app	Programming, interactive play	Robotics, block-based coding
Stop Motion	Puppets, tripod, animation rig, iPad	Animation, Storytelling	Media tech, visual sequencing
VR	VR headset, controllers, curated apps	Immersive tech, creative exploration	Virtual reality, spatial computing
DiD	Design it Deck, prompt book	Creative thinking, user-centered design	Design thinking, tech literacy
3D Scanning	3D scanner, modelling software	Spatial thinking, object modelling	3D scanning, object modelling
Mini Arcade	Handheld console, build and code guide	Game design, hardware assembly	Electronics, game programming
3D Printing Lab	3D Printer, filament, design software	Prototyping, digital fabrication	3D printing, engineering design

3 CONCLUSIONS AND FUTURE RESEARCH

The Library of Inspiration demonstrates a scalable, co-designed approach to widening participation in STEM education. By making take-home kits available through libraries, the initiative removes barriers to access and fosters self-directed, hands-on learning. Future work will focus on evaluating the long-term impact of the kits on student engagement, expand the initiative to more schools and libraries, as well as explore interdisciplinary applications across subjects.

4 SUPPLEMENTARY MATERIALS

You can view the explanatory video here https://www.youtube.com/shorts/qX6HfRoWGQY

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