Health Hackathon: empowering students as tomorrow's leaders in health

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The Health Hackathon empowers students to become agents of change within their school communities while inspiring them to explore careers in the health workforce.

Traditionally, hackathons have served as a methodology to foster the rapid generation of innovative solutions leveraged by digital technologies and immersive collaboration across a broad range of multidisciplinary contexts.[1] In educational settings, hackathons are transformative tools for engaging students, knowledge retention and enhancing soft and technical skills. Importantly, hackathons offer students a hands-on, experiential learning opportunity to address broad systemic issues which fall beyond the remit of regular educational curricula.[2]

School-based preventative health interventions targeting adolescents can significantly enhance health literacy and foster health behaviours that persist into adulthood.[3] Peer education is a well-established approach for delivering such interventions, with evidence demonstrating positive impacts on student's knowledge, attitudes and behaviours across various health topics.[4] However, to ensure effectiveness and avoid unintended harms, peer leaders require close support from adults to guide their responsibilities and communicate accurate health messaging.[5] The hackathon methodology offers an innovative solution to these challenges by creating a structured and supportive environment where students can collaborate with industry experts to develop and test their ideas.

Leveraging this methodology and youth voice to foster impactful health innovation, the Prevention Education and Research Unit, Western Sydney Local Health District, partnered with the Regional Industry Education Partnerships, New South Wales Department of Education and Ministry of Health to deliver the 'Health Hackathon'. This programme seeks to upskill high school students to develop a health promotion campaign for their school community while fostering industry connections and broadening awareness of careers in the healthcare sector. This initiative is not just youth focused but driven by young people, their innovation, creativity and their will to be drivers in the delivery of health messages that impact them.

METHODOLOGY

We held the Health Hackathon over 2 days at Westmead Hospital in November 2023 (n=27) (online supplemental file 1) and June 2024 (n=35) (online supplemental file 2). Project staff recruited western Sydney high schools through their professional networks. School staff had the autonomy to select up to seven interested Year 10 students (aged 14–16 years). To participate in the programme, parents/guardians were required to sign a consent form provided by the school. On day 1, students were asked to develop a health promotion campaign for the local government health agency as their 'client', with the autonomy to select any health issue they identify as affecting high school students and determine the type of campaign assets developed. Students worked on their campaigns in small groups of 2–3 while staying within their larger school group. To inform their campaigns, students received presentations from industry experts in public health, communications, social media, gamification(Gamification is the application of games or game-like elements to concepts to enhance participant engagement), and technology within the health sector. Project staff facilitated discussions to help students articulate the 'who', 'why', 'what' and 'how' of their campaigns. Students also had the opportunity to seek feedback from the project

staff and industry leaders to develop their ideas. On day 2, students received presentation tips and additional time to further refine their pitches. They presented their health promotion campaigns to a live audience and judging panel composed of health and education professionals. Student campaigns were evaluated on their ability to clearly define the target audience, describe the campaign and its importance, and presentation skills. At the end of the second day, students completed postsurveys to conduct process and impact evaluation.

BENEFITS FOR YOUNG PEOPLE

The Health Hackathon has fostered strong student engagement through high-quality industry presentations and an adequate balance between theory and practical work. Students were guided to identify a range of priority health issues experienced by young people and develop acceptable, feasible and targeted solutions. Students identified priority issues such e-cigarette use, physical inactivity, mental health challenges, substance abuse, technology addiction and exposure to harmful chemicals in cosmetics and food.

When considering what is needed to address such health priorities, students recognised social media as an important public health tool for delivering tailored health promotion messages. Students also indicated a preference for holistic school-based interventions which seek to address stigmatised issues like mental health and e-cigarette use within a supportive school environment. Ideally, school-based interventions should be curriculum aligned and incorporate interactive elements such as group discussion.

Student campaigns demonstrated the application of a range of technical skills in marketing and communications, gamification, health promotion and public speaking. Winning campaigns included a TikTok dance video to raise awareness of e-cigarette use harms, and an interactive Instagram account to raise awareness of technology addiction and promote healthier digital habits. Other innovative approaches included an anti-vaping Fortnite game and interactive novel on mental health challenges.

In postevent surveys, 62% of students reported improved confidence in addressing health issues, while 87% expressed interest in a career in health. Through 'learning by doing', students enhanced their soft skills essential for future employment prospects, including

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communication, teamwork, problem-solving and leadership. Additionally, students improved their overall understanding of the health industry, including the types of careers available, the skills and training required and what a career in health might entail. Of the students who expressed interest in pursuing a career in health, most reported they would possibly explore a career which was showcased during the programme.

IMPLICATIONS FOR PRACTICE
The Health Hackathon represents a forward-thinking, collaborative approach to health promotion and health workforce development. The Health Hackathon's distinctive benefits span multiple priorities:

► Career exploration: Inspiring a new generation of health professionals through exposure to a diverse range of careers, industry professionals and hands-on experience in health promotion.

► Youth-led health improvement: Empowering students with the confidence, skills and tools to address health priorities and develop public health campaigns which resonate with their peers.

► Skill building: Skill-building in areas such as marketing and communications, gamification, health promotion and public speaking, enhancing students' job readiness.

► Innovation in health: Fostering the rapid generation of solutions to address emerging health priorities through teamwork, creativity and problem-solving.

► Intersectoral collaboration: Creating opportunities and enriching student experience through sustained partnerships between health and education sectors.

Despite these benefits, maintaining the momentum and evaluation of student actions beyond the 2-day event has been problematic. To address this gap, future Health Hackathons should involve a nominated school staff member to support students in developing and delivering health promotion campaigns and provide a key point of contact for follow-up. Moreover, students should be encouraged to seek support from school executives, local health organisations and mentors to optimise the implementation and sustainability of their campaigns. School drop-outs due to staff shortages and illness can also pose a significant challenge. To mitigate this, project staff should recruit more schools than what is initially required of the programme.

By fostering job-readiness skills, broadening awareness of diverse health career pathways, and empowering students as agents of change within their school communities, the Health Hackathon showcases the transformative potential of experiential learning. This collaborative approach between health and education sectors highlights the value of cross-disciplinary partnerships in addressing complex challenges and inspiring innovative solutions. The Health Hackathon serves as a model for preparing the next generation to make meaningful contributions to healthcare and holds great promise for expansion to other regions.

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REFERENCES
1 Oyetade K, Zuva T, Harmse A. Educational benefits of hackathon: A systematic literature review. *WJET* 2022;14:1668–84.
2 Affia AO, Nolte A, Matulevičius R. Integrating hackathons into an online cybersecurity course. ICSE '22; Pittsburgh Pennsylvania, May 21, 2022 Available: https://dl.acm.org/doi/proceedings/10.1145/3510456
3 Manganello JA. Health literacy and adolescents: a framework and agenda for future research. *Health Educ Res* 2008;23:840–7.
4 Dodd S, Widnall E, Russell AE, *et al*. School-based peer education interventions to improve health: a global systematic review of effectiveness. *BMC Public Health* 2022;22:2247.
5 Widnall E, Dodd S, Russell AE, *et al*. Mechanisms of school-based peer education interventions to improve young people's health literacy or health behaviours: A realist-informed systematic review. *PLoS ONE* 2024;19:e0302431.