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# Active Learning through Celebration: a New Approach to Stem Engagement

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## Abstract

Science themed events provide a powerful means to extend learning beyond the traditional classroom, particularly within diverse, technology mediated educational settings. This study examines how National DNA Day was leveraged at a U.S. community college to enhance engagement, curiosity, and active learning through structured co curricular programs. Hands on activities including DNA bracelet construction to reinforce base-pair rules, live DNA extraction, gel electrophoresis simulations framed as forensic investigations, and microscopy based mitotic phase identification were designed to make abstract concepts tangible while promoting collaboration and confidence with laboratory skills. A mixed methods evaluation captured both quantitative and qualitative outcomes. Of 50 participants, 38 completed a post-event survey. Categorical data were analyzed using descriptive statistics and chi square tests; open ended comments underwent thematic coding. All respondents (100%) reported increased enthusiasm for biology (95% CI: 0.91–1.00), and 97% reported improved conceptual understanding (95% CI: 0.86–1.00). The most engaging activities included microscopy based mitotic phase identification (23.7%; CI: 0.12–0.40) and DNA bracelet building (21.1%; CI: 0.10–0.36). Themes emphasized the value of hands on practice, a relaxed learning environment, and interdisciplinary links, highlighted by engineering department-supported 3D DNA printing of DNA model. Despite limitations in sample size, reliance on self-reports, short-term assessment, and lack of a control group, this initiative demonstrates that celebrating science themed events can transform passive learners into active participants and offers a scalable model for fostering STEM engagement beyond the classroom. The study will continue in the following years with larger populations and longitudinal assessment to measure sustained learning in the coming years.

**Keywords:** Beyond Classroom; Experiential Education; Science Themed Events; Student Engagement; Stem Outreach