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Have interdisciplinary collaborations increased over the last 10 years at Johns Hopkins University? Results of a pilot study

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OBJECTIVES/SPECIFIC AIMS: The purpose of this study is to determine if the prevalence of interdisciplinary collaborations has increased over the past 10 years at 1 CTSA-funded institution. **METHODS/STUDY POPULATION:** We used Scopus to identify all articles published by authors affiliated with any of the Johns Hopkins Institutions for the years 2005, 2010, and 2015. We limited the search by the Scopus Field Codes "Subject Area" to biomedical science only, "Document Type" to articles only, and "Source Type" to journals only. We further eliminated all articles with 1 author or more than 10 authors. This resulted in 2800 articles for 2005, 3987 for 2010, and 4569 for 2015. After exporting the articles, we randomly selected 25 from each of the 3 time periods. Using the World Public Library Outline of Academic Disciplines as a guide, every author was assigned 1 of the following disciplines: Social Science (eg, Psychology), Basic Science (eg, Biology, Chemistry), Agriculture, Computer Science, Engineering, Medicine, Public Health, Nursing, or an Interdisciplinary field (eg, Genetic Medicine) based on their department and school affiliation. Articles with authors who belonged to 1 discipline only were considered single-discipline articles, and articles with authors in a least 2 different disciplines were considered "interdisciplinary." **RESULTS/ANTICIPATED RESULTS:** Based on the results of an initial pilot study, in 2005, 24% of articles were interdisciplinary, in 2010, 20% of articles were interdisciplinary, and in 2015, 60% of articles were interdisciplinary. The large gap between the first 2 time periods (2005 and 2010) and the most recent (2015), suggests a possible pattern of increasing growth of interdisciplinary collaborations over time. Expanding this analysis to a much larger sample size will provide additional important evidence. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Increasing emphasis is being placed on evaluating the effectiveness of the CTSA consortium in achieving its goals and on developing methods to gauge its success. Systematic methods that are easy to replicate across hubs are needed to better understand and track the evolution of scientific collaborations over time. This study outlines a process for determining whether one of the major desirable outcomes of the CTSA, notably the growth of interdisciplinary collaborations, can be determined through the analysis of authorship patterns. Further research is needed to confirm the generalizability of these results across other CTSA hubs.

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Use of an online provider learning community to assess clinical HIV/HCV/STDs-related training needs

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OBJECTIVES/SPECIFIC AIMS: The prevention, management, and treatment of HIV, STDs, and HCV requires continuous training that reflects contemporary best-practice and innovative care models. In order to improve the NYS AIDS Institute's comprehensive web-enabled training program, which enhances the capacity of a diverse healthcare workforce, a needs assessment (NA) of our community of practice (CoP) is needed to better understand their training needs, circumstances, and instructional modalities preferences. The goal of the assessment was to better understand our CoP's preferences of online trainings, and as a result to develop a "responsive design" system that will enhance user's learning experience thus improving patient care. **METHODS/STUDY POPULATION:** We developed and deployed an NA survey using REDCap. The instrument consisted in 27 questions related to providers' preferences on receiving continuing educational training and their use of technologies, including mobile platforms, online modules, webinars, and telehealth. As part of the recruitment strategy, several resources were deployed over a 1-month recruitment period including sequential email blasts, website promotion, and assessment links included in newsletters and social media. Weekly reminders were also used to promote the participation from our CoP. **RESULTS/ANTICIPATED RESULTS:** A total of 310 respondents participated in the NA, with 85.8% from NYS. 177 were clinicians (20.5% MD, 2.9% PA, 17.3% NP, and 16.3% RN) and 133 nonclinical providers (case/care managers, social workers, public health professionals, coordinators/administrators, and other). The participants worked in hospitals, community health centers, substance use centers, private practices, and state/local health departments. More than 90% of respondents indicated that they preferred both live/in-person and online training, and participants most strongly indicated that they stayed up-to-date on current developments through CDC, the AIDS Institute, and conferences. More

than 60% of respondents considered that receiving CE credit for the training was very important and 28% indicated they would use training materials in Spanish if offered. In terms of technology, over 80% of the respondents preferred computers, but more 50% also used mobile devices (computer at home 61.8%, computer at work 85%, tablet 29.9%, iPhone 20.9%, Android 16.6%, other device 2.3%). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Accessing an online CoP provided a useful opportunity to assess training needs and preferences of clinical and nonclinical providers. Most providers indicated that they were primarily likely to use a work computer to complete online training or secondarily a home computer. With a significant portion of respondents indicating use of tablets, smartphones, and other devices, online training opportunities should be developed with responsive design to assure flexibility and access. In addition to online training, participants indicated that they also strongly valued live, in-person training. Offering training with CDC and the NYS AIDS Institute branding, in Spanish, together with offering continuing education credit, were all seen as desirable training elements. Accessing this online CoP helped streamline and target training priorities and logistics.

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Enhancing KL2 Scholar poster communication skills for lay audiences using community judges

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OBJECTIVES/SPECIFIC AIMS: The 2 primary objectives were to (i) insure that Scholars can effectively communicate the translational impact of their research to a lay audience and (ii) assess the benefits and efficacy of having community, as well as faculty members, judge the translational impact of KL2 Scholar's poster presentations. An explicit secondary goal was to further the engagement of community members in CTSI-sponsored translational research. **METHODS/STUDY POPULATION:** CTSI's Education, Community Engagement, Discovery and Translation, and Translational Workforce Development Cores created the translational impact questions and evaluation sheets. The Community Engagement and Office of Discovery and Translation recruited community judges from their respective networks and they were assigned to relevant studies. Scholars were provided with the judges scoring template in advance. After the Research Poster Session, the KL2 Scholars evaluated the quality of their presentations and the impact of having feedback from Community Judges. The Community Judges evaluated their perceived "added value" to the research presentations and their interactions with the Scholars. Both Scholars and judges completed evaluations of the poster presentation and judging process, performed on a 5-point Likert scale. **RESULTS/ANTICIPATED RESULTS:** KL2 Scholars felt that the community impact judges provided valuable feedback on their research (3.8/5) and were satisfied overall with the poster session (3.4/5). In evaluating their own presentations, Scholars tended to rate themselves higher (4.2–4.6/5) on the clarity of their translational impact presentations than the community judges rated the Scholars (4.1–4.2/5). Scholars also rated themselves somewhat higher in the quality of their dealing with any ethical issues and their dissemination plan (4.0/5) than the community judges (3.8/5). Judges were very positive and felt they brought value to the experience (4.2–4.4/5). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Community judges added qualitative value to the Scholar presentations based on the Scholar and community judge evaluations and based on comparison based on prior year poster sessions. Documenting the degree of impact of the combination of this proscribed poster format and community-judging process awaits future assessment of Scholar presentations before and after the next annual poster presentation.

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Research participant 101: What you need to know before joining a research study

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OBJECTIVES/SPECIFIC AIMS: The goal of this innovative course is to provide community members with sufficient information to either join or decline participation in clinical research. We anticipate that they will gain knowledge in why research is conducted, the ways participants are recruited, the history of research, regulations that guide research today, participant protections, understand the consent process, their risks and benefits of participating in clinical research. **METHODS/STUDY POPULATION:** We will recruit interested community members via flyers placed at the training location and at other local community centers and agencies that receive heavy foot traffic.

The course is listed in the Communiiversity catalogue which is distributed in hardcopy (over 30,000) and email each semester. The course will be taught by a longstanding community member and research coordinator at the University of Cincinnati. Each session will be highly interactive including videos, role-play, and discussion of the presented research topics. Evaluation will occur both pre and post-session, along with pre and post-course. RESULTS/ANTICIPATED RESULTS: We anticipate 20–30 participants at each of the 4 sessions. We anticipate that we will learn current perceptions of clinical research and barriers to their participation to enable improved research recruitment. In addition, we will gain new insights into clinical research needs of the community. DISCUSSION/SIGNIFICANCE OF IMPACT: Through these interactive sessions, we will learn why community members participate in research and their barriers to participating. Understanding the perception of research by the target community is critical when developing clinical research recruitment strategies. We will also be developing a more educated community towards clinical research. We will also gain great insight into new clinical research directions as indicated by community members.

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Mentor training for KL2 Scholars through vertical integration

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OBJECTIVES/SPECIFIC AIMS: The NIH states, “The training of the biomedical workforce has always been an integral part of the NIH mission... It takes just one good mentor to influence the career of a new investigator; it takes a robust culture of mentorship across the research community to strengthen, sustain and diversify the entire biomedical research enterprise.” The University of Minnesota’s CTSI-Education core strives to build and maintain a strong culture of mentoring by providing CTSI KL2 scholars an opportunity to mentor an undergraduate student participating in the Pathways to Research Program (PReP). Using this mentoring model, participants gain valuable benefits and CTSI’s culture of mentoring is strengthened. METHODS/STUDY POPULATION: Participating KL2 scholars are matched with a promising PReP scholar for a 12-week mentored research project. The PReP program selects top candidates through a highly competitive application process. Students work in their mentor’s lab full-time, funded by CTSI-Ed. They engage in additional activities together including a mentor/mentee, an interview activity and 2 social events. Junior faculty scholars are asked to participate as judges at CTSI’s Poster Session and are invited to present at PReP seminars. The program culminates with the announcement of the Junior Mentor of the Year, in which scholars nominate their mentors for the award. Junior faculty mentors receive support through a training course, Optimizing the Practice of Mentoring, mentor orientation and a roundtable discussion with the program director and other mentors. The program’s infrastructure is designed to foster mentee/mentor relationships through faculty and staff support. Junior faculty receive one-on-one coaching when faced with difficult mentoring situations and are recognized for their mentoring successes. RESULTS/ANTICIPATED RESULTS: Junior faculty mentors highly rate the program on the following points; the experience was a good use of time, I am satisfied with my experience, I would recommend this program to faculty colleagues and students. Undergraduates and Professional students rated their mentoring relationship as 1 of 3 best outcomes of the program. In exit surveys, their highly rated program successes include having a network that helps move their career forward, and confidence to persist through training to become a successful researcher. DISCUSSION/SIGNIFICANCE OF IMPACT: Creating a culture of mentoring is important to the strengthen, sustain and diversify the biomedical research workforce. This mentoring model contributes to the mission while vertically integrating CTSI-Ed’s KL2 and PReP programs. On an individual level, junior faculty improve communication and management skills, develop leadership qualities, increase their network, provide a sense of fulfillment and personal growth, and reinforce their own skills and knowledge of subject. They are also provided a top undergraduate student worker fully funded by the program.

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Sinai MedMaker Challenge: A model of experiential team science education

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OBJECTIVES/SPECIFIC AIMS: Innovation in healthcare is increasingly dependent on technology and teamwork, requiring effective collaboration among

diverse disciplines. However, large knowledge barriers exist between these diverse disciplines which hinders effective communication and the innovation processes. We organized an intensive team-based competition event, Sinai MedMaker Challenge, that engaged individuals with a wide range of backgrounds in medicine, biomedical research, computers science, and engineering to collaborate in solving medical problems with technology-based solutions. The learning objectives were to: enable participants to identify healthcare problems which lend themselves to technology-based solutions; delineate key behaviors critical to multidisciplinary team success; identify optimal strategies for communicating in teams; engage and inspire participants to apply knowledge of technology to meaningfully impact clinical care and well-being. METHODS/STUDY POPULATION: The Sinai MedMaker Challenge was a 48-hour team-based competition, modeled after previously held health “hackathons.” Adapting from guidelines provided by MIT Hacking Medicine, the event gathered participants from diverse backgrounds (clinicians, medical students, graduate students in biomedical science and humanities, software developers, engineers, and others), for the purpose of utilizing technology to address pressing problems in the diagnosis, management and/or treatment of pain and/or fatigue. The event flow can be outlined as follows: Phase 1—pre-event brainstorming via Slack and Sparkboard online platforms; Phase 2—problem review with clinical experts; Phase 3—solution pitches, formation of teams, development of prototype solutions; Phase 4—presentations and prizes awarded. The event was sponsored by ISMMS Institutes and Technology Companies. Mentors roamed throughout the event to support the teams in the technical, clinical, and business development aspects of their solutions. RESULTS/ANTICIPATED RESULTS: In total, 78 participants forming 14 teams, worked on the development of software and hardware prototypes (apps/websites, devices, wearables) to address a variety of pain and fatigue problems, culminating in final pitch presentations to a panel of judges comprised of academic experts; innovators and entrepreneurs in the technology start up space. Award recipients were: (1) PT partners, a wearable device for monitoring physical therapy post knee replacement; (2) SickMeNot, an interactive, multimodal website/app for children designed to assess, monitor and manage pain; and (3) Biolumen, a functional biofeedback system, to treat chronic back pain. Evaluations revealed a high-degree of satisfaction with the event. Several teams continue to develop their prototypes. DISCUSSION/SIGNIFICANCE OF IMPACT: The Sinai MedMaker Challenge (1) was a compelling and productive forum to bring together students, trainees, faculty and other stakeholders to explore tech-based solutions for management, monitoring, and treatment of pain and fatigue; and (2) can be repeated annually, fostering a “Community of Practice,” and expanded to offer pre and post event opportunities to encourage iterative learning and ongoing creative output.

ETHICS

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“Understandable to the subject”: Plain language IRB informed consents

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OBJECTIVES/SPECIFIC AIMS: Develop a plain language informed consent template that met IRB and regulatory requirements. Evaluate the effectiveness of the template at improving the readability of informed consents. Field test the informed consent with low health literacy. METHODS/STUDY POPULATION: We conducted a retrospective analysis of over 200 UAMS IRB approved, investigator initiated informed consents from 2013 to 2015 to determine the readability before intervention. The mean grade level readabilities were derived from the results of 3 readability formulas (Flesch-Kincaid, SMOG, and Fry) using open-source readability tools. A plain language informed consent template that meets IRB and regulatory requirements was developed, adhering to health literacy best practices for written communication. The template was made available to investigators as an optional resource, and IRB committees were trained on use of the template. In addition, a focus group will be conducted to qualitatively assess understandability of the template with study participants identified as having inadequate health literacy. Data analysis will include readability assessment of IRB approved informed consents post intervention with and without use of the plain language template, as well as qualitative feedback from focus group participants. RESULTS/ANTICIPATED RESULTS: The retrospective analysis revealed a mean readability of 10th grade for IRB approved informed consents from 2013 to 2015 (n = 217). The readability of the developed plain language template was 5th grade. Preliminary post-intervention results show adoption of the template by investigators (n = 16)