

The Vanderbilt Neuroscience Outreach Initiative



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Providing exceptional science, technology, engineering, and mathematics (STEM) education has been at the top of America's educational agenda for nearly a decade. Despite a consensus on the importance of STEM education in developing thoughtful, innovative, and talented students that will help ensure the strength of America's intellectual, scientific, and economic base, relatively little guidance exists on how to integrate outreach programs to improve learning outcomes or public awareness of relevant research findings. Recently, the Vanderbilt Silvio O. Conte Center for Neuroscience Research and the Vanderbilt Brain Institute (VBI) embarked on a mission to increase public awareness of STEM topics, and specifically neuroscience, in the greater Nashville area. The first and perhaps most critical component of this effort was an application for NIH funds to create a state-of-the-art neuroscience exhibit at a local children's science museum, the Adventure Science Center (ASC). This application was written as a supplement to the already very large Conte Center headed by Randy Blakely, Ph.D. The grant, which was co-written by VBI Director Mark Wallace, Ph.D., was enthusiastically funded by the NIMH for a period of one year. In that time, (July 2010 to July 2011), Vanderbilt neuroscience has the opportunity to make a large and lasting impression on the youth of Greater Nashville—both through this endeavor with the ASC and in its collaboration with the Vanderbilt Center for Science Outreach (VCSO) to bring neuroscience and neuroscientists

into Nashville classrooms. A critical component of this effort is, obviously, a measure of its success. Despite the lack of literature on evaluation studies from the field, we plan to proceed by incorporating standard evaluation principles such as program design and goal setting, establishment of benchmarks and indicators, and fidelity to our objectives. Herein, we will describe our initial plan to report these indicators.

Program design

In creating a collaborative and intricate outreach program such as this, it is important that all collaborators have a clear understanding of the goals, objectives, and intents of the program and that these understandings are mutually agreed upon and shared by all. This consensus step is crucial for programmatic coherence. Construction of a "logic map" or "roadmap" is a valuable exercise that should be conducted to ensure outreach goals are established and actionable. Program benefits should be designed so that they are meaningful to each segment of the target population (students, teachers, parents, young children, adults). For example, in collaboration with the Middle Tennessee Chapter Society for Neuroscience (MTNCSfN) and its President (Vivian Casagrande, Ph.D.), the VBI and the VCSO plan to create brain-based literature for distribution to each child at area schools, but the age, cultural background and comprehension-level must all be considered before conducting an expensive and resource-draining campaign. School curricula and

parental involvement must also be considered as serious elements of such a large effort. Because many science outreach initiatives are open to the general public, planners must be cognizant of the diverse nature of their target audience and highlight its benefits accordingly.

All participants should understand whether the program is a partnership (whose design can range from the input of one stakeholder to the input of many stakeholders with a range of expertise) or outreach (which tends to be conducted by experts for the benefit of a targeted group). Lastly, it is also important to note that cultural optics—how different cultural groups within the target audience perceive the program—matter and can easily be overlooked, particularly if being designed by experts with little outreach experience and minimal community input. The incorporation of multicultural community-based knowledge with various methods of learning are critical for the success of any educational outreach effort, and must be cognizant of and engaging to different cultural backgrounds without pandering or being offensive. We hope to achieve these cultural proficiencies through the expertise of our collaborators, and further test curricula and print material before mass public distribution.

Benchmarks and Indicators

Whenever possible, we hope to gather data to ensure that adequate progress is being made to accomplish program goals. Although the impacts of outreach programs are mostly qualitative in nature, relevant data can and will



be collected throughout the implementation process. Attendance logs, procurement records, press releases and print materials are useful indicators of a program's success.

Program Fidelity

Finally, we end with the beginning. Program fidelity returns us to the question of intent. Was our mission accomplished? Was the target population reached? Were the desired observable outcomes achieved? Measures of program fidelity can take years—did the second graders we talked to in 2010 end up with a degree in some STEM discipline in 2024? In the time between our interaction with that child and the completion of her/his degree, was a passion for science nurtured by his/her family/teachers/community. It goes without saying that this endeavor should not be a one-year commitment, but rather a yearly contribution of passionate science from the Vanderbilt Brain Institute and its collaborators.

Conclusion

More formative evaluation of STEM outreach should be conducted to see how to best increase public engagement and awareness of vital health and science issues. Evaluation of this sort is necessary because the literature documenting science outreach is thin and current suggestions for “best practices” and/or strategies to integrate within high school curricula are even sparser. The aim of our future evaluations will be to inform the field by enriching the “best practices” literature on science education outreach programming so that concrete strategies can be developed to best support the implementation of STEM educational outreach programs in the future...



A note from the Director

“Wow!” That was the universal comment I received whenever I showed anyone the inaugural issue of *VRN*. The feedback on last year's issue has been nothing short of phenomenal, and this year's edition looks to be equally exceptional! I carry a copy of *VRN* with me whenever I travel – whether to conferences, to talk at other universities, to study section, etc. When at these venues, I make it a point to show my colleagues the issue, and to watch their faces drop as they leaf through the pages. In today's increasingly electronic age, I've been surprised and delighted that something so tangible as a copy of *VRN* can be such an effective advertisement for the quality of the research and training endeavors within the Vanderbilt Neuroscience Program. We should all be proud to be a part of this remarkable endeavor. A special thanks goes out to Caleb Doll and Mariam Eapen, who have worked tirelessly to begin to assume the reins of editorial leadership from the founding father – Chris Ciarleglio.

Yours in science,

Mark T. Wallace, Ph.D.



Program Update

The Neuroscience Graduate Program at Vanderbilt University is entering its twelfth year of existence under the young directorship of Prof. Mark Wallace. For the upcoming 2010-11 academic year, the program will have 71 trainees doing coursework and research in their mentors' laboratories, pursuing their doctoral degrees in Neuroscience. These trainees come from 23 states and 9 foreign countries. We have 94 training faculty committed to preparing our students for careers in teaching and research. Our students receive strong academic and research training from our outstanding training faculty.

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