

ARTICLE

Volunteerism is Key to Offering Successful Neuroscience Outreach with Limited Resources

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As sponsors of a university Society for Neuroscience (SfN) organization, we and our student members are committed to neuroscience outreach but with limited resources, it is not feasible for us to host a week-long program during National Brain Awareness Week (BAW). Hence, we decided on a half-day program wherein attendees are provided with information about the workings of the nervous system and current research in the field in a fun and interactive environment. Our volunteers — mostly

undergraduate students — select hands-on activities, gather required materials, and actively engage participants of all ages. We coined the event Brain Awareness Day (BAD) and organize the annual program on a budget between \$100-\$300.

Key words: Society for Neuroscience; science outreach; undergraduates; public education; Brain Awareness Week (BAW)

OUR UNIVERSITY, ORGANIZATION and COMMUNITY

Arkansas State University (ASU) was established in 1909 as a state agricultural school in Jonesboro, Arkansas. Today, enrollment exceeds 10,000 undergraduate and 1,500 graduate students in programs at the doctoral, specialist, master, bachelor, and associate degree levels, but there is no formal neuroscience degree program. Three faculty have doctoral degrees in neuroscience and a handful of others are involved in research and education related to neuroscience. ASU is known as a quality regional institution of higher education and recognized for offering special services to the people of the Arkansas Delta, an area of the state characterized as agricultural, poverty stricken, and below national averages in science proficiency.

An ASU-SfN student organization was chartered by the authors in 2004 and has grown from a mere five members to over 30 in 2010. In line with the mission of the larger Society for Neuroscience, ASU-SfN seeks to promote education in the neurosciences; to inform the general public on the results and implications of current research in neuroscience; and to promote other activities that will contribute to interest in science as a course of study or a career.

The concept of Brain Awareness Day (BAD) grew out of our roles as faculty sponsors of ASU-SfN and our interest in public outreach and education. With the active participation of our student members, this annual community outreach event has become extremely popular. This article shares our experiences of hosting a successful science outreach event with very limited resources in the form of personnel, supplies, and financial support.

BRAIN AWARENESS DAY

Since 2005, ASU-SfN has promoted interest in neuroscience in the community by organizing this annual low-budget outreach event. The half-day program is held

at the county library and is open to all members of the community. Volunteers, most of whom are our undergraduate students, instruct and engage attendees in hands-on and interactive activities at separate learning stations.

During our first year of the program we secured about \$300 in funding from the university's Student Government Association. Most of this went toward the purchase of t-shirts for volunteers, promotional flyers, and materials for activities. However, for many of the activities, the volunteers either collected the necessary materials or spent about \$5.00 out of their own pocket. Most activities employed inexpensive, second-hand, or common items to demonstrate basic functions of the nervous system. For instance, a ruler and stop watch were used to gauge reaction time and items for visual memory tests were selected from volunteers' personal items. The library also donated play-dough for a make a brain activity (Figure 1) and we secured prizes and food from local bookstores, grocers, and restaurants.



Figure 1. Attendees make a brain model out of play-dough.

After hosting BAD for a few years, we had accumulated

many leftover and reusable materials and in 2009 we organized the entire event on a budget of less than \$100 without cutting any activities offered in previous years. In fact, we offered over twenty learning activities, several of which were new to the 2009 program. Two new activities focused on head protection. Using scrap Styrofoam, plastic and paper materials, participants created helmets for raw eggs, then tested their creations to see which materials protected the egg best when dropped from varying heights. In conjunction with this theme, another activity led by university football players and engineering students used football helmets embedded with sensors to demonstrate the results of physical impact on the head. In this way we were able to communicate the importance of protecting the brain through both a simple activity as well as cutting edge research.

The success of our condensed approach is being gauged from the fact that attendees enthusiastically participate in activities each year. They ask pertinent questions about the nervous system and inquire about available resources to access more information and research updates from the field of neuroscience. Thus ASU-SfN is able to organize an educational and informative event at a nominal cost which yields highly positive outcomes.

Recruiting and Training Volunteers

The key to offering our program on such a limited budget comes from our extensive volunteer group consisting of undergraduate and graduate students and faculty representing the areas of psychology, biology, chemistry, nursing, engineering, physical therapy, and environmental sciences (Figure 2).



Figure 2. Our volunteer group ranges from 20-30 high school, undergraduate and graduate students as well as university faculty representing many disciplines.

Late in the fall semester the ASU-SfN officers and members decide on a date and place for the event. We attempt to schedule it around BAW but it does not always coincide due to our region's spring break schedule. We

also discuss potential guest speakers and any needed changes or potential additions to the program. Then early in the spring semester we approach additional students in our science classes such as physiological psychology or animal physiology and describe the event that is already on their syllabus. (Volunteering for the event is optional--they do not receive a grade.) We also contact faculty sponsors and student leaders in organizations such as the Medical Arts Club, Psi Chi, Physical Therapy Association, and others on our campus, and request involvement of their members.

Once about 20-30 volunteers have committed to the event, we then delegate responsibilities such as deciding on a theme, designing t-shirts, taking t-shirt orders, promoting the event, and soliciting donations based on their choices. One of us usually invites the guest speaker. Closer to the date of the event, we send out a list of activities to the volunteers. This list contains a title, a short description, and if possible a weblink to more information about the activity. We ask each volunteer to review the list and descriptions then notify us of their top two choices. They are also highly encouraged to create, or find, new activities to add to the list. Most of this is accomplished through email communication and we have only one big meeting prior to BAD. It is during this meeting, held just a few days before the event that volunteers pick up their t-shirts and an information packet. The packet contains FAQs such as date, place, time, a map, what to wear, who to contact, etc. It also includes a materials and supplies list for their selected activity and any supplemental materials we may have, such as an educational poster. We review the FAQs in the meeting, address any questions, then the volunteers are dismissed and asked to show up at BAD prepared to deliver their activity with explanations suitable for a lay audience.

We have found this approach to preparation and training effective for us as it requires minimal investment of time from our all-too-busy schedules. Further, by assigning only one activity to one volunteer we find that the whole program doesn't crumble if a few commitments are not fulfilled.

Neuroscience Topics Covered by the Various Activities

Many activities are adapted from the excellent online Neuroscience for Kids site developed by Dr. Eric Chudler, see <http://faculty.washington.edu/chudler/experi.htm>. We also gained ideas by attending the 2008 SfN Outreach Social hosted at the annual conference. During the social previously submitted activities were performed, and the accompanying handouts were published and distributed on a disk.

In other cases, volunteers designed new activities. For instance, one of our psychology students created an interactive station explaining the vestibular system and the cerebellum's role in making us feel dizzy. Participants were blind-folded and spun around then attempted to pin a cut-out of the cerebellum on a larger poster of a brain (Figure 3). To further fill out the program, we borrow microscopes and brain models from labs and invite

engineering majors to demonstrate their latest creations that have included robots and football helmets embedded with sensors.

Neuroscience topics addressed in our activities vary yearly but usually include neuroanatomy, electrophysiology, sensation and perception, memory processes, nanotechnology, neurodegenerative disorders, addiction, brain injury and plasticity.

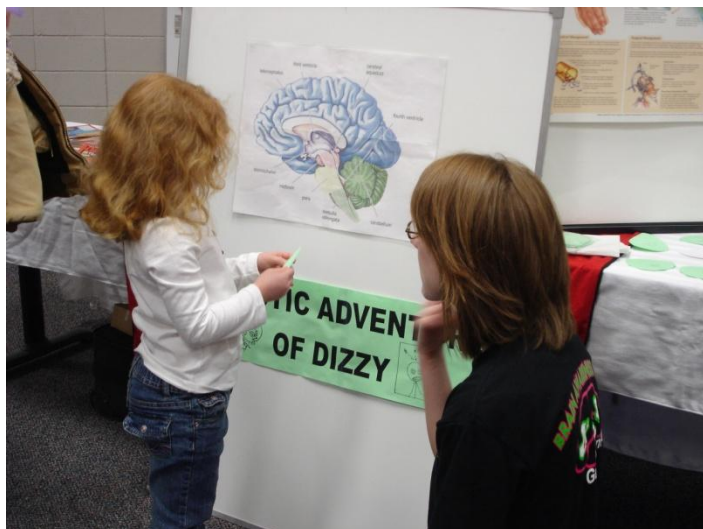


Figure 3. A young attendee participates in the Mr. Dizzy activity led by undergraduate psychology major Caitlin Sammons.

Participant and Volunteer Feedback

Through these various activities we communicate the importance of the nervous system as well as cutting edge research. This attracts attention from both children and their parents. Further, we find that middle and high school-aged attendees relate better to our undergraduate student volunteers who are only slightly older than themselves. Their interaction with our students helps them not only to develop an interest in neuroscience but also visualize themselves in similar future roles, either as university students, volunteers or scientists. Additionally, this event is very beneficial for our volunteers because they learn the subject better as they accept the responsibility for an activity. They also learn to organize as a team and realize that learning and helping others to learn can be fun. The overall success of our efforts is apparent from the fact that attendees enthusiastically participate in activities and we often receive requests to organize similar events for local schools and civic organizations. In some cases school teachers who attended our event have requested us to develop materials and hands-on activities for them to use in their classrooms.

Responses from surveys collected over the five years reveal that our event appeals to people from age three up to age 70 and 100% (N=100+) of all adult attendees surveyed said they would recommend our event to others. When asked what attendees learned from the event typical responses were: different parts of a neuron and the brain; how science helps us; more about nano-technology; more about ASU and the psychology and biology departments.

Our own volunteers have commented on their personal experiences with BAD. In a recent survey (N=14), 100% of volunteers stated they enjoyed volunteering and also thought participants enjoyed the event. Volunteers agreed the event was well organized, that everyone did a good job of demonstrating their activity to a lay audience, and that it is important to offer science events for the community. The majority of respondents also said they would include the experience on their resume (n=12) and would consider volunteering again (n=13). Further, from the faculty perspective, we believe this event provides experiential training of our future science communicators in a welcoming and low-pressure environment.

Impact

Informal survey results from our event show we are making an impact in Northeast Arkansas, which is very significant and encouraging considering Arkansas ranks low in terms of science proficiency. Further, since only one medical university exists in central Arkansas which is not able to serve all of the state through its science outreach programs, our efforts fill that void effectively.

Since beginning BAD, we have witnessed a related increase in community interest in neuroscience. For instance, attendance grew from 88 participants in the first year to over 230 in 2010. Also, it is possible this event affected our other major outreach effort, Brain Bee. Our regional Brain Bee competition commenced in 2005 with only one student entrant, who represented Northeast Arkansas in the state competition. By 2007 our regional event attracted over 26 students from six high schools. We now host a regional run-off and the top two students and their teachers attend the state competition.

Recommendations for Hosting BAD

Based on our experience, we make the following recommendations for organizing a successful Brain Awareness Day:

Initial Preparations

- Select a suitable date in Spring (avoid Easter and Spring breaks).
- Begin preparations at least two months prior to your date.
- Apply for funding through university or community sources.
- Consider a community-wide program, do not limit it only to school-aged children.
- Choose a public place frequented by children and adults e.g., libraries, museums, schools.
- Promote through local libraries, schools, and medical clinics.
- Invite specialists to speak on topics of current and local interest.
- Invite local civic groups such as Girl and Boy Scouts to attend.
- Solicit free advertising from local radio, television stations and newspapers.
- Seek donations from community businesses to

support materials, lunch for volunteers, and door prizes.

- Recruit volunteers from other university student organizations such as Medical Arts, and Psychology clubs.
- Set up a social networking site such as Facebook to connect with volunteers.
- Carry out most communication electronically.

Week of the Event

- Provide training for volunteers.
- Request one volunteer be responsible for only one learning station or activity.
- Make posters and banners to promote the event and to decorate the location.
- Gather token rewards for games played at individual work stations.
- Set up tables for display of models and activities the previous night.

On the Day

- Assign greeters and guides for attendees.
- Provide music or other live entertainment.
- Award door prizes.
- Evaluate the event, even if informally.
- Feed volunteers.

After the Event

- Make a note of improvements for next year.
- Report results and outcomes to interested parties.
- Thank all supporters and volunteers.

FUTURE DIRECTIONS

Interest in BAD continues to grow and we seek to expand and improve ongoing relations with the large and varied lay audience in Northeast Arkansas.

We encourage other groups who are interested but have not yet participated in neuroscience outreach due to budget, time or personnel shortages to start small as it is possible to host an educational and informative event with highly positive outcomes at a nominal expense. The key to offering our program with such limited resources comes from cross-disciplinary faculty, staff and student collaborations.

Like many similar operations, to successfully improve outreach opportunities for the community, we are in need of funding to purchase new materials and to replace old ones. Our future goals include preparing learning modules, such as those designed for use in the middle school classroom, especially since we have had interest by teachers and participants in this age group. We also intend to formally evaluate both participants and our volunteers to determine if they gain a better understanding of the concepts illustrated in the activities. Finally, we hope to expand our regional ties to reach more rural areas and under-represented groups in the Delta region. However, we have offered BAD on a shoe-string budget six times so we know that through volunteerism and reusable materials we are able to self-sustain. Nevertheless, ASU-SfN aspires to host activities over multiple days during Brain Awareness Week.

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