BRAINedu: A Window into the Brain/ CEREBROedu: Una Ventana al Cerebro

Front-end evaluation report

CEREBROedu

SEPA SCIENCE EDUCATION PARTNERSHIP AWARD
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Significant findings

The independent evaluation firm Knight Williams, Inc. conducted a front-end evaluation focused on gathering input from primary *BRAINedu* public audiences (Hispanic middle school youth and their parents/guardians living in underserved communities) and professional audiences (the project's advisors and partners). A total of 81 participants representing these diverse audience perspectives were asked to review a set of materials prepared by TPT, including two sample role model profile videos and a curriculum content framework, with some variations in the materials reviewed by each group, as determined by the target audiences for each resource. Scheduled early in Year 1, the evaluation provided an opportunity for TPT to assess, prior to significant production or development work, the extent to which the feedback validated the project team's key assumptions in planning *BRAINedu*, including the importance of: developing Spanish language resources, showcasing Hispanic role models, and featuring more authentic and culturally appropriate elements.

Background of participants

There were more females than males in all three participant groups, although the gender imbalance among the youth group (62% female) was smaller than in the advisor/partner (83% female) and parent/guardian (90% female) groups. About half of the advisors/partners (47%) and all of the youth and parents/guardians (100% each) were of Hispanic or Latino origin. Two-fifths of the parents/guardians completed the evaluation activities in Spanish (41%), while all of the youth completed the evaluation in English (100%).

Parent/guardian prior interest in and knowledge of BRAINedu topics: In general, prior to reviewing the *BRAINedu* resources, the youth and parents/guardians were moderately interested in the five topics being considered: brain structure, brain connections, brain activity, the brain and behavior, and careers or jobs in neuroscience. Meanwhile, both groups generally thought they knew a little about brain structure, brain connections, brain activity, and the brain and behavior. As another indicator of their knowledge of brain structure and function, on a short five-item quiz about these topics, none of the youth (0%) and only one parent/guardian (3%) answered all five questions correctly. Finally, with respect to careers or jobs in neuroscience, youth indicated they knew nothing about this topic while parents/guardians thought they knew a little about it.

Advisor/partner familiarity with the BRAINedu topics and target audiences: The participating advisors/partners worked in diverse fields, including STEM education and specific STEM fields. Almost all, however, indicated they had experience implementing, developing, or evaluating/researching STEM programs for Hispanic middle school youth and/or their parents/guardians from underserved communities. As many of the front-end evaluation questions asked advisors/partners for their opinion on how the *BRAINedu* target audiences were likely to respond to the proposed project resources, the evaluation approach relied on them being able to draw on their direct knowledge of and experience working with Hispanic middle school youth and parents/guardians from underserved communities. While the findings indicate that the advisors/partners' responses were often generally in sync with participating youth and parent/guardian responses – with exceptions noted throughout this front-end evaluation – it is important to keep in mind that the advisors/partners were asked to consider the *BRAINedu* target audiences as defined by TPT, as opposed to, for example, the specific participants in the evaluation or middle school youth and their parents/guardians in general.

Main findings

Role model profile videos

Appeal: Overall, youth somewhat liked and parents/guardians generally liked the two sample role model profile videos. Both groups further indicated that they would like to see similar videos about people who work in neuroscience, although parents/guardians were more positive about this aspect

than youth. The advisors/partners generally expected that the parent/guardian audience would share positive feedback in these areas; however, they expected the videos' overall appeal among the youth audience to be somewhat more positive than the feedback shared by participating youth.

Pacing, density, and role model focus: Youth and parents/guardians generally thought the sample profile videos' pacing, amount of information, and level of scientific explanations were all about right. They also generally thought the videos struck the right balance in terms of the amount of focus they gave to the role models talking about their work, doing/showing their work, and featuring their lives outside of work. The advisors/partners also generally anticipated that the youth audience would find each of these elements about right.

Overall appeal and relatability of the role models: Youth generally liked the role models and were interested in seeing similar role models in the new neuroscience videos, although not to the extent advisors/partners thought would be the case among the youth audience. Youth were also generally neutral about whether they could or could not relate to the role models, whereas advisors/partners generally thought the youth audience would relate to them. Parents/guardians generally liked the role models, related to them, and were interested in seeing similar role models in the new videos, while advisors/partners anticipated this would be the case among the parent/guardian audience.

Use of Spanish in the new neuroscience profile videos: When asked which language they would recommend for the new neuroscience videos, the majority of youth (62%), parents/guardians (52%), and advisors/partners (94%) suggested TPT make some videos in English with Spanish subtitles and some in Spanish with English subtitles.

Inclusion of personal experience with mental illness in the new neuroscience profile videos: The majority of youth (56%), parents/guardians (89%), and advisors/partners (100%) thought this subject should be included in the *BRAINedu* profile videos, and some of the participants explained that this would help make the role models more relatable.

Curriculum content framework

Overall appeal, clarity, and relatability: Based on the curriculum content framework they reviewed, youth generally thought they would somewhat like the final curriculum, find it somewhat clear, find it somewhat interesting, find that the content would somewhat relate to their everyday lives, and would want to do the activities in the curriculum. Meanwhile, the advisors/partners generally anticipated that these same curriculum elements would be well received by the youth audience.

Information and science density: Overall, youth thought the final curriculum would have slightly too much information and science, and that the level of scientific explanations would be about right, while advisors/partners thought these aspects would each be about right for the youth audience.

Interest in the four topics being considered: Overall youth were very interested in brain-related diseases and how the brain works/how to keep it healthy, and moderately interested in neuroscience careers and how to discuss and seek support for brain diseases/mental health conditions. Advisors/partners, meanwhile, generally anticipated that the youth audience would be very interested in brain-related diseases and moderately interested in the other three topics. In particular, advisors/partners who elaborated on the issue of neuroscience careers noted that the information might seem "*distant*" or "*disconnected for middle school youth,*" but explained that "*the more we can connect the core concepts to real-life experiences and examples, the better.*"

Possible hooks to engage youth: Advisors/partners most often suggested focusing on the brain and health (63%) and/or the brain in action (50%), including examining how the brain responds when one is eating, listening to music, watching TV, or playing video games.

Overall organization, use, and likelihood of recommending: Advisors/partners generally felt the final curriculum would be well organized, easy to use, and that they would recommend it to educators.

Reflection activity

Prompts: Both the youth and advisors/partners most often suggested using prompts that focused on learning or comprehension (37% and 69%, respectively). Youth next pointed to prompts about the program or program elements (21%) while advisors/partners suggested prompts related to youth interest (44%).

Importance of including video: Approximately two-thirds each of the youth (65%) and advisors/ partners (64%) thought a video component would be very or extremely important to include as part of the reflection activity.

How the activities should be shared: Beyond being privately shared with the evaluator, the majority of youth (58%) and advisors/partners (65%) thought students should choose with whom they wanted to share their reflections.

Family Resource Guide

Interest in learning about brain diseases: Parents/guardians indicated they would be very interested in reading tip sheets providing information about brain diseases such as Alzheimer's, epilepsy, and depression. Advisors/partners also expected these tip sheets would be of interest to the parent/guardian audience.

***Alzheimer's, epilepsy, and depression topics of interest*:** In each case parents/guardians (and advisors/partners commenting on the interests of the parental audience) tended to point to four main topics: causes and/or prevention; signs, symptoms, or diagnosis; treatment; and care for loved ones. Depression, in particular, was one area where parents/guardians and advisors/partners thought it would be important and beneficial to provide information about the disease.

***Interest in doing activities at home with family members*:** Youth and parents/guardians both indicated they were very interested in doing hands-on activities at home with one another. While advisors/partners expected this to be the case among the youth audience, they tended to anticipate that the parent/guardian audience would be moderately interested in this activity.

Training workshop

Timing and number of sessions: Advisors/partners were fairly divided on whether TPT should hold one six-hour session before the program begins (53%), or whether they should hold multiple sessions in the beginning of the program (47%). Those who suggested one session most often cited issues of workshop scheduling and program planning. Those who suggested holding multiple sessions generally recommended sessions of one or two hours (six or three sessions, in total), to help with the retention of new information.

Training workshop approach: Advisors/partners most often thought a combination of webinar lectures and demonstrations (76%) would be most effective in preparing educators to implement neuroscience programming at their organizations.

***Training prep work*:** A third of advisors/partners had concerns about the anticipated training prep work (35%). The concerns expressed by the group touched on recruitment, funding/educator pay, motivation, time, and the challenging nature of the material.

Educator support: As a whole, advisors/partners shared four main suggestions regarding how they thought TPT could best support educators after the workshops/during their programs: social media groups (63%), online office hours (50%), webinars (38%), and access to experts (38%). In addition, almost all of the advisors/partners (94%) thought the *BRAINedu* educators would like to have access to a virtual space for a written Q&A, such as Facebook or Slack, where project leaders could respond directly to their questions.

Introduction

BRAINedu: A Window into the Brain/CEREBROedu: Una Ventana al Cerebro (hereafter called *BRAINedu*) is a four-year national English/Spanish informal education project directed by Twin Cities Public Television (TPT) and funded by the National Institutes of Health (NIH) Science Education Partnership Award. As summarized on the project website, *BRAINedu* will develop and disseminate culturally competent programming and media resources designed to: 1) empower informal STEM educators to provide culturally competent activities about the brain's structure and function to Hispanic youth and families; 2) encourage Hispanic youth to consider careers in neuroscience and mental health, and demonstrate to parents the value of this academic path; and 3) promote mental health literacy among Hispanic families, thus reducing stigma and increasing utilization of mental health resources.

In order to fulfill these goals, the project is currently focused on developing the following four deliverables:

- Six role model video profiles of Hispanic neuroscience professionals
- Guidelines to facilitate student-created reflection activities to be produced at the *BRAINedu* outreach partner sites
- Culturally competent bilingual educational resources about the brain for multigenerational audiences
- Professional development around neuroscience education to informal educators, enabling them to implement programming with Hispanic youth and families via afterschool clubs, STEM Saturdays, day camps, and other out-of-school initiatives

As part of TPT's planning for these deliverables, the independent evaluation firm Knight Williams, Inc. conducted a front-end evaluation, the subject of this report, focused on gathering input from primary *BRAINedu* public audiences (Hispanic middle school youth and their parents/guardians living in underserved communities) and professional audiences (the project's advisors and partners).

Scheduled early in Year 1, the evaluation provided an opportunity for TPT to assess, prior to significant production or development work, the extent to which the feedback validated the project team's key assumptions in planning *BRAINedu*, including the importance of: developing Spanish language resources, showcasing Hispanic role models, and featuring more authentic and culturally appropriate elements. These assumptions were based on: TPT's extensive experience directing past projects, particularly *SciGirls*, the Emmy award-winning PBS Kids television show, website, and educational outreach program; prior external evaluations of *Latina SciGirls*, *SciGirls en Familia,* and *SciGirls en Español*; and review of the literature. The front-end work in essence helped to serve as a check on these assumptions as applied to *BRAINedu* and helped inform specific decisions with regards to the planned deliverables.

Method

Evaluation Approach

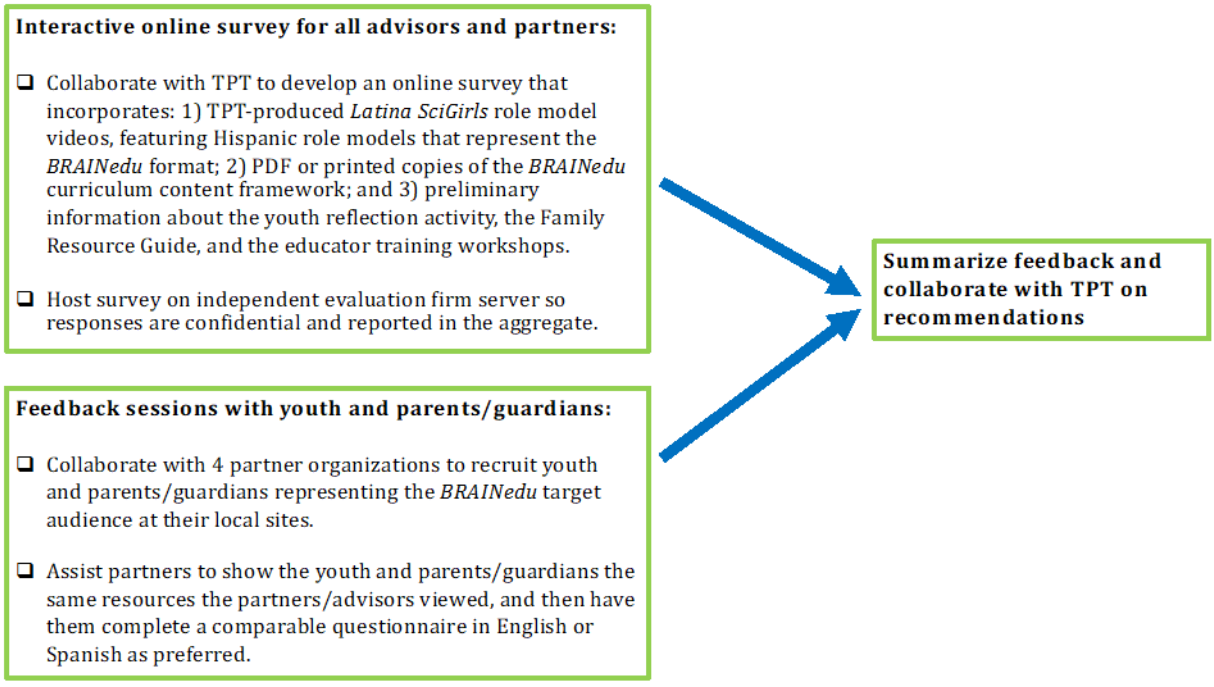
In planning the front-end evaluation, the project and evaluation teams met frequently to determine goals and a timeline. As part of this process, the project team was asked to consider and reflect on the following questions to help move the evaluation forward:

1) Who does TPT consider to be the target audience(s) for the project materials and what are TPT's audience goals in each case?

2) What kind of feedback does TPT want from its stakeholders (advisors/partners and youth/family members) to help inform development decisions?

3) What materials does TPT want the stakeholders to review? What about these materials would TPT like them to consider?

After several meetings, which further involved reflecting iteratively on the *BRAINedu* project, the teams arrived at the following evaluation approach, which varied somewhat depending on the audience targeted for feedback, as summarized in the graphic below.



Professional audiences

Twenty (20) *BRAINedu* advisors and partner educators were asked to provide feedback on a set of materials prepared by TPT, including two sample role model profile videos and a curriculum content framework. Feedback was collected via an interactive online survey divided into three parts, hosted on the independent evaluation firm's website:

- Part 1 – Feedback on sample role model profile videos: http://www.knightwilliams.com/bedu/bedufrontend.aspx
- Part 2 – Feedback on the curriculum content framework: http://www.knightwilliams.com/bedu/bedufrontend2.aspx
- Part 3 – Feedback on the reflection activity, Family Resource Guide, and training workshop plans: http://www.knightwilliams.com/bedu/bedufrontend3.aspx

All of the advisors/partners were asked to submit the full survey within approximately two weeks of the initial email invitation.

Public audiences

Collaborating with four of the project's partners[1] with regular access to Hispanic youth and families, the evaluation and project teams organized feedback sessions with the goal of reaching approximately 32 youth and 32 parents/guardians fitting the target audience for *BRAINedu* as described in the NIH proposal: "*Hispanic middle school students and their families in underserved communities*." The locations of the four front-end partners are shown in Image 1.

Image 1: Map of front-end partner locations

During the sessions, the respective program leaders at each partner site met with groups of youth and their parents/guardians for approximately one hour. At each site, evaluation activities were conducted in Spanish and/or English, as appropriate, with subsequent translation to English for use in reporting to TPT. The sessions involved: watching two sample role model videos, reviewing printed copies of the curriculum content framework, and completing paper versions of the survey completed by advisors and partners, with some questions reworded to be more appropriate for youth and parent/guardian input. In addition to gathering the participants' reactions to the video and paper materials and TPT's specific plans for *BRAINedu*, the evaluation also included questions designed to assess youth and parent/guardian knowledge of and interest in the proposed *BRAINedu* topics. Finally, the evaluation gathered basic demographic and background information, including gender, age, ethnicity, and (among parents/guardians) occupation.

While the sessions were led by the local program leaders with whom the youth and their family members were familiar and shared a history of meeting together in group settings, the evaluation team provided each leader with guidelines and a script for implementing a simple set of evaluation procedures.[2] The expectation was that, using this collaborative approach, the

[1] The project and evaluation teams are collaborating to select a diverse cross-section of to-be-determined partner organizations participating in *BRAINedu*.

[2] As part of this procedure, participants were informed that: the purpose of the session was to gather their feedback on early draft educational materials and resources about the brain as part of the *BRAINedu* project; completing the survey was completely voluntary and they could stop at any time; and their responses were anonymous and would be combined with those from other youth and families across the country. Participants were asked to remember that there were no right or wrong answers and that their frank and honest feedback was appreciated and would be used to help inform the final materials.

project team, evaluation team, and project partners would all directly benefit from the opportunity to learn from the youth and family members that are part of the project's core target audience.[3]

Analysis

Basic descriptive statistics were performed on the quantitative data generated from the evaluation. Content analyses were performed on the qualitative data generated in the open-ended questions. The analysis was both deductive, drawing on the project's goals and objectives, and inductive, looking for overall themes, keywords, and key phrases. All analyses were conducted by two independent coders. Any differences that emerged in coding were resolved with the assistance of a third coder.

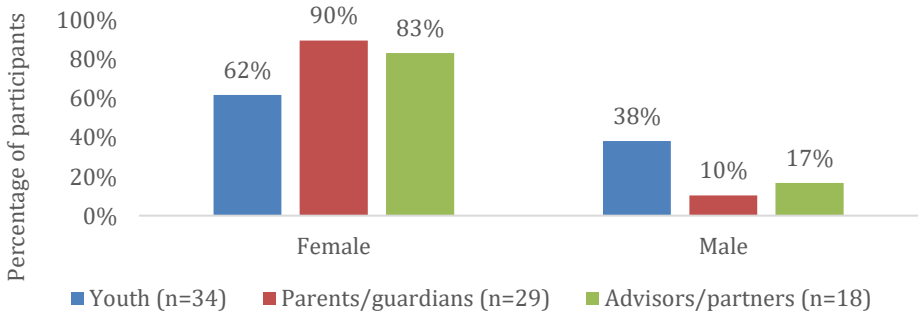
Participant information

Among the 81 participants in the *BRAINedu* front-end evaluation, about two-fifths were youth (n=34), more than one-third were parents/guardians (n=29), and about one-fifth were advisors/partners (n=18). This section summarizes the gender balance, age range, ethnic composition with respect to Hispanic or Latino origin, choice of language for survey completion, and the occupations of parents/guardians. Some additional information about the advisors/partners is also provided.[4]

Gender balance

Figure 1 shows the gender balance among participants. In all three groups, there were more females than males, although the gender imbalance among the youth (62% female) was smaller compared to the advisors/partners (83% female) and parents/guardians (90% female).

Figure 1. Gender of participants



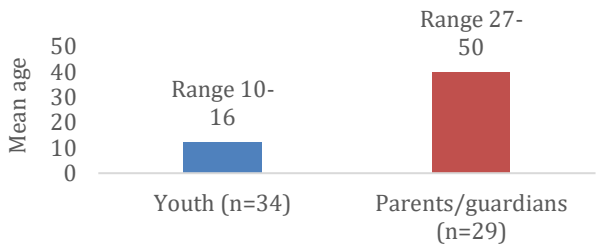
[3] Knight Williams has successfully used similar collaborative arrangements in past TPT projects, including the National Science Foundation-funded *SciGirls Season Four: Latina SciGirls* front-end evaluation, in which advisors/partners and Hispanic girls and family members provided feedback about a set of video materials prepared by the *SciGirls* production team (http://www.informalscience.org/latina-scigirls-front-end-evaluation-executive-summary).

[4] One of the advisors/partners did not complete this section of the survey. All that was known about this person's demographic and background information was her gender.

Age range

Figure 2 shows the age ranges and means for youth and parents/guardians. The youth group ranged in age from 10-16 while the parent/guardian group ranged in age from 27-50. The mean ages were 12 for the youth and 40 for the parents/guardians. The ages of the advisors/partners were not gathered.

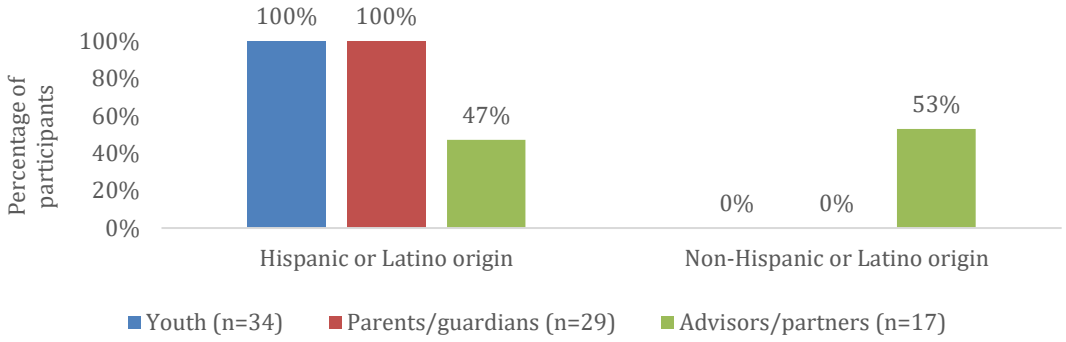
Figure 2. Ages of youth and parents/guardians



Hispanic or Latino origin

Figure 3 shows that all of the youth and parents/guardians (100% each) and just under half of the advisors/partners (47%) who shared information identified as being of Hispanic or Latino origin.

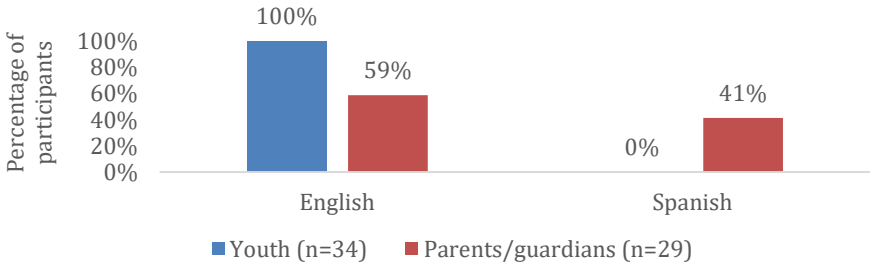
Figure 3. Whether participants were of Hispanic or Latino origin



Choice of language for survey completion

Figure 4 shows that all the youth (100%) and more than half of the parents/guardians (59%) chose to complete the front-end survey in English. The advisor/partner survey was only available in English.

Figure 4. Youth and parents/guardians who submitted survey in English or Spanish



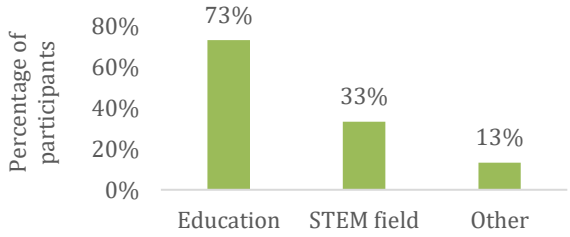
Occupations of parents/guardians

Parents/guardians shared a wide range of occupations, including: teacher, housekeeper, marketing, stay at home mom, sales, painter, customer service representative, and government/law enforcement.

Additional feedback about advisor/partner experience

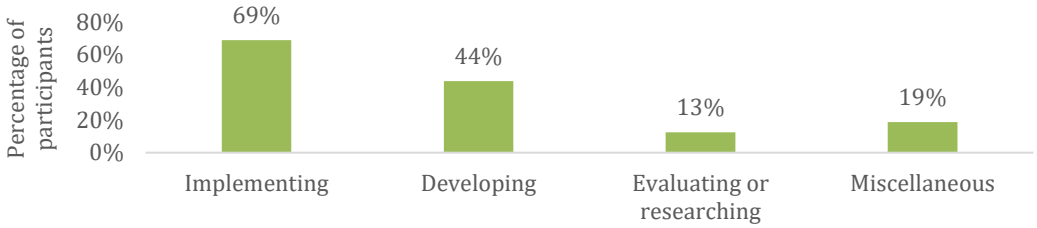
Figure 5 details the areas of STEM in which advisors/partners work. Among those who shared a response, advisors/partners most often pointed to working in STEM education (73%) or a specific STEM field (33%), such as computer science, neuroscience, or mental health. The two who selected *other* said they worked in "*diversity and inclusion*" or "*all of STEM.*"

Figure 5. STEM areas in which advisors/partners work (n=15)



The advisors/partners were also invited to comment on any experience they had in developing, implementing, or evaluating STEM programs for middle school Hispanic youth from underserved communities and/or their parents/guardians. As shown in Figure 6, among those who shared a response, advisors/partners most often had experience implementing (69%) and/or developing (44%) these types of programs. Examples of feedback from the advisors/partners in each case are below the chart.

Figure 6. Advisor/partner experience with STEM programs for underserved Hispanic youth and/or families (n=15)



Implementing STEM programs (69%)

- *Program manager for several middle school STEM summer camps, middle school STEM research programs during school, and K-12 education outreach programs.*
- *I've implemented middle school programming, though not specific to Hispanic middle schoolers.*
- *I often teach Latinx child and adolescent clients and their parents about brain basics during the course of therapy. I primarily work with kids with trauma histories and/or developmental differences, so it comes up a lot.*
- *We don't teach we co-learn with our students (who we call members so to stay away from school jargon) and explore STEM and STEAM projects through the creative use of technology.*
- *More than 60% of my work was bringing STEM learning experiences to girls …*

Developing STEM programs (44%)

- *I have experience with creating online activities that include Hispanic youth but are not exclusively for that demographic. They are designed to be broadly and cross-culturally appealing.*
- *My role at my organization is to create programs and activities with a focus on STEM that are interest-driven by our members in a creative learning environment that is unlike traditional school settings*
- *… four years as a person developing STEAM curriculum and programing for youth across the state.*
- *I … have developed educational programs on mental illnesses*

Evaluating or researching STEM programs (13%)

- *I now work with university faculty members and researchers in project design, broader impacts, and evaluation.*
- *I am also an evaluator.*

Miscellaneous (19%)

- *Latina SciGirls is really the only one*
- *I have been involved in four NSF grants providing programming to this demographic.*
- *Managed a scholarship initiative for H/L students to pursue STEM degrees and followed/supported them throughout their four/five years of their college experience.*

Finally, the advisors/partners were asked if there was anything else about their backgrounds they wanted to share. Among the ten who gave a response, nearly all (90%) shared more information about their personal or work histories, as shown in the examples below. Finally, one advisor/partner (10%) elaborated that she consulted a Hispanic student with a degree in neuroscience when completing parts of her front-end survey.

Shared personal or work histories (90%)

- *I am Latino and grew up … with a high Latino population and saw firsthand the poor attitude towards mental health as opposed to physical health. Injuries should be treated immediately if there was blood, but head trauma wasn't an issue because it didn't immediately manifest itself physically. Even dizziness was played off. This attitude is a huge obstacle in the success of this program.*
- *My daily work focuses on national Latina outreach efforts and diversity and inclusion so I'm excited to support this work in the area of cultural considerations and nuances.*
- *I was never a K-12 classroom teacher. I have done extracurricular or special feature classroom activities with children via lectures and hands-on activities.*
- *I've been a clinical social worker serving Latinx kids and families … for 13 years.*
- *I was a girl scout leader in a high poverty school with mostly American Indian girls - and we focused on science*
- *Our organization has worked with SciGirls for several years and has run SciGirls programs in a variety of formats.*
- *I work with trauma informed educators and programs and I am very familiar with the importance of early learning, bonding and attachment and healthy brain/healthy baby support. I am excited to see this offered to the middle school population and to extend family engagement opportunities to our partners.*

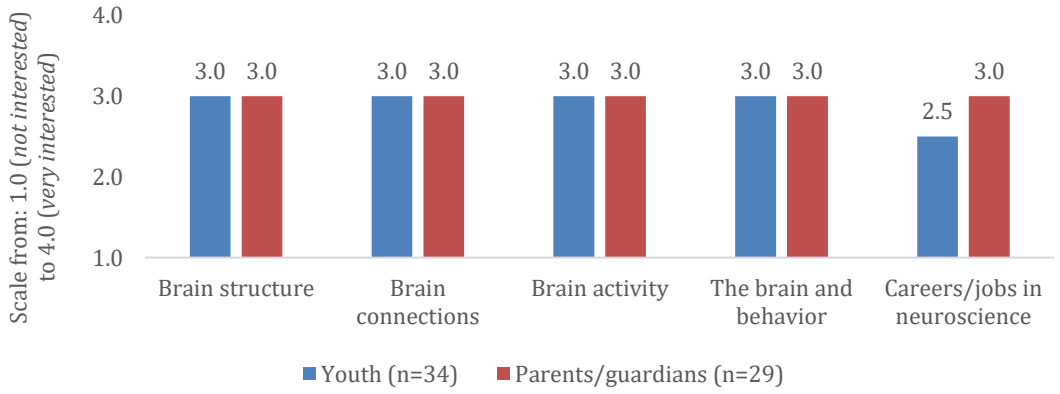
Youth and parent/guardian interest in and knowledge of *BRAINedu* topics

This section summarizes youth and parent/guardian interest in and knowledge of five topics that may be featured in *BRAINedu*: brain structure, brain connections, brain activity, the brain and behavior, and careers or jobs in neuroscience. All of the questions in this section were asked in the beginning of participants' sessions, before they reviewed the *BRAINedu* materials.

Participants' interest in the proposed BRAINedu topics

Figure 7 shows how interested youth and parents/guardians were in five topics about the brain, using a scale from 1.0 (*not interested*) to 4.0 (*very interested*). In general, youth and parents/guardians were moderately interested in all five topics: brain structure, brain connections, brain activity, the brain and behavior, and careers or jobs in neuroscience.

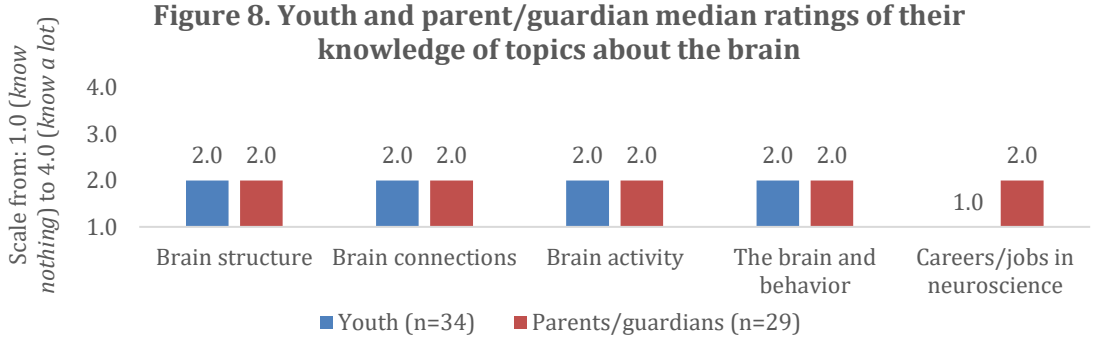
Figure 7. Youth and parent/guardian median ratings of their interest in topics about the brain



How much participants thought they knew about the proposed BRAINedu topics

Figure 8 shows how much youth and parents/guardians thought they knew about the same five topics, using a scale from 1.0 (*know nothing*) to 4.0 (*know a lot*) in each case. Both groups generally thought they knew a little about brain structure, brain connections, brain activity, and the brain and behavior. Parents/guardians thought they knew a little about careers or jobs in neuroscience, while youth indicated they knew nothing about this topic.

Figure 8. Youth and parent/guardian median ratings of their knowledge of topics about the brain



Participant knowledge of topics that may be featured in BRAINedu

Youth and parent/guardian participants were also asked five questions to gauge their pre-session knowledge of topics relating to brain structure and function that may be featured in *BRAINedu*. Table 1 details the five questions asked and the correct response(s) in each case.[5] Looking across the full question set, none of the youth (0%) and only one parent/guardian (3%) answered all five questions correctly.

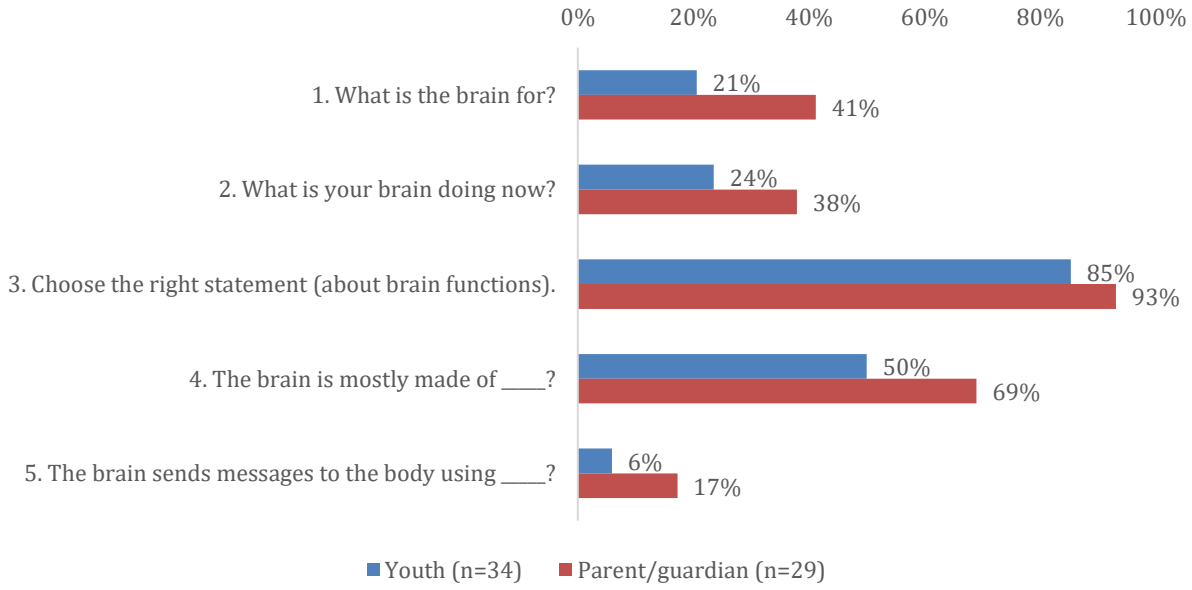
Table 1. Knowledge questions asked of *BRAINedu* participants, and the correct answers to each question (checked)

1. What is the brain for? Please check any that apply.
   - ✓ Thinking
   - ✓ Talking
   - ✓ Coordinating body movements
   - ✓ Feeling hunger, thirst, cold
   - Making nails grow
   - Dividing cells
   - Don't know
2. What is your brain doing now? Please check any that apply.
   - ✓ Reading and understanding the questions
   - ✓ Regulating your body temperature
   - ✓ Thinking how to answer
   - ✓ Making your heart beat
   - ✓ Making your hand move
   - Dreaming
   - Don't know
3. Choose the right statement below.
   - ✓ The brain is divided in several parts that perform different functions
   - Each part of the brain is equal, all performing the same functions
   - Don't know
4. The brain is mostly made of _____? Please check only one answer.
   - ✓ Neurons
   - Skin
   - Muscles
   - Don't know
5. The brain sends messages to the body using _____. Please check any that apply.
   - ✓ Neurotransmitters
   - ✓ Chemicals
   - ✓ Electric signals
   - Sounds
   - Don't know

[5] Questions 1 through 4 were adapted from: Sperduti A, Crivellaro F, Rossi PF, Bondioli L (2012) "Do Octopuses Have a Brain?" Knowledge, Perceptions and Attitudes towards Neuroscience at School. PLoS ONE 7(10): e47943. doi:10.1371/journal.pone.0047943. Question 5 was suggested by a member of the project team.

Figure 9 shows the percentages of youth and parents/guardians who correctly answered each question.[6] Although a larger percentage of parents/guardians shared a correct response for each of the five questions, most participants in each group correctly answered that the brain is divided into several parts that perform different functions (85% youth, 93% parents/guardians) and half or more correctly answered that the brain is mostly made of neurons (50% youth, 69% parents/guardians). The remaining three questions about brain function and connections, however, were answered correctly by two-fifths or less of each group.

Figure 9. Percentages of participants who correctly answered each of the five knowledge questions



[6] Due to a translation error, question #1 (What is the brain for?) did not include the full set of response options. For this reason, only the surveys submitted in English (n=17) were used to determine the percentage of correct responses shared in response to question #1.

Findings

Part 1: Feedback on the role model profile videos

In addition to following the procedural information provided under Method, the session leaders provided participants with information about the two profile videos viewed for the evaluation. Specifically, they informed participants that they would be watching two four-minute videos from the TPT-produced *Latina SciGirls* project about role models working in different STEM professions and that the *BRAINedu* team chose these videos as both feature Hispanic STEM professionals and represent the anticipated *BRAINedu* profile video format.

The session leaders further informed participants that their feedback would be used to inform the production of a new set of profile videos of Hispanic professionals who work in the field of neuroscience, and that they could think of the *Latina SciGirls* videos as samples. They were also told that, while the two sample videos featured women in different science careers, the *BRAINedu* team would produce videos featuring both female and male neuroscience professionals, and that some careers that might be featured included neuroscientist, neuropsychologist, neurologist/doctor, nurse, laboratory technician, and biostatistician.

The first video, featuring physician Dr. Rebeccah Rodriguez Regner, was in English with Spanish subtitles. The second video, featuring biologist Dr. Amelia Merced, was in Spanish with English subtitles.

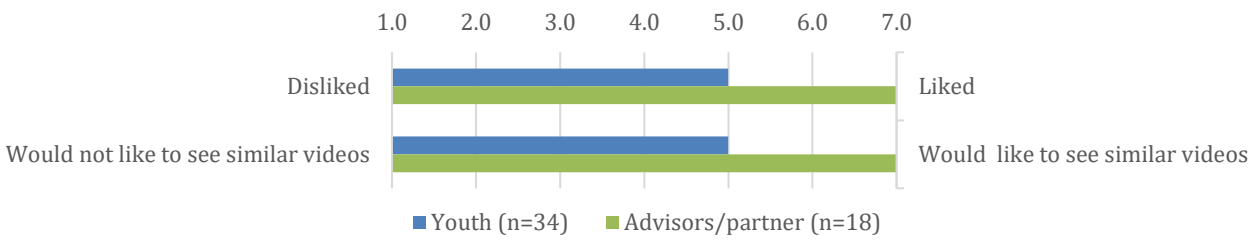
1.1 Overall appeal of the profile videos

Youth and parents/guardians were asked to rate the overall appeal of the two videos and their interest in seeing similar videos about people who work in neuroscience on a scale from 1.0 (*disliked/would not like to see similar videos*) to 7.0 (*liked/would like to see similar videos*), with 4.0 being neutral in each case. Using the same scale, the advisors/partners were asked to rate the same questions from the perspectives of the target audiences of underserved Hispanic middle school youth and their parents/guardians.

1.1a Overall appeal to Hispanic middle school youth

Figure 10 shows that, although overall youth somewhat liked the videos and indicated that they would like to see similar videos about people who work in neuroscience, their ratings in each case were not as high as the advisors/partners anticipated for the youth target audience.

Figure 10. Median ratings of overall appeal of the profile videos (to Hispanic middle school youth)



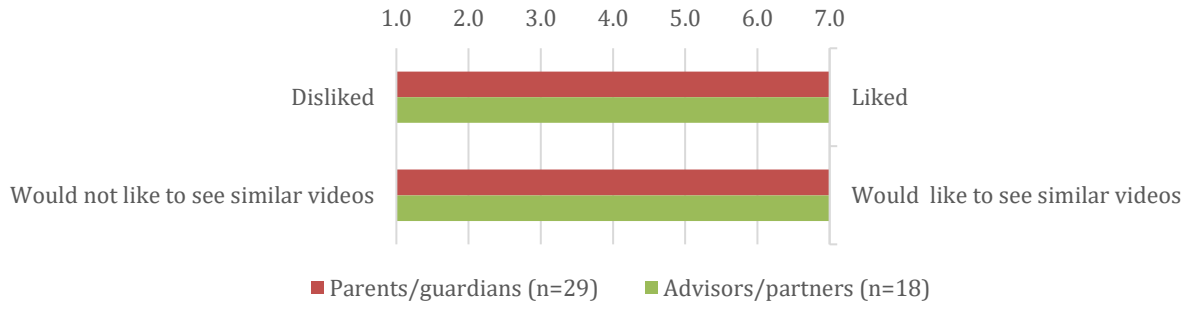
Those who shared ratings of 4.0 or lower were invited to elaborate, examples of which are presented below:

- *Youth: They didn't really interest me and later on it got boring. It felt too bland.*
- *Youth: I picked [these ratings of 4 and 3, respectively] because I am really not interested.*
- *Youth: There should have been a video with a boy.*
- *Advisor/partner: I think having students their age along with the adults in the videos would help them appeal more to younger kids.*
- *Advisor/partner: I think Amelia's video would be more engaging for youth because of her personality and energy, and because she talks a little bit about it being hard to get to where she is as well as how she managed that. I think parents want to know how their kids can get into these kinds of careers and why it's worth doing a 4-year or Master's degree. I think kids want to see people like them, who grew up in the Midwest, who had barriers they overcame. I don't know how many of the youth I know would connect with [Rebeccah's video] because of the geographical location and the perceived privilege and affluence of the speaker during her childhood.*

1.1b Overall appeal to Hispanic parents/guardians

Figure 11 shows that parents/guardians generally liked the videos and would like to see similar videos about people who work in neuroscience. Advisors/partners also anticipated this would be the case among the parent/guardian target audience.

Figure 11. Median ratings of overall appeal of the profile videos (to Hispanic parents/guardians)



Those who shared ratings of 4.0 or lower were invited to elaborate. Although only one parent/guardian and one advisor/partner shared a response, both suggested including more information about the role model's job/career, as in:

- *Parent/guardian: Too much family info; not enough about their field of work*
- *Advisor/partner: I would suggest more information about the field/academics instead of background of the adult. For Rebecca's segment, more than half was about her personal story. Amelia's segment was more closely related/informative about her career.*

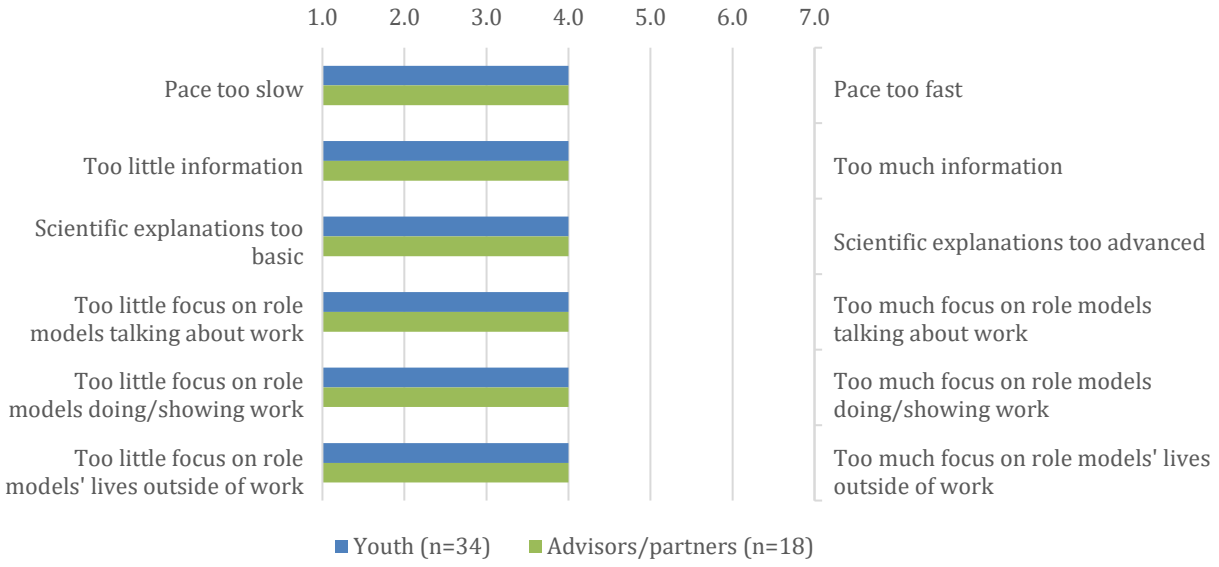
1.2 Profile videos' pacing, density, and focus on role models

Youth and parents/guardians were asked to rate the profile videos with respect to pacing, amount of information, level of scientific explanations, and focus on the role models' work and outside life, using a scale from 1.0 to 7.0, with 4.0 being about right in each case. Using the same scale, the advisors/partners were asked to rate the same aspects from the perspective of the youth target audience. They were also invited to provide open-ended feedback on the parent/guardian audience's point of view.

1.2a Overall perceptions of pacing, density, and role model focus among Hispanic middle school youth

Figure 12 shows that youth generally thought the videos' pacing, amount of information, and level of scientific explanations were all about right. They also generally thought the videos struck the right balance in terms of the amount of focus they gave to the role models talking about their work, doing/showing their work, and featuring their lives outside of work. Using the same scale, the advisor/partner ratings show that this group generally anticipated this would be the case among the youth target audience.

Figure 12. Median ratings of pacing, density, and focus on role models (to Hispanic middle school youth)



When invited to elaborate on their ratings, some of the youth and advisors/partners felt that all of the aspects described above were about right, while others suggested focusing more on the role models' job/career, as in:

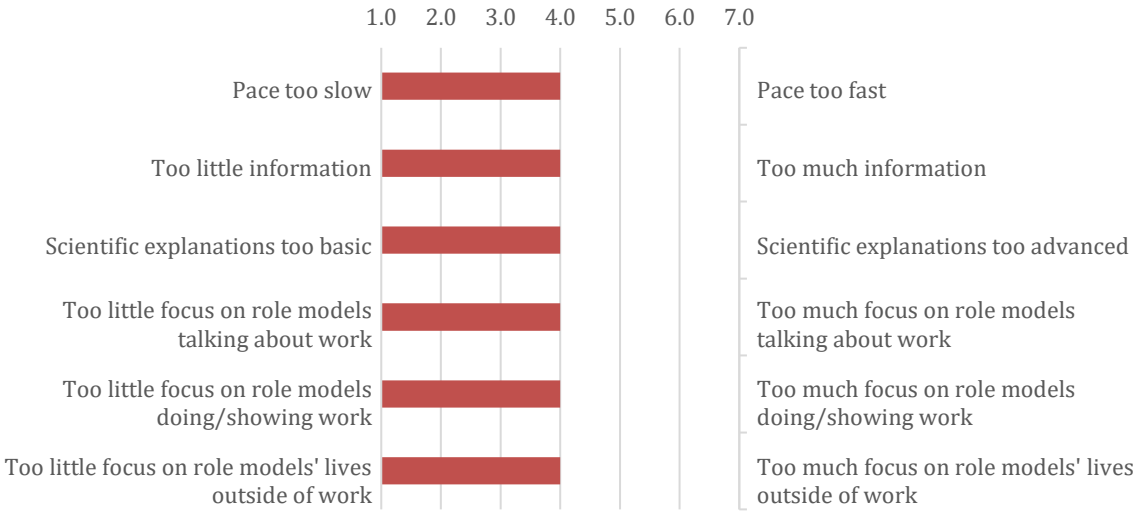
- *Youth: I pick fours for all due to all of them being just right, not too little or too big.*
- *Youth: For the most part, both videos gave a basic description that was necessary information about both people.*
- *Youth: Not enough information of the neuroscience aspects … scientific explanations were too basic to give me a basic understanding in relation to their field of work, I feel like there was a bigger focus on their personal lives than their work.*
- *Youth: More in depth scientific explanation might be good.*
- *Youth: On the last question I chose a 6 because it did talk too much about the life and not the work.*
- *Advisor/partner: I thought there was a perfect balance of the focus on their work vs. lives outside of work. This is what is needed for this audience.*
- *Advisor/partner: I watched these videos for the Minneapolis meeting and watched them again for this survey and was not bored. Each of the women brings their authentic self in their story telling that allows the viewer to connect with them and therefore, understand their work even if they're not familiar with STEM/science. In addition, the warmth of their laughter as they reminisce, is catchy for you to listen closely.*
- *Advisor/partner: I thought both videos hit all of the above just right. The scientists are appealing, engaging, well educated, work in "helping" fields (high appeal for girls), and respectful of their families/parents, culture and language. They also mention challenges in reaching their goals, and how they overcame them.*
- *Advisor/partner: These videos were just right if intended to inspire youth to want careers in science/medicine (and in the future ones, neuroscience). They also did a good job making a person seem accessible, still integrated culturally, etc. They may not be quite detailed enough if you want to provide information specifically about a given career. For that, you might want to include more info about what the daily activities are for a career and maybe some of the wow of the cool science, medicine or technology that they are applying for their job.*

- *Advisor/partner: Did not see much scientific explanation.*
- *Advisor/partner: I would suggest sharing more information about technology and academics and less … personal story.*
- *Advisor/partner: I think the videos are excellent as is but if you were going to shift them in one direction or the other, I would shift to incorporate a bit more about their science and showing them involved in different aspects of their work, while still providing a thorough glimpse of their life outside of work.*

1.2b Overall perceptions of pacing, density, and role model focus among Hispanic parents/guardians

Figure 13 shows that parents/guardians generally thought the videos' pacing, amount of information, and level of scientific explanations were all about right. They also generally thought the videos struck the right balance in terms of the amount of focus they gave to the role models talking about their work, doing/showing their work, and featuring their lives outside of work.

Figure 13. Median parent/guardian ratings of pacing, density, and focus on role models (n=29)



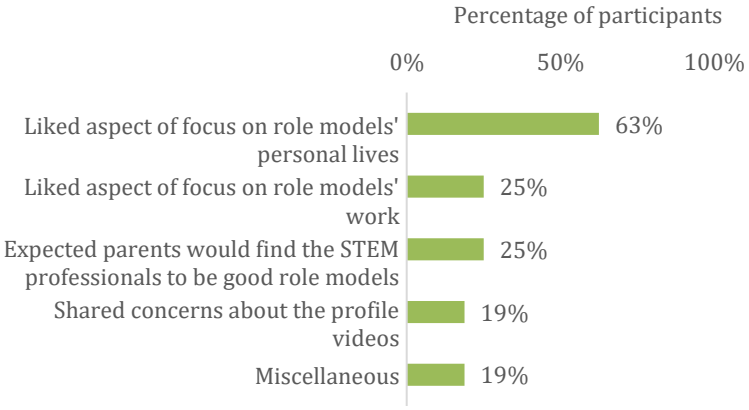
When invited to elaborate on their ratings, some felt that the above aspects were about right, while others wanted more information about the role models' jobs or careers, as in:

- *Parent/guardian: Good videos. I got an idea of what the people do.*
- *Parent/guardian: I liked the videos and they have a lot of information*
- *Parent/guardian: I enjoyed the explanations of each of the role models, didn't feel scripted, but genuine.*
- *Parent/guardian: The first video, I feel focus too much on her life and not science or explaining her work. Second vides was perfect balance of both.*
- *Parent/guardian: Would prefer a bit more focus on showing/explaining what they do as careers with a bit less of the personal aspects.*
- *Parent/guardian: Would like to see more of what they do and their real-world applications. Videos were kind of basic and not specific to areas of expertise.*
- *Parent/guardian: The video of biology, I would have liked to know more about what all it does in that field, not just about plant.*

Additional advisor/partner feedback on parent/guardian audience's point of view

Separately, the advisors/partners were asked if they had any comments about the above aspects of the videos from the point of view of the parent/ guardian audience. Figure 14 shows that, among those who shared a response, the advisors/partners most often commented on the videos' focus on the role models' personal lives (63%), among other topics mentioned. Examples of advisor/ partner feedback in each area are provided below.

Figure 14. Advisor/partner feedback on the parent/guardian point of view (n=16)



Liked aspect of focus on role models' personal lives (63%)

- *I think that they do a good job at being nonthreatening to traditions and culture.*
- *The highlights of family life I think was appropriate as many Hispanic youth can relate to the role models.*
- *Love that the role models speak about their parents and their influence in the life, and wanting to be able to give back to them, very important in Latino culture.*
- *Parents/guardians will be able to relate to the personal stories and the emphasis on the importance of education.*

Liked aspect of focus on role models' work (25%)

- *Parents concerned about their daughters working in what they might feel are careers better suited for males will see women who love their job …*
- *I think parents will really like and appreciate the videos. They … help to share info about a STEM career while not feeling like they're forcing kids into a particular career pathway …*
- *I want both my daughter and my son to understand that anyone can be a scientist if they are passionate about it.*

Expected parents would find the STEM professionals to be good role models (25%)

- *Great models for daughters*
- *As mentioned above, parents will appreciate the respectful attitude demonstrated by the scientists.*

Shared concerns about the profile videos (19%)

- *… more information about how they perform their job (like in Amelia's video) would be suggested.*
- *As a parent, I have no more idea about how to support my child pursuing a neuroscience career after watching the video than I did before. I also wouldn't have gained a lot of information that would help me see how this is realistic for my child growing up in poverty, in a decent but not great public school.*
- *These videos feature women who seem to be pretty wealthy, which is hard for the youth and families with whom we most want to share STEM resources.*

Miscellaneous (19%)

- *Soundtrack in the videos is good background*
- *I think they're interesting and appropriate*

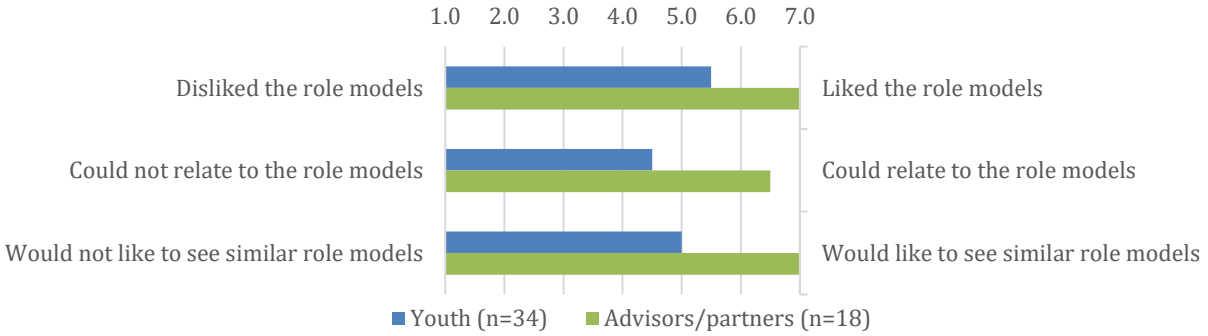
1.3 Overall appeal and relatability of the role models

The youth and parents/guardians were asked to rate the overall appeal and relatability of the two role models and their interest in seeing similar role models in the new neuroscience videos on a scale from 1.0 (*disliked/could not relate/would not like to see*) to 7.0 (*liked/could relate/would like to see*), with 4.0 being neutral in each case. Using the same scale, the advisors/partners were asked to rate the same questions from the perspectives of the youth and parent/guardian target audiences.

1.3a Overall appeal and relatability to Hispanic middle school youth

Figure 15 shows that youth generally liked the role models and were interested in seeing similar role models in the new neuroscience videos, although not to the extent advisors/ partners thought would be the case among the youth target audience. Additionally, youth were generally neutral about whether they could or could not relate to the role models, whereas advisors/partners generally thought the youth target audience would relate to them.

Figure 15. Median ratings of overall appeal of the role models (to Hispanic middle school youth)



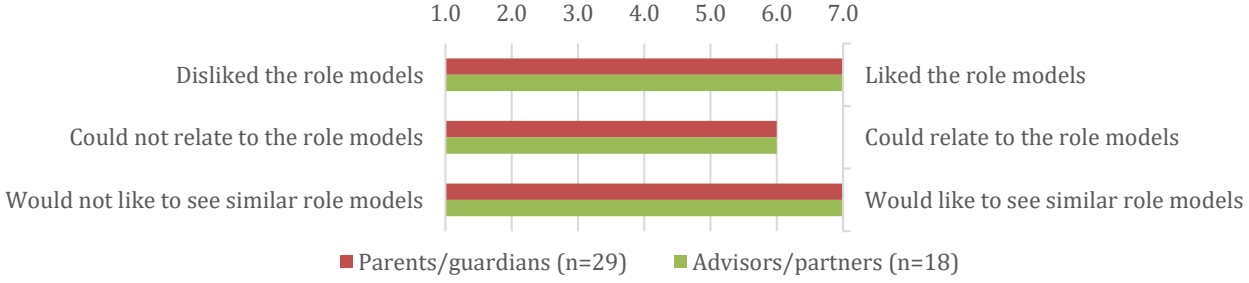
Those who shared ratings of 4.0 or lower were invited to elaborate, examples of which are presented below:

- *Youth: It was boring*
- *Youth: I cannot relate to the role models because I don't want to do the same job.*
- *Youth: Boy role models.*
- *Advisor/partner: Look for role models like Amelia, that are energetic and silly, for the youth videos.*
- *Advisor/partner: The role models shown have interesting careers, but making them relate to the youth is tricky, and these videos didn't show anything that connected to the youth unless the youth were already interested in science careers.*
- *Advisor/partner: … youth lost interest in role models more quickly. These videos feature women who seem to be pretty wealthy, which is hard for the youth and families with whom we most want to share STEM resources.*

1.3b Overall appeal and relatability to Hispanic parents/guardians

Figure 16 shows that parents/guardians generally liked the role models, would like to see similar role models in the new neuroscience videos, and could relate to the role models featured, although they were slightly less positive about this last issue of relatability. The advisor/partner ratings show that they generally anticipated this would be the case among the parent/guardian target audience.

Figure 16. Median ratings of the overall appeal of the role models (to Hispanic parents/guardians)



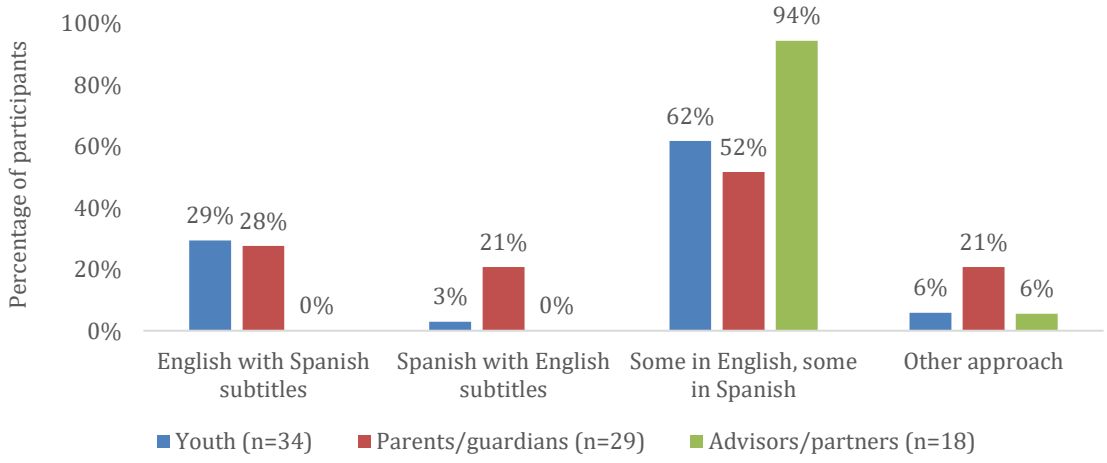
Those who shared ratings of 4.0 or lower were invited to elaborate, examples of which are presented below:

- *Parent/guardian: I could sense more energy and love with career choice with the second video model.*
- *Advisor/partner: For parents relating to role models, it depends on the community group you're serving. If you've more 1st generation parents, then they may not be able to connect with a role model who's a second generation. But if your audience is younger parents who are 2nd or 3rd generation Americans, then, they'll relate more to these role models.*
- *Advisor/partner: Consider the potential socio-economic variation among populations who might benefit from these materials, mainly in the role-modeling aspects of it.*

1.4 Use of Spanish in the new neuroscience videos

Figure 17 shows participants' suggestions about the language of the new neuroscience videos.[7] Although their responses were mixed, youth (62%), parents/guardians (52%), and advisors/partners (94%) all most often suggested that TPT make some videos in English with Spanish subtitles and some videos in Spanish with English subtitles. Examples of their specific comments are presented in Table 2 on the following page.

Figure 17. Participants' suggestions about the language of the new *BRAINedu* neuroscience videos



[7] Participants were told that the language of the new neuroscience videos was still under consideration. They were then asked to select which approach they would recommend: English with Spanish subtitles, Spanish with English subtitles, some videos in English with Spanish subtitles and some videos in Spanish with English subtitles, or another suggestion.

Table 2. Participant comments on the use of Spanish in the new neuroscience videos

Youth (n=34)

English with Spanish subtitles (29%)

- *Most children in the U.S. speak English. I assume k-12 students are your main demographics.*
- *That's what I am used to watching in English.*
- *I understand English [better] … because I understand Spanish when it is a small sentences but when a whole paragraph I don't understand and English subtitles are too fast.*
- *I speak mostly English, so the English video was easier to understand.*

Spanish with English subtitles (3%)

- *It would be easier to follow and easier to understand.*

Some in English, some in Spanish (62%)

- *It's important to have both languages in the videos and for some it might be easier to listen in one language or the other. This allows more people to be educated.*
- *It helps unite the cultures, but it also helps make the speaker feel welcome and proud of their story.*
- *People should learn to speak some Spanish.*
- *So I can get used to both languages.*
- *I think some people understand Spanish better than English but some understand English better, so some of both would be best.*
- *When watching videos in English, Spanish speakers may not want to read subtitles and want to listen to Spanish speaking videos or vice versa.*
- *I think that there is a large percentage of people that speak more English than Spanish, but some do speak Spanish.*

Other approach (6%)

- *English DUB for people with it as their first language, Spanish DUB for people with it as their first language*
- *Present videos with subtitles in the languages the speakers are speaking. I chose this option because I will be able to read what I didn't hear without having to translate into the other language*

Parent/guardian (n=29)

English with Spanish subtitles (28%)

- *Only English without subtitles for the youth*
- *It is easier for me with subtitles.*
- *This works well for me because in my household we speak both languages*

Spanish with English subtitles (21%)

- *The reason is because I don't speak English*

Some in English, some in Spanish (52%)

- *For parents speaking Spanish is useful. Most students will see it in English.*
- *English and Spanish, because they are the two most spoken languages in this country, but do not forget that there are areas where another language is spoken instead of Spanish … [Also,] I think that subtitles help those who like to read and when there is an accent you know exactly what they are trying to say.*
- *I think it helps us to share the viewing, I really enjoyed seeing the Spanish, but the majority of youth [do] not all read Spanish.*
- *I feel that having videos with both English with Spanish subtitles and Spanish with English subtitles are a great way to present to the children some may struggle with English or vice versa.*

Other approach (21%)

- *I suggest having English speakers then Spanish translation by the same speaker. So we hear from the main character in both languages.*
- *All videos should be presented with both options… dialect, accent, cultural idioms, etc. aren't always understood by the viewer and the option to understand in their dominant language is beneficial.*

Advisor/partner (n=18)

Some in English, some in Spanish (94%)

- *Some students will be fluent in English; others will be English learners. The videos make clear that the scientists are Latinos and that's the important part. I can speak Spanglish, since my Spanish is not great. I loved hearing the women use Spanish to describe technical things. They did not switch back and forth. I think girls and families will better understand that other people from other parts of the world are serious scientists.*
- *It seemed to work with families whose older members spoke only Spanish who had kids who spoke mostly English. Some adults cannot read and write in any language.*
- *As shown in the first video, being Latino doesn't necessitate the speaking of Spanish. There are lots of Latinos who aren't good at speaking Spanish and still are of Latino culture.*
- *More of the youth I know would prefer to watch the videos in English. Some, however, would prefer to have it in Spanish and most parents would prefer the video be in Spanish. Some members of both groups will struggle to get the content through subtitles. This seems like a fair way to make some portions really accessible to both kids and parents/guardians.*
- *Without specific demographic breakdowns such as knowing that 75% of a local community speaks Spanish, I would say that some videos in English and some in Spanish - all with subtitles - would be the best option to appeal to most people. I would also note that literacy is key because if any parents/guardians cannot read, they would need to watch the video that speaks in their native language. We need a sensitive way to inquire about this as a way to ensure all can be engaged in watching/listening to the videos in a language they understand.*
- *I [believe] youth by default of being in the school system will speak English hence I think it's appropriate to show videos in English. However, for many Hispanic youth parents their first language is not English, and they might not easily relate to English speaking professionals. The Spanish videos provide a sense of "these are our people" that English speaking videos cannot provide. Hearing their native tongue I believe gives them a sense of familiarity.*

Other approach (6%)

- *Make a playlist of both. Have each person perform the interview in English and in Spanish. Use the same b-roll sequence for both segments. Have the subtitles available in either language for each. I think it is important to make videos available for all audiences; I am considering the literacy skills of both populations (adult and child).*

1.5 Inclusion of personal experience with mental illness

Figure 18 shows whether participants thought the featured neuroscience professionals should talk about their personal experience with mental illness within the family and how it impacted their career choices.[8] Youth (56%), parents/guardians (89%), and advisors/partners (100%) most often said they thought this subject should be included in the new *BRAINedu* videos. Examples of their specific comments are in Table 3, below and on the following page.

Figure 18. Whether participants thought the videos should include role models' personal experience with mental illness

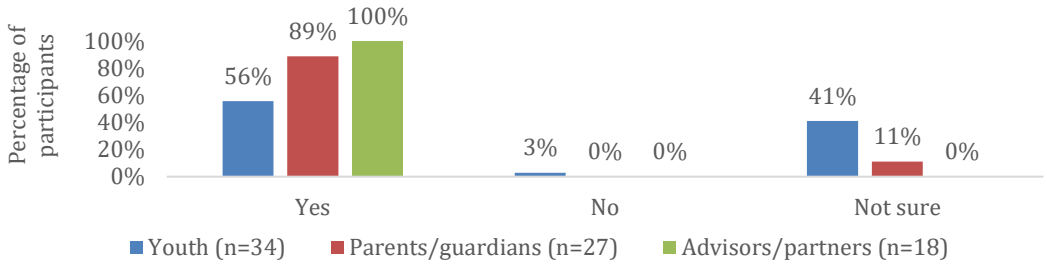


Table 3. Participant comments on including role models' personal experience with mental illness in the new neuroscience videos

Youth (n=34)	Parent/guardian (n=27)	Advisor/partner (n=18)
Yes (56%)	***Yes (89%)***	***Yes (100%)***
• *I say yes because if the family issue made you become with you are you have to explain bad always comes with good.* • *I think it shows how they are a real person.* • *It was cool to see someone want to help their family.* • *This motivation was important in the person's life and career. If they are comfortable with opening up about it, it is an important experience to share, as it affected many aspects of their life and ultimately led them to pursue this career.* • *It shows how curiosity can spark inspiration and motivation to move forward and succeed.*	• *Mental illness needs to be talked about! It shouldn't be a taboo subject! Everyone is affected by it one way or the other. Making the video will help many that feel they are alone and no help is available.* • *It brings credibility to the role model and makes them more tangible as real people. It might also be relatable to many going through similar situations. I do not think they need to go into specifics of the mental illness the family members went through simply mention that it was impactful to their life decisions.*	• *Students need to see these professionals as persons - sharing personal information can help students see the career in context.* • *I think it helps develop a stronger connection between the role model and their audience, and acknowledges that many participants will likely be impacted by their own personal experiences in choosing a career path. Many participants will likely have friends or family dealing with some form of mental illness or brain condition and I think this will help spark and sustain their interest in the program.* • *It is important to know what influences us. If personal experience, like this, influenced the individual, it is part of his/her story and should be told.* • *Thinking about my own parents, they don't make connections with data, or just reading about something. They need to see how it impacts peoples' lives, people like them. My parents see mental illness as being weak. They grew up in East LA and you can never show weaknesses. They brought me up thinking the same thing. However, I outgrew this thinking with education. Now when I talk to my parents about it, they don't believe me. Seeing someone who has these experiences and has overcome them would be powerful.*

[8] The youth, parents/guardians, and advisors/partners were given the following prompt: *In Rebeccah's video, she talked about how she chose to become a doctor instead of an actress given her desire to be able to care for her parents as they became older. Along these lines, in the new BRAINedu profile videos the production team is considering having a neuroscience professional talk about how mental illness within her/his family impacted her/his career choices in the field of neuroscience.* The participants were then asked if they thought the featured neuroscience professionals should talk about this personal experience with mental illness within the family and how it impacted their career choices.

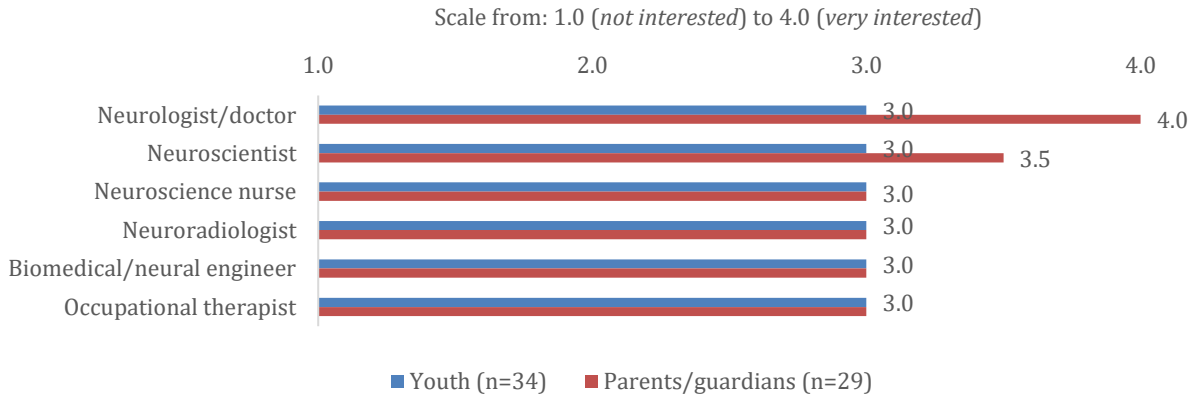
Table 3. Participant comments on including role models' personal experience with mental illness in the new neuroscience videos, continued

Youth (n=34)	Parent/guardian (n=27)	Advisor/partner (n=18)
No (3%) • *Some things might want to be kept private unless they want to share the information.* ***Not sure (41%)*** • *It's her choice.* • *It depends if that neuroscience professional wants to share that info.*	• *We can see how they took on challenges* • *Always I think that the family is a big influence on the youth* • *Very motivational for youth* • *For example the illness of Alzheimer's is closely related to the brain … the importance of keeping the brain active by means of reading, writing, as well as exercising to maintain enough oxygen in the brain … This can help others pay attention to their relatives if they present symptoms.*	• *The research shows that the best way to change public attitudes is through sharing personal stories.* • *Absolutely! We need to get mental illness out of the closet. Show that it is okay to discuss it. Demonstrate how lots of people have their own issues or have people close to them with issues. It is as much a part of being human as cancer, arthritis, and allergies! Also, people are more successful in their career if they are passionate about it; it is thus good to show what motivates people and encourage people to do things that they care about, even if the career path is not easy.* • *There is a lot of stigma and misinformation around mental illness for a lot of Latinx families. I think including this would normalize people having mental health difficulties and also normalize a common path to psychology/neuroscience -- our own struggles (personal or those of a loved one) often significantly shape our career path and how we do our jobs.*

1.6 Youth and parent/guardian interest in neuroscience jobs/careers

Figure 19 shows youth and parent/guardian median ratings of their interest in learning about six neuroscience jobs or careers from the new *BRAINedu* role model videos, using a scale from 1.0 (*not interested*) to 4.0 (*very interested*).[9] Overall, both groups found each job/career at least *moderately interesting*, and parents/guardians generally found two careers more interesting than others: neurologist/doctor and neuroscientist.

Figure 19. Youth and parent/guardian median ratings of their interest in neuroscience jobs/careers



[9] When invited to share their ratings, both groups were given short descriptions for the following jobs/careers: neuroscientist (studies the brain and nervous system); neurologist/doctor (diagnoses and treats diseases of the nervous system); neuroscience nurse (cares for patients with neurological diseases); neuroradiologist (uses imaging methods such as X-ray, MRI, CT to diagnose diseases of the nervous system); biomedical/neural engineer (designs, develops, evaluates instrumentation, medical information systems, prostheses, etc.); and occupational therapist (assists individuals who have a brain-related injury, illness, or disability to have improved health and independence).

Those who shared ratings of 2.0 or lower were invited to elaborate, examples of which are presented below:

- *Youth: A neuroscientist's job description sounds interesting but I know that the brain is very complex so I don't think I could chase that career without knowing if I could handle that level of difficulty. I like helping people, like one on one, so being a neuroscience nurse and occupational therapist sound interesting. I know being a doctor will require more schooling and I want to work sooner.*
- *Youth: I don't really want to go into a science job about the brain.*
- *Parent/guardian: [I gave higher ratings to neurologist/doctor and neuroscientist because] I am passionate about the brain and its function. If I could choose, I would completely focus on the brain and its functions.*
- *Parent/guardian: The two [neuroscience nurse and neuroradiologist] are not as interesting as the others, to me since they apply to more known careers than the others.*

1.7 Potential questions or curiosities about video segments among youth

Youth and advisors/partners were told that the sample profile videos they viewed, and the *BRAINedu* profile videos to be produced, would both generally include four segments, not necessarily in this order: *My Job (at work), My Life (outside work), Challenges/barriers and solutions/strategies,* and *Advice to youth*. Thinking ahead to the new *BRAINedu* profile videos, youth were asked to list as many questions or curiosities about neuroscience professionals as came to mind for each segment of the profile videos. The advisors/partners were asked to share questions or curiosities they thought the youth target audience might have about each segment. For additional context, both groups were reminded that neuroscience is the science of the brain and nervous system, and that an education in neuroscience prepares for a wide range of career paths. Advisors were also asked to note, wherever possible, any relevant cultural values they thought could help the videos establish a cultural connection with youth.

1.7a Youth questions or curiosities about the *My job (at work)* segment

Figure 20 shows that, among those who shared a response when asked about the *My job (at work)* segment, youth most often thought they would have questions or curiosities about challenges or difficulties the role model faced at work (50%), followed by general career or lifestyle questions (33%). Meanwhile, advisors/partners most often suggested that the youth target audience would focus on questions or curiosities about neuroscience and what neuroscientists do (67%), followed by the requisite education/skills (39%). Examples of these and other responses from youth and advisors/partners are shared in Table 4 on the next page.

Figure 20. Youth questions/curiosities about the *My job (at work)* segment

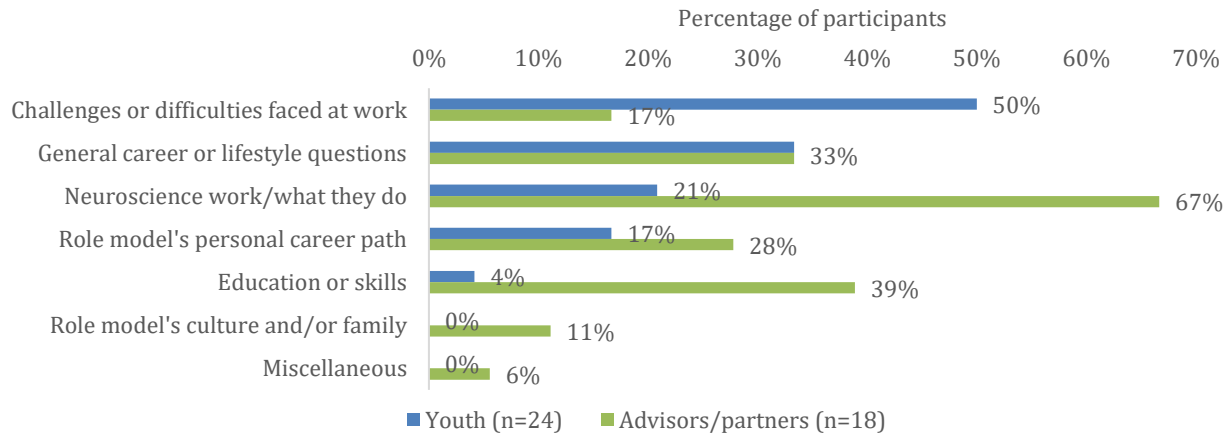


Table 4. Youth questions or curiosities about the *My job (at work)* segment

Youth (n=24)

Challenges or difficulties faced at work (50%)

- *Is life at work difficult?*
- *Is the job hard?*
- *Is it hard helping people with brain problems?*
- *Is it hard to see so many patients with many different questions?*
- *Is it hard sometimes in the field that they work in? Does it take a lot of time or patience?*
- *Where did you struggle the most? Who do you go to when you struggle?*
- *Did you have anyone that doubted you?*
- *Do they always get the results they want to get?*
- *Is it boring?*

General career or lifestyle questions (33%)

- *How well does it pay? What are work hours like and flexibility in work hours? How much interaction is there with other people?*
- *How long is your job?*
- *How much do they get paid? How often do they get free time?*
- *Do you get paid well?*
- *Is it fun working in neuroscience professional job/work?*
- *Is it a good career?*

Neuroscience work/what they do (21%)

- *What do you do?*
- *How do you believe artificial intelligence will affect careers and learning in neuroscience?*
- *Do you get to study only parts of the brain?*
- *How does your nervous system work?*

Role model's personal career path (17%)

- *How did you know you wanted to specialize in neuroscience?*
- *Did you always want to go into neuroscience?*
- *How did you get there?*
- *At any point in your work life have you thought of leaving it to pursue something different?*

Education or skills (4%)

- *How long was the process of being a neuroscience professional?*

Advisor/partner (n=18)

Neuroscience work/what they do (67%)

- *What do they do each day, what does the application of their work mean for people in general?*
- *What happens on a daily basis? How does the work help people?*
- *What kinds of careers are open to neuroscientists? What kinds of technologies are use in the neurosciences? How is the movement of my body connected to my brain? Isn't neuroscience about the brain and touching the brain?*
- *Are you working within your community or working outside (different town, state, etc.)? If you are bilingual, does that help you connect with others in your work?*
- *What cool problems can I solve? What cool scientific/technological/medical tools can I use? How can I most help people? How can I personally contribute to fields/problems that need advancement? (many kids will be motivated after observing someone they know with a disorder…..)*
- *Can a neuroscientist help prevent or treat kids with depression? Suicide? Addiction? ADHD? What specific careers can help with these problems? What is the latest discovery that you have made? Most exciting?*

Education or skills (39%)

- *How do you become a neuroscientist?*
- *What should I be doing now to prepare? How long will it take me to get trained? And how much money will it cost?*
- *What subjects should they focus on early in their education if they want to become a neuroscientist*
- *Where did they go to school? How long was their course of study?*
- *How long did it take to get there?*
- *What kinds of skills do you need to succeed in this field?*

General career or lifestyle questions (33%)

- *How much will I earn?*
- *How much will I earn in one of these careers? Do I have to be a lab all day?*
- *Long hours? What do you wear? Who works with you*
- *What does the work environment/culture look like?*
- *What can you do as part of this job (travel, etc.)? Is this job fun/how is this job fun?*

Role model's personal career path (28%)

- *What made you interested in specific career? What aspects of it do you like or not like?*
- *Why did you want to get into neuroscience? What part of neuroscience got you hooked?*
- *How did you get into that career?*
- *Why is it the right job for you? How did you know that was the right job for you?*

Challenges or difficulties faced at work (17%)

- *Is it hard? … What do you dislike about it?*
- *What are … the worst things about your job?*

Role model's culture and/or family (11%)

- *How does the work you do relate to your cultural identity? What did your parents/family do to support your interest? Do they understand your job?*
- *Do any of their siblings/family members have similar careers?*

Miscellaneous (6%)

- *I noticed that you did not really include social worker or mental health professional in your list of careers…Is that not a focus with this project?*

1.7b Youth questions or curiosities about the *My life (outside work)* segment

Figure 21 shows that, among those who shared a response when asked about the *My life (outside work)* segment, youth most often listed questions or curiosities about how a career in neuroscience impacts the role model's personal life (43%), followed by the role model's personal interests (24%) and the role model's work (24%). Advisors/partners, as a whole, similarly expected that the youth target audience would focus on the first two areas mentioned above (59% and 47%, respectively). Examples of these and other responses from youth and advisors/partners are shared in Table 5.

Figure 21. Youth questions/curiosities about the *My life (outside work)* segment

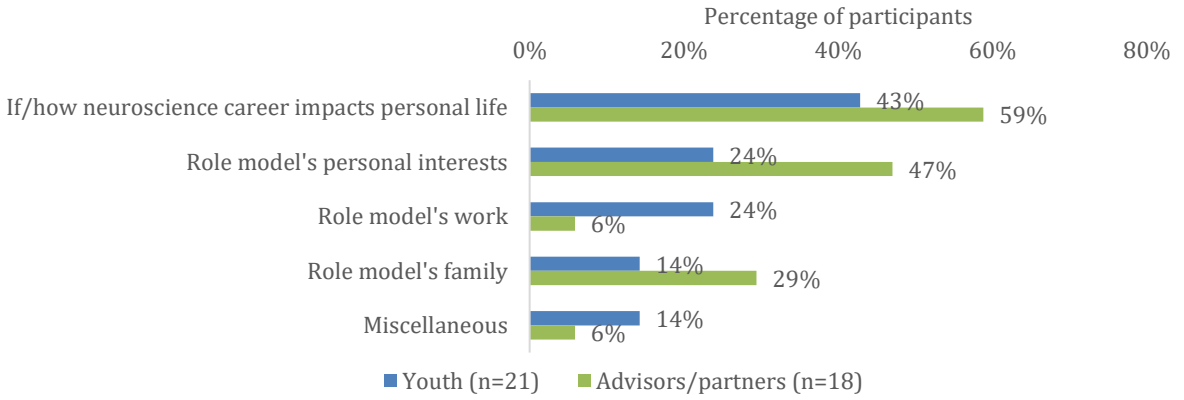


Table 5. Youth questions or curiosities about the *My life (outside work)* segment

Youth (n=21)	Advisor/partner (n=18)
If/how neuroscience career impacts personal life (43%)	***If/how neuroscience career impacts personal life (59%)***
• *Is pursuing a career in neuroscience too time-consuming? That is, does it affect outside life in a negative way?* • *Will I, if I decide to pursue something in this field, have time to continue my hobbies?* • *Do you get to have a lot of free time?* • *When do you usually get home from work?* • *How do you make time to spend with your kids?* • *How many friends do you have? Does work ever leave your mind? How much dedication is required to be successful?* • *Does the job influence where you decide to live/visit?*	• *How do you balance work and personal life?* • *How does your job affect your normal life?* • *Is their personal lifestyle (nutrition, healthy habits) influenced by their career?* • *Do you get to have fun outside of work? Do you have time to go on vacation in this career?* • *Do you have friends who are not scientists? Do you go to church? Are you religious? How do you bring together your work and your faith?*
Role model's personal interests (24%) • *What are your hobbies? How do you destress?* • *What do you do outside of work?*	***Role model's personal interests (47%)*** • *What other interests do you have (hobbies, etc.)?* • *What do you do for fun? What kinds of things can you afford to do because of your job? What are some activities (music, food, travel) that the person is interested in outside of work?*
Role model's work (24%) • *How has your career changed your view of the outside world?* • *Do they still look at the things they study in their lab, outside is nature?* • *Who motivates you?*	***Role model's family (29%)*** • *Are you married? Do you have kids?* • *Are you still close to your family, can you fall in love?*
Role model's family (14%) • *Do your kids know a lot about brains?* • *How do they cope with having to work and not be able to spend a lot of time on family?*	***Role model's work (6%)*** • *Do you work with others and how?*
Miscellaneous (14%) • *How fun is it to see things you know about and be able to call them out?*	***Miscellaneous (6%)*** • *Can they relate to them?*

1.7c Youth questions or curiosities about the *Challenges/barriers and solutions/ strategies* segment

Figure 22 shows that, among those who shared a response when asked about the *Challenges/ barriers and solutions/strategies* segment, youth most often focused on how the role models overcame any challenges they faced (50%) and the challenges they faced at work or in their field (45%). Meanwhile, advisors/partners most often thought the youth target audience would have questions/curiosities about education-related challenges (78%), followed by the topic of overcoming challenges (33%). Examples of these and other responses from youth and advisors/partners are shared in Table 6.

Figure 22. Youth questions/curiosities about the *Challenges/barriers and solutions/strategies* segment

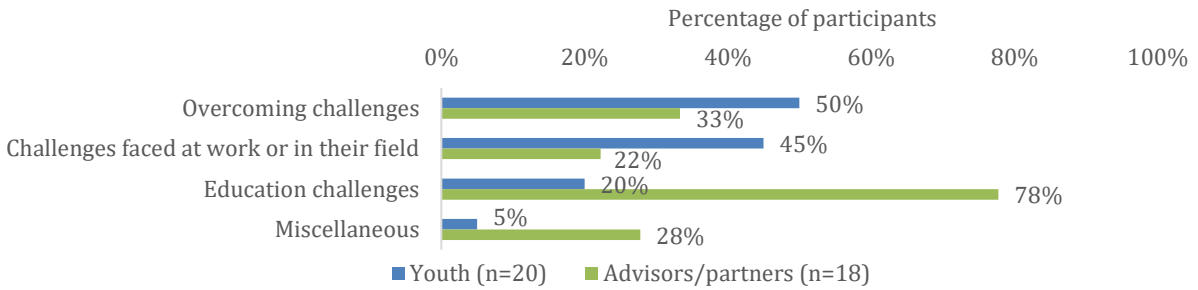


Table 6. Youth questions or curiosities about the *Challenges/barriers and solutions/strategies* segment

Youth (n=20)	Advisor/partner (n=18)
Overcoming challenges (50%) • *Do they persevere through the thought of their patient dying but go through it and work extra hours trying to cure that disease?* • *There is much competition for jobs in neuroscience nowadays. How did you overcome that?* • *What are some strategies you used to make your life easier in the lab?* • *How did you deal with stress? What did you do to not give up?* • *What did you do to overcome your challenges?* • *Is it hard to find the solutions? What strategies do you use when you can't find the solution?* • *Who gave you the strength to beat the challenges?* ***Challenges faced at work or in their field (45%)*** • *Have they ever had trouble diagnosing someone with neuro problem?* • *What if you fail to complete a task?* • *Was there a point where it was too stressful/hard and you wanted to give up?* • *What was the hardest part of your job?* • *Have you not solved a challenge that got it the way?* ***Education challenges (20%)*** • *What was the hardest part of studying for your job?* • *How much does the average school cost and how long does it take?* • *Are there groups that will help myself, as a minority, to continue to pursue a profession in neuroscience?* ***Miscellaneous (5%)*** • *Is it fun?*	***Education challenges (78%)*** • *What classes did you had to take in high school? Are these careers more expensive to study or require special schools to complete certificates and degrees? How hard were the classes? Do you have to love biology (or math, etc.) in order to pursue a career in neuroscience?* • *Will I be able to do the math? Am I smart enough? Will I be prepared enough before I go to school so that I can do well? How will I do on the entrance exams? Do I have to have had really awesome grades all through K-12 school?* • *What if I'm not a straight-A student? How do I know I can handle this job? … Who can help me with that if my parents don't know or aren't familiar with US systems?* • *Financial barriers, parents unable to help them with homework* ***Overcoming challenges (33%)*** • *How did they handle it when they had doubts or things got really hard?* • *How did they overcome [educational] barriers in those areas they did?* • *What strategies can you share, that have helped you be successful?* ***Challenges faced at work or in their field (22%)*** • *Did you have any struggles trying to get to where you are?* • *What was the one thing that almost made you quit?* • *What has been the most difficult part of their career?* • *Not a question but a comment: I think it may be important to address the need for Latinx scientists here but in addition, how the need for Latinxs in science means most colleagues will not share backgrounds or cultures, so being a Latinx in science can at times be isolating. Thus, it is important to find a community that feels safe and allows Latinx neuroscientists to flourish and learn.* ***Miscellaneous (28%)*** • *What was their family background?*

1.7d Youth questions or curiosities about the *Advice to youth* segment

Figure 23 shows that, among those who shared a response when asked about the *Advice to youth* segment, youth most often focused on aspects of the neuroscience career path (including skills and education) (64%) or shared miscellaneous responses (27%). Meanwhile, the advisor/partner group primarily thought the youth target audience would focus on just one of these areas, specifically the neuroscience career path (92%). Examples of these and other responses from youth and advisors/partners are in Table 7.

Figure 23. Youth questions/curiosities about the *Advice to youth* segment

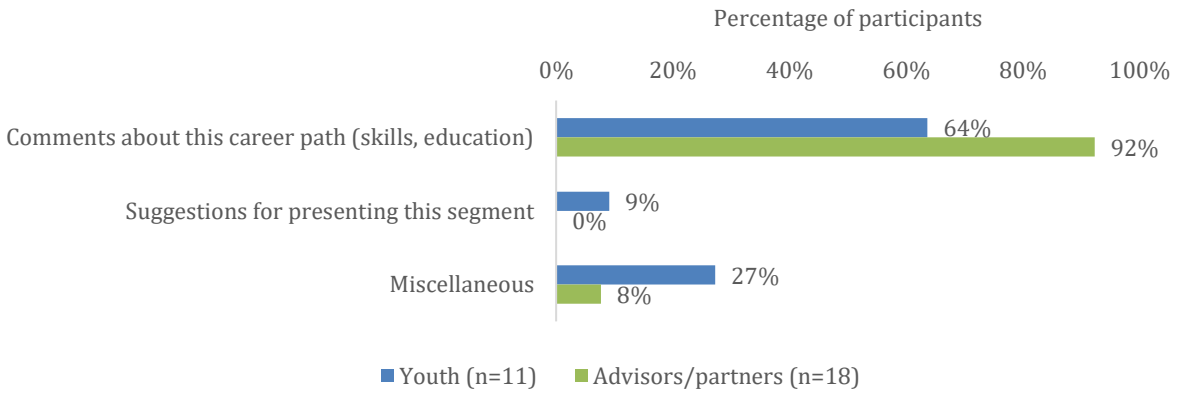


Table 7. Youth questions or curiosities about the *Advice to youth* segment

Youth (n=11)	Advisor/partner (n=18)
Comments about this career path (skills, education) (64%) • *What skills are needed for neuroscience? What skills are important for education.* • *If I were to pursue this what should I do in high school?* • *What programs are available in relation to neuroscience?* • *What should I study in college to go into a job like this.* • *Where can I learn about the brain?* • *What classes did you take in high school?*	***Comments about this career path (skills, education) (92%)*** • *What advice would you give to young students who might be interested in neuroscience?* • *What classes do I have to take and pass for this career? What activities or projects should I be involved with to pursue this career? What kind of role models or mentors should I seek to prepare?* • *What should I study? How can I get prepared in other ways? What can I do now to find out whether I will like the work when I am an adult? Do I have to choose right now (age 11-13) exactly what I want to be when I grow up and What if I choose wrong?* • *How can they get help/guidance to consider careers in neuroscience?* • *I want to hear more advice about getting into college. Can she tell me about what classes to take in high school?* • *What did they study in college? Did they have an internship/practicum experience?* • *Talk about the importance of internships before going to college. What other type of experience they recommend youth get?* • *What recommendations do you have for a student pursuing this field? What skills should I work on acquiring if I want to work in this area?* • *What do they wish they had known while they were working toward this career?* • *Do you have to love a specific subject to follow a career in neuroscience? How hard is it to get into these careers? What if they don't like the career or a class?*
Suggestions for presenting this segment (9%) • *Make it sound intriguing.*	
Miscellaneous (27%) • *How old do you have to be a neuroscientist?* • *Would they risk their lives just for a patient to have another year or so to live?* • *What things will you do to persuade the youth to grow up and be like you?*	***Miscellaneous (8%)*** • *What is the one thing that you would tell all kids to do right now?*

1.8 Potential questions or curiosities about video segments among parents/guardians

Parents/guardians were told that the sample profile videos they viewed, and the *BRAINedu* profile videos to be produced, would both generally include the same four segments detailed in the previous section. Thinking ahead to the new *BRAINedu* profile videos, parents/guardians were asked to list as many questions or curiosities about neuroscience professionals as came to mind for each segment of the profile videos. The advisors/partners were asked to share questions or curiosities they thought the parent/guardian target audience might have about each segment. For additional context, both groups were reminded that neuroscience is the science of the brain and nervous system, and that an education in neuroscience prepares for a wide range of career paths. Advisors were also asked to note, wherever possible, any relevant cultural values they thought could help the videos establish a cultural connection with the parental audience.

1.8a Parent/guardian questions or curiosities about the *My job (at work)* segment

Figure 24 shows that, among those who shared a response when asked about the *My job (at work)* segment, parents/guardians most often focused on the role models' (or other neuroscience professionals) education or skills (52%), followed by their personal career path (29%). At the same time, advisors/partners most often thought the parent/guardian target audience would have questions/curiosities about the role models' education or skills (78%), followed by general career or lifestyle questions (44%). Examples of these and other responses from parents/guardians and advisors/partners are shared in Table 8 on the following page.

Figure 24. Parent/guardian questions/curiosities about the *My job (at work)* segment

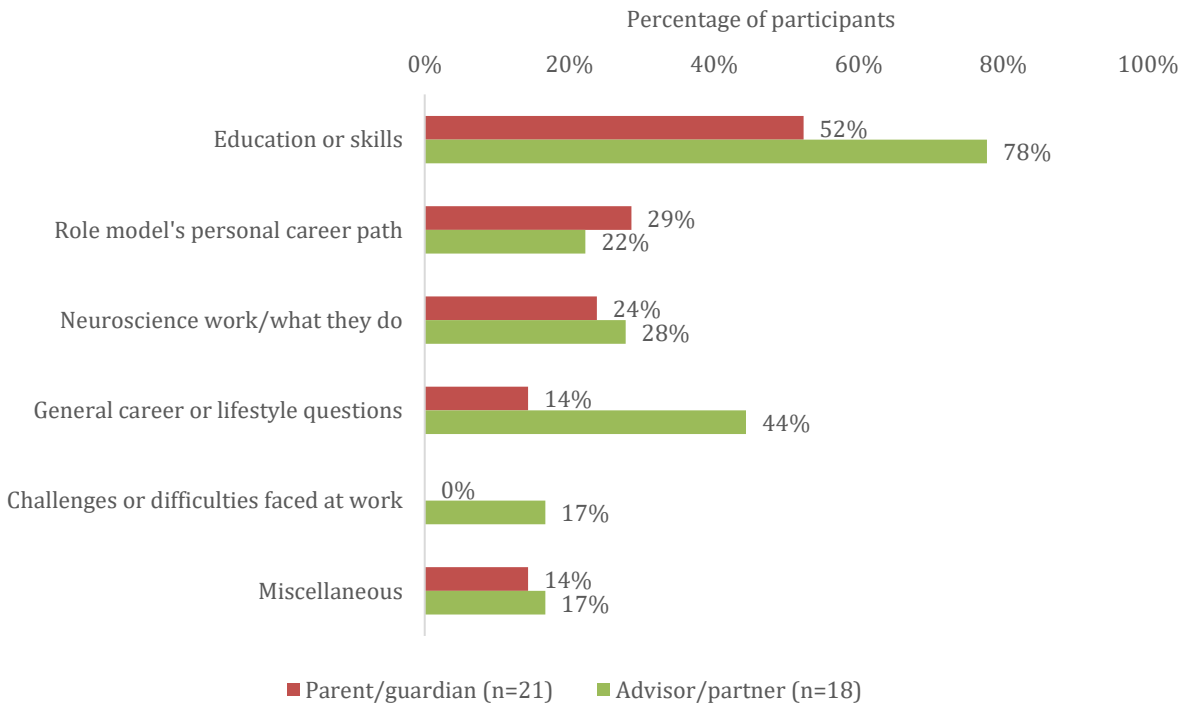


Table 8. Parent/guardian questions or curiosities about the *My job (at work)* segment

Parent/guardian (n=21)

Education or skills (52%)

- *How many years does one have to study to have a profession like that?*
- *How long did they go to school/university?*
- *Where did you go to college? What was your major?*
- *Where did you study?*
- *What did they study in school?*
- *What path were taken in college to become [a neuroscientist], what suggestions would they give.*
- *How often do they have to update their studies?*

Role model's personal career path (29%)

- *What made them so interested to want to know about the brain?*
- *What made them choose their career? What is their favorite part of their career?*
- *What kinds of things got them interested in neuroscience?*
- *How or what made you pick your career and do you love your job?*
- *How did you become interested in this field?*
- *How did they narrow down specific job choice?*

Neuroscience work/what they do (24%)

- *Daily activities and what they look like. Examples of how they have helped others.*
- *What the day to day work looks like?*
- *How do you help people?*
- *Regarding the field of work, only in a hospital? Or can you work in a place other than a clinic or hospital? Give more options of the labor field. [Also,] do you have enough time to share with people who do not have access to a medical center? As a rural place outside the city and share with young people about their career? How do you share your knowledge with others who do not know about it?*
- *I would prefer that the professionals explain their profession in more detail. This would help to motivate the children to choose that career.*

General career or lifestyle questions (14%)

- *Income potential and opportunities for travel*
- *Where would a person find this kind of job? Does it require to relocate?*

Miscellaneous (14%)

- *Do you speak Spanish at work?*
- *Is mind control real?*
- *Are all brains alike?*

Advisor/partner (n=18)

Education or skills (78%)

- *What are the high school math and science requirements? What can I/we do to prepare them? What kinds of classes will my child need to take?*
- *Is a bachelor's degree sufficient for a career in neuroscience or is more education usually recommended?*
- *What is required to pursue a career in this area? How long do you have to study? Do all these careers work in medical fields or do they have to go to medical school?*
- *What subjects in school prepared you for your career?*
- *How long will it take to get trained? How will we afford it?*
- *Will my daughter have to study for a long time? Will it be expensive?*
- *How much/what specific education do you need for this job? How much does the education cost and how can we get assistance to pay for it? Does my child have to go away to study for this career?*

General career or lifestyle questions (44%)

- *What does it pay?*
- *How much money do you make/how well can you provide for your family?*
- *What kind of salary does this position earn? Where would my child work if they pursued this career path?*
- *What opportunities will this career afford my child and our family? How much money will they earn in this career?*
- *Is there job stability in neuroscience? Is it difficult to find a job in neuroscience after college?*

Neuroscience work/what they do (28%)

- *What do the different careers mean?*
- *What do you do?*
- *Parents might also ask about the different jobs available to neuroscientist as they might not have imagined existed.*
- *What do they do each day, what does the application of their work mean for people in general?*

Role model's personal career path (22%)

- *At what age did you know this was what you wanted to do?*
- *How did you get into that career?*
- *Are you happy [in this career]?*
  What sort of projects/research have they been involved with? Have they been published? Can youth learn more about the person's career online? (i.e. For more information, visit...)

Challenges or difficulties faced at work (17%)

- *Will it be hard for her since there are so few Hispanic women in these careers?*
- *What is it like for a woman in this field?*
- *Will these careers make my daughter too smart? Will she fit in with other boys and girls?*

Miscellaneous (17%)

- *Is it safe?*
- *How do peers support each other?*

1.8b Parent/guardian questions or curiosities about the *My life (outside work)* segment

Figure 25 shows that, among those who shared a response when asked about the *My life (outside work)* segment, parents/guardians most often cited questions or curiosities about if/how a career in neuroscience impacts someone's personal life (68%) and the role model's personal interests (32%). Meanwhile, the advisor/partner group primarily thought the parent/guardian target audience would focus on just one of these areas, specifically if/how a career in neuroscience impacts someone's personal life (86%). Examples of these and other responses from parents/guardians and advisors/partners are shared in Table 9.

Figure 25. Parent/guardian questions/curiosities about the *My life (outside work)* segment

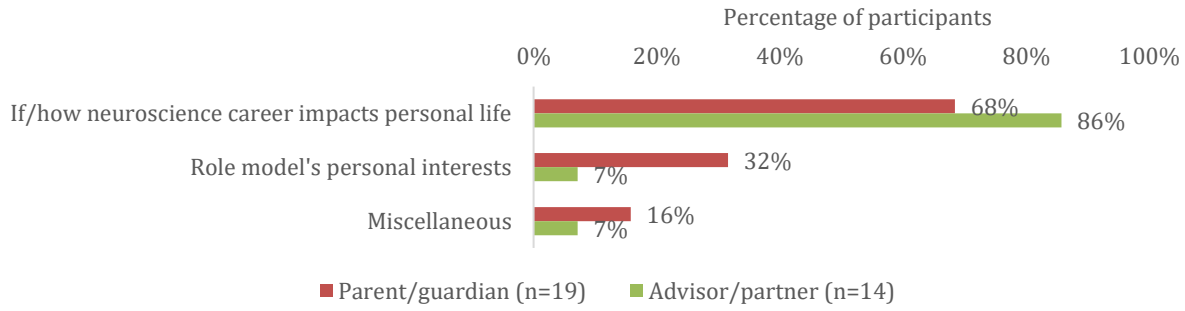


Table 9. Parent/guardian questions or curiosities about the *My life (outside work)* segment

Parent/guardian (n=19)	Advisor/partner (n=14)
If/how neuroscience career impacts personal life (68%)	***If/how neuroscience career impacts personal life (86%)***
• *How do you balance your work and personal life?* • *How can they separate work with personal life?* • *How much time are they free after work?* • *Can you fully enjoy your time away from work? Can you dismiss your job from your mind?* • *How much time is required to work away from working hours? Will a person be on call most of the time?* • *Are you constantly over analyzing how people are reacting, acting? [Also,] how do "shut off" your work day? How do you transition from work to family?* • *I think these professionals might always be analyzing other people they meet.* • *Can your family be indirectly/directly involved in what you do? Does your work interfere with your family life?* • *If you have kids, are they interested in what you do?*	• *I think parents might ask questions about family work life balance.* • *Do you have a family/kids? How do you balance work and family life?* • *Family is important - so can women in these careers have a family?* • *Do they have close relationships to their families and communities?* • *How has their family been supportive? How is the individual supporting/involving their family?* • *What sort of flexibility does a career in neuroscience offer in regard to starting a family?* • *What is the lifestyle of the job (will we still get to see him/her, will he/she still have time for family, etc.)?* • *Can you have this career and be a good parent/family member?* • *Does she have time to spend with her family? Will she be more concerned about her plants than her family? (I my experiences, family members don't know what it is like to be well educated and this causes fear.) [Also,] how much time does she have to spend with her children?* • *Do they have to move far away from me to do these jobs?* • *Will my child have time to visit with family or be part of important family events in this career? Will my child be able to have a family of their own in this career? Will my child be able to stay near family or will they need to move far for this career?* • *Will she have time for a family? Can she be a neuroscientist and still believe in God?*
Role model's personal interests (32%) • *What hobbies do they have?* • *What do they do for fun?* • *What activities do they like outside of work?* • *What places do you enjoy away from work?*	***Role model's personal interests (7%)*** • *What is your life like outside of work?*
Miscellaneous (16%) • *Did they have a family member that led them to becoming a brain doctor.* • *How important is being bilingual in your life?* • *No questions [this is] too personal.*	***Miscellaneous (7%)*** • *Where are you from? What do your parents do? What are some hobbies and activities that I can do at home to support my child?*

1.8c Parent/guardian questions or curiosities about the *Challenges/barriers and solutions/strategies* segment

Figure 26 shows that, among those who shared a response when asked about the *Challenges/barriers and solutions/strategies* segment, parents/guardians most often focused on the challenges the role models faced at work or in their field (52%), followed by education challenges (24%). Advisors/partners, meanwhile, most often thought the parent/guardian target audience would focus on education challenges (65%), but they also frequently pointed to their overcoming challenges (47%), an area that was cited less frequently by participating parents/guardians. Examples of these and other responses from parents/guardians and advisors/partners are shared in Table 10, below and on the following page.

Figure 26. Parent/guardian questions/curiosities about the *Challenges/barriers and solutions/strategies* segment

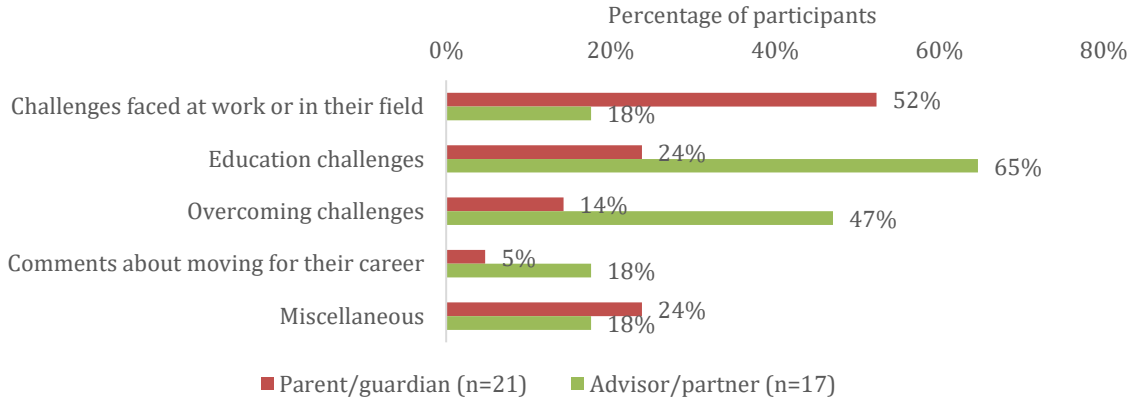


Table 10. Parent/guardian questions or curiosities about the *Challenges/barriers and solutions/strategies* segment

Parent/guardian (n=21)	Advisor/partner (n=17)
Challenges faced at work or in their field (52%) • *Stigma because of race? Stigma due to sex?* • *Is it harder to be a woman or be Hispanic?* • *Did the females have a hard time in school or their careers because they're females? Did they feel they had to work harder to prove themselves?* • *What challenges she had being a woman.* • *How does being a female change how hard you have to work?* • *Women in this field being limited and how they overcome that.* • *When something goes wrong, does it become a barrier?* • *How really hard is being a neuroscientist? The brain has a lot of parts.* • *What has been your biggest challenge to continue your career?* • *Are there times you may struggle with a patient?* ***Education challenges (24%)*** • *Why do many schools not teach neuroscience?* • *How often do they have to learn new information?* • *To improve in your profession: What other related career would you study to improve yourself and learn more about the brain?* • *It is very expensive to study neuroscience.*	***Education challenges (65%)*** • *What were the most challenging barriers to getting into college? How expensive is it to pursue a career in neuroscience? Do students have access to scholarships or other aid when pursuing a career?* • *Is it expensive going to school to become a neuroscientist? … Does it pay well enough to justify so many student loans?* • *How do we know if this is an appropriate path/option for our child? What steps do they need to take to get to this job? Who can help us and them with those steps?* • *How much will it cost to study neuroscience?* • *Where do students study for these careers?* ***Overcoming challenges (47%)*** • *Did any of the role models have to work and go to school at the same time? How do you balance that?* • *Where did you find help to overcome barriers?* • *What financial help is out there?* • *How did the role models surpass economic challenges if any?* • *In what ways did your families provide support?*

Table 10. Parent/guardian questions or curiosities about the *Challenges/barriers and solutions/strategies* segment, continued

Parent/guardian (n=21)	Advisor/partner (n=17)
Overcoming challenges (14%) • *What keeps them motivated to keep giving?* • *Did you get a scholarship to go to college?* ***Comments about moving for their career (5%)*** • *If you need to relocate and could not feel comfortable at location how will that work?* ***Miscellaneous (24%)*** • *Did your family support your career decision?* • *Research funding (how does it get paid... donors, university, etc.). Real world application opportunities... how long to move from lab to trial?* • *When they discover something, how do they present to colleagues?*	***Comments about moving for their career (18%)*** • *Will my son/daughter have to live far away?* • *Are there jobs everywhere or will she have to move away?* ***Challenges faced at work or in their field (18%)*** • *Does this career cause extreme stress and how do people handle it? Will my child's health suffer if they pursue this career?* • *Did you encounter any barriers because of your culture?* • *What challenges did you face?* ***Miscellaneous (18%)*** • *Will my son/daughter be able to better take care of the family members?* • *Are they bilingual … [and does it] help them in their field?*

1.8d Parent/guardian questions or curiosities about the *Advice to youth* segment

Figure 27 shows that, among those who shared a response when asked about the *Advice to youth* segment, parents/guardians most often focused on the neuroscience career path (including necessary skills and education) (52%), commented on the videos inspiring youth (19%), or suggested youth follow their passions (19%). Meanwhile the advisors/partners primarily thought the parent/guardian target audience would focus on the neuroscience career path (77%) or would have questions about the role model's personal career path (23%). Examples of these and other responses from parents/guardians and advisors/partners are shared in Table 11 on the next page.

Figure 27. Parent/guardian questions/curiosities about the *Advice to youth* segment

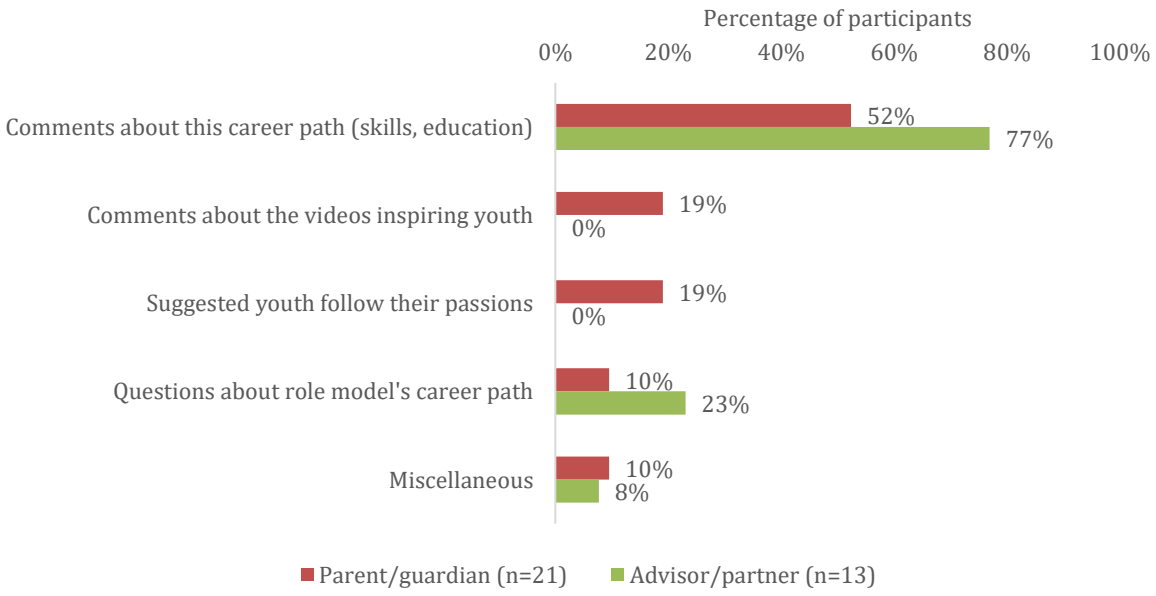


Table 11. Parent/guardian questions or curiosities about the *Advice to youth* segment

Parent/guardian (n=21)

Comments about this career path (skills, education) (52%)

- *What hobbies/clubs can prepare or build my interest in this field? What hobbies are related to your field of work (for preparation/expose to this field)?*
- *Best ways to start to prepare and look into whether or not this is a field that would interest them. Access to learning more in fun ways.*
- *What are good activities to get in as a kid?*
- *How do you engage a youth to get interested and want them to be interested in this field of work?*
- *What can a parent do to help get their kids on that path?*
- *Do they advocate starting science younger? Hope they encourage kids to try new things.*
- *How can we get more females involved in the neuroscience career? Get girls interested in science.*
- *Different careers, job opportunities that exist in this area.*
- *My advice is that: The young people are informed about this career and the ones that are related to each other. Also, to get the information to all the youth in urban and rural areas. I think it is important to inform the parents of these young people to know how to help them in case they decide to study a career related to the brain. Inform them about the importance of the brain and nervous system.*

Comments about the videos inspiring youth (19%)

- *It is very good that they share their knowledge to motivate them. (youth)*
- *I liked all the videos a lot. But I would like them to be more motivational so that young people can become more interested in these beautiful professions.*
- *I would like there to be more projects with young people, especially in middle school so that from an early age they can learn and awaken their interest. Every day we are more robots, the digital is absorbing them.*

Suggested youth follow their passions (19%)

- *The key for me is to do something that you love and what you enjoy the most. Many times young people follow what is going to help them make more money.*
- *I think it's inspiring to follow your path in your studies and profession.*
- *Does the brain interest you?*
- *Be sure you love the study of neuroscience.*

Questions about role model's career path (10%)

- *How did they choose their career path?*
- *What is the one thing that has motivated you to go into this study? What are the benefits?*

Miscellaneous (10%)

- *Importance of speaking, writing and reading Spanish preparing to go to college.*
- *Recommend sleep*

Advisor/partner (n=13)

Comments about this career path (skills, education) (77%)

- *How can I support my child from early to set them up for STEM career? What classes does my child have to take? What activities or programs does my child need to be part of to prepare?*
- *What can I do to help my child be prepared?*
- *What classes they should take to be in these careers? What skills should they learn to be prepared for these careers? How do they know which (neuroscience) career options are available in their area?*
- *What would you tell parents to do early to help prepare their kids for college?*
- *Talk about the importance of internships before going to college. What other type of experience they recommend youth get?*
- *I think parents might want to know what academics and schooling would be appropriate for their kids to explore neuroscience just as the role models did.*
- *How did they handle it when they had doubts or things got really hard? What do they wish they had known while they were working toward this career? How can parents be helpful when it's hard?*

Questions about role model's career path (23%)

- *Who influenced them?*
- *When deciding on college, what criteria did you look at?*

Miscellaneous (8%)

- *Will role models tell my daughters to put their work first? Can she give good advice to my daughter if she does not stay home with her children?*

Part 2: Feedback on the curriculum content framework

Youth and advisors/partners were asked to share feedback on a four-page *BRAINedu* curriculum content framework, an early plan for the proposed curriculum.[10] Both groups were told that the final curriculum would have four modules focusing on brain structure, brain connections, the brain in action, and brain activity linked to behavior. As shown in the image below, the framework described – in broad strokes – what TPT hopes youth will learn from each module and how youth may reflect on the information covered.

Youth and advisors/partners were also told that the topic of each module would be explored with hands-on, age-appropriate activities for middle school youth. Advisors/partners were further informed that these activities would follow the scientific inquiry process, use readily available materials, incorporate research-based strategies for engaging Hispanic youth in STEM, and align with the Next Generation Science Standards.

The youth and advisors/partners were shown slightly different versions of the curriculum content framework, with the advisors/partners reviewing a more detailed document containing additional facts and concepts that will be incorporated into each of the four modules. The English version of the first page of the curriculum content framework shared with youth is below, in Image 2.

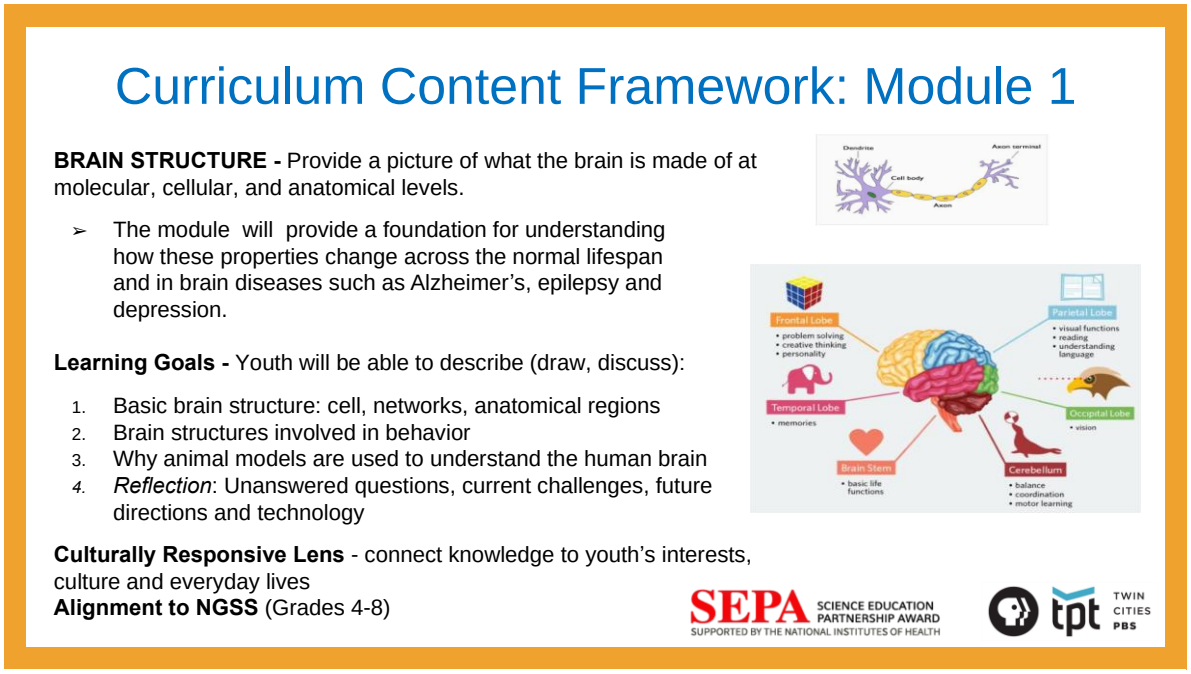


Image 2: English version of the first page of the curriculum content framework shared with youth

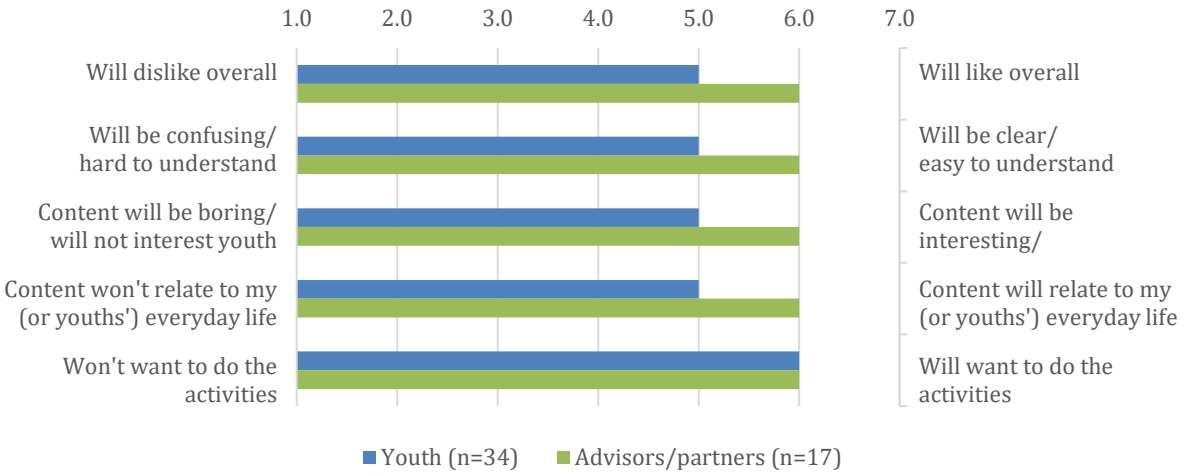
[10] Parents/guardians were also asked to review and share feedback on the curriculum content framework. However, as they were asked to reflect on their *own* thoughts about the framework, rather than how they thought their children would respond to the resource, their feedback about the curriculum is shared separately, in Appendix 1.

2.1 Anticipated appeal of the final curriculum among youth

Reflecting on the curriculum content framework, youth were asked to rate how they thought they would feel about the final curriculum on a scale from 1.0 to 7.0, with 4.0 being neutral in each case. Using the same scale, the advisors/partners were asked to rate how appealing they thought the target audience of underserved Hispanic middle school youth would find the final curriculum.[11]

Figure 28 shows that youth generally thought they would somewhat like the curriculum, find the curriculum somewhat clear, find the content somewhat interesting, find that the content would somewhat relate to their everyday lives, and would want to do the activities in the curriculum. When asked the same questions about the youth target audience, the advisors/ partners also generally shared positive ratings about the overall appeal of the final curriculum, although their median ratings in each case were higher than those shared by the participating youth, except in response to the question about youth interest in the curriculum activities, for which both groups shared a median rating of 6.0.

Figure 28. Median ratings of anticipated appeal of the final curriculum (to Hispanic middle school youth)



Those who shared a rating of 4.0 or lower were invited to elaborate, examples of which are presented below:

- *Youth: It should be more relatable to their everyday lives.*
- *Youth: The activities should have more hands-on activity to help understand the brain parts.*
- *Youth: Too much reading.*
- *Youth: I don't think I will like to do this because I am not interested.*
- *Advisor/partner: The language of the [curriculum content framework] is pretty dense. It would be nice to have an idea of what the activities are like.*
- *Advisor/partner: It seems dry for middle school youth. I think there needs to be something more flashy and catchy. I normally do not make this type of suggestion, but it needs something to catch the kids' interests. There are (or used to be) brain "training" games where one would have to wear a headband with contacts touching the forehead and ear. If you think hard enough, you can move a ball with your brain. It would be interesting to start with something like this, then take a look*

[11] One advisor/partner indicated that she did not think she had the background or experience to assess the likely appeal and clarity of the curriculum among the *BRAINedu* audience of Hispanic middle school youth, and was thus prompted to skip the survey questions about this resource.

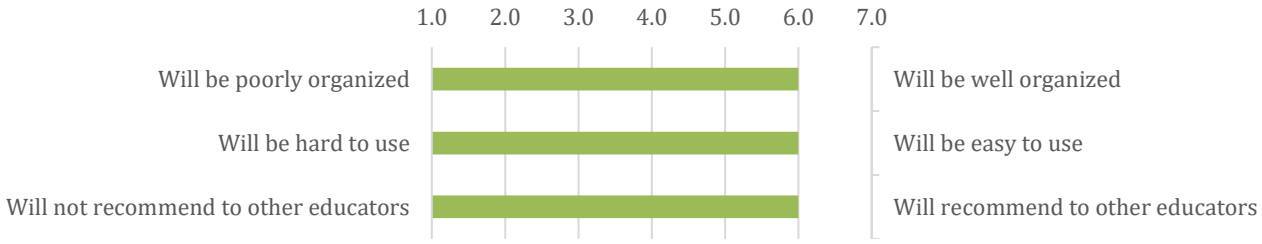
at how the brain works. Also, I think there is a lot of misconceptions people hold about the brain. Using interesting activities would give kids, and their parents, opportunities to talk through and try to explain what is happening could be powerful. The material does not seem very engaging, but a lot of information that needs to be memorized.

- *Advisor/partner: I am not 100% sure about some of these areas because it is a lot of information, much of it is scientific, and will likely be the first time youth hear this much about the brain, brain development, etc. That said, I believe that good visuals like some of the images included in the guide, will help youth associate the information with their everyday lives and connect with other things they learn at school or through media. I think the information is good and would just caution that implementation be a key focus for us so that the information is presented in ways that youth can understand. Hands on sessions and visuals can help a lot here.*

Additional ratings of educational appeal provided by advisors/partners

Using the same scale detailed above, advisors/partners were asked to rate three additional aspects of the final curriculum: organization, ease of use, and whether they would recommend it to other educators. Figure 29 shows that advisors/partners generally shared positive ratings in these areas. Although those who shared a rating of 4.0 or lower were invited to elaborate, none of the advisors/partners shared additional feedback on these ratings.

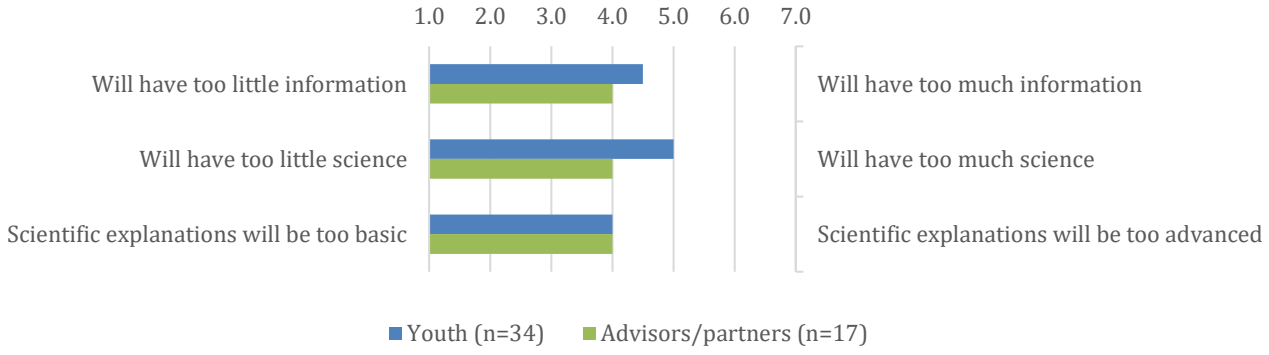
Figure 29. Median advisor/partner ratings of educational appeal of the final curriculum (n=17)



2.2 Overall ratings of the information and science density

Using a scale from 1.0 to 7.0 with 4.0 being about right in each case, Figure 30 shows that youth generally thought the final curriculum would have slightly too much information and science, and that the level of scientific explanations would be about right. When asked the same questions from the perspective of the youth target audience, the advisors/partners generally thought these aspects would each be about right.

Figure 30. Median ratings of anticipated amount and density of information in final curriculum (to Hispanic middle school youth)



When invited to elaborate, the youth who shared additional feedback were generally positive about the curriculum, as in:

- *Youth: I feel like the way these modules are structured and separated will help teach me [to] study the brain without filling my head with too much information.*
- *Youth: I think the middle schoolers will have an easy time understanding this module.*
- *Youth: Has to be able to be understood by all.*

The advisors/partners shared a range of comments about their ratings, including what they liked and aspects they thought could be expanded or reduced, as in:

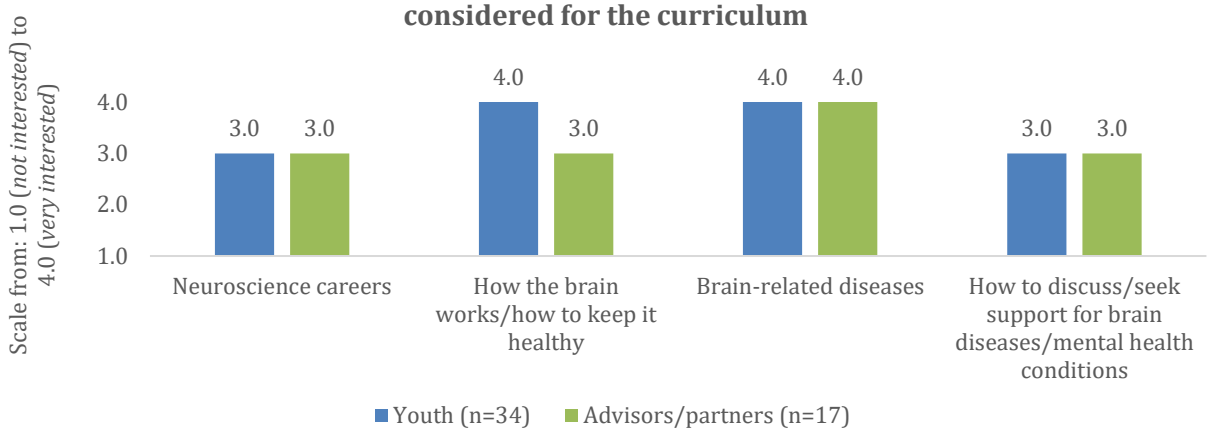
- *Advisor/partner: This guide so far is thorough and well written, with the right amount of information and science. I'm looking forward to seeing hands-on interactive activities that are open ended and foster creative thinking, not just regurgitation of answers.*
- *Advisor/partner: Depending on who is presenting the material, their background may be limited. Having more information than not enough will be critical. Sharing information re: time frame (# minutes) will be important. Also, it is important to be aware of different learning styles-- to include kinesthetic learners. It is important to have [state knowledge and skills] alignment too.*
- *Advisor/partner: It's a bit hard to tell because the details of the activities and lesson plans are not here. I did notice only a very top-level discussion going "below" the cellular level to the molecules of the nervous system. In this day and age, it might be good to add that in a bit more detail, since DNA and mutants, measuring proteins, drug binding for treatments, high tech immuno/fluorescent/electrophysiology, etc. is where some of the cool tech and careers these days will operate. Also, I notice an absence of discussion of social workers, mental health professionals and psychiatrists in these modules. Is that off the table for BRAINedu?*
- *Advisor/partner: I think the content presented in the outline looks solid but if it's too overladen with neuroscience content, it could be intimidating to facilitators who don't have a science background.*
- *Advisor/partner: I think that the content described in the modules seems to overlook some things. First, there is leap in module #1 from what happens in terms of brain development in young children to fully developed by age 25. What's going on in middle school age brains? There has been a lot of information about the teenage brain research shared with the public via publications such as Time, and that seems like it would be fascinating for middle schoolers - and their parents! Module 3, point 8, states: "Mental diseases like epilepsy, autism, and schizophrenia are associated with faulty neuronal circuits." Module 1, overview, states: "The module will provide a foundation for understanding how these properties change across the normal lifespan and in brain diseases such as Alzheimer's, epilepsy and depression." Are they mental diseases? Brain diseases? Brain disorders? Neurological disorders? I think that clarification/definition of terms is needed, and maybe a glossary, or definitions in balloons on the page, to avoid misuse or misunderstanding.*
- *Advisor/partner: Instead of learning difficult content, it might be better to just students and their families to get a better idea of just how complex the brain is.*

2.3 Youths' anticipated interest in possible curriculum topics

Youth were asked to rate their interest in four topics being considered for the curriculum on a scale from (*not interested*) to 4.0 (*very interested*): neuroscience careers, how the brain works and how to keep it healthy, brain-related diseases, and information on how to discuss and seek support for brain diseases and mental health conditions. Using the same scale, the advisors/partners were asked to rate the same topics from the perspective of the youth target audience.

Figure 31 on the following page show youth were interested in each topic and the advisors/partners thought the youth target audience would also find each topic interesting.

Figure 31. Median ratings of youth interest in topics being considered for the curriculum



When invited to elaborate on any ratings of 3.0 or lower, some of the youth and advisors/partners commented on each of these topics, as shown in the examples below.

Neuroscience careers

- *Youth: I don't think … neuroscience careers [are] very interesting*
- *Youth: I am curious about the brain but I'm not sure if I want to make this my career.*
- *Advisor/partner: I think we have a big challenge in how to make neuroscience careers feel attainable given many kids' difficulties in school and lack of relationships with Latinx folks already in these careers. The more we can connect the core concepts to real-life experiences and examples, the better.*
- *Advisor/partner: I think middle school students think they already know about the brain and the types of careers you can have regarding the brain (doctor and shrink). They will need to be "wowed" to be more open.*
- *Advisor/partner: I think it's important to expose girls to different STEM careers (and role models are a great way to do that) - but sometimes information about careers can feel very distant or disconnected for middle school youth.*

How the brain works and how to keep it healthy

- *Advisor/partner: I think for most Hispanic kids in underserved areas might see neuroscience as something new and not easily relatable at first, so this might make it mysterious to them and will only moderately interest them. On the other hand, if one presents something a bit more relatable such as how hitting their head on a soccer ball (assuming they like soccer) or drinking coffee (many Hispanics have coffee as part of their diet and after dinners) can affect their brain then neuroscience becomes a bit more interesting.*
- *Advisor/partner: I don't think students at this age connect to their bodies aging and having to be pro-active about keeping their brain healthy. It is too far away for them to be concerned about it.*
- *Advisor/partner: From my experience with youth development, this is not a topic area that youth might be totally excited about at first. However, with the right approach such as terms they understand and hands on implementation, they will be marveled at what they learn and how it relates to their lives.*

Brain-related diseases

- *Advisor/partner: I'm not liking the phrase "brain diseases" – [it] seems odd. Not sure there was really much about mental illness. They are also symptoms and not behaviors.*
- *Advisor/partner: You have to consider the depth of information that is presented. I see that the learning goals include connections with mental health and mental diseases but the content concepts samples do not touch on them. I would like to see more information … this might help me reevaluate interest. [Also, in our location], we would like to have a workshop series for adults/youth to participate in together. This multigenerational approach would help families communicate and explore their interests together.*

How to discuss and seek support for brain diseases and mental health conditions

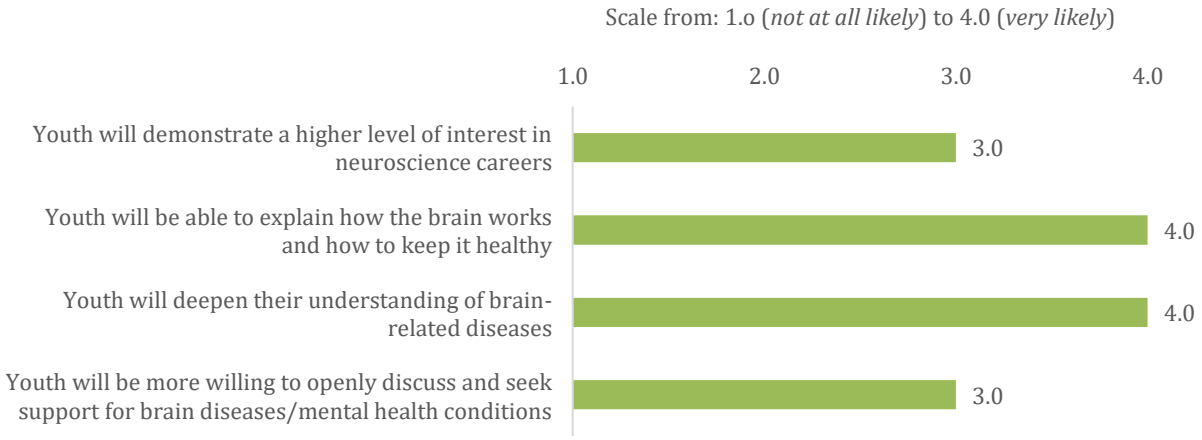
- *Youth: It might not be something people want to talk about.*
- *Advisor/partner: For information and seeking help, there's a certain stigma in Latinx communities about seeking help/support for mental health conditions. I think the audience will be interested in careers, why and how the brain works but their aim will not be about seeking help.*
- *Advisor/partner: Mental illness is still a difficult topic in many Latino communities. Often these illnesses, such as depression can be dealt with a "Get over it, life goes on" attitude instead of treating mental illness as an actual malady. This is a difficult stigma for youth to get over if the home does not reinforce the message.*
- *Advisor/partner: Most middle school kids have a hard time just talking to people outside their social circles, or asking for help from a teacher. I don't think they are interested in learning how to talk about brain diseases. I would say if they would be more interested to talk about it if the topic was "gross" in a fun way.*

2.4 Potential impacts among youth audiences

The advisors/partners were also asked to rate the likelihood that, if the final *BRAINedu* curriculum closely followed the framework, it would have the following four impacts on the youth target audience: youth will demonstrate a higher level of interest in neuroscience careers; youth will be able to explain how the brain works and how to keep it healthy; youth will deepen their understanding of brain-related diseases; and youth will be more willing to openly discuss and seek support for brain diseases and mental health conditions. In each case they were asked to use a scale from 1.0 (*not at all likely*) to 4.0 (*very likely*).

Figure 32 shows that advisors/partners generally thought it was somewhat or very likely that the curriculum would have each of these impacts on youth.

Figure 32. Advisor/partner median ratings of potential impacts of the curriculum on Hispanic middle school youth (n=17)



Those who shared ratings of 3.0 or lower were invited to elaborate, examples of which are presented below:

Increased interest in neuroscience careers

- *Advisor/partner: Regarding careers, it seems like that will be highlighted more in the last module? I thought set up would be more similar to SciGirls activities where careers are spread out throughout all activities. Since neuroscience has many different jobs/areas of work, it'd be nice to showcase those throughout.*
- *Advisor/partner: … the newness of neuroscience will be what either interest or not interest them as they cannot easily identify with neuroscience. Once they are exposed to the role models and all the different fields within neuroscience I think the. They will have a higher interest.*
- *Advisor/partner: I think it will be hard to measure if this had that kind of direct impact.*
- *Advisor/partner: It would … be great to share resource information about the different careers and how professionals apply their field of study within the different modules. It is important to be as direct as possible.*
- *Advisor/partner: This is a tough area to assess without seeing the audience and getting a feel for their interest and engagement. However, I am responding on a general level. In my experience, once exposed to STEM careers and information in a fun way, youth get excited about STEM careers because they often just need exposure to the information so they can realize this is an option for them*

Be able to explain how the brain works/how to keep it healthy

- *Advisor/partner: I don't think that there was enough detail in the content of the units to say "very likely" to some of these. I don't recall seeing "how to keep it healthy" in the guide - eating well, exploring especially as a young child, not doing drugs/alcohol, exercising, etc. -- where is that?*

Deepen understanding of brain-related diseases

- *Advisor/partner: I don't recall the connection to disease except to say that "the brain does not function right for Alzheimer's and epilepsy."*
- *Advisor/partner: I think it wasn't easy to understand for that age and didn't bring in perhaps how it might relate to people they love - a grandmother with dementia, etc.*

Be more willing to discuss/seek support for brain diseases/mental health conditions

- *Advisor/partner: For [the] last question, again because of stigma connected to mental illness, I'm not sure how big an impact it'll have in changing attitudes. It'll be interesting to see what actually happens.*
- *Advisor/partner: This issue is the same as the last answer, with Latinos often downplaying mental illness and their symptoms. I hope this does foster an interest in the career, and at the same time, help the youth recognize and respect that these illnesses are not weakness or imaginary.*
- *Advisor/partner: I saw nothing about seeing help; where is the info about how to do that and when you should and how it is a good idea to do so early before problems get worse?*

2.5 Potential questions or curiosities among youth

Thinking about the four main areas covered in the *BRAINedu* curriculum, youth were asked to list as many questions or curiosities they had about the brain. At the same time, the advisors/partners were asked to share questions or curiosities they thought the youth target audience might have about each area covered. Both groups were also asked to note, wherever possible, any relevant cultural values they thought could help them (or other Hispanic youth) establish a cultural connection.

2.5a Youth questions or curiosities about Module 1: Brain structure

Figure 33 shows that, among those who shared a response when asked about Module 1, youth most often shared questions or curiosities about how different parts of the brain work (38%) and the physical structure of the brain (27%). Meanwhile, advisors/partners most often thought the youth target audience would have questions/curiosities about how different parts of the brain work (50%), the brain and health (36%), and brain development (36%). Examples of these and other responses from youth and advisors/partners are in Table 12 on the following page.

Figure 33. Youth questions/curiosities about brain structure

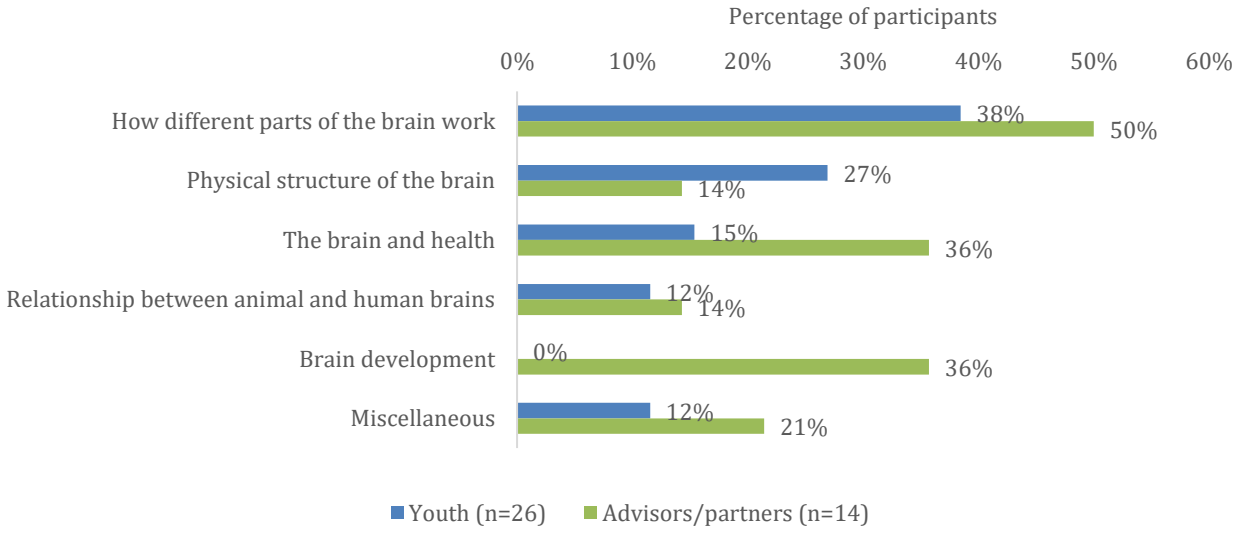


Table 12. Youth questions or curiosities about Module 1: Brain structure

Youth (n=26)	Advisor/partner (n=14)
How different parts of the brain work (38%) • *How do the functions of brain structures overlap? Do different functions occur only in individual parts of our brain, or do they work together? How?* • *How does each separate lobe function?* • *How does the brain structure work?* • *What specific functions do they do?* • *The differences and importance of each structure?* • *How do they know what part does what?* • *Why is it structured this way?* • *What is the most vital portion of the brain, or the one we use the most?*	***How different parts of the brain work (50%)*** • *Which parts of the brain do what, and how do we know?* • *How the brain is formed and why brains form differently* • *How does my brain work? How can I easily remember the areas of the brain and their functions?* • *How do we know what the parts of the brain are?* • *What is the whole left is science and right is creative bit that I've been hearing?*
Physical structure of the brain (27%) • *Why are some parts bigger than other parts of the brain?* • *What do the parts of the brain look like?* • *Do all brains look the same?* • *Do people have different sized brains?* • *What is the biggest part of the brain?* • *What is the brain's outer shell made of?*	***The brain and health (36%)*** • *What happens if one part doesn't work correctly?* • *What happens when you don't have a fully functioning brain?* • *What happens during concussion when your brain is injured? What happens in car accidents? How is my old grandma's brain different and she can't remember things very well?* • *Why one person acts 'normal' and the other 'crazy'* • *How can we keep the brain healthy? Here's an article from PBS: http://www.pbs.org/parents/expert-tips-advice/2016/08/three-things-parents-teach-kids-brain/*
The brain and health (15%) • *How do you get any disorders in your brain?* • *I wonder what happens to your occipital lobe when you go blind?* • *Is there something around the brain that is processing it from impact?*	***Brain development (36%)*** • *Why does it take so long to be fully developed - could add why teens are impulsive* • *How is the brain changing throughout teenage years?* • *What should I do to help my baby sister's brain develop right?* • *What parts of their brain are active/developed/developing at different ages (birth/2/5-start of kindergarten/8-second grade/11-start of middle school/14-start of high school)* • *I am older than five but younger than 25. Is my brain fully developed? If not, what does that mean? What about my abuelita's brain? [Also,] most two-year-old's' brains have twice as many neuron connections as adults. Unused connections disappear as the brain matures. I'm 12 years old. What does this mean for me?*
Relationship between animal and human brains (12%) • *Does our brain have similar structure to anything else/animals?* • *What is the connection between animal and human brains?*	***Physical structure of the brain (14%)*** • *What do these brain part really look like?* • *Do the different sections of the brain have different colors?*
Miscellaneous (12%) • *What would we do if we didn't use the brain?* • *What do brain cells look like?* • *Hands on learning. Label parts.*	***Relationship between animal and human brains (14%)*** • *How do the brains of different animals compare - humans, cats, frogs, fish, etc.* • *Comparing size, shape, structure of brains across different types of animals.* ***Miscellaneous (21%)*** • *How do drugs and alcohol affect the brain* • *Learning about memory, perception, emotion, etc.* • *Why do I need to learn about the brain? How will this information be helpful to me? Will this information be helpful for my family/how? It will be important here to set up the conversation with context about how this information relates to the youth and their lives, even if on a broad scale. It will be easier for youth to commit and for parents/guardians to allow them to commit, if they have an overarching connection to the information (what the youth will learn and how they will use it).*

2.5b Youth questions or curiosities about Module 2: Brain connections

Figure 34 shows that, among those who shared a response when asked about Module 2, youth most often shared questions or curiosities about how brain connections work (67%) and breaking, repairing, or building connections (19%). Advisors/partners, as a whole, most often expected that the youth target audience would focus on these two areas as well (75% and 25%, respectively). Examples of these and other responses from youth and advisors/partners are shared in Table 13.

Figure 34. Youth questions/curiosities about brain connections

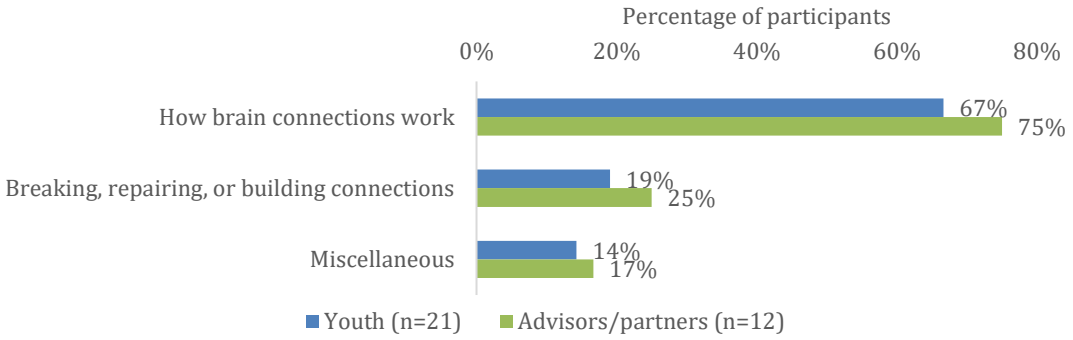


Table 13. Youth questions or curiosities about Module 2: Brain connections

Youth (n=21)	Advisor/partner (n=12)
How brain connections work (67%)	***How brain connections work (75%)***
• *Are the brain's connections similar to those of computers? How does our brain communicate with the rest of our body? With our spinal cord? How does pain work?*	• *Anything to show how parts of the brain work together (i.e. fMRI scans) during a task would be different. Or side-by-side comparisons of how different brains with different issues/abilities function in the same task. ALSO, how bi-/multilingual brains are more creative/flexible problem solvers, have more "work-arounds" when impacted by TBI or Alzheimer's, etc. Really emphasize how a bi-/multilingual brain works and the ways in which this is an asset.*
• *How are they formed, and does the speed at which impulses/currents travel affect intelligence?*	• *How do electric impulses work in relation to communication within the brain*
• *Why are some brain connections stronger than others?*	• *Comparing communication across neural networks to transmission of information across other physical types of networks.*
• *How does it work when something is connected to the brain?*	• *How do we know this?*
• *How does information flow?*	• *How does it work when we're sleeping?*
• *What is anatomical connectivity?*	• *Does what I eat and drink, think and do, have any impact on the connections in my brain? What about when I listen to music?*
• *Which is the longest connection?*	• *How do connections on a biological level relate to concepts or outcomes like memory, behavior etc.*
• *How did they figure this out?*	• *How does memory work? Does a baby's brain make connections? How early?*
• *How does the brain connect to the body?*	
• *How does the brain get in connection with every part of our body?*	***Breaking, repairing, or building connections (25%)***
• *Curiosities [about how] the brain connects to the eye*	• *If the brain is using electrical signals, can I short circuit my brain?*
• *How does it connect to the lower limbs?*	• *What about pruning?*
	• *How do different diseases impact connections in the brain?*
Breaking, repairing, or building connections (19%)	
• *I wonder what happens when one circuit breaks?*	***Miscellaneous (17%)***
• *If a connection is broken, can it be repaired?*	• *So how can you see them telephone lines? What are those :)*
• *What would happen if the atom ripped?*	• *Do these diseases impact people like me/my family and how? How will this information help me at school and for future career? Here it will be important to make the family connection using statistics about Latinos that will help youth and their parents/guardians visualize why the information is important.*
• *How can we strengthen connections?*	
Miscellaneous (14%)	
• *How complex are mental diseases?*	
• *How come some brains work differently?*	
• *Hands on learning. Explaining importance.*	

2.5c Youth questions or curiosities about Module 3: The brain in action

Figure 35 shows that, among those who shared a response when asked about Module 3, youth most often shared questions or curiosities about how the brain functions (35%) and the link between brain activity and the body (26%). Meanwhile, advisors/partners most often thought the youth target audience would have questions/curiosities about how the brain functions (46%) and studying neuronal activity (46%). Examples of these and other responses from youth and advisors/partners are shared in Table 14.

Figure 35. Youth questions/curiosities about the brain in action

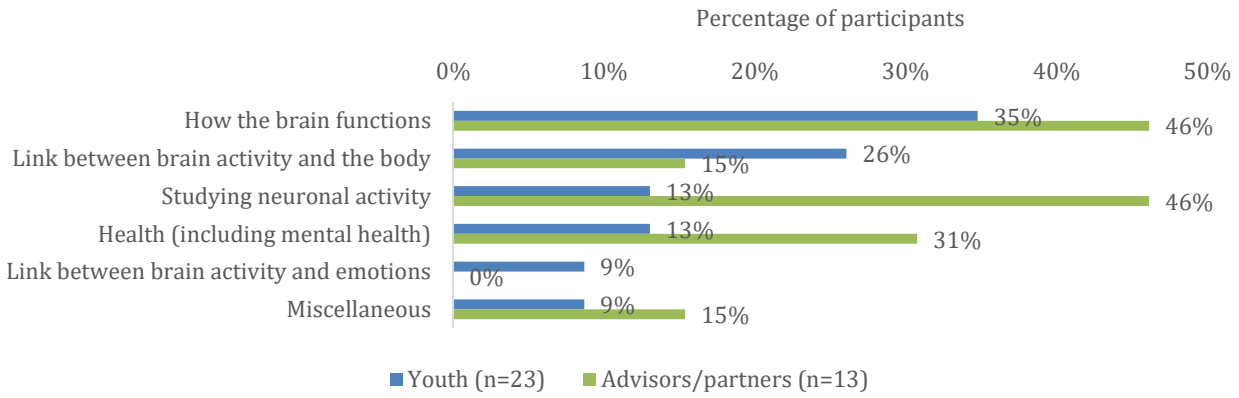


Table 14. Youth questions or curiosities about Module 3: The brain in action

Youth (n=23)	Advisor/partner (n=13)
How the brain functions (35%) • *Is it true that the brain cannot multitask? What occurs when we sleep? What is muscle memory? How many things are occurring in our brain at once?* • *When is the brain most/least occupied? What can enhance brain activity?* • *How fast does the brain react? Why does it react the way it does?* • *Does this mean we have electric[ity] in our brain?*	***How the brain functions (46%)*** • *What happens when you sleep and when you dream?* • *What does the brain look like when I am reading, sleeping, thinking hard, or exercising?* • *Do the circuits shut off at night? How are my dreams linked to the brain?* • *How do we learn language?*
Link between brain activity and the body (26%) • *How does it make us do things without realizing it?* • *How does the brain help the body be in action?* • *How does it control multiple body parts at once.* • *What would happen when the brain can't control your body?*	***Studying neuronal activity (46%)*** • *What is a brain wave and how is it measured?* • *Someone … had an MRI, CT Scan, what are those?* • *What technology helps measure neuronal activity? What technology is down the pipeline to help?* • *How do scientists study brain activity in young children? Techniques for studying and measuring activity in the brain.*
Studying neuronal activity (13%) • *How will techniques used to measure neuronal activity help students?* • *How long does it take to measure the activity?* • *What do they do to take pictures of the brain?*	***Health (including mental health) (31%)*** • *If someone has a learning disorder, what is happening in their brain? If someone has experienced trauma, what does their brain do when they have a flashback, for example?* • *What … is getting disrupted in the brain with different conditions/diseases? Role of chemistry in brain activity; how do depression medications work.*
Health (including mental health) (13%) • *Why do people in comas have less brain action?* • *What happens to the brain when the nerves become too active?* • *What would happen when the brain can't control your body?*	***Link between brain activity and the body (15%)*** • *Why does the doctor tap my knee during my annual exa* • *Exploring vision and other senses*
Link between brain activity and emotions (9%) • *Does your brain tell you to act certain ways? Does your brain tell your mood/feelings?* • *How does your brain change your mood?*	***Miscellaneous (15%)*** • *Does being bilingual help my brain or confuse it?*
Miscellaneous (9%) • *What makes a brain smart?*	

2.5d Youth questions or curiosities about Module 4: Brain activity linked to behavior

Figure 36 shows that, among those who shared a response when asked about Module 4, youth most often shared questions or curiosities about health (including mental health) (47%) and behavior (32%). At the same time, the advisor/partner group also most often thought the youth target audience would have questions/curiosities about these two topics (45% and 36%, respectively), as well as brain activity (36%). Examples of these and other responses from youth and advisors/partners are shared in Table 15.

Figure 36. Youth questions/curiosities about brain activity linked to behavior

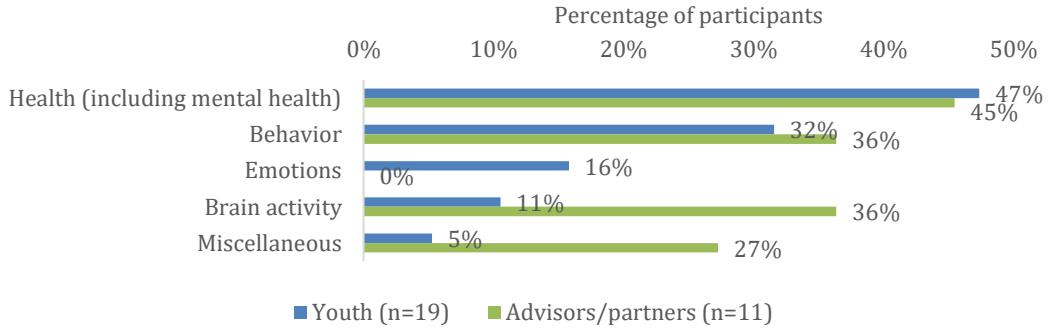


Table 15. Youth questions or curiosities about Module 4: Brain activity linked to behavior

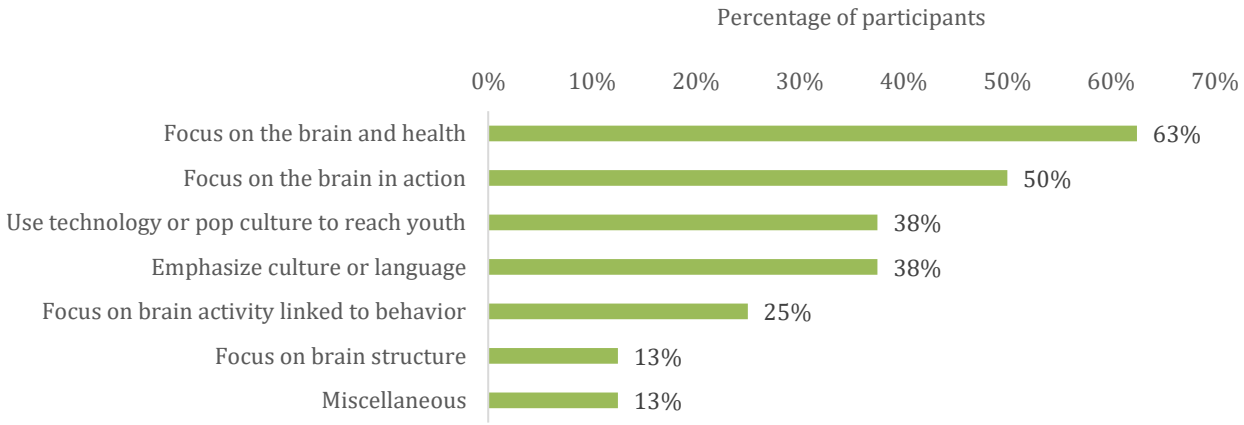
Youth (n=19)	Advisor/partner (n=11)
Health (including mental health) (47%)	***Health (including mental health) (45%)***
• *How do diseases affect our brains? How do tumors work?*	• *Do all healthy brains act the same? Do all sick brains act the same?*
• *Why do people with mental illnesses have more brain activity?*	• *Why does my brother need to take medicine to keep his grades up? What happens when you have a seizure? What happens when you drink alcohol or take cocaine or smoke pot? (I know that this is loaded!!!) Why do some people talk to a therapist and why does that help?*
• *How does our brain get to look not normal?*	• *How can I tell if someone has a brain disorder?*
• *Talk about someone with a brain problem and share their story. Bring in X-rays.*	
• *What is Alzheimer's brain?*	
• *Are there more than just three mental diseases?*	
Behavior (32%)	***Behavior (36%)***
• *When does behavior become cemented in someone?*	• *Do different brains create different behaviors?*
• *How does your brain control your behavior?*	• *Why are people so different in personalities?*
• *How can behavior affect me in everyday activities?*	• *How do they change the brain? Do they touch it? The brain just controls n actions, how is that related to what I choose to do?*
• *Is the brain free will?*	
• *Can your brain make you a good or bad person?*	
Emotions (16%)	***Brain activity (36%)***
• *How do emotions work?*	• *How do you change neuronal activity?*
• *When I am mad does my brain turn red or another color?*	• *Why do I get sleepy when I read? Why do I forget stuff so easily? How do I make myself smarter?*
• *What makes you have a certain emotion?*	• *fMRI images are amazing to look at! They'll enjoy learning how scientists study brain activity and seeing images that illustrate which parts of the brain are doing what.*
Brain activity (11%)	***Miscellaneous (27%)***
• *What will manipulating brain activity help us understand?*	• *How can it be affected by outside forces? Can we read minds if we understand the brain activities as an example?*
• *How does the brain act?*	• *What are some easy way for me to do these activities …*
Miscellaneous (5%)	• *What is the purpose of understanding this information? How can I use this information to make a difference for people? Again, it will be key to support the youth in being able to connect the information they're learning, the purpose of learning it, and how to use it in their lives so they can be committed and learn what they need to, to make a difference in their lives.*
• *Can they do things to the brain to make a person smarter?*	

2.6 Additional engagement ideas shared by advisors/partners

Reflecting further on the four modules, advisors/partners were asked if they had: "*…any ideas about the types of 'hooks' (e.g. kids' habits and practices, preferences, interests, cultural insights, priorities, beliefs, aspects of everyday life, socioeconomic elements, etc.) that TPT might consider to help engage the BRAINedu audience of middle school youth to learn about brain structure and function.*"

Figure 37 shows that, among those who shared a response, advisors/partners most often suggested focusing on the brain and health (63%) and/or the brain in action (50%), with other ideas being mentioned by smaller groups of advisors/partners. Examples of their suggestions in each case are shared below the chart.

Figure 37. "Hooks" suggested by advisors/partners to engage youth (n=16)



Focus on the brain and health (63%)

- *They are interested in learning … about brain diseases, etc.*
- *Stressing the importance of developing a healthy brain to prevent being sick as an adult and/or to be a successful and effective person*
- *Statistics about Latinos to help the visualize how this information can be helpful. I think presenting the information relating to health and maintaining your brain health by knowing this information, as well as being able to help other maintain their brain health, is a good hook - empowering youth to gain the knowledge and put it into practice. The aspects of everyday life around how brain health allows them to do certain activities, build relationships with friends, function in terms of school and getting a good-paying career, etc. would also make the information relevant.*
- *Start with abnormalities of the brain. Talk about things we cannot yet explain. Start with the "brain training" games.*
- *Family members with these illnesses and how to help them*
- *Interest in helping friends/family who may be dealing with a related condition (e.g., friend with depression or anxiety, grandparent with dementia/Alzheimer's, etc.) … Becoming more aware of mental health issues and better prepared to help others seek help if needed. Impacts of drugs/alcohol on the brain and vice versa, influence of brain structure/function on likelihood of engaging in risky behavior*
- *Observed family members w disorders; friends on medications like ADHD, etc.; seeing alcohol and drugs changing behavior; how to help when you feel sad … evidence of the value of exercise to prevent dementia, etc.; value of eating certain foods to make you "smarter" - e.g. fish; how to get help for you or someone else if needed.*
- *Many kids are living in poverty; many have experienced more than one A.C.E. or traumatic/toxically stressful experience.*

Focus on the brain in action (50%)

- *MRI images of the brain when listening to music, or watching TV, or playing video games; images of the brain while the youth are doing activities that relate to them.*
- *Anything that is culturally relatable will be a good hook in my opinion. As an example, taking a special dish and letting people know that that particular dish causes something in the brain. "Tacos make your brain happy!" Or music. Perhaps music causes certain activity in our brains and we can get the hook through popular songs known to Hispanics.*
- *Idea that you can build your own better brain - i.e., impact of exercise, music, learning new things, etc. on improving your brain.*

Use technology or pop culture to reach youth (38%)

- *Making an app, creating something that's digitally interactive*
- *Use of current technology (smart phones, tablets). When possible include links to videos.*
- *Pop culture*
- *Movie - Inside Out*
- *Perhaps music causes certain activity in our brains and we can get the hook through popular songs known to Hispanics.*
- *Linking music, like rap, to what happens to the brain when you are listening or performing?*

Emphasize culture or language (38%)

- *… making connections to their culture and their individual expression.*
- *Use food from different cultures - why do I like food from my own culture, but maybe not others? what happens in my brain when I smell different foods? … Impact of speaking one vs. two vs. more languages? learning a second language*
- *… using the family dynamics of abuelitos (grandparents) to help youth connect the information to their families and experiences*
- *Bilingual households.*
- *Bilingual format.*

Focus on brain activity linked to behavior (25%)

- *Activities that encourage kids to think about their own behavior, and be better at observing others.*
- *Teens making bad decisions - not thinking*
- *Many teens are interested (or at least think they are) in studying psychology.*
- *How to be a good friend (peer counseling)*

Focus on brain structure (13%)

- *Differences between boys' and girls' brains?*
- *Dispel rumors about brain sizes over the centuries and intelligence.*

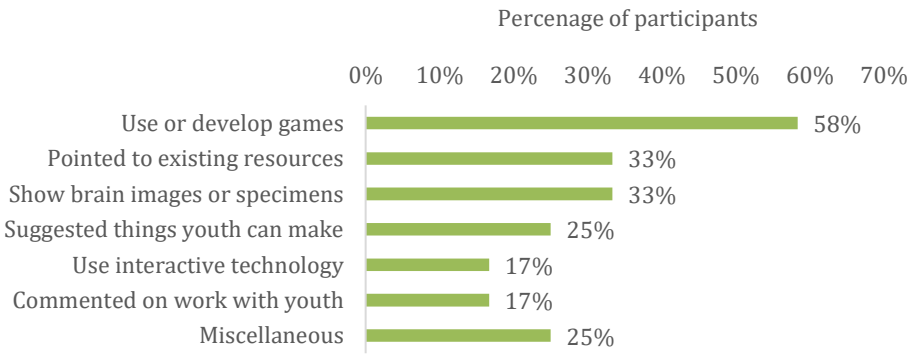
Miscellaneous (13%)

- *Why you should study math and science; roles in these fields even if you are not an engineer/science type (e.g. art) … don't know whether you can dispel myths about the origin of some mental disorders as "possession by the devil" etc.? Have a special topic on Artificial Intelligence (all in the news and made to sound scary!) vs human intelligence.*
- *Personal experiences.*

Suggestions for hands-on activities

The advisors/partners were also asked to share ideas for hands-on activities that would effectively engage the youth target audience in learning about brain structure and function. Among those who shared a response, Figure 38 shows that they most often suggested the project team use or develop games (58%), pointed to existing resources such as films and activities (33%), and/or recommended showing brain images or specimens (33%), with other ideas being mentioned by smaller groups. Examples of their suggestions in each case are shared on the following page.

Figure 38. Advisor/partner suggestions for hands-on activities (n=12)



Use or develop games (58%)

- *Anything that can be gamified would be good. Perhaps sending messages through neurons as a game.*
- *An interactive game or app that the kids can use to manipulate the parts of the brain*
- *Play a memory-matching card game and think about the strategies used to play and what parts of the brain might be involved.*
- *Memory tests (recall)*
- *Please add memory making strategies, brain breaks, brain stretches and brain challenges where you incorporate movement, vocabulary building, trivia, and math like Sudoku or computation. Like Body Part math, Twister, or other group games, being physical and interactive.*
- *Testing reaction time against different variables … Testing different senses, optical illusions, testing each other with the Stroop test, ways that your brain can play tricks on you (recent white & gold vs black and blue dress debate, laurel/yanny, etc.)*

Pointed to existing resources (33%)

- *Story telling is another powerful tool in learning. What if emotions had stories to them like the movie Inside Out.*
- *Recently played a game called Brain Architecture which built a structure of straws and [pipe cleaners] which are built by teams according to cards drawn that reflect possible life traumas through early development. At the end, the brains have to support weights which represent hardships.*
- *Here are some resources, which the team has probably already reviewed, but just in case: 1. Brain Teasers - do they work? How? Do they help with any of the diseases? https://sharpbrains.com/resources/1-brain-fitness-fundamentals/brain-functions-perception-attention-memory-and-more/ 2. This NIH funded project website has several activities that could be incorporated/adapted http://www.brainu.org/lesson-table 3. Take a look at this art activity, based on the work of Nobel prize winning Spanish neuroscientist Santiago Ramon y Cajal http://www.brainu.org/lesson/beautiful-brain-do-you-see-what-i-see 4. NIH Curriculum Supplement https://science.education.nih.gov/supplements/webversions/Brain/default.html 5. https://sharpbrains.com/summit-2018/*
- *Resource from PBS: http://www.pbs.org/wnet/humanspark/uncategorized/journey-into-the-brain-lesson-activities/551/*

Show brain images or specimens (33%)

- *Look at animal brains (specimens in jars or drawings/photos?) and compare sizes of different parts of the brain - infer how that relates to the animals needs and capabilities in the wild.*
- *3D printing various brain areas and building a brain like a puzzle might be a cool activity.*
- *Comparing the relative size and structure of brains of different animals (I used to work with a faculty member who had a 'brain zoo', which everyone was always super interested in - but it may have less appeal with pictures or models than actual specimens) … After learning about the functions of different regions of the brain, matching different fMRI images to different scenarios.*
- *I think we need to have a 3D brain model that youth can take apart to really learn the parts of the brain and become familiar with what they are learning.*

Suggested things youth can make (25%)

- *Draw comics/make 2D and 3D art/write music/write stories/make videos with stories about normal or aberrant brain structure/function. Make a simple bread board electronic circuit modeling nerve cells and connections … Plan a meal for the family that is "good for the brain" and cook it!*
- *Building neurons with pipe cleaners and different colored beads (possibly as a keychain?) to learn about the different parts of neurons. Building a neural network out of pipe cleaners.*
- *The drawing activities outlined in the modules will be good to check if the youth have learned the information.*

Use interactive technology (17%)

- *An interactive game or app that the kids can use to manipulate the parts of the brain*
- *Use of current technology (smart phones, tablets)*

Commented on working with youth (17%)

- *Having kids work in groups and presenting to their classmates may help increase learning and make it fun; groups can be tasked with a region, lobe, structure of the brain, etc.*
- *More how it relates to them - when they are feeling sad, which part of the brain is working*

Miscellaneous (25%)

- *Team with a local hospital/university and have a brainwave demonstration and show off some imaging equipment.*
- *Start with the sense and how they are related to the brain.*
- *A project including a presentation will also demonstrate what the youth have retained about the information they heard.*

Part 3: Feedback on the reflection activity

Youth and advisors/partners[12] were asked to provide feedback on elements of the *BRAINedu* reflection activity. An example of a youth doing a reflection activity for a different TPT project, *SciGirls Code*, is in Image 3 to the right. Youth and advisors/partners were both told that, at the end of the *BRAINedu* programs, middle school youth would complete a creative project meant to reflect on what they learned and/or connected with during their program. They were also told that the *BRAINedu* project would like to encourage video production, but that students could create something different. The advisors/partners were further informed that youths' reflection activities would be analyzed by the project evaluator. Finally, the advisors/partners were told that, if they wanted additional context, they could watch full video examples of program reflections from a different TPT project on a password protected website.[13]

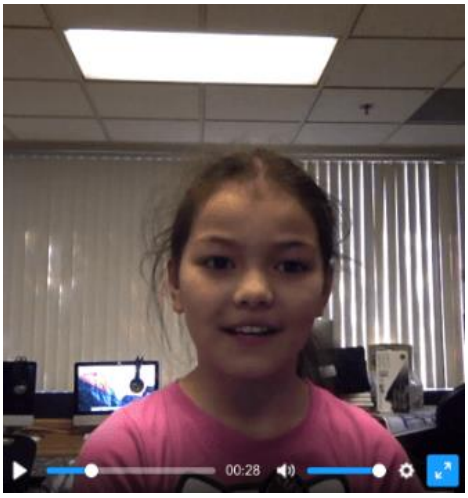
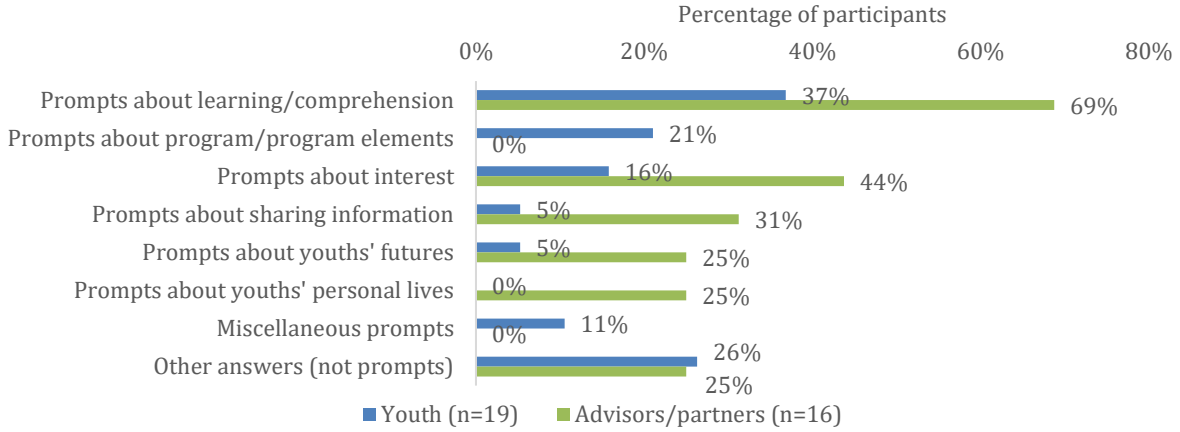


Image 3: Example of a youth doing a reflection activity for a different TPT project, *SciGirls Code*

3.1 Prompts or questions to encourage youth reflection

Youth were asked what kinds of prompts or questions they would like to respond to if they were to do a *BRAINedu* reflection activity, while advisors/partners were asked to suggest prompts or questions TPT might pose to the target audience of underserved Hispanic middle school youth. Figure 39 shows that youth most often suggested prompts about learning or comprehension (37%) and prompts about the program or program elements (21%), while advisors/partners most often pointed to prompts about learning/comprehension (69%) and youth interest (44%). Examples of these and other responses from youth and advisors/partners are shared in Table 16 on the next page.

Figure 39. Suggested prompts/questions to encourage youth reflection



[12] One of the advisors/partners did not complete this section of the survey.
[13] Youth who participated in the front-end evaluation were not shown these program reflection examples, as session time was limited.

Table 16. Prompts or questions participants suggested to encourage youth feedback during the reflection activity

Youth (n=19)

Prompts about learning/comprehension (37%)

- *Did you understand the lessons presented?*
- *What did BRAINedu help you understand about the brain?*
- *What was the most useful or cool information you learned?*
- *What did you learn about the brain?*
- *What did you learn through BRAINedu?*

Prompts about program/program elements (21%)

- *I would like to respond to prompts like, "Do you believe the topics presented in BRAINedu should be taught on a greater scale level?" or "What did you think of the activities?"*
- *What did you think about BRAINedu?*
- *What could we do to make BRAINedu better?*

Prompts about interest (16%)

- *What part of the brain interested you the most and why?*
- *What's the most interesting thing you learned about the brain?*
- *What would you like to know more about?*

Prompts about sharing information (5%)

- *What would you share about BRAINedu?*

Prompts about youths' futures (5%)

- *… is [BRAINedu] going to impact your life in the future?*

Miscellaneous prompts (11%)

- *Why do people see things?*
- *How do you feel about brain disease? How do you think life is different for people with brain problems?*

Other answers (not prompts) (26%)

- *I think it would be very interesting to learn about the brain and especially what it does.*
- *I think there should be a reflection activity because I am interested how other people learned how the brain worked.*
- *My favorite part was the videos because it show[ed] me scientist lives.*

Advisor/partner (n=16)

Prompts about learning/comprehension (69%)

- *What is something you learned that you didn't know before? How have your perceptions changed about xxxx?*
- *What did you learn today?*
- *Why is it important for you and other students to learn about the brain? Tell us about something new you learned.*
- *If they could research/learn more about one thing from this module, what would it be? What is a misconception they had challenged today?*
- *What did you learn that might make do things differently?*
- *What did they find … confusing?*
- *Can you describe a brain-related disease and what is happening?*

Prompts about interest (44%)

- *What did you find interesting that you did not know? What do you want to know more about?*
- *What did you find most interesting about what you learned?*
- *What did they find most fascinating?*
- *Why did you attend the workshop? What interests you about the brain? … What do you want to know more about? If you could ask an (occupational therapist) any question, what would it be?*

Prompts about sharing information (31%)

- *How would you share your knowledge with someone else about what you know about the brain?*
- *How would you explain how the brain works to a family member?*
- *Did you learn anything that you want to share with your family or friends?*
- *How will you share the information you learned with others?*

Prompts about youths' futures (25%)

- *Was there anything mentioned that made you more interested in being a neuroscientist?*
- *Would you like to have a neuroscience-related career, and if so, which one and why? … What will you change in your life after having learned more about the brain and how it works?*

Prompts about youths' personal lives (25%)

- *Was there any part that directly related to you or someone you know?*
- *Do you have a personal story to tell about why you found the topic interesting?*
- *What did this help them understand about themselves or someone they care about?*
- *[How] does it relate to their life/family/culture?*

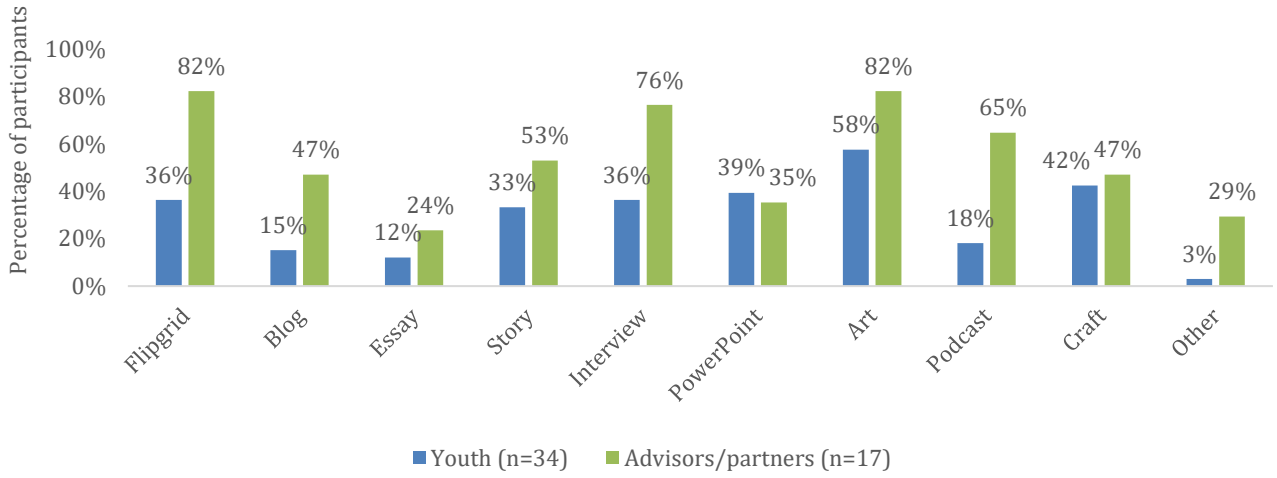
Other answers (not prompts) (25%)

- *A podcast or news report about what they have learned.*
- *I think you should encourage them to create their responses in an art form of music, dance, theater or poetry, allowing them to express, and connecting them to their culture and how the brain lights up when performing.*
- *It might elicit more thoughtful reflections if the girls had either a photo of their work or any artifacts from their activity.*

3.2 Potential platforms for the reflection activity

Youth were asked to indicate which platforms they would be interested in using if they were to do a reflection activity about *BRAINedu*, while advisors/partners were asked which platforms they thought the target youth audience might find fun and informative as a reflection activity. Figure 40 shows that youth most often pointed to art (58%) and crafts (42%), while advisors/partners most often suggested art (82%) and the video platform Flipgrid (82%), among other recommendations.[14]

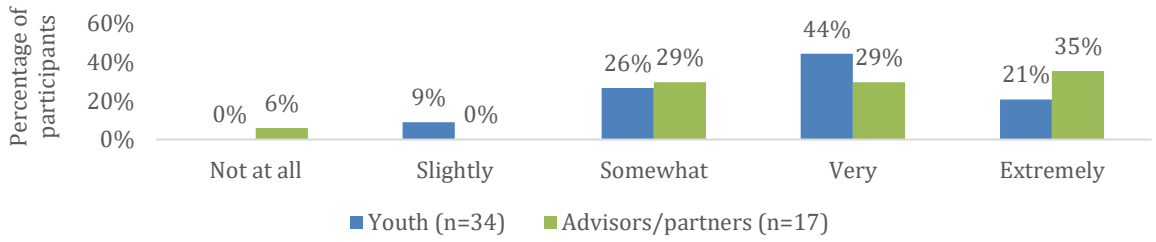
FIgure 40. Platforms youth might be interested in using for the reflection activity



3.3 Importance of including video in the reflection activity

Figure 41 shows how important youth and advisors/partners thought it would be for the *BRAINedu* reflection activity to include a video component. Approximately two-thirds of the youth (65%) and advisors/partners (64%) thought a video component would be very or extremely important.

Figure 41. Participant ratings of the importance of having the youth reflection activity include a video component



Some of the youth and advisors/partners elaborated on their ratings, as shared in the examples in Table 17 on the following page.

[14] The one youth who selected *other* recommended "*some sort of group project*." Advisors/partners who selected *other* suggested music, theater, a role play or skit, poetry, "*acting out (embody learning)*," and interviews including family members.

Table 17. Participant comments about the importance of having the reflection activity include a video component

Youth (n=34)

Extremely important (21%)

- *Youth: Videos are more interesting than books.*
- *Youth: Videos are interesting.*
- *Youth: Videos are awesome.*
- *Youth: Because it will tell our opinion and let it out.*

Very important (44%)

- *Youth: Helps give a better perspective of the programs*
- *Youth: Videos are good ways to share.*
- *Youth: I think a video would be a good way to explain things.*
- *Youth: To show that they are learning something new.*

Somewhat important (26%)

- *Youth: While a video would be the easiest and most efficient method, thoughts and reflections can still be communicated through other mediums.*
- *Youth: Some people would like to do it in some other way*

Slightly important (9%)

- *Youth: A youth's understanding of something can be verified in other ways.*
- *Youth: It's boring.*
- *Youth: Some students forget after it isn't important.*

Advisor/partner (n=17)

Extremely important (35%)

- *Advisor/partner: Youth prefer to talk rather than write. By talking to them, they can explain their thoughts spontaneously and honestly rather than writing down something they think they're supposed to write.*
- *Advisor/partner: [I] do not like idea of kids' project leader relaying info to evaluators, feedback should come directly from the kids if at all possible - if not via video at least in writing or a taping of kid doing class presentation*
- *Advisor/partner: Allowing kids to express themselves using digital media is a natural fit for today's kids. They are tech savvy and love this medium.*
- *Advisor/partner: Video gives girls a different way to express what they learned and what they think about the topic. They may not be able to express themselves as well through answering questions. Plus, they can use body language, facial expressions, etc. to show what they learned.*
- *Advisor/partner: In a video you can pick up on reactions from the facial/other expressions, tone of voice, and overall demeanor to learn about the youth's experience, what information stayed with them from what they heard, and possibly some of the impact the experience had on them.*

Very important (29%)

- *Advisor/partner: Kids like video, and like to be able to express themselves in a moving media.*
- *Advisor/partner: I think youth would like doing a video and that it would be a familiar format for them.*
- *Advisor/partner: It's important because it allows evaluators to see first-hand what the youth are learning. It gives them a perspective that conveys a lot of information that might not be available through writing as an example.*
- *Advisor/partner: The video captures more than their words!*

Somewhat important (29%)

- *Advisor/partner: Depends on if the information needed can be evaluated based on surveys or final projects. I worry for the prompts used, it may be too personal and they'll feel awkward sharing in something that will be recorded.*
- *Advisor/partner: If a child would prefer to write or even draw their reflections, that should be allowed since each student expresses him/herself more easily in different ways. But video is easiest for the evaluator.*
- *Advisor/partner: Many project styles can be used to explore student engagement in the topics*
- *Advisor/partner: I think it's most important to capture their reflections, whether that is with video, drawings, writing or something else. However, we've found that kids generally find the videos more appealing than other types of written reflection, so I do think they can be very useful.*

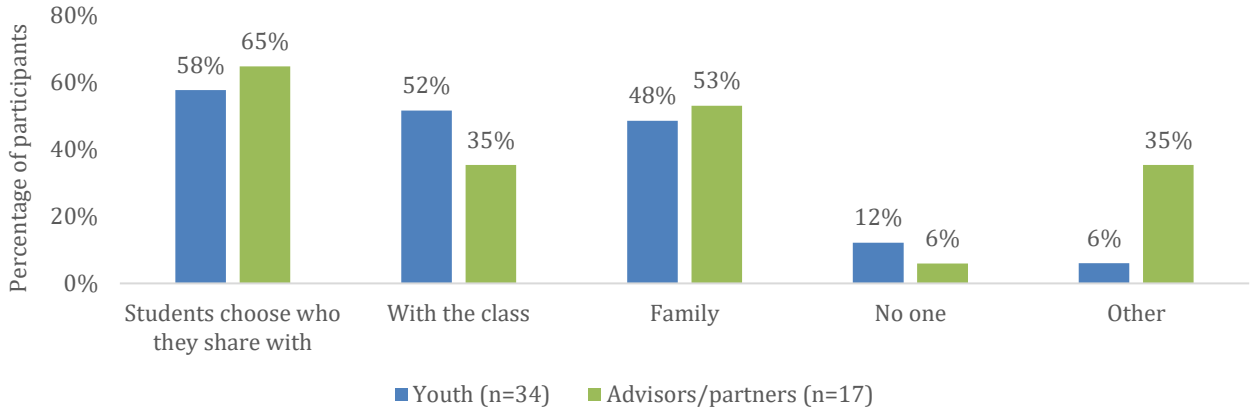
Not at all important (6%)

- *Advisor/partner: Will everyone have access to video equipment? Will they want to talk on a video that others can see?*

3.4 How participants thought youth reflections should be shared

Youth and advisors/partners were asked how they thought the youth reflections should be shared, beyond being privately shared with the evaluator. Figure 42 shows that youth most often thought students should choose with whom to share their reflections (58%) and/or that the reflections should be shared with the class (52%). Advisors/partners most often thought students should choose (65%) and/or that they should be shared with the family (53%).

Figure 42. How participants thought the youth reflections should be shared



Elaborations from youth and advisors/partners who selected *other* are below:

- *Youth: If consent is given, social media.*
- *Advisor/partner: Students can always share with or without our encouragement! Needs to be done in a no-pressure way and after first reviewing the content.*
- *Advisor/partner: Kids should be able to opt into sharing with anyone besides the evaluator. It could be interesting for the class to hear other kids' reflections, but I wouldn't want that pressure to limit a kid.*
- *Advisor/partner: If art, maybe a contest.*
- *Advisor/partner: Other educators.*
- *Advisor/partner: Depends on the quality, releases, and purposes.*
- *Advisor/partner: I think the youth should be asked who they are comfortable having the video shared with and respect their wishes to ensure they feel protected and supported which will help them open up more …*

Part 4: Feedback on the Family Resource Guide

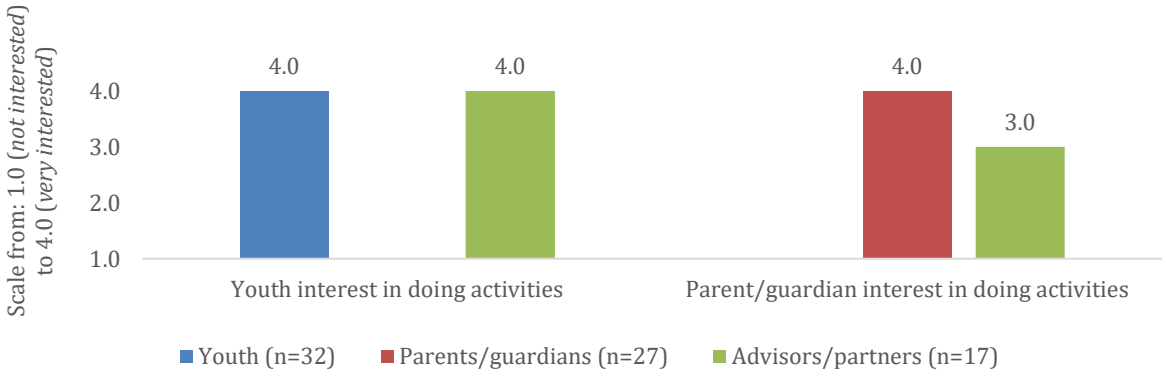
Parents/guardians and advisors/partners[15] were asked to share feedback on TPT's early plans for the *BRAINedu* Family Resource Guide. Although they were not shown any drafts or examples, they were told that the finished guide would feature activities and videos family members could do or watch together. They were also told that the guide would provide access to four documentary films about brain health/diseases, as well as accompanying discussion guides and information about raising awareness and support for these issues.

4.1 Participant interest in doing activities at home with family members

Youth, parents/guardians, and advisors/partners were told that the *BRAINedu* team was considering developing hands-on activities about the brain for family use at home, as part of the Family Resource Guide. Youth were asked to rate their interest in doing these activities with their parents/guardians, using a scale from 1.0 (*not interested*) to 4.0 (*very interested*). Using the same scale, parents/guardians were asked to rate their interest in doing the activities with their youth. Finally, advisors/partners were asked to rate how interested they thought the target audiences of underserved Hispanic middle school youth and their parents/guardians would be in doing the hands-on activities at home with their respective family members, again using the same scale.

Figure 43 shows that youth generally felt they would be very interested in doing the activities with their parents/guardians, and that advisors/partners also anticipated this to be the case among the youth target audience. Meanwhile, parents/guardians thought they would be very interested in doing the activities with their children, while advisors/partners though the parent/guardian target audience would be moderately interested in doing so.

Figure 43. Participants' median ratings of youth and parent/guardian interest in doing hands-on activities with their family members



Those who provided ratings of 3.0 or lower were invited to elaborate, examples of which are presented below:

- *Youth: It would be great to make the activities as engaging as possible, and not make the information too basic. Introduce new concepts to keep it interesting, and be thorough in the information presented.*
- *Youth: Working with others is either good or stressful.*
- *Youth: I could be doing better things at home other than homework*

[15] One of the advisors/partners did not complete this section of the survey.

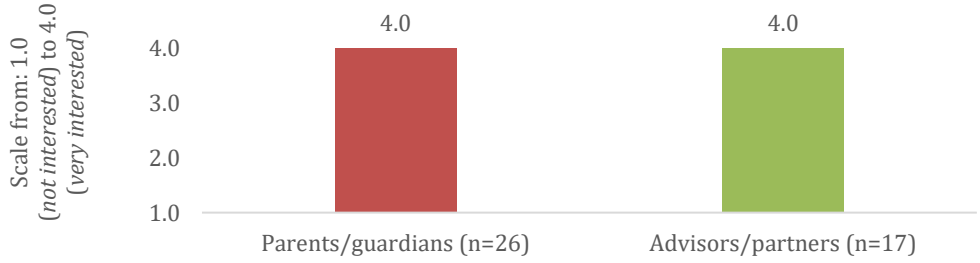
- *Youth: I'm not interested in doing hands on activities but I love learning so it would be better and more comfortable for me to talk to someone.*
- *Youth: It's boring.*
- *Parent/guardian: Depends on family history (influences, interest).*
- *Advisor/partner: Youth should be prompted to teach the games/activities to their elders … to engage them*
- *Advisor/partner: Relate the activity to something they do anyway, like cooking, eating, sleeping, and working, and make short videos about how they relate to brain health. Have the activity be girl-led.*
- *Advisor/partner: Family time is important to Latinos. Kids want to do more with their families, but parents get home tired at the end of the day, and might struggle to find the time to do these activities with their kids.*
- *Advisor/partner: Many Latino parents don't have lengthy formal education and may not be equipped to help student with homework assignment, family guide activity; low literacy among older Latinos caring for Latino youth - must be explored further*
- *Advisor/partner: Depends on the activity and if the content is something the parent would feel comfortable discussing …*
- *Advisor/partner: Some parents will need coaching on how to participate in the activity with their children -- they may not have had access to enough schooling to do similar activities themselves, or they may expect the "experts" to guide the activities.*
- *Advisor/partner: I think families will be very interested in learning more about what their kids have been learning, but I'm not sure how many will actually do hands-on activities at home.*
- *Advisor/partner: … I think it is easier for families to learn about these issues in a group setting. I'm not sure families will feel like they have the capacity to do the activities at home around topics that seem scientific and medical but also, I'm not sure they will have time among such busy schedules to do activities without an incentive. Maybe having activities similar to a board game of some sort that can be fun or having an app or other technologically focused activities might be more useful.*

4.2 Parent/guardian interest in tip sheets

Parents/guardians and advisors/partners were told that TPT was considering making tip sheets for the Family Resource Guide that would provide information about brain diseases such as Alzheimer's, epilepsy, and depression. Parents/guardians were asked to rate their interest in reading these types of tip sheets on a scale from 1.0 (*not interested*) to 4.0 (*very interested*). Using the same scale, the advisors/partners were asked to rate how interested they thought the parent/guardian target audience would be in reading these types of tip sheets.

Figure 44 shows that both groups thought they or the parent/guardian target audience, respectively, would be very interested in reading this type of proposed tip sheet.

Figure 44. Median ratings of parent/guardian interest in the Family Resource Guide tip sheets



When invited to elaborate on their ratings, parents/guardians and advisors/partners shared a range of comments about why the target parental audience may or may not be interested in the tip sheets. Examples of their responses are below:

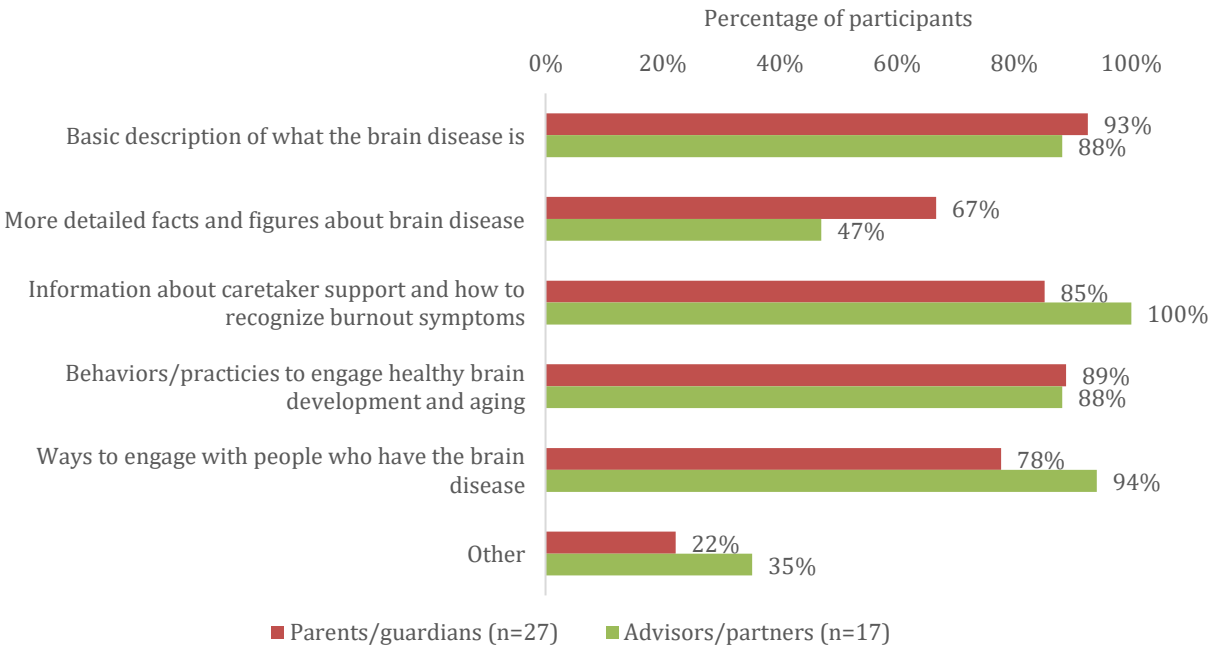
- *Parent/guardian: It's always good to learn and the information is good to educate ourselves of these terrible diseases.*
- *Parent/guardian: Talks to learn more about behavior and the brain.*

- *Advisor/partner: I always like tip sheets as a handy resource. I would suggest tip cards or magnets - something that can be easily displayed, carried in a purse or kept in the car so the information is kept handy for those who are most interested or in need. I'm thinking for the depression and epilepsy information. If just about the brain, a full tip sheet (one pager) with visuals would be good for ongoing learning and longer-term use.*
- *Advisor/partner: They would want to take it home to share it with their family members.*
- *Advisor/partner: [I think they would be] very interested, particularly among families with a personal connection. I think Alzheimer's and Depression would have the highest interest, with some interest in epilepsy but more narrow audience*
- *Advisor/partner: Great to have supplemental information; make sure it is easy to understand and written at a 6th grade level. How can you tailor this information for communities?*
- *Advisor/partner: Any information of these diseases would be empowering.*
- *Advisor/partner: This could help break the stigma of mental illness in Latino households.*
- *Advisor/partner: Watching a video and listening to a presentation are good tools, but a written tip sheet, in both languages, provides a tool that doesn't depend on understanding what they hear (language or content), and is also something they can read later and share with others.*
- *Advisor/partner: I think that they SHOULD be interested, but they are busy and may ignore cause it "won't happen to us". But hopefully, they will keep the info and file it away somewhere in case they ever need it. The team should actually go over the content before sending it home so that the parent will have at least heard the info, even if they never read it again.*
- *Advisor/partner: We need to remember that many Latinx immigrants have limited or low literacy, so translating a fairly academic fact sheet won't make the information automatically accessible.*
- *Advisor/partner: I'm wondering why you'd need one. Depends on information you want to list (websites, phone numbers, causes?). I feel that one single piece of paper would be misplaced and not used.*
- *Advisor/partner: I like using handouts, but some educators feel they are not read thoroughly, especially individuals with low literacy levels. I think as long as you have resources handy or a website available instead to refer to.*
- *Advisor/partner: I don't think families make connections between Alzheimer's and their own children. I am not sure about epilepsy. I wonder if families connect depression with suicide and thus don't want to bring up the topic. (The idea that if you talk about suicide with someone, they are more likely to take action.)*

4.3 Suggested tip sheet topics

Figure 45 shows that more than half of the parents/guardians were interested in each of the potential topics proposed for the Family Resource Guide tip sheets, and that about half or more of the advisors/partners thought that parent/guardian target audience would be interested, in each case.

Figure 45. Topics participants suggested including in the Family Resource Guide tip sheets



Elaborations from parents/guardians and advisors/partners who selected *other* are below:

- *Parent/guardian: Food for the brain.*
- *Parent/guardian: Tip sheets for grandparents or parents to talk with grandkids when a grandparent is affected by Alzheimer's or a parent is affected by depression.*
- *Parent/guardian: Tips on how to strengthen the brain*
- *Parent/guardian: Various professionals to turn to for help understanding these diseases.*
- *Parent/guardian: Explain the different career paths in this area/college degrees, etc.*
- *Parent/guardian: ADD, ADHD, OCD, etc.*
- *Advisor/partner: Tips for getting help for people dealing with depression or other conditions*
- *Advisor/partner: Misconceptions, prescription drugs*
- *Advisor/partner: How to make a difference - career paths*
- *Advisor/partner: Preventions if any or is it hereditary*
- *Advisor/partner: How to seek help if affected by one of these diseases*
- *Advisor/partner: Depression, epilepsy, Alzheimer's - the actual diseases with causes, treatments, coping methods and resources.*

4.4 Potential parent/guardian interest in documentary clips

Advisors/partners were told that the *BRAINedu* team was considering pulling together clips from documentaries about Alzheimer's, epilepsy, and depression that had been featured on public television programs. They were also given short descriptions of two possible programs from which TPT might select clips: *SEIZED: Inside the Mystery of Epilepsy* and *DEPRESSION: Out of the Shadows*.[16] Next, advisors/partners were asked how interested they thought the parent/guardian target audience would be in watching these types of clips at home, using a scale from 1.0 (*not interested*) to 4.0 (*very interested*). In general, advisors/partners thought this audience would be very interested (median rating 4.0) in watching these types of clips at home.

Examples of the responses advisors/partners shared when invited to elaborate on their ratings are provided below. As the examples show, some thought the parent/guardian target audience would be interested in these types of clips, others were less certain and/or commented on specific subjects they thought might be of particular interest, and one recommended an additional media resource.

- *I feel that parents that being their children to this type of program are willing to learn more to assist their youth.*
- *I think they'd be moderately interested after participating in the BRAINedu program, provided it provides the right context and fosters that interest in them learning more and keeping an open mind. It may allow them to realize that some of the behaviors of close family members (or their children) are not just things that they "need to get over with" with just hard work but will need outside help, and medical support.*
- *Both [films] are very relevant and I think would be of high interest to families. (the Depression video might be of greater interest because the issue is so widespread, particularly among teens; epilepsy video might be of interest to a more narrow audience)*
- *Mental illness is scary and hard to talk about. providing a ready-made format where people just have to watch is good. they don't even have to discuss after the movies if they don't want to, but they will still have learned something. The hard thing for me is limiting to only these topics --- there is also concussion, ADHD, Alzheimer's, etc. that needs discussing*
- *I think many people have been impacted by mental illnesses and want to learn more. But we don't call depression a disease.*
- *While interesting, it's a bit of a sad subject matter.*
- *While I think they will be interested, I wonder if they will have the dedicated time to watch these videos because many are working several jobs or get really busy with the kids and home life. If possible, I would suggest sessions where refreshments are provided, the youth are doing activities around the topic, and the parents/guardians can watch the videos (maybe 2 each time) and have an opportunity to react to what they watched. I think watching the videos and reacting with other parents/guardians will ensure the information has greater impact on people.*

[16] Parents/guardians who participated in the front-end evaluation were not asked about the documentary clips, as session time was limited.

- *Families are terribly busy these days and if they watch TV, they might be doing it for relaxation and entertainment. What about anxiety? This seems to affect many teen girls, and families are not often equipped to handle this in a healthy way … I think anxiety is a big issue for teen girls. If it cannot be addressed, it can lead to self-medicating, self-injury, unhealthy relationships with food, etc. Girls may not realize that they have anxiety.*
- *It depends on what is driving them to participate/watch. Is it part of an assignment? Will they be asked for feedback or to be engaged online or within the program?*
- *They would need to be available in Spanish and view-able on a phone to really be accessible. [Also,] I am really concerned that the "Out of the Shadows" video will reinforce misconceptions about mental illness by primarily presenting people from the severe end of the spectrum.*
- *Have you considered the Nova series: The Brain? it's really engaging!*

4.5 Topics of interest to parents/guardians

Finally, the parents/guardians and advisors/partners were asked to consider three brain diseases: Alzheimer's, epilepsy, and depression. Parents/guardians were asked what about these diseases they were interested in learning more about, and advisors/partners were asked what they thought the parent/guardian target audience would be interested in.

4.5a Alzheimer's

Figure 46 shows that, among those who shared a response, parents/guardians most often expressed interest in learning about the causes and/or prevention of Alzheimer's (64%), signs/symptoms/diagnosis (29%), and treatment of the disease (29%). Meanwhile, the advisor/partner group most often thought the parent/guardian target audience would be interested in these three topics as well (81%, 63%, and 63%, respectively). Examples of participants' specific comments about these and other areas of interest are presented in Table 18, on the following page.

Figure 46. Parent/guardian interest in aspects of Alzheimer's

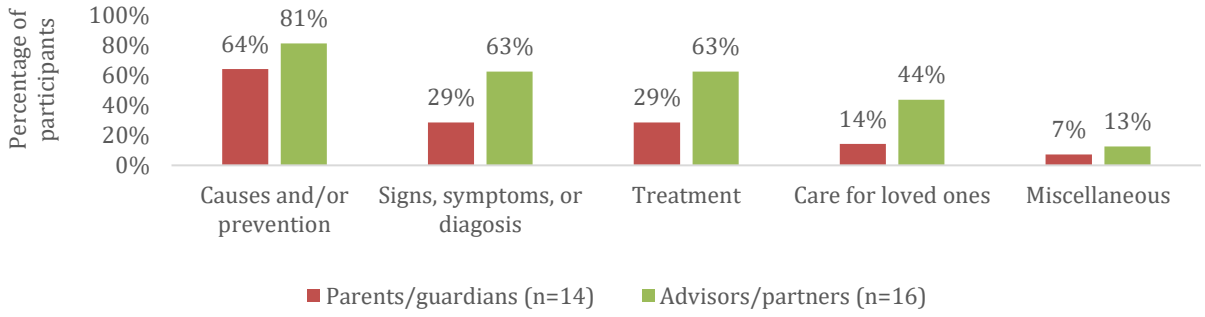


Table 18. Participant comments on parent/guardian interest in aspects of Alzheimer's

Parent/guardian (n=14)	Advisor/partner (n=16)
Causes and/or prevention (64%)	***Causes and/or prevention (81%)***
• *How does it occur?*	• *What causes it?*
• *How it happens …and ways to avoid naturally*	• *Causes … as well as if Latinos are more or less likely to develop it.*
• *Can anything be done early to prevent it?*	• *Who does it affect?*
• *Interested [in] … knowledge on prevention.*	• *Prevention*
• *What leads us to have it at an older state, how can we overcome it?*	• *Why did grandma get so forgetful? Will it happen to me? How can I prevent it?*
• *Preventative measures … hereditary influences*	
• *How to prevent it. Do they know why it happens? Explain how it affects different people.*	***Signs, symptoms, or diagnosis (63%)***
	• *How to identify it*
Signs, symptoms, or diagnosis (29%)	• *What is it? … Misconceptions (they may not know about).*
• *How to know you have it*	• *Signs and symptoms*
• *… ways to properly diagnose*	• *What are the signs I should look for? … What is the difference between Alzheimer's and dementia?*
• *I would like more information.*	• *Quick Facts about Alzheimer's. Resources.*
	• *Differences between early onset - various stages*
Treatment (29%)	***Treatment (63%)***
• *Interested on developments for a cure …*	• *Treatments available.*
• *Current treatments*	• *What are we doing to help cure it?*
• *Cures*	• *New research and possible cures.*
	• *What can doctors do to help? Is there a cure?*
Care for loved ones (14%)	***Care for loved ones (44%)***
• *What resources are there for families dealing with a loved one that has Alzheimer's?*	• *Support for those who need to manage someone with Alzheimer's disease.*
• *How can we help family members cope with Alzheimer's?*	• *How can I help someone with this problem*
	• *Care-taking best practices*
Miscellaneous (7%)	• *How that affects families*
• *I've never heard of that*	• *What can I do to help my family member? What can I do to take care of myself as I help my family member?*
	Miscellaneous (13%)
	• *Very interested; it's very likely that many participants will have a family member or friend dealing with Alzheimer's*

4.5b Epilepsy

Figure 47 shows that, among those who shared a response, parents/guardians most often expressed interest in learning about the signs/symptoms/diagnosis of epilepsy (46%), followed by the treatment of the disease (38%). At the same time, the advisor/partner group most often thought the parent/guardian target audience would be interested in signs/ symptoms/diagnosis (64%) and causes and/or prevention (57%). Examples of participants' specific comments about these and other areas of interest are presented in Table 19.

Figure 47. Parent/guardian interest in aspects of epilepsy

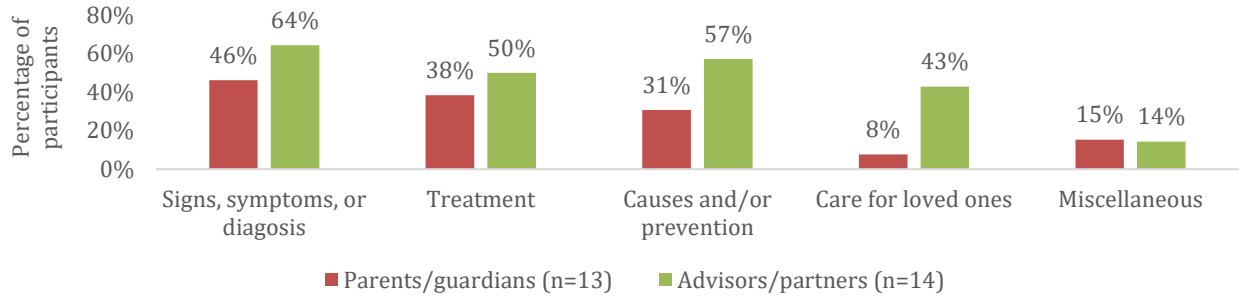


Table 19. Participant comments on parent/guardian interest in aspects of epilepsy

Parent/guardian (n=13)

Signs, symptoms, or diagnosis (46%)

- *I would love to learn more about epilepsy and how it works.*
- *How to know you have it*
- *What is it?*
- *I would like to know more about it.*
- *Proper diagnosis*
- *Early diagnosis*

Treatment (38%)

- *What new improvements have been made to treat it?*
- *How to medicate to help not have seizures.*
- *How to help it? Is there a cure?*

Causes and/or prevention (31%)

- *What causes it. Can video games affect it.*
- *Is there a choice?*
- *Can anything be done to prevent this?*
- *Preventative measures … hereditary influences*

Care for loved ones (8%)

- *How impacts family and those that help them.*

Miscellaneous (15%)

- *I've never heard of that*

Advisor/partner (n=14)

Signs, symptoms, or diagnosis (64%)

- *What it is?*
- *What can cause it? … Common misconceptions.*
- *How this disease affects daily life.*
- *What is happening?*
- *How to identify*
- *Symptoms*
- *Quick facts, resources*

Causes and/or prevention (57%)

- *What causes epilepsy?*
- *Who is affected by it?*
- *Who it affects*
- *Why does it happen to some people and not others? Will it happen to me?*
- *Causes … Is it really triggered by flashing lights. What else can cause an attack?*
- *How to … prevent*

Treatment (50%)

- *Treatments.*
- *How do the drugs help?*
- *What is being done to treat it?*
- *Is there a cure?*

Care for loved ones (43%)

- *Support for those who manage someone with epilepsy.*
- *How can I help someone with this problem?*
- *How to help if they come across someone with it*
- *How that affects families, what happens to those who are afflicted in their lives*

Miscellaneous (14%)

- *Yes this seems mysterious and has a mystique to it.*
- *Some interest; might be of greater interest to those with a personal connection*

4.5c Depression

Figure 48 shows that, among those who shared a response, parents/guardians most often expressed interest in learning about the signs/symptoms/diagnosis of depression (53%), followed by causes and/or prevention (40%). At the same time, the advisor/partner group most often thought the parent/guardian target audience would be interested in signs/symptoms/diagnosis (71%) and the treatment of the disease (59%). Examples of participants' comments about these and other areas of interest are presented in Table 20.

Figure 48. Parent/guardian interest in aspects of depression

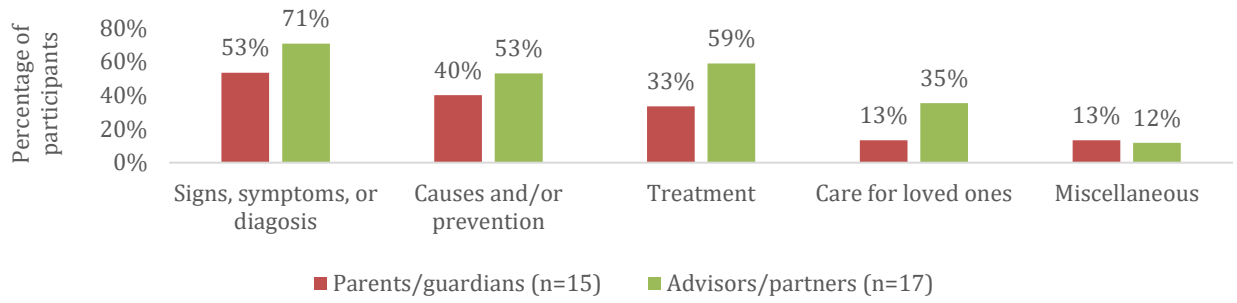


Table 20. Participant comments on parent/guardian interest in aspects of depression

Parent/guardian (n=15)	Advisor/partner (n=17)
Signs, symptoms, or diagnosis (53%)	***Signs, symptoms, or diagnosis (71%)***
• *More education! It is not a taboo. Needs to be talked about.* • *How is this a disease?* • *How to spot someone suffering from it.* • *How it can be seen.*	• *How does one identify depression?* • *This one really needs to be explained as an actual disease and not just overall sadness.* • *How to I recognize the difference between depression and just "normal" sadness?* • *How is this a disease? Many might not consider many depressions as a disease so it would be interesting to them.* • *Not sure. Too many people think that if someone tries hard enough, they can overcome depression. So, maybe learning that it is a disease.* • *What are the signs I should look for?*
Causes and/or prevention (40%)	***Treatment (59%)***
• *What leads our brain to overthink and cause depression?* • *…the reasons why depression is related to the brain.* • *How can an active happy person have this?* • *Can it happen to anyone? … How to prevent it.* • *Can anything be done to prevent it?*	• *Misconceptions about … treatment? How does one recover from depression or manage depression? What treatments are available?* • *How to cope with it* • *What do I do if I feel depressed? Are drugs the only answer? How might nutrition, exercise, positive behaviors, therapy help?* • *Treatment options and paths to healing* • *What is being done to prevent/treat it*
Treatment (33%)	***Causes and/or prevention (53%)***
• *I suffer from depression and would like coping skills.* • *Future ways of treatment and different treatment options vs medications and various professionals that can help.* • *Is there a cure?*	• *Causes of depression* • *Who can suffer depression? Misconceptions about causes?* • *What causes it, can my children suffer from depression, is it my fault?* • *How can they prevent it,*
Care for loved ones (13%)	***Care for loved ones (35%)***
• *How to help someone who suffers from it?* • *… what to do to help the sufferer or if its oneself, to know what to do*	• *How can I help someone who I think might be depressed?* • *… how to help others that have it.* • *Emotional toil/effects it has on family members of someone suffering from depression.*
Miscellaneous (13%)	***Miscellaneous (12%)***
• *Why?*	• *Yes. I believe this would extend into discussion about suicide, post-partum depression and PTSD.* • *Very interested - particularly for teens and their families, who will likely know someone dealing with depression.*

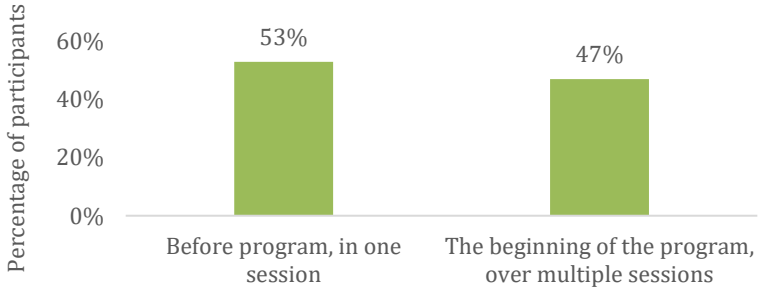
Part 5: Feedback on the training workshops

Advisors/partners were invited to provide feedback on the preliminary plan for the six hours of *BRAINedu* online training workshops.[17] They were informed that TPT would design a professional development program for informal educators in alignment with the four *BRAIN 2025* pillars of raising awareness of brain structure, brain connections, the brain in action, and brain activity linked to behavior. They were also told that the online training workshops would provide instruction on how to do the *BRAINedu* hands-on activities, best practices for engaging Hispanic families, and general program implementation, and they were given information about the proposed workshop elements.[18] Following this overview, they were asked to provide feedback with respect to the workshop timing and number of sessions, the online training approach, the need for workshop preparation, and follow-up activities and support.

5.1 Suggestions regarding timing and number of sessions

Figure 49 shows advisor/partner suggestions for the timing of the training workshops and the number of sessions, assuming they will include six hours of online sessions. The advisors/ partners were fairly divided on this question, with just over half suggesting TPT hold one six-hour session before the program begins (53%), and just under half suggesting the training workshops take place in the beginning of the program, over multiple sessions (47%).

Figure 49. Advisor/partner suggestions regarding timing and number of sessions (n=17)



When asked to explain their choice, those who selected *Before program begins, in one session* most often cited issues of workshop scheduling and program planning. Those who selected *In the beginning of the program, over multiple sessions* were asked how often they thought the workshops should occur and why; this group generally suggested sessions of one or two hours, to help with the retention of new information. The advisor/partner responses in both areas are shared on the following page.

[17] One of the advisors/partners did not complete this section of the survey.

[18] As further context, advisors/partners were told that the project team was thinking about including the following elements in the training workshops: a project overview; an introduction to TPT's Engaging Latino Families guide; information about using Flipgrid or non-video tools in the reflection activity; a review of TPT's Family Fiesta guide; guidance on locating Latino role models and mental health care workers; tips on using the role model videos; and, for each of the four curriculum modules, information about the science content and two activities, an additional career exploration activity (role model/role model video), and student reflection.

Before program begins, in one session (53%)

- *I prefer to have all the information I need before I start planning. Otherwise, I may need to wait around trying to get the information I need as I'm planning. That's when I realized that I missed a step or don't have what I need to answer questions from my audience.*
- *There could be information in the later sessions that is needed right off the bat. Train the educators fully and completely before starting.*
- *So they can better understand the big picture of the entire program. Allow them to review each piece before each type of activity too.*
- *I think it will be easier for people to understand the overall arc if they are fully trained before it begins. One day is easier to set aside in a schedule than multiple blocks of time.*
- *Educators should be fully aware of overall program, benefits, desired goals, etc.*
- *From my perspective, one session improves the likelihood of the agreement to participate. Programs are more likely to commit to one training day in person*
- *Easier to schedule, will have the big picture*
- *It would provide participants with the overall big picture as well as the details of what each session will entail. Provides time for the educators to plan for their particular audience.*
- *I think it helps secure the commitment of the educators/partners, by knowing what is expected and allows them to plan for best implementation of the program.*

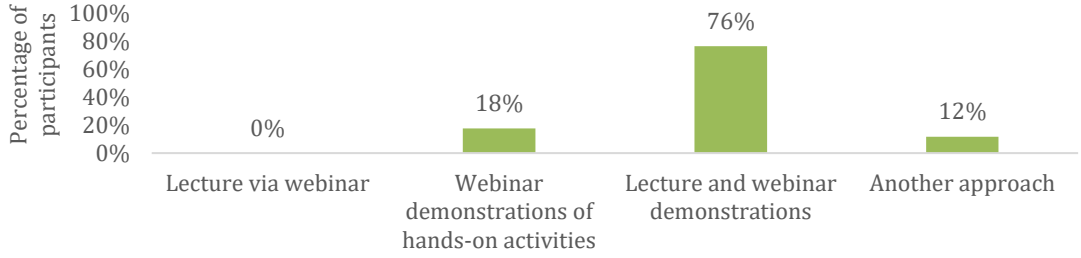
In the beginning of the program, over multiple sessions (47%)

- *I think the answer options are limited. My suggestion would be to have a session before the program begins and then multiple sessions when the program begins so there will be prep and ongoing sessions. I recommend 1 hour a week for 6 weeks for ongoing support/learning while implementing program. Adult learning research says that longer sessions cause people to lose interest and they don't retain as much information.*
- *People are so busy, I would recommend spreading this out within one month.*
- *Two hours per week so it will not feel overwhelming.*
- *Two hours per week to make sure the depth of knowledge can be gained.*
- *2 Hour max. It just helps spread out the information and make it so it can be more easily absorbed.*
- *Either 6 1-hr sessions or 3 2-hr sessions; it can be difficult to set aside a big chunk of the day for training and it's also difficult to maintain attention for an online training for an extended period of time.*
- *One hour per week is ideal and repeating the workshops makes it easier to recall information instead of one long workshop where information recall can be lost after a week if not practiced.*

5.2 Most effective online training workshop approach

Figure 50 shows that advisors/partners most often thought a combination of webinar lectures and demonstrations of the hands-on activities would be most effective in preparing educators to implement neuroscience programming at their organizations (76%), while a smaller group pointed on to webinar demonstrations of hands-on activities (18%) (and none suggested only using lectures via webinar).[19]

Figure 50. What advisors/partners thought would be the most effective online training approach (n=17)

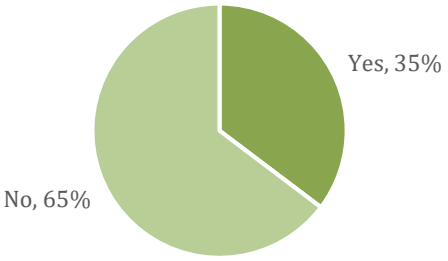


[19] The two advisors/partners who recommended another approach suggested: "*It would be cool if there could be an engaging webinar and if participants can do the activity along with the presenter. People should watch in cohorts whenever possible*" and "*Possibly also an initial in-person session because sometimes you need the focused time away from other responsibilities and this is a lot to learn and prepare for.*"

5.3 Feedback regarding anticipated prep work

At the time the survey was developed, TPT thought the training workshops might involve two to three hours of additional requirements, such as prep work or readings. Figure 51 shows that about a third of advisors/partners had concerns about this anticipated prep work (35%). The concerns expressed by the group are shared below, including recruitment, funding/educator pay, motivation, time, and the challenging nature of the material.

Figure 51. Whether advisors/ partners had concerns about workshop prep work (n=17)

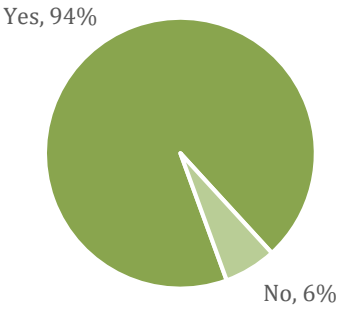


- *How will recruitment happen? Is it an already interested population who have sought out additional resources? Is it embedded into required activities? Will they receive a certificate of training for all components?*
- *Are the teachers paid? How are the selected and by what are they motivated? Will they have any guidance to help them overcome their fears and stereotypes if too much of the learning is self-executed?*
- *It will be difficult for programs to pay staff for this much PD time, and so educators will be less inclined to commit to begin with.*
- *How many people at a site need to go through this full training? Do sites receive funding to support site leaders' participation? We are part of multiple networks that increasingly require substantial time commitments on the part of instructors and want to be prepared for ensuring that instructors complete all requirements.*
- *Time is always limited.*
- *Will the 2-3 hours prep time take place before the program begins or for each session? The topics are heavy and will require the facilitators to be versed and to be culturally aware and sensitive so they can adapt to the audience in order for success.*

5.4 Anticipated educator interest in a virtual Q&A space

Figure 52 shows that nearly all of the advisors/partners thought *BRAINedu* educators would like to have access to a virtual space for a written Q&A, where project leaders could respond directly to their questions (94%). As a group, the advisors/partners suggested the following platforms, and elaborated on a few of their recommendations. Facebook ("*Hopefully someplace we are already using (FB closed group?). Having another login/platform to keep track of makes it hard but if that's the only option then [it's] necessary.*") and Slack ("*A tool such as Slack might works, as it allows for multiple 'channels' for group discussions, space to upload or access documents, plus the ability to direct message project leaders about local issues.*") were each mentioned by a few of the advisors/partners, while other suggestions included: Google Drive, freeforums.net, Canvas, Zoom, Go To Meeting, Adobe, WebEx, a Yahoo group listserv, and an unspecified listserv ("*in which program leaders or other educators could chime in?*").

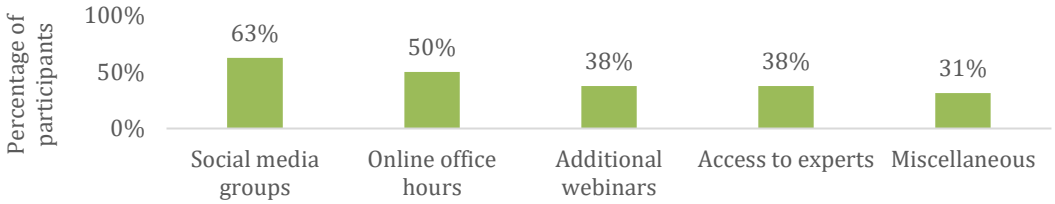
Figure 52. Whether advisors/partners thought educators would be interested in a virtual Q&A space (n=17)



5.5 How TPT can best support educators after the training workshops

Figure 53 shows advisor/partner suggestions for how TPT could best support educators after the workshops/during their programs. Among those who shared a response, advisors/ partners most often pointed to social media groups (63%) and online office hours (50%). Examples of their responses in these and other areas are shared below the chart.

Figure 53. How advisors/partners thought TPT could best support *BRAINedu* educators during their programs (n=16)



Social media groups (63%)

- *Social Media forum*
- *A private Facebook group or the freeforum to share what worked and what didn't and other ideas they had?*
- *Social media groups connecting the partner educators*
- *Helping to develop the community of educators engaged in the project through social media*
- *I recommend staying connected with educators through … social media groups to understand their needs*

Online office hours (50%)

- *Online office hours*
- *Maybe office hours. With [a] new curriculum, you never know what issues you will run through until you are doing the program*
- *I recommend staying connected with educators through office hours … to understand their needs.*

Additional webinars (38%)

- *Quarterly webinars that provide space/time for programs to communicate as a cohort*
- *Webinars*
- *Webinars on different themes, etc.*

Access to experts (38%)

- *In my experience, nothing compares to being able to talk to someone on the phone. Could be through scheduled group and individual check-ins, with the option of being able to contact someone to discuss any challenges as they arise. It helps to sort out problems before they become unsolvable.*
- *Helpline*
- *… a number they can text immediately with help.*
- *Will TPT have advisors (mental health professionals maybe) who can help answer questions we may get during our program (related to mental health)?*
- *Access to the people profiled.*
- *Connection to subject matter experts to whom they can defer tough questions from the kids (and themselves) - having this might help remove some fears about the subject matter*

Miscellaneous (31%)

- *Overall, the materials and videos are all useful information but I want to remind and caution that educators need prep and support to effectively deliver the information and that we need to be sensitive to families that the information is new, scientific and medical so content/implementation might need to be continuously adapted to ensure effective delivery, as well as to ensure that individuals retain the information and can connect it to their lives and experiences.*
- *Also, trainers and facilitators will need support, not just tips, for recruiting role models and connecting with health professionals.*
- *Keep a log of questions and answers others have asked. It helps to know that other people have similar questions. Sometimes, facilitators don't think of the right question until the night before the event. Make sure to have as much information available in several easy to access formats.*
- *A website hub for all the resources being developed.*
- *Technical assistance.*

Discussion

This front-end evaluation of *BRAINedu* presents feedback from the project's primary public audiences (Hispanic middle school youth and their parents/guardians living in underserved communities) and professional audiences (advisors and partners) on educational deliverables TPT is considering developing as part of its NIH Science Education Partnership Award program grant. To facilitate the participants' review of these deliverables, the evaluation process incorporated a set of sample materials prepared by TPT, including two sample role model profile videos and a curriculum content framework, with some variations in the materials reviewed by each group, as determined by the target audiences for each resource.

Overall, the participants' responses indicate that the proposed *BRAINedu* deliverables have the potential to engage, interest, inform, and motivate the project's target audiences of Hispanic middle school youth and their parents/guardians in the ways envisioned by TPT. At the same time, caution should be taken in drawing broad implications from the findings given the inherent goals and limitations of front-end evaluations, with the evaluation design in this case relying on a budget-limited sample of 81 participants to provide in-depth feedback for the purpose of informing the development of the *BRAINedu* materials, as opposed to providing a full assessment of their impact, as is characteristic of a summative evaluation.

Below we look across the findings that emerged in numerous places to briefly summarize themes and issues that may help inform TPT's further development of the project deliverables. Where appropriate, comments and suggestions are given in the spirit of assisting the project team's brainstorming, although the ideas presented are certainly not the only way to respond to the participants' feedback.

Extent to which participants represented the *BRAINedu* target audiences

Recognizing the limitations inherent in relying on a budget-limited purposive sample, the 63 youth and parents/guardians that participated in the front-end evaluation generally represented the project's target demographic (as described in the NIH proposal) of: "*Hispanic middle school students and their families in underserved communities*." Specifically:

- **Inclusion of Hispanic or Latino families and Spanish speakers:** All of the participating youth and parents/guardians (100% each) were of Hispanic or Latino origin. In terms of Spanish language use, two-fifths of the parents/guardians chose to complete the evaluation activities in Spanish (41%), while all of the youth chose to complete the evaluation in English (100%).

- **Focus on underserved communities:** All of the participating youth and parents/guardians resided in underserved communities as a function of the *BRAINedu* partner locations, the partners' own target audience organizational focus, and the front-end recruiting criteria the partners followed to organize the evaluation sessions.

- **Middle school age range:** Participating youth ranged in age from 10-16, while the parent/guardian group ranged from 27-50. The mean ages of the groups were 12 and 40.

- **Gender balance**. The evaluation recruiting guidelines strove for equal gender balance, although due to site constraints there were more females than males among youth (62% female) and parents/guardians (83% female). There did not appear to be notable differences in the responses from male and female participants in the front-end evaluation, other than a few responses suggesting that some of the male youth participants would have liked to review sample role model profile videos featuring male STEM professionals. It is important to keep in mind, however, that the gender balance was somewhat uneven and the sample itself was small.

The 18 advisors/partners who participated in the evaluation worked in diverse fields, including STEM education and specific STEM fields. Almost all, however, indicated they had experience implementing, developing, or evaluating/researching STEM programs for Hispanic middle school youth and/or their parents/guardians from underserved communities. As many of the front-end evaluation questions asked the advisors/partners for their opinion on how the *BRAINedu* target audiences were likely to respond to the proposed project resources, the evaluation approach relied on the advisors/partners being able to draw on their direct knowledge of and experience working with Hispanic middle school youth and parents/guardians from underserved communities. While the findings indicate that the advisors/partners' responses were often generally in sync with participating youth and parent/guardian responses – with exceptions noted throughout this front-end evaluation – it is important to keep in mind that the advisors/partners were asked to consider the *BRAINedu* target audiences as defined by TPT, as opposed to, for example, the specific participants in the evaluation or middle school youth and their parents/guardians in general.

Prior knowledge of and interest in the five topics being considered for *BRAINedu*

At the beginning of their evaluation sessions, youth and parents/guardians were asked to rate their knowledge of and interest in five topics being considered for *BRAINedu*. Specifically:

- With respect to knowledge, parents/guardians thought they knew a little about careers or jobs in neuroscience, and youth indicated they knew nothing about this topic. Additionally, youth and parents/guardians generally thought they knew a little about brain structure, brain connections, brain activity, and the brain and behavior. Based on the informal short five-item quiz both groups completed on topics relating to brain structure and function, none of the youth (0%) and only one parent/guardian (3%) answered all five questions correctly. Although a larger percentage of parents/guardians shared a correct response for each of these five questions, most participants in each group correctly answered that the brain is divided into several parts that perform different functions (85% youth, 93% parents/ guardians) and half or more correctly answered that the brain is mostly made of neurons (50% youth, 69% parents/guardians). The remaining three questions about brain function and connections were answered correctly by two-fifths or less of each group.

- With respect to interest, youth and parents/guardians generally expressed moderate interest in: careers or jobs in neuroscience, brain structure, brain connections, brain activity, and the brain and behavior.

- Throughout their surveys, some advisors/partners explained that they thought youths' interest in neuroscience topics would likely grow during their involvement in *BRAINedu*, particularly once they saw the subject's relevance to their lives. For example: "*From my experience with youth development, this is not a topic area that youth might be totally excited about at first. However, with the right approach such as terms they understand and hands on implementation, they will be marveled at what they learn and how it relates to their lives*" and "*I think for most Hispanic kids in underserved areas might see neuroscience as something new and not easily relatable at first, so this might make it mysterious to them and will only moderately interest them. On the other hand, if one presents something a bit more relatable such as how hitting their head on a soccer ball (assuming they like soccer) or drinking coffee (many Hispanics have coffee as part of their diet and after dinners) can affect their brain then neuroscience becomes a bit more interesting*."

The above knowledge and interest findings are positive in the sense that they suggest, overall, that *BRAINedu* audiences may be generally interested in the proposed topics, about which they have relatively little knowledge to date.

Youth, parent/guardian, and advisor/partner feedback on the role model profile videos

The youth and parents/guardians often shared similar feedback on various aspects of the role model videos, and their feedback was also often in sync with what advisors/partners expected as they reflected on the *BRAINedu* audiences. In some instances, though, participating youth were slightly less positive than advisors/partners anticipated for the youth audience. Specifically:

- **Overall appeal:** Overall, the youth somewhat liked and the parents/guardians generally liked the two sample role model profile videos. Both groups further indicated that they would like to see similar videos about people who work in neuroscience, although parents/guardians were more positive about this aspect than were youth. The advisors/ partners generally expected that the parent/guardian audience would share positive feedback in these areas; however, they expected the videos' overall appeal among youth to be somewhat more positive than the feedback shared by participating youth.

- **Pacing, density, and role model focus:** Youth and parents/guardians generally thought the sample profile videos' pacing, amount of information, and level of scientific explanations were all about right. They also generally thought the videos struck the right balance in terms of the amount of focus they gave to the role models talking about their work, doing/showing their work, and featuring their lives outside of work. The advisors/ partners also generally anticipated that the youth audience would find each of these aspects of the videos about right.[20]

- **Appeal and relatability of the role models:** Youth generally liked the role models and were interested in seeing similar role models in the new neuroscience videos, although not to the extent advisors/partners thought would be the case among the youth audience. Youth were also generally neutral about whether they could or could not relate to the role

[20] Advisors/partners were not asked to rate these aspects from the perspective of the parent/guardian audience.

models, whereas advisors/partners generally thought the youth audience would relate to them. Parents/guardians generally liked the role models, related to them, and were interested in seeing similar role models in the new neuroscience videos, while advisors/ partners anticipated this would be the case among the parent/guardian audience.

- **Language recommended for the new *BRAINedu* videos:** The majority of youth (62%), parents/guardians (52%), and advisors/partners (94%) suggested TPT make some videos in English with Spanish subtitles and some in Spanish with English subtitles. Some participants felt this approach would help the materials reach the largest audiences possible (as one youth noted, "*I think some people understand Spanish better than English but some understand English better, so some of both would be best*"), and a few thought incorporating Spanish would indicate familiarity and inclusion to potential viewers (for example, as explained by one advisor/partner, "*I [believe] youth by default of being in the school system will speak English hence I think it's appropriate to show videos in English. However, for many Hispanic youth parents their first language is not English, and they might not easily relate to English speaking professionals. The Spanish videos provide a sense of 'these are our people' that English speaking videos cannot provide. Hearing their native tongue I believe gives them a sense of familiarity*").

- **Whether the featured neuroscience professionals should talk about their personal experience with mental illness in their families:** The majority of youth (56%), parents/guardians (89%), and advisors/partners (100%) thought this subject should be included in the *BRAINedu* profile videos. Some of the participants explained that this would help make the role models more relatable (as one parent/guardian put it, "*It brings credibility to the role model and makes them more tangible as real people. It might also be relatable to many going through similar situations"*). Additionally, as a few participants noted, hearing about a role model's experience with mental illness might help reduce the negative stigma associated with mental health (for example, as stated by one advisor/partner, "*The research shows that the best way to change public attitudes is through sharing personal stories*").

- **Questions and curiosities about the four segments:** Youth, parents/guardians, and advisors/partners shared a wide range of questions or curiosities about the four segments of the profile videos. Specifically:

  - ***My job (at work)* segment**. Youth most often had questions or curiosities about the challenges or difficulties the role models face at work (50%) (for example, "*Is it hard helping people with brain problems*?" and "*Where did you struggle the most? Who do you go to when you struggle?*"), while parents/guardians most often expressed interest in the requisite education or skills (52%), including where the role models studied, what they majored in, and how long it took them to receive their degrees.[21] Although smaller groups of youth (21%) and parents/guardians (24%) shared specific questions or curiosities about neuroscience and the role model's work, this was the area where advisors/partners most often thought the youth audience would have questions or curiosities (67%). Thus, this segment of the profile videos likely offers the best opportunity to incorporate aspects of the four curriculum modules (1. Brain structure,

[21] Please see sections 1.7 and 1.8 for details regarding additional responses given by participants when asked about questions or curiosities they thought they would have about the four segments of the profile videos.

2. Brain connections, 3. The brain in action, and 4. Brain activity linked to behavior), as some of the participants' questions/curiosities touched on these topics, as highlighted in the examples below:

- *Youth: How does your nervous system work?*
- *Youth: How do you believe artificial intelligence will affect careers and learning in neuroscience?*
- *Parent/guardian: How do you help people?*
- *Parent/guardian: I would prefer that the professionals explain their profession in more detail. This would help to motivate the children to choose that career.*
- *Advisor/partner: What do they do each day, what does the application of their work mean for people in general*
- *Advisor/partner: How is the movement of my body connected to my brain? Isn't neuroscience about the brain and touching the brain?*
- *Advisor/partner: Can a neuroscientist help prevent or treat kids with depression? Suicide? Addiction? ADHD? What specific careers can help with these problems? What is the latest discovery that you have made? Most exciting?*
- *Advisor/partner: What cool problems can I solve? What cool scientific/technological/medical tools can I use? How can I most help people? How can I personally contribute to fields/problems that need advancement? (many kids will be motivated after observing someone they know with a disorder.....)*

- ***My life (at home)* segment**. Youth and parents/guardians most often had questions or curiosities about how a career in neuroscience impacts the role model's personal life (43% youth, 68% parent/guardian), while advisors/partners also most often thought this issue would be of interest to youth (59%) and parental audiences (86%). In general, participants raised questions about the role models having free time for their hobbies, families, and friends, as well as questions about work-life balance or separating work from other aspects of their lives (as one parent/guardian wondered, "*How do 'shut off' your work day? How do you transition from work to family?*").

- ***Challenges/barriers and solutions/strategies* segment**. Youth most often focused on how the role models overcame challenges (50%) and the challenges they faced at work or in their field (45%). Meanwhile, parents/guardians most often focused on the challenges role models faced at work or in their field (52%), with a much smaller group expressing questions or curiosities about how the role models overcame specific challenges (14%). Advisors/partners most often thought the youth (78%) and parent/guardian audiences (65%) would have questions or curiosities about education challenges, a topic that was addressed by smaller groups of participating youth and parents/guardians.

- ***Advice to youth* segment**. Youth and parents/guardians most often focused on aspects of the neuroscience career path, including necessary skills and education (64% youth, 52% parent/guardian). Advisors/partners also most often thought this issue would be of interest to youth (92%) and parental audiences (77%).

- **Interest in six neuroscience careers:** Overall, youth were moderately interested in six careers being considered for future profile videos: occupational therapist, biomedical/neural engineer, neuroradiologist, neuroscience nurse, neuroscientist, and neurologist/doctor. Overall, parents/guardians were also moderately interested in the first four careers listed above, and very interested in neuroscientist and neurologist/doctor.

- **Desire for information about the role models' jobs/careers:** Throughout their comments about the role model profile videos, some participants thought the sample videos could have benefited from more information about the role models' jobs or careers. Some examples from the participants on this issue are below, including comments from one parent/guardian and one advisor/partner who felt Rebeccah Regner's video focused too heavily on her personal life, and that Amelia Merced's video struck the right balance:

  - *Youth: Not enough information of the neuroscience aspects … scientific explanations were too basic to give me a basic understanding in relation to their field of work, I feel like there was a bigger focus on their personal lives than their work.*
  - *Youth: … it did talk too much about the life and not the work.*
  - *Parent/guardian: Would like to see more of what they do and their real world applications. Videos were kind of basic and not specific to areas of expertise.*
  - *Parent/guardian: [Rebeccah's video], I feel focus too much on her life and not science or explaining her work. [Amelia's video] was perfect balance of both.*
  - *Advisor/partner: … more information about how they perform their job (like in Amelia's video) would be suggested.*
  - *Advisor/partner: I think the videos are excellent as is but if you were going to shift them in one direction or the other, I would shift to incorporate a bit more about their science and showing them involved in different aspects of their work, while still providing a thorough glimpse of their life outside of work.*

- **Preferences among the individual videos featured**: Although participants were not asked to provide individual feedback on the two sample profile videos, they were invited throughout their surveys to point to specific videos as needed to clarify their responses. Although none of the youth indicated a preference for one video or another (other than one who found the subtitles in Amelia's video slightly too fast), a few parents/guardians and advisors/partners seemed to favor Amelia's video for its focus on her career (as detailed in the previous bullet point), her passion for her work as a biologist, her "*energetic and silly*" personality, and/or her relatability (as in, "*I think Amelia's video would be more engaging for youth because of her personality and energy, and because she talks a little bit about it being hard to get to where she is as well as how she managed that. I think parents want to know how their kids can get into these kinds of careers and why it's worth doing a 4-year or Master's degree. I think kids want to see people like them, who grew up in the Midwest, who had barriers they overcame. I don't know how many of the youth I know would connect with [Rebeccah's video] because of the geographical location and the perceived privilege and affluence of the speaker during her childhood*").

Youth and advisor/partner feedback on the curriculum

Youths' feedback on various aspects of the proposed curriculum was often in sync with what advisors/partners expected for the youth audience, although in some cases youth were slightly less positive than the advisors/partners anticipated.[22] Specifically:

- **Overall appeal, clarity, and relatability:** Based on the curriculum content framework they reviewed, youth generally thought they would somewhat like the final curriculum, find it somewhat clear, find it somewhat interesting, find that the content would somewhat

[22] Parents/guardians were also asked to provide feedback on the curriculum, as detailed in Appendix 1. In general, they shared positive ratings about the appeal of the final curriculum, although they thought the amount and density of information would be slightly too high. They also expressed interest in the four topics being considered for the curriculum, and shared a range of questions/curiosities that came to mind for each module.

relate to their everyday lives, and would want to do the activities in the curriculum. Only a few youth elaborated in a manner that could help guide the development of the final curriculum, as in: "*Too much reading*," "*The activities should have more hands-on activity to help understand the brain parts*," and "*It should be more relatable to [our] everyday lives*." Meanwhile, the advisors/partners generally anticipated that these same curriculum elements would be well received by the youth audience, although in most cases their median ratings were higher than those shared by participating youth.

- **Overall organization, use, and likelihood of recommending:** Advisors/partners generally felt the final curriculum would be well organized, easy to use, and that they would recommend it to other educators.

- **Interest in the four topics being considered for the curriculum:** Overall youth were very interested in brain-related diseases and how the brain works/how to keep it healthy, and moderately interested in neuroscience careers and how to discuss and seek support for brain diseases/mental health conditions. Advisors/partners, meanwhile, generally anticipated that the youth audience would be very interested in brain-related diseases and moderately interested in the other three topics. In particular, advisors/partners who elaborated on the issue of neuroscience careers noted that the information might seem "*distant*" or "*disconnected for middle school youth,*" but explained that "*the more we can connect the core concepts to real-life experiences and examples, the better.*" As one advisor/partner noted, "*middle school students think they already know about the brain and the types of careers you can have … they will need to be 'wowed' to be more open.*"

- **Information and science density**: In reviewing the framework, youth generally thought the final curriculum would have slightly too much information and science, and that the level of scientific explanations would be about right, while advisors/partners thought these aspects would each be about right among the youth audience. Although one advisor/partner cautioned that making the curriculum "*overladen with neuroscience content … could be intimidating to facilitators who don't have a science background*," another felt that the best way to assist educators less familiar with the material would be to provide "*more information than not enough*." Other advisors/partners recommended adding topics to the curriculum, such as technology careers and the molecular level of the nervous system, and thus also suggested more information rather than less.

- **Possible hooks to engage youth:** When asked if they if had "…*any ideas about the types of 'hooks' (e.g. kids' habits and practices, preferences, interests, cultural insights, priorities, beliefs, aspects of everyday life, socioeconomic elements, etc.) that TPT might consider to help engage the BRAINedu audience of middle school youth to learn about brain structure and function,*" advisors/partners most often suggested focusing on the brain and health (63%) (including through personal connections, such as "*Interest in helping friends/family who may be dealing with a related condition … Becoming more aware of mental health issues and better prepared to help others seek help if needed*") and/or the brain in action (50%), for example connecting the topic to youths' lives by looking at how the brain responds when one is eating, listening to music, watching TV, or playing video games.

- **Questions and curiosities about the four modules:** Youth and advisors/partners shared a range of questions or curiosities about the four modules proposed for the curriculum. Specifically:

  - **Module 1: Brain structure.** Youth most often shared questions or curiosities about how different parts of the brain work (38%) and the physical structure of the brain (27%). Meanwhile, advisors/partners most often thought the youth audience would have questions/curiosities about how different parts of the brain work (50%), the brain and health (36%), and brain development (36%).

  - **Module 2: Brain connections.** Youth most often shared questions or curiosities about how brain connections work (67%) and breaking, repairing, or building connections (19%). Advisors/partners generally expected that the youth audience would focus on these two areas as well (75% and 25%, respectively).

  - **Module 3: The brain in action.** Youth most often shared questions or curiosities about how the brain functions (35%) and the link between brain activity and the body (26%). Meanwhile, advisors/partners most often thought the youth audience would have questions/curiosities about how the brain functions (46%) and studying neuronal activity (46%).

  - **Module 4: Brain activity linked to behavior.** Youth most often shared questions or curiosities about health (including mental health) (47%) and behavior (32%). These were the same two topics the advisor/partner group expected the youth audience would have questions/curiosities about (45% and 36%, respectively).

Youth and advisor/partner feedback on the reflection activities

Youths' feedback on various aspects of the proposed reflection activities was generally in sync with what advisors/partners expected for the youth audience. Specifically:

- **Appealing prompts/questions:** Both the youth and advisors/partners most often pointed to prompts about learning or comprehension (37% and 69%, respectively). Youth next pointed to prompts about the program or program elements (21%) while advisors/ partners pointed to prompts about youth interest (44%).

- **Appealing platforms:** Both the youth and advisors/partners most often pointed to art as a fun and informative platform for the reflection activities (58% and 82%, respectively). Youth next pointed to crafts (42%) while advisors/partners pointed Flipgrid (82%).

- **Importance of the video component:** Approximately two-thirds each of the youth (65%) and advisors/partners (64%) thought a video component would be very or extremely important.

- **How to share the youth reflections:** Beyond being privately shared with the evaluator, both the youth and advisors/partners most often thought students should choose with whom to share their reflections (58% and 65%, respectively).

Youth, parent/guardian, and advisor/partner feedback on the Family Resource Guide

Parent/guardian feedback on various aspects of the Family Resource Guide was often in sync with what advisors/partners expected for the parent/guardian audience. Specifically:

- **Parent/guardian interest in the tip sheets:** Parents/guardians indicated they would be very interested in reading tip sheets providing information about brain diseases such as Alzheimer's, epilepsy, and depression. Advisors/partners also thought these tip sheets would be of interest to the parent/guardian audience.

- **Alzheimer's, epilepsy, and depression topics of interest to parents/guardians:** When asked if there was anything about Alzheimer's, epilepsy, and depression they would be interested in learning more about, in each case parents/guardians (and advisors/partners commenting on the interests of the parent/guardian audience) tended to point to four main topics: signs, symptoms, or diagnosis; causes and/or prevention; treatment; and care for loved ones. Depression, in particular, was one area where parents/guardians and advisors/partners thought it would be important and beneficial to provide information about the disease, explaining that "*it is not a taboo … [it] needs to be talked about*" (as noted by one parent/guardian) and "*[it] needs to be explained as an actual disease and not just overall sadness*" (as described by one advisor/partner).

- **Interest in watching documentary clips:** Although parents/guardians were not asked about their interest in viewing documentary clips, as session time was limited, advisors/partners generally thought the parent/guardian audience would be very interested in watching clips at home from existing public television documentaries about Alzheimer's, epilepsy, and depression.

- **Interest in doing activities at home with family members:** Youth and parents/guardians both indicated they were very interested in doing hands-on activities at home with one another.[23] While advisors/partners expected this to be the case among the youth audience, they tended to anticipate that the parent/guardian audience would be moderately interested in this activity.

Advisor/partner feedback on the training workshops

The advisors/partners provided detailed feedback on the proposed *BRAINedu* workshop length, approach, and the types of preparatory and follow-up support they thought would be most helpful to participating educators. Specifically:

- **Length and number of sessions:** Just over half of the advisors/partners suggested TPT hold one six-hour session before the program begins (53%), and just under half suggested the training workshops take place in the beginning of the program, over multiple sessions (47%). Those who suggested one session most often cited issues of workshop scheduling and program planning. Those who suggested holding multiple sessions generally

[23] This was the only question youth were asked about the Family Resource Guide.

recommended sessions of one or two hours (six or three sessions, in total), to help with the retention of new information.

- **Workshop approach:** Advisors/partners most often thought a combination of webinar lectures and demonstrations (76%) would be most effective in preparing educators to implement neuroscience programming at their organizations.

- **Training prep work:** A third of advisors/partners had concerns about the anticipated training prep work (35%). The concerns expressed by the group touched on recruitment, funding/educator pay, motivation, time, and the challenging nature of the material.

- **Educator access to a virtual space:** Almost all of the advisors/partners thought the *BRAINedu* educators would like to have access to a virtual space for a written Q&A, where project leaders could respond directly to their questions (94%). In particular, they suggested Facebook ("*Hopefully someplace we are already using (FB closed group?). Having another login/platform to keep track of makes it hard but if that's the only option then [it's] necessary.*") and Slack ("*A tool such as Slack might works, as it allows for multiple 'channels' for group discussions, space to upload or access documents, plus the ability to direct message project leaders about local issues.*"), among other less-frequently mentioned platforms.

- **Best forms of post-workshop educator support:** Advisors/partners shared four main suggestions regarding how they thought TPT could best support educators after the workshops/during their programs: social media groups (63%), online office hours (50%), webinars (38%), and access to experts (38%) "*to whom they can defer tough questions from the kids … [as] having this might help remove some fears about the subject matter.*"

Overarching feedback about the project's goals

In closing, the participant feedback considered in this evaluation indicates that the final *BRAINedu* resources have the potential to engage, interest, inform, and motivate the project's target audiences of Hispanic middle school youth and parents/guardians from underserved communities. Specifically, and with regards to the three goals for the culturally competent *BRAINedu* programming and media outlined on the project website:

- ***Goal 1: Empower informal STEM educators to provide culturally competent activities about the brain's structure and function to Hispanic youth and families.*** Throughout their surveys, advisors/partners shared a number of suggestions that may be helpful in guiding the project team's efforts in this area. Although advisors/partners were somewhat divided about the timing and number of workshop sessions they thought might best aid educators' training, they generally agreed that the information should be presented through a combination of webinar lectures and demonstrations of hands-on activities. Additionally, they suggested a number of areas where TPT may want to provide ongoing support to ensure that *BRAINedu* educators are comfortable sharing the neuroscience material with Hispanic youth and their families, such as a virtual Q&A space, social media groups, online office hours, ongoing webinars, and access to mental health experts. As one advisor/partner noted, "*Depending on who is presenting the material, their background may be limited. Having more information than not enough will be critical.*"

- ***Goal 2: Encourage Hispanic youth to consider careers in neuroscience and mental health, and demonstrate to parents the value of this academic path.*** Participating youth and parents/guardians expressed interest in learning more about neuroscience careers in general, and also expressed interest in six specific careers (occupational therapist, biomedical/neural engineer, neuroradiologist, neuroscience nurse, neuroscientist, and neurologist/doctor). Throughout their surveys, both groups asked questions about and expressed interest in potential role models' work, their career paths and educational backgrounds, and the advice they would offer students interested in similar careers. Although some advisors/partners thought information about careers might seem "*distant*" or "*disconnected for middle school youth,*" others believed that any potential disconnect could be overcome by relating neuroscience experiences to youths' lives and interests. Finally, in terms of reaching youth and parent/guardian audiences, advisors/partners commented on the value of making the *BRAINedu* materials available in Spanish and showing youth and parent/guardian audiences Hispanic role models from relatable backgrounds.

- ***Goal 3: Promote mental health literacy among Hispanic families, thus reducing stigma and increasing utilization of mental health resources*.** When asked if there was anything about Alzheimer's, epilepsy, and depression they would be interested in learning more about, in each case parents/guardians (and advisors/partners commenting on the interests of the parent/guardian audience) tended to point to four main topics: signs, symptoms, or diagnosis; causes and/or prevention; treatment; and care for loved ones. With depression in particular, parents/guardians and advisors/partners pointed to the value of mental health literacy in reducing stigma and increasing utilization of mental health resources, both for others and for themselves (as one parent/guardian shared, "*I suffer from depression and would like coping skills*"). Additionally, some participants thought another way to potentially reduce the negative stigma associated with mental health would be through personal stories from role models working in neuroscience fields. As one advisor/partner explained, "*We need to get mental illness out of the closet. Show that it is okay to discuss it. Demonstrate how lots of people have their own issues or have people close to them with issues. It is as much a part of being human as cancer, arthritis, and allergies!*"

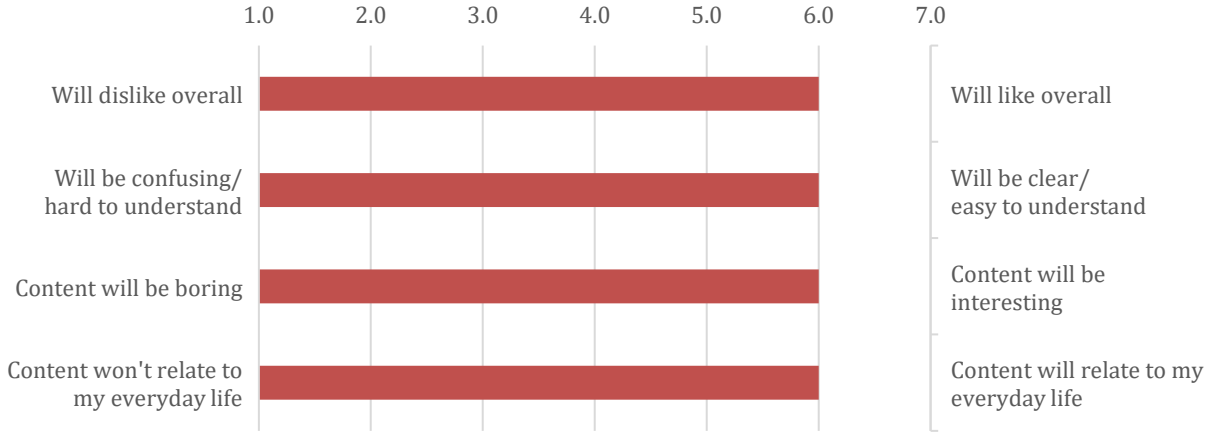
Appendix 1: Parent/guardian feedback on the curriculum content framework

Complementing Part 2 of this report, which presents youth and advisor/partner feedback on the curriculum content framework from the perspective of the target audience of underserved Hispanic middle school youth, Appendix 1 presents parent/guardian reflections on the framework.

Part A. Anticipated appeal of the final curriculum

Reflecting on the curriculum content framework, parents/guardians were asked to rate how they thought they would feel about the final curriculum on a scale from 1.0 to 7.0, with 4.0 being neutral in each case. Figure 54 shows that parents/guardians generally thought they would like the curriculum, find it clear, find the content interesting, and find that the content would relate to their everyday lives.

Figure 54. Median parent/guardian ratings of anticipated appeal of the final curriculum (n=29)



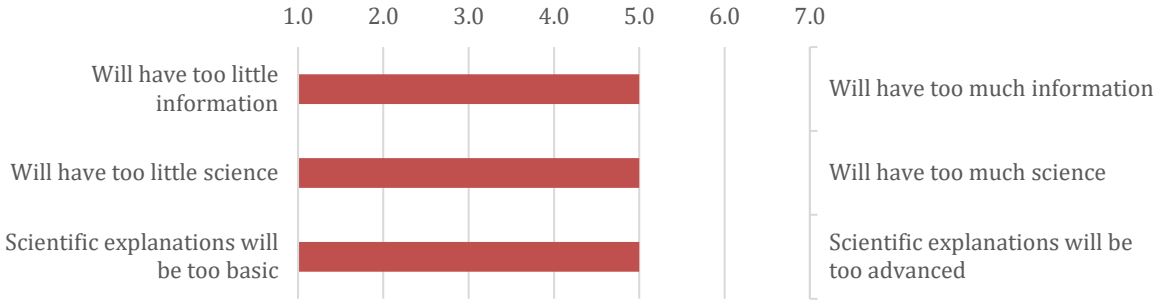
Those who shared a rating of 4.0 or lower were invited to elaborate, examples of which are presented below:

- *Parent/guardian: It seems complicated. I would like more interactivity. Hands-on, like they teach in Mexico.*
- *Parent/guardian: Dependent on age. It can be confusing to read.*
- *Parent/guardian: Need to know what the actual activity is going to be. As a teacher the modules are interesting but vague.*

Part B. Overall ratings of the information and science density

Using a scale from 1.0 to 7.0 with 4.0 being about right in each case, Figure 55 on the following page shows that parents/guardians generally thought the final curriculum would have slightly too much information and science, and that the level of scientific explanations would be slightly too advanced.

Figure 55. Median parent/guardian ratings of anticipated amount and density of information in final curriculum (n=29)



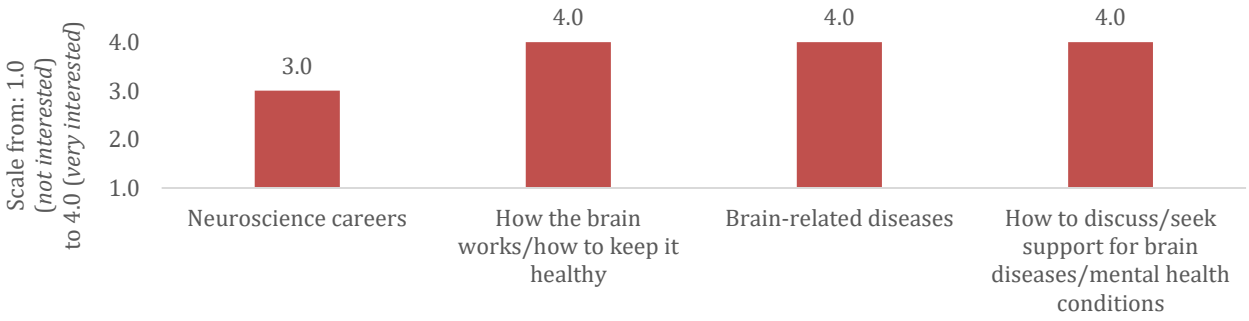
When invited to elaborate, two parents/guardians shared positive feedback and one said it was difficult to determine at this point, as in:

- *Parent/guardian: I believe that the module would be perfect and give a clear understanding to the brain.*
- *Parent/guardian: With mental illness awareness, these guides can open discussion with families.*
- *Parent/guardian: Hard to truly rate... have to see the actual activity, resources, etc. to accurately rate.*

Part C. Interest in possible curriculum topics

Using a scale from (*not interested*) to 4.0 (*very interested*), Figure 56 shows that parents/ guardians were very interested in three topics being considered for the curriculum: how the brain works and how to keep it healthy, brain-related diseases, and information on how to discuss and seek support for brain diseases and mental health conditions. They were also moderately interested in the topic of neuroscience careers.

Figure 56. Median ratings of parent/guardian interest in topics being considered for the curriculum (n=29)



When invited to elaborate on any ratings of 3.0 or lower, some of the parents/guardians commented on two of these topics, as shown in the examples below.

Neuroscience careers

- *Parent/guardian: [I gave a lower rating here because] I am interested as general knowledge.*
- *Parent/guardian: Never was interested on any medical career.*
- *Parent/guardian: [I gave a lower rating here because I'm] not sure about the interest in middle school; possibility of gearing toward end of middle school to high school.*

How to discuss and seek support for brain diseases and mental health conditions

- *Parent/guardian: Since modules are for young youth [it] depends on how deep the section on mental health conditions would [go].*

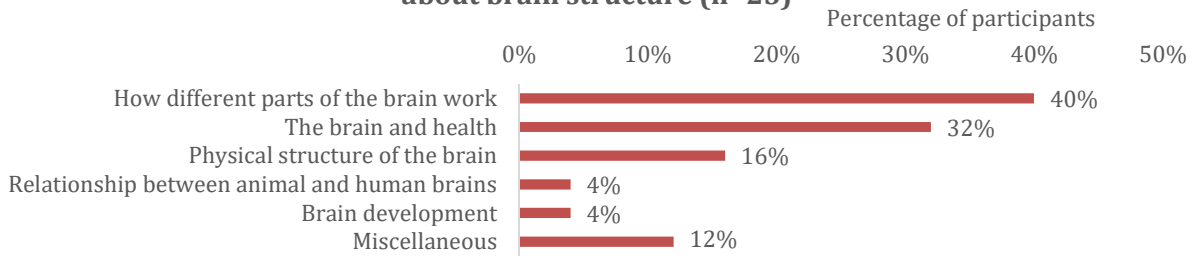
Part D. Questions or curiosities

Thinking about the four main areas covered in the *BRAINedu* curriculum, parents/guardians were asked to list as many questions or curiosities they had about the brain. There were also asked to note, wherever possible, any relevant cultural values they thought could help them (or other Hispanic parents/guardians) establish a cultural connection.

Module 1: Questions or curiosities about brain structure

Figure 57 shows that, among those who shared a response when asked about Module 1, parents/guardians most often shared questions or curiosities about how different parts of the brain work (40%) and/or the brain and health (32%). Examples of these and other responses are shared below the chart.

Figure 57. Parent/guardian questions/curiosities about brain structure (n=25)



How different parts of the brain work (40%)

- *Specific activities that the different parts of the brain helps with.*
- *What does each area or part of the brain control.*
- *How does it work? [And] what are the names of the parts of the brain?*
- *How does the brain all work together?*
- *How are the different hemispheres related to the rest of the body? What happens if one of the lobes does not develop to its maximum capacity?*

The brain and health (32%)

- *How does the brain look when someone is diagnosed with epilepsy or is going through a seizure compared to a normal brain?*
- *How damaged does the brain get with a disease like epilepsy?*
- *Give examples/case studies of real people who have had these diseases and how it affected them affected them giving more significance as to importance of learning these topics. Include brain/spinal connections and impact of healthy spine.*
- *What causes Alzheimer's and depression. How to keep brain healthy.*
- *How the brain is affected by disease*
- *Are there ways to support our brains? Or keep them healthy even with family history of mental illness or brain disease?*

Physical structure of the brain (16%)

- *How do they know the brain is separated into areas? It just looks like one piece to me.*
- *How is its structure shaped and why is it modified with age?*
- *I'd like to see more pictures of the parts of the brain.*
- *How much they weigh.*

Relationship between animal and human brains (4%)

- *Why do they study the brain of animals? Related to human being behavior?*

Brain development (4%)

- *How the brain in created in the womb and how it grows at different ages.*

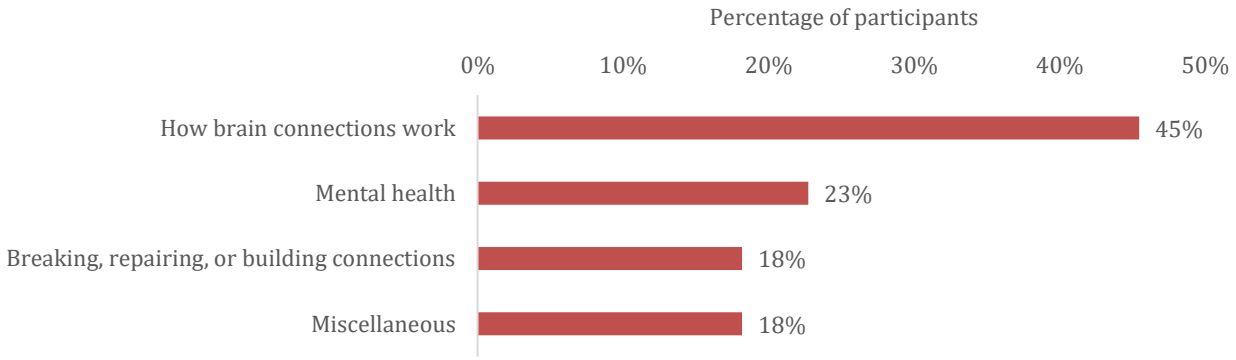
Miscellaneous (12%)

- *Provide flash cards with words to be used on part of the brain.*
- *What resources will be used? Hands-on/manipulative resource.*

Module 2: Questions or curiosities about brain connections

Figure 58 shows that, among those who shared a response when asked about Module 2, parents/guardians most often shared questions or curiosities about how brain connections work (45%), followed by mental health (23%). Examples of these and other responses are shared below the chart.

Figure 58. Parent/guardian questions/curiosities about brain connections (n=22)



How brain connections work (45%)

- *How does our brain communicate with our body?*
- *What chemical and electrical connections mean/work. What do those connections help my body with?*
- *How do the circuits mediate between cells or how does it trigger certain connections?*
- *What other parts of the body is the brain connected to as an important function, and why is it important?.*
- *Where the connections start?*
- *How does it all link together?*

Mental health (23%)

- *What causes our brain to shut down, or why do some people suffer from brain diseases and not others?*
- *How do you discover mental health disorder through someone who denies it?*
- *Are all mental diseases hereditary?*
- *How are brain connections involved with mental illness/diseases? How can we protect?*

Breaking, repairing, or building connections (18%)

- *In which cases or circumstances can these connections be interrupted?*
- *Is there certain circumstances where the connection can be interrupted?*
- *How to make stronger connections for information to flow.*
- *What happens if there is trauma to the connectivity? [Also,] is there anything that can repair damage to electrical and chemical activity?*

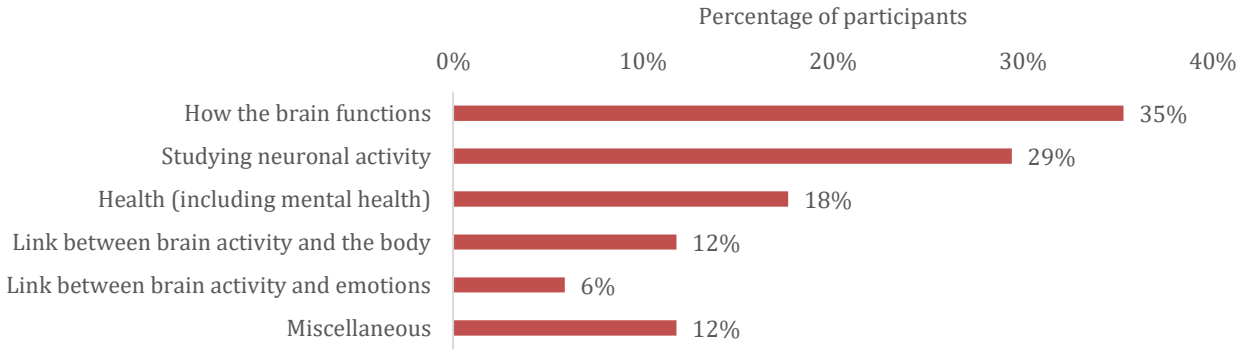
Miscellaneous (18%)

- *How does the brain respond under drugs?*
- *How much do drugs affect our brain?*
- *Provide reading material so students can highlight what is important to them.*
- *Have images shown on tools used to have visualizations.*

Module 3: Questions or curiosities about the brain in action

Figure 59 shows that, among those who shared a response when asked about Module 3, parents/guardians most often shared questions or curiosities about how the brain functions (35%) and/or studying neuronal activity (29%). Examples of these and other responses are shared below the chart.

Figure 59. Parent/guardian questions/curiosities about the brain in action (n=17)



How the brain functions (35%)

- *What other activity does the brain do? Happiness and why it is related to the brain?*
- *What is the neuron that my body produces the most?*
- *It's a wonder how it can send different signals and commands at the same time.*
- *Very interesting to learn about brain activity.*
- *What could limit the brain actions?*

Studying neuronal activity (29%)

- *Is it possible to see the electrical activity of the brain?*
- *How can you see what the brain is doing*
- *How do you actively and accurately measure brain activity?*
- *Give more examples of professions that help in measuring brain activity and examples of impact they have made. What new tools and developments are in the horizon.*
- *Provide student with individual techniques to measure neuronal activity.*

Health (including mental health) (18%)

- *How to detect if something is damaging our brain? And how can we stay healthy to help our brain?*
- *What causes electricity to shut down in brain, does the chemical activity cause the depression?*
- *I would like to learn more about the action to help understand how mental disorder works with the brain.*

Link between brain activity and the body (12%)

- *What is the activity in the brain like when we eat healthy, or exercise, read, study, etc.?*
- *The electrical activity commands your brain to exercise movements in your body. The sight part detects the colors, seems like they are sensors in our head?*

Link between brain activity and emotions (6%)

- *Happiness in the young and why is it related to the brain?*

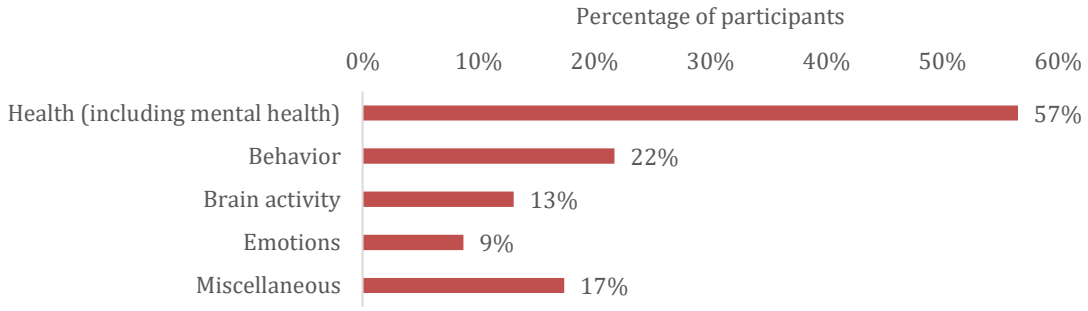
Miscellaneous (12%)

- *Will the brain show if you are super smart?*
- *What can be done to stimulate a part of the brain?*

Module 4: Questions or curiosities about brain activity linked to behavior

Figure 60 shows that, among those who shared a response when asked about Module 4, parents/guardians most often shared questions or curiosities about health, including mental health (57%), followed by behavior (22%). Examples of these and other responses are shared below the chart.

Figure 60. Parent/guardian questions/curiosities about brain activity linked to behavior (n=23)



Health (including mental health) (57%)

- *If we will ever find a cure or therapy for Alzheimer's or dementia?*
- *Is Alzheimer's hereditary? Can it be prevented from developing in fetuses?*
- *Does the brain have anything to do with depression?*
- *How can we help the brain with memory loss?*
- *What can we do to help have a healthy brain activity or prevent problems with our brain?*
- *Show more images like the one here. Normal brain vs ... Speak to treatments not only used now but on the horizon too.*
- *Can certain therapies help the brain?*
- *How can medication change behavior?*
- *Address ADHD, ADD, OCD, etc. Things middle school students are aware of but not taught*

Behavior (22%)

- *If, with time and therapies, someone's behavior can be modified for the better.*
- *What techniques are used? It would be great to show kids how different brains are and how they affect our behavior.*
- *Role play behaviors with students to make learning more interested instead of just reading.*
- *I would like to know what triggers a certain behavior ...*

Brain activity (13%)

- *Why is it important to know and know the function of our brain?*
- *Can neural activity be faked? Or manipulated by outside factors?*
- *How does food make my brain different?*

Emotions (9%)

- *I would like to know what triggers a certain ... reaction like crying, anger, happy, etc.*
- *When you feel sad about something does the brain go through changes?*

Miscellaneous (17%)

- *It is true that neurons cannot be reordered?*
- *What are they called?*
- *More picture would be great*
- *What new tools are being developed? How long do they take to develop and how much do the cost to develop?*