

**DETERMINING USER EXPERIENCE: RAPID ETHNOGRAPHY** Table 2 synthesizes ethnographic field notes gathered during iterative evaluation sessions, an observation of an inclusive high school physics classroom, and consultations with teachers and learning disabilities SMEs.

Table 2. SUBJECT MATTER EXPERT (SME) INPUT USED IN CREATING PERSONAS

	<b>LD SMEs</b>	<b>TEENAGED SMEs</b>	<b>TEACHER SMEs</b>
<b>CHARACTERISTICS</b>	L1. 25% are math deficient L2. higher ADD incidence L3. lower level of prior knowledge L4. science vocabulary L5. average intelligence	K.1. more male K.2. comfortable with computers K.3. like to work in groups K.4. like to talk while working	T.1. busy T.2. knowledgeable about science T.3. may not be proficient navigating in VR environments T.4. concerned about classroom management
<b>WANTS/NEEDS</b>	L6. concrete examples L7. alternate methods L8. repetition & redundancy L9. concrete cues L10. emphasis on concepts L11. emphasis on terminology L12. simple text L13. advance notice of vocabulary L14. more time on task L15. consistency L16. systematic instruction	K.5. quality sounds effects K.6. numerical displays of data K.7. graphical display of data (such as bar graphs) K.8. to be able to see the most important things at all times. K.9. interactivity K.10. explanations of new elements	T.5. program to reflect accurate science T.6. methods of assessing students T.7. “safety” elements (reset button, “where am I?” button) T.8. option to control some program elements
<b>HINDRANCES/ THINGS TO AVOID</b>	L17. numbers too small L18. too many variables L19. overload for self-contained students	K.11. Errors in written directions K.12. Errors in interface (like mouseovers) K.13. Excessive repetition K.14. Frustrations like move/drag problem	T.9. distracting program elements T.10. programs that require teacher Intervention T.11. confusing students with too many variables T.12. irritating noise T.13. navigation problems

**CAST OF CHARACTERS FOR PROJECT DEVISE** *The Cast of Characters shown in Table 3 contains three personas, each of which is defined by personal characteristics, a typical quote, a photograph, and a narrative description.*

Table 3. **PERSONS CREATED AS DESIGN TOOL FOR PROJECT DEVISE**

	<b>AMBER</b>	<b>HECTOR</b>	<b>MRS. GRADY</b>
<b>CHARACTERISTICS</b>	<ul style="list-style-type: none"> <li>▪ Bored in school</li> <li>▪ Gamer</li> <li>▪ Problems expressing knowledge</li> <li>▪ Low reading comprehension level</li> <li>▪ Low vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>▪ easily distracted</li> <li>▪ new to computers</li> <li>▪ below grade-level in math</li> <li>▪ does not know how to express information as graphs</li> </ul>	<ul style="list-style-type: none"> <li>▪ short on time</li> <li>▪ doesn't like surprises</li> <li>▪ may have to manage a large number of students</li> <li>▪ may be short on resources (paper &amp; computers)</li> <li>▪ may have students with and without LD in same class</li> </ul>
<b>WANTS/NEEDS</b>	<ul style="list-style-type: none"> <li>▪ to be engaged</li> <li>▪ high amount of interactivity</li> <li>▪ to work alone</li> <li>▪ graphical representations</li> <li>▪ multiple ways of demonstrating knowledge</li> <li>▪ auditory feedback</li> </ul>	<ul style="list-style-type: none"> <li>▪ cues about what to do next</li> <li>▪ clear indication of what is important/key concepts</li> <li>▪ to work in groups</li> <li>▪ mouseovers</li> <li>▪ help in seeing data as graphs</li> <li>▪ options to turn off sounds</li> </ul>	<ul style="list-style-type: none"> <li>▪ this to be used as part of curriculum</li> <li>▪ kids to be engaged in activities</li> <li>▪ some built-in options (to customize use for particular students)</li> <li>▪ "safety" elements, such as restart button, or other shortcuts to use if lost</li> </ul>
<b>AVOID</b>	<ul style="list-style-type: none"> <li>▪ dull appearance</li> <li>▪ singular form of expressing information</li> <li>▪ long or complicated text in directions or assignments</li> </ul>	<ul style="list-style-type: none"> <li>▪ frustrations, such as allowing student to get lost in program</li> <li>▪ including items that have no use</li> <li>▪ distracting or meaningless sounds</li> </ul>	<ul style="list-style-type: none"> <li>▪ elements that will take kids off task</li> <li>▪ misrepresentations of science</li> <li>▪ confusing user interface</li> </ul>
<b>QUOTE</b>	<p>"I hate math and science. I can't wait for this class to be over. I don't get it and I don't even care."</p>	<p>"I'd like to do better in this class, but it doesn't matter that much. I just want to graduate and start working full-time to keep my mom proud and help my family out."</p>	<p>"I know my students can learn physics, but some of this material is so dull. I'll use technology when it's appropriate, but I won't waste class time with something that's confusing or hard to use."</p>

**PERSONA 1 -- AMBER**

Amber Tibbals is a 16-year-old high school junior of average intelligence. She has no interest in science and finds class discussions and reading from the textbook particularly boring. Science terms confuse her and she doesn't feel like asking the teacher for help. She often doodles and sketches during class or takes brief naps. Amber enrolled in Active Physics in order to complete her high school science requirements: she had heard that chemistry and regular physics classes were too hard. It's all Amber can do to stay awake in class. She needs bright colors, interesting sounds, and interactivity to keep her attention.

**PERSONA 2 -- HECTOR**

Hector Rosario is an 18-year-old Hispanic male. Hector works long hours after school and on weekends. He is motivated by the need to earn money to help support his younger siblings and to buy his own clothes. An ESL student with a fifth-grade reading level, Hector serves as a translator for his parents, who do not speak English. Because of his workload, and frustration with language skills, Hector neglects his homework regularly. He is easily distracted in class and has very little prior experience with computers. Hector likes to tinker with his car and hang out with his friends. He enjoys hands-on activities and group work.

**PERSONA 3 -- MRS. GRADY**

Mrs. Grady is a 43-year-old teacher with 15 years of experience, all of it in this ethnically mixed neighborhood near her home. Mrs. Grady loves physics and teaching, and has confidence that her students could learn more science, if only they would try harder. She wants to expose and break down the physics concepts into manageable pieces for her students. She has three children close in age to those of her students, and understands teenagers well. She likes to have students work in groups and on class assignments. She spends time preparing her lessons and thinking about classroom management issues. Mrs. Grady uses technology and would like to include it more in her classroom; however, she is aware that technology can be daunting to some of her students and she isn't willing to delay instruction in order to figure out some kind of technological glitch.

