PROJECT TITLE: Baseball Bat Grip

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Executive Summary:
OTA-Engineering Teams have joined together to create products for individuals with disabilities so he or she is able to do certain tasks easier. Each team was given a separate product that focused on a different disabilities caused by a disease that a person could have. OTA-Engineering Team 2 was given the task of creating a “Baseball batting ‘glove’ to allow a child to maintain a grasp while hitting baseball. The ‘glove’ device should also allow a child with grasp/coodination deficits to scoop/catch a ball. It could possibly have the ability to be used with 2 hands and have some type of shield to prevent the ball from hitting the child in the face.”

As a team, a baseball bat adaptable device seemed to be a predominant product that isn’t currently on the market.

In order to achieve the goal of creating a baseball batting ‘glove’ to allow a child to maintain a grasp while hitting a baseball, it is necessary that the team works together, allows new ideas, and creates a product that is cheap, light weight, and easy to use.

Because this OTA-Engineering group needs to achieve the task given of creating an easy grasp baseball bat, a code of conduct was given and signed by each member that stated it was essential to meet at least one time a week, must respond when contacted, and leaders of tasks. The following procedures do/will occur during the one hour meetings once a week:

- brainstorming
- concept selection
- creating the product
- final designs
- and reports, working on the webpage, and poster construction.

The final product will be submitted, finished and presented by May 2nd, 2016. All of the product and revisions will be with in the budget of around $100. The project at the end will include:

- new way to grip a bat
- a way to allow individuals with low grasping skills to enjoy a sport
- website that explains the product in depth
- a poster board that explains product in depth
- a final design product
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Problem Statement:
Design an inexpensive, lightweight, adaptive device to allow people ranging from children to adults, who have a weak grip, to grasp a bat comfortably and firmly without it falling out of his or her hand while swinging a bat.

Assumptions:
As a team, the OTA and Engineering students have unified our thoughts and came up with some assumptions for the target customers. The customers will have interact cognition, users are ages 3-21, buyers have minimal grasp, full range of motion in upper extremities, and have strength.

Objectives:
Design an adaptable device that has the following qualities:
1. improved grip,
2. light weight,
3. easy to use, handle, carry around, and put on,
4. has multi-use,
5. durable,
6. waterproof.

SMART Goals:
✓ Specific: allow HD, CMT and FMSD individuals to participate with friends  
✓ Measurable: ranging from ¼ lbs - ½ lbs  
✓ Achievable: easily implemented  
✓ Realistic: the resources used to make the adaptable device are cheap and readily assessable 
✓ Time framed: May 2nd, 2016 (Also see timeline on page 5)

Background:
In occupational therapy, the age range of children is 3-21. Knowing this is a large range of ages, this team wanted to be sure on what disabilities and products were out there to allow these children more time playing sports with friends.
Publicized by the National Institute of Neurological Disorders and Stroke, under their Charcot-Marie-Tooth Disease Fact Sheet, 1 in 2,500 people in the United States is affected by Charcot-Marie-Tooth Disease (CMT). CMT affects the peripheral nerves that lie outside the brain and spinal cord. These nerves affect the sensory organs to the limbs and disables people from being able to move their hands, fingers, feet, and toes properly.
Moving on, 30,000 Americans have symptoms of Huntington’s disease (HD), and over 200,000 are at risk of having the disease. In recent years, scientists have found that this disease does not only affect adults, but HD impacts children as well.
Children with Motor Skills Disorder have difficulty with actions such as dancing, gymnastics, catching or throwing a ball, swinging a bat, and producing legible handwriting. After much assessment, four to five percent of mainstream preschool students and six percent of children age five to eleven were found to have some sort of component of Fine Motor Disorder.
Because children want to enjoy time with friends and family, Team 2 has decided to make a specific activity easier to participate in. In baseball, children with any of the above
disabilities would not be able to grip a bat easily. Searching the internet, there was no sign of any tool, device, or glove that aided people with CMT, HD, or Motor Skills Disorder to grasp a bat for them to be able to hit a ball. Luckily, Team 2 has decided to create an adaptable device that will allow CMT, HD, and Motor Skill Disorder individuals to play baseball easier.

**Methodology:**

**Recognizing the need:**
This OTA-Engineering team recognized the need of an adaptable baseball bat gripper by receiving a project assigned informing students to create or better design a product that would help with maintaining a grip while gripping a baseball bat. After long discussion between the engineering students and the OTA students, it was apparent that many children are unable to participate in sports due to the fact that they are unable to properly use their hands as well as other people who do not have a disability.

**Defining the problem:**

**Goal Statement-** Design a product to help with gripping a bat.
**Objectives-** Design an inexpensive but durable batting glove/device that services children that struggle with gripping a baseball bat. (Also, see above objectives on Page 3)
**Constraints-** has to be made with materials that costs under $100, must weigh between ¼ lbs – ½ lbs, and must be easy to put on and remove.
**Criteria-** Cost, Weight, Safe, Easy to use

**Planning the Project:**
Knowing that this product had a lot of tedious work alongside of it, this OTA-Engineering Team started by creating a code of conduct and assigning everyone in the group a role. Team 2 decided to create officers which are the following; the leader is Dominique Martino, the manager is Ashlee Johnston, the organizer is Brianna Nussbaum, and the Treasurer is Andrew Ramage. Each position has a set of guidelines that are to be followed to make sure each team member in the group works effectively and efficiently. The officers use their authority to assign deadlines and times to work together on this project. Our OTA-Engineering team has already decided on great ideas for the adaptive bat gripper. Next is to decide how to design it. Building and finishing this project will follow.

**Stage 1- Statement of work**
- Identify tasks
- Qualifications of team members
- Management plan
- Constraints

**Stage 2- Concept Development**
- Analyze design flaws
- Conceptualize
Stage 3- Detail Design
   o Think of more explicit ideas
   o Pick final plan

Stage 4- Production
   o Make the product
   o Machine, purchase and fit parts together

Stage 5- Testing and Refinement
   o Install parts
   o Test device
   o Fix what is necessary

Stage 6- Presentation Accessories
   o Create the webpage
   o Create poster

Stage 7- Project Finalization
   o Final report
   o Final presentation
   o Showcase

Timeline-

Gathering Information:
Finding background information on previous inventions that were produced was a long process; however, other products, similar to the adaptable bat gripper that would help people with HD, CMT, FMSD, or any other diseases that cause weak grasp in someone’s hands, were unable to be found. Because there was close to no other company, product, or device that is made for weak grasps, it was evident that the idea of an adaptable bat gripper was a marvelous idea.
Generate Ideas:
Below are ideas that have been talked about by this OTA-Engineering Team 2:

1. An adaptable device that can attach to the base of the baseball bat that would be made of spongey material. With that, this cylinder looking sponge would have magnate on the inside of the material. Knowing this, a pair of batting gloves would be with the package that would also have magnates on them. With this, it would be evident that the magnates in the gloves and the magnates in the adaptable device on the bat would join and allow a grip on the base of the bat.

2. An adaptable device that can attach to the base of a baseball bat that would be made of spongey material. With that, this cylinder looking sponge would have Velcro on the outside. Along with that, a pair of baseball batting gloves will be paired with the adaptive device that also have Velcro on them. Then, it would be obvious that the Velcro on both products would connect and allow an amazing grip to the bat.

3. An adaptable device that can attach to the base of the baseball bat that would be made of spongey material with 3 thin, light, metal rods in it. In this one, the baseball batting gloves would already be attached to this adaptable device for the bat, that way nothing has to be attached. In this idea, the user would just have to slide his or her hand into the device instead of attaching one device to another device.

4. This device would just be a betting glove. In the batting glove there would be metal bands, such as ones in a slap bracelet. When the user gets the glove on with help of someone or even on themselves, the fingers would be splinted almost straight. With this, all that would need to be done is slap the hands with the gloves onto the bat and the glove will rap itself, along with your hands, around the bat.

5. Lastly, this device would be a batting glove that provides a textured material that creates friction and prohibits the bat from rotating in the user’s hand.

Evaluate ideas:
All numbers below refer to the numbers above under “Generate Ideas”
1. The baseball player using this device might have a hard time getting the gloves on and aligning the magnates.
2. The baseball player would need help getting the gloves on
3. The baseball player’s hands might come out of the adaptable device he swinging if not inserted correctly.
4. The baseball player would need help with putting the glove on. Also, this might not allow a perfect grip due to the metal that raps itself not being able to rap correctly on certain bats.
5. The baseball player would need help placing the gloves on their hands. Along with that, it would be a problem if the user could not squeeze, move, or control their fingers/hands.
Chose the best idea:
Through thorough investigation, research, and screening/scoring charts, it was evident that number 3 was the best product idea out of the five. This product will easily achieve the objectives, customer needs, and constraints that were given.

Communicate:
As a team, team members are expected to message back after being contacted about any information that has to do with this project. Furthermore, each person is expected to bring an idea, their task that was given to be done, and be present. It is important that the members of OTA-Engineering Team 2 are on time with work. All work for a specific project/assignment is due to the Team Leader at least 4 days before the scheduled dates below.

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Implement:
As a team, all members are expected to do all work given for the above tasks and assignments, that way the team can implement the ideas, tasks, and projects.

Costs/Budget:
Of the $100 allocated for this project we will use:
- About $10 will go to fabric
- About $15 for batting gloves
- About $20 for spongy material
- About $5 on buttons/Velcro
- About $20-$30 for metal rods
- And $20-$30 on supplies that might come up to work better than what we are

Expected Results:
Some results that we are expecting thus far includes the following:
- allow the user to not feel out of place
- allow the user to use and adaptive device independently or help of one person to put it on
- allow a better grasp and perform as equally as others.
Links to Background Info.

http://www.ninds.nih.gov/disorders/charcot_marie_tooth/detail_charcot_marie_tooth.htm
