

I PRO 353

Rainbows EndPro

Tummi Pals Interactive Dolls

Spring 2009

Sponsor:

Angela Davis of All-4-Kidz Enterprises, Inc.

Advisors:

Jim Braband
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Team Members:

Chris Anglin
Philip Brierley
Chris Chachakis
Fernando Gomez
Chris Salgado
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Branden Toro
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1. Abstract

The purpose of IPRO 353 was to develop a series of multicultural dolls based on the storybooks written by the sponsor Angela Davis. The dolls would fill a void in the market for entertaining, and educational dolls that promote diversity. In this first semester IPRO, the team divided into 3 subgroups to develop a prototype, research interactive capabilities of the doll, find the appropriate target market and customer, and identify potential competitors. The team built a working prototype crafted out of the exact materials that are recommended for the final product. We also found the appropriate target markets, market sizes, and revenue potential. Additionally, the team determined 3 key competitors, one for each aspect of the doll. Finally, the team conducted Interviews with daycare teachers to learn more about the daycare market.

2. Background

- A. The author, Angela E. Davis, is a retired elementary teacher with a Master's Degree in Curriculum and Instruction/Early Childhood Education. Her passion for educating young people led her to develop a series of books that would be both educational and enjoyable. She is also a frequent visitor to schools, conducting "Meet the Author Day", where she speaks to both students and teachers about realizing their dreams.

Angela's mission is to provide young children with books and toys that will enhance their learning and broaden their thinking. To that end, she has developed a concept for a line of learning doll called Tummi Pals. Angela has researched the market and has not found a doll with the attributes that the Tummi Pals have. Her hope is to fill the void left by the initial excitement of the Cabbage Patch Kids dolls.

Angela is also the founder of "All 4 Kidz Enterprises, Inc.", a minority and women-owned business based in Homewood, Illinois. "All 4 Kidz Enterprises, Inc." specializes in providing multicultural learning aids and children's books with audio CDs for children ages 2 and up. This is done primarily through its "Urban Kidz" series of books.

- B. We are trying to respond to the void in the marketplace for a doll that:

- Promotes education
- Promotes awareness of diversity
- Is enjoyable to children, and
- Is affordable to parents

We believe that the Tummi Pals doll addresses this void.

- C. There is no history on previous technical attempts to create a doll like ours. For the interactivity in the Tummi Pals doll, we used Radio Frequency Identification (RFID) technology. For the doll aspect, we used standard doll parts: polyester fiber stuffing, a cloth body, and a soft vinyl head and limbs.

- D. This is a first Year IPRO. All previous research came from our sponsor, Angela Davis.

E. Studying and observing children is an important ethical issue to consider. A relevant IRB issue to consider when conducting testing on humans – specifically children – for our doll would be to make sure that the RFID technology and materials used for our prototype are not harmful in anyway. Additionally, parent waivers are required before gaining access to children. For these reasons, we decided not to pursue the testing of children. However, we ensured that the prototype was made out of pre-approved doll parts and other toys (including the RFID chip). More issues will be covered in the ethics section.

F. N/A

3. Objectives

I PRO 353 dedicated this semester to materializing our sponsor's product, the Tummi Pals doll. In order to achieve this goal, the team developed a set of manageable objectives for the semester.

A. Design a prototype:

- Research and acquisition of materials (price, safety)
- Design of doll and accompanying accessories
- Construction of crude prototype
- Construction of working prototype

B. Identify target customer:

- Research gender, age and education level of potential costumers
- Research target customer demographics
- Conduct surveys for feedback (parents and daycare center personnel)

C. Research competition:

- Define our product industry
- Identify our product's multiple components
- Research competitors (which provide similar products?)

D. Draft numerous business reports:

- Develop a value proposition

4. Methodology

We divided ourselves into three sub teams based on our major and personal preference

A. Creation Team: Hana Tai, Fernando Gomez, Gustavo Untiveros

- Researched materials and potential dimensions for dolls and accessories
- Produced crude clay-dough prototype to gage proportions
- Produced working prototype
- Constructed prototype key rings and carrying case

B. Tech Team: Christopher Chachakis, Branden Toro

- Researched various scanning systems prospects for the doll

- Conducted further research on selected RFID scanning system
 - Researched battery options for doll
 - Designed the night lamp
 - Purchased and outfitted RFID system for working prototype
- C. Business team: Christopher Salgado, Phillip Brierley, Christopher Anglin
- Researched potential competitors
 - Researched target market and size
 - Researched initial target customer
 - Developed and conducted surveys for daycare center faculty
 - Developed revenue projections for daycares and private customers

5. Team structure and Assignments

A. Tech Team

- Christopher Chachakis – Conducted large amounts of research of scanning technology. Suggested use of RFID system for our prototype. Purchased and studied RFID technology for our prototype. Assembled the RFID system for our final prototype using a current toy’s pre-approved RFID technology. Presented at both the midterm and IPRO Day. Accepted the role of Secretary for the team and composed all of our mintues.
- Branden Toro – Conducted extensive research on nightlights. Designed a prototype nightlight with CD player to possibly be created later by our sponsor. Also performed extensive research on memory usage and capability for the Tummi Pals dolls. He also aided in compiling individual surveys into a final report.

B. Doll Creation Team

- Hana Tai – Researched materials that were to be used for the creation of the prototype and any future dolls, including hair type and body type. Designed team logo and provided sketches for possible storage systems to be used in daycares. Purchased doll parts used in the creation of the final prototype. Aided in creating the IPRO Day posters and aided in compiling individual surveys into a final report.
- Gustavo Untiveros – Researched and designed the size and dimensions of the doll. Researched and designed accessories for the doll, including a hair brush, scan card rings, and a rainball carrying case. Conducted interviews for our surveys and helped compile other surveys to create a final report. He also aided in the creation of our IPRO Day poster.
- Fernando Gomez – Researched and designed the shape of the doll as well as the appearance and integration of all technology, including the tummy scanner, voice recording, and light-up abilities. Assembled the prototype and all of its accessories and modified the rainball carrying case. Conducted interviews for our surveys and worked on poster for IPRO Day. Presented at both the midterm and final presentations.

C. Marketing Team

- Christopher Anglin – Researched product market and who the competitors are. Did extensive research into Cabbage Patch Kids phenomenon, including their history and selling strategies. Conducted research on My Buddy doll to determine if boys will play with dolls. Did extensive amount of work on brochure. Conducted interviews for our surveys and helped compile interview report.

- Christopher Salgado – Did just about everything to help team along. Managed the project. Was sole source of sending out emails and assignments to keep team busy. Conducted extensive research in Cabbage Patch Kids phenomenon. Created agendas to be used for each meeting. Conducted interviews for our surveys and assigned other interviewees for teammates to interview. Was the main presenter at both the midterm review and IPRO Day. Acted as the liason between the team and our sponsor, relaying critical information back and forth.
- Philip Brierley - Researched and defined the target market. Researched the optimal price in which to sell the doll. Conducted extensive research into daycares in the surrounding area. Helped construct our brochure. Presented for our final on IPRO Day.

6. Budget

At the start of the semester, the team proposed a reasonable budget for our project. The following breakdown addresses the specifics of our budget:

Proposed budget:

- Equipment ***** \$135
 - Travel ***** \$50
 - Participant Support *** \$300
 - Competing Products * \$150
 - Team Building ***** \$75
- Total: \$710

Proposed budget:

- Equipment ***** \$140
 - Travel ***** \$0
 - Participant Support *** \$0
 - Competing Products * \$60
 - Team Building ***** \$130
 - Other (Unexpected \$) \$109.63
- Total: \$439.63

During the course of the semester, the team members attempted to reduce costs for the sake of our budget. Approximately \$130 was spent on team building exercises including food and drink, \$140 on materials to create our prototype, and \$60 on competing products. The rest of the money was spent on items such as batteries and other components to ensure the prototype was functional.

At the end of the semester, the total amount spent was computed. The team had spent \$439.63, resulting in a favorable variance of \$270.37.

7. Code of Ethics

A. Confidentiality – Contracts, Professionalism

- We didn't have a full patent for the entire system and had to keep the project confidential
- Pressure during IPRO Day to disclose our entire project to the public; this was mitigated by having guests register beforehand

- When asking a 3rd party member to sew the prototype, we had to let her see what our project was; we entered into an oral agreement of confidentiality
 - Risks during everyday conversations about IPRO to friends and family to reveal confidential aspects of the product
- B. Survey Bias – Moral Values, Community, Personal Relations
- Conducted interviews with potential customers about our project
 - Some of the interviews were friends and contacts which conflicted with the tendency for them to be more positive than honest about our project
 - Pressure to find evidence that our product will sell
 - Can run a risk of generating a bias interpretation of our results
 - Another risk would be to only show positive answers, and not the entire results of our interviews
 - Presented both positive and negative interview answers in our presentation and exhibit
- C. Child Testing / Observing – Law, Industry Standards
- Child testing requires parent waivers and IRB approval to ensure toy is safe
 - Pressure to bend the rules by simply giving the toy to children and “casually” observing
 - Pressure to see how children would react to the toy within a short deadline
 - Risk of giving an unsafe toy to a child with small parts
 - For this term we did not conduct any child research, but ensured that our prototype was made out of preapproved parts from other toys

8. Results

- A. Defined what the product system consisted of
- Created a complete system of products for two different markets
 - For the home market system:
 - Tummi Pals Doll, round carrying case, master book and character book, 2 CDs, and set of learning key rings.
 - Optional night light and additional learning key rings
 - For the preschool and daycare market:
 - 7 dolls with the books, 7 rainball carrying cases, accessories, Complete book set
 - Optional storage display unit
- B. Doll Prototype
- Drafting the dimensions of a prototype
 - Used drawings provided to determine the relative ratios between the arms , legs, head, and body
 - Sponsor wanted doll to be approximately a foot tall
 - Crude prototypes
 - Made out of Styrofoam balls and clay-dough
 - Gave a tangible idea of the exact size and shape of the real doll
 - Final Working Prototype
 - Made out of the proposed final materials
 - Cloth body, polyester fiber stuffing, vinyl arms and legs
 - Used parts from different dolls and sewed body to create the round belly
 - Used RFID chip from another toy to demonstrate the interactivity
 - Estimated price using prices of the various components within the doll

C. Marketing / Business

- Identified the target market
 - Decided to target 3-5 year olds as our product users, and parents and daycares as the target costumers
 - Used U.S. census data do determine market size and growth for home market
 - Used listings and a purchasing power report from our sponsor to determine the childcare center market size
 - Created revenue potential charts using the market sized, proposed retail price, and a small and large market share basis
- Found competitors in three different toy categories that were similar to our product
 - Cabbage Patch Kids dolls were competitors in the aspect of a cute and adorable doll
 - Leapfrog Leapster rivaled the product for interactive learning
 - Jambo Kids dolls offered a competing doll that teaches awareness of diversity

D. Observations and Conclusions from interviews

- As a group, we conducted interviews of preschool and nursery directors and teachers
- We asked each interviewee over 40 questions ranging from purchasing habits to popular toys to what they thought of our proposed product
- Children enjoy advanced technology (leapfrogs, computer games) and interactive hands on toys
- Teachers give 30min-1hr of free choice playtime
- Toys must be washable and have long battery life
- Teachers buy toys through catalogs and websites, with a limited budget, and also receive donated toys from parents
- To teach diversity, educators use multicultural puppets, dolls, books, posters, etc.
- Price is important as well as a demonstration of the product
- On average, interviewees would pay \$20-40 for the doll, and would enjoy purchasing a full set with a display unit for the dolls

9. Obstacles

A. Group Logistics:

The schedules of the group always seemed to be a conflict which limited out of classroom cooperation. To resolve this problem, the group used many different modes of communication to keep in touch with one another. Another, similar problem dealt with the geographic issues. Many team members are commuting students which makes meeting outside of the class room much more difficult. iGroups was very effective in communicating amongst group members, sponsors, and professors. The group also used instant messaging, emails, and phone calls to get in touch with others.

B. Research Limitations:

Due to our inability to do any research on children, our research was not as extensive as we hoped. To perform research on children, several liability papers and permission grants would have had to come into play after being approved by the appropriate governing bodies. To account for our inability to research and interview children, we moved to teachers and other day care faculty for some insight on our product as well as key features of other successful products. Interviews were conducted in person, over the phone, and through emails to gain

feedback on our product. Approximately forty questions were asked in order to gain the most effective information.

C. Product Complexity:

At the beginning of the project, the group did not understand the complexity that the project entailed. The group understood that the IPRO project itself would be complex but did not understand just how complex the Tummi Pals product would be. Since the project was a first year IPRO, the group decided that a business plan would not be completed. However, business reports would be completed relating to our efforts and observations.

10. Recommendations

The group reached a couple of suggestions for our sponsor to follow when completing the project herself. The group recommended that the materials suggested for the product be researched further and used for the final product. We recommended researching children's interest in the product. We also recommended demonstrating the technology capabilities of the doll to parents, teachers, and children, which will result in more reliable feedback on the product. Another recommendation was to investigate other forms of interaction that might relate to the story and the characters within the story. The group recommended investigating interactive DVD's or CD ROMs. This recommendation is due to the technological advancements that children have in their toys today. Finally, the group recommended that our sponsor begin looking for an investor for financial assistance. The production of the prototype will be expensive and having some source investment will allow for the product to make its way onto the market.

11. References and Resources

- Possible source of RFID chips:
 - <http://www.atmel.com/products/rfid/default.asp>
- Comparison/contrast between toys that boys and girls like
 - <http://www.educational-toy-guide.com/kindergartentoy.html>
- Listings of child care centers around the US
 - <http://www.metroprofiles.com/>
- ASTM International Document F963-07: Standard Consumer Safety Specification for Toy Safety
- Materials used in Final Prototype creation
 - Wild Planet Animal Scramble game – Toys-R-Us
 - Madame Alexander Baby Doll – Wal-Mart
 - Dora the Explorer Doll head – Wal-Mart
 - Polyester fiber and cloth – Michael
- Doll seamstress
 - Debby Siegel
- Interview respondent schools and day care centers
 - Bright Horizons
 - Tiny Treasures Child Care
 - Diversey daycare
 - St Francis Xavier Kindergarten
 - Our Lady of Prepetual Help Early Childhood Education

- Glenview Methodist Preschool

12. Acknowledgements

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