Cyberchase Museum Outreach Initiative Needs Assessment

Report for
WNET-TV

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INTRODUCTION

WNET is planning an initiative to involve museums in the outreach associated with Season V of *Cyberchase*. A written feedback survey gathered information from 32 museums as to their current practices and recommendations with respect to museum kits, discovery carts, discovery boxes, video screenings and educational computer games. The goal of the survey was to assess the needs of the museums and to guide the development of an outreach plan for Season V.

METHOD

Respondents

Surveys were received from 32 museums: 16 children's museums[1] (50%); 13 science museums or centers (41%) and 3 natural history museums (9%). The museums represent 18 states from the mid-west (28%); northeast (19%); south (19%); southeast (13%); mid-Atlantic (6%); west coast (9%); and west (3%). Respondents hold a range of titles focused on education and programs:

(13) Director or VP of Education
(2) Manager of Program Development
(2) Special Projects Coordinator
(2) Director of Programs and Education
Deputy Director Education and Guest Services
Director of Design and Production
Director of Public Programs and Special Events
Director of School Services and Family Programs
Director of Student and Educator Programs
Education Resources Manager
Interpretive Program Coordinator
Lead Educator, Technology Lab
Museum Educator
Program Supervisor, Education
Senior Manager of School Programs
VP for Operations
VP of Guest Experience

Procedure

Museums received a package of *Cyberchase* related items including videos and kits along with a feedback survey. The survey asked about current usage, most important components and design advice with respect to kits, discovery carts, discovery boxes, video screenings and educational computer games. Respondents also rated their interest in receiving free or competitively priced items.

Report

This report summarizes only the major trends of the survey data. The original surveys should be reviewed for details regarding usage and needs.

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[1] Note that five children's museums serve children age eight and younger.

EXHIBITS AND PROGRAMMING RELATED TO PROBLEM-SOLVING AND INVENTIONS

Respondents were asked to describe briefly exhibits that relate to math problem solving or inventions. The three natural history museums note zero to few exhibits in these categories. Most of the science museums describe one to five exhibits, with four museums describing full galleries devoted to math and math problem solving. Three science museums note exhibits related to inventions or inventors, and two museums run invention workshops. Of the children's museums, most mention they had exhibits that include math problem solving, four describe traveling exhibits related to inventions, and three museums run invention workshops.

For school or public programming, the three natural history museums deal with problem-solving but not inventions. Most of the science museums have programs that cover both math problem-solving and inventing workshops. Most of the children's museums include problem-solving in their public programs with four museums also focusing on inventing.

So the respondent sample feels their exhibits and public programs cover math problem-solving but much less so inventions. Note, however, that many of the exhibits and programs are science-based.

UTILIZATION OF TELEVISION SERIES IN EXHIBITS AND PROGRAMMING

Respondents explained their past or present exhibits or programming that utilize a television series. Two of the three natural history museums use video including a Ms. Frizzle classroom and *Bill Nye* in a traveling exhibit.

In terms of children's programming, nine of 13 science museums have used programming based on children's TV series: *Magic School Bus* (54%); *Beakman's World (23%)*; *Bob the Builder*; *Busytown*; *Mr. Rogers Neighborhood*; and *Zoom*. The science museums have also used various adult science television series and/or their outreach materials including *Building Big, Court TV, Innovation, Journey to Planet Earth, Origins*, *Rough Science* and *Star Trek*.

Two-thirds of the 16 children's museums mentioned scheduling TV series based traveling exhibits in the past, present or future:

(50%) *The Magic School Bus* (there are two different exhibits);
(44%) *Mr. Roger's Neighborhood*;
(25%) *Arthur*;
(19%) Pigtails and Hardhats (Bob the Builder);
(19%) Sesame Street
(13%) *Clifford the Big Red Dog*
Busytown
Curious George
Dora the Explorer
Good Grief! *(Peanuts)*
Pizza Anyway You Slice It

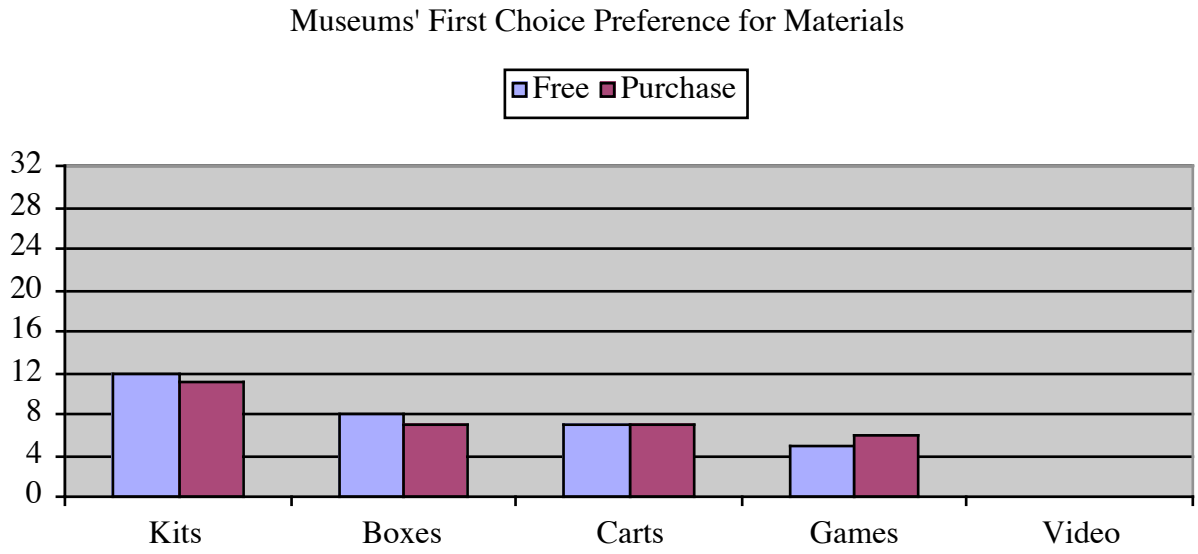
Three children's museums also host a *Zoom Zone*.

MUSEUM KITS

The survey described that:
Museum Kits will include existing *Cyberchase* workshop activity kits such as *The Footprint Files* that you received in your package. Kits will also include *Cyberchase* videos, *Cyberchase* magazines and web activities as well as parent and teacher guides in Spanish and English. Also provided are branded materials and products (e.g., logo, camera ready images of the characters, graphics, posters and displays), and suggested use of artifacts, objects and inexpensive materials. Kits will be appropriate for school trips, after-school groups, museum camps and clubs.

Of the 32 museums, 56% use kits on any content with their public or classes. Most museums use their own kits and a few use out-of-house kits in family and youth programs, outreach classes and after-school activities. A few use kits as part of teacher training and a few loan kits out to teachers. One museum only uses kits that are directly related to their museum's own exhibits. Out-of-house kits listed include: Brooklyn Children's Museum kits; Celebration of the Genome (Science Museum of MN); *Cyberchase* Workshops in a Box; Delta Education kits; FOSS kits; Genome (Biotech Co.); HealthRich (SEPA); *Origins* (Pacific Science Center); Prentice-Hall Science kits; Science All Around Us (NSF funded); Sunwise (AAAS, EPA).

Respondents were most interested in receiving free kits and purchasing kits as compared with the other materials described. The chart below presents the numbers of respondents who ranked each material as their first choice to receive free or purchase at a competitive price.



Components of kits that are most important to museum respondents include the following:

Activity oriented; hands-on interactive activities
Create and interact with objects or artifacts as part of experience
User's guide with explicit instructions to ensure quality and content
User-friendly and succinct user's guide (for volunteer, teacher use)
Background information for those not as knowledgeable about the content

Appropriate graphics and reproducible worksheets; electronic format that permits modification
Visual aids
Provide materials central to activity that site or user may have difficulty acquiring
Provide all materials that cost more than a nominal amount
List of materials required and sources for materials
Labeled storage containers provided with materials contribute to care of materials and extend life
List of objectives being met
Correlations to state curriculum but not feel like school
Timeline
Organized format such as notebook, binder, packet
Colorful fun items such as poster, magazine, character graphics
Make & Take or follow up at home activity to extend experience
Giveaway, something to take home
Students' guide
For teachers; pre-visit, onsite, and post-visit materials
Suggested reading materials; resources for additional information
Appropriate evaluation tools

Respondents were asked for advice in designing kits to meet their needs and environments. Comments that do not replicate the above include:
Conduct staff training
Easy to use materials and activities
Keep it simple but engaging and interactive
Make activity repeatable
Very durable
Make to be used many times
Provide all or most of materials
Use inexpensive and easy to replenish materials
Use materials that are durable and dramatic to illustrate a concept
Safe materials
Minimize pieces that are easily lost
No paper products
Assume that materials will be used in a variety of unintended ways
Make flexible to be adapted for different audiences, different ages
Make the resource useable and applicable
Staying current ("cool")
Relate to school curriculum
Create materials that can last over time
Suggested adaptations for much larger groups than *Cyberchase* kits seem aimed for
Bilingual
Test activities before dissemination

One reservation was noted by a respondent about *Cyberchase*'s kit:

> "Although I think the video is excellent, and that television is a useful medium for this kind of activity, I have a problem as a museum with showing up to an after-school or outreach function and showing a video produced by someone else. Our difficulty as a museum is to offer opportunities that cannot be offered by teachers in the classroom. If what we present is easily replicated by the teacher, why would they ask us to present it?

DISCOVERY BOXES

The survey described boxes as follows:
Cyberchase Discovery Boxes would include materials, books, artifacts and laminated self-guided activity sheets. Boxes could be placed together on several tables in a staffed area so visitors can go from one self-guided activity to another. One person could staff the area and assist the visitor with instructions and answer questions as well as motivate. Discovery boxes could be used for scout badge programs, sleepovers, family nights, drop-in workshops and community outreach.

Of the 32 museums, 53% use boxes with their public. Science and natural history museums are more likely to use boxes than children's museums. Museum respondents often note that boxes are monitored by young volunteers.

Components of boxes that are most important to museum respondents include the following:
Inviting signage on outside, giving hint of what's inside
Recognizable graphics that relate to content theme
Clear concise simple instructions; self-explanatory; easy to read
Guides to help those assisting visitors – how to set up and monitor activity, background information
Bilingual
Simple hands-on materials to touch and manipulate
Materials should be earth-friendly, kid-friendly, very durable
Puzzles and brain teasers
Easily cleanable replaceable parts and pieces
Activities appropriate for a wide age range in terms of content, skills, safety
Specific goals and outcomes
Durable container that lets volunteers quickly see that all pieces are present

Advice on boxes beyond what is listed above includes:
"Fun/varied activities that last no more than 10-15 minutes per station, some kind of wow for engagement, the guest must feel the topics relevance to their lives, personalize the experience."
"We like to use plastic containers for easy transport. It would be great from a training standpoint to have a video showing the boxes in use."
"We write up the educational value of the various activities we set out, which helps parents to understand what their child is gaining from the experience."
"You much include something that is different from the child's everyday experience. A discovery box containing only common household items may be just as educational, but it precludes the feeling of usefulness in visiting the museum."
"Include materials that are easy to maintain, manipulate and yet are unique to the end user (i.e., they may not have a stethoscope at home). Make the enclosures light/portable but durable and easy to store, and easy for a student or elder adult volunteer to transport."
"Portable, easy to repair, constructed with sturdy, quality materials."
"The best discovery boxes I have seen have Styrofoam cut-out storage with the place for each item labeled, so it is obvious where each item goes and is easy to reassemble the kit."
"Activities should be prepared with as little text as possible. Boxes should be designed so that the presence of all the materials can be verified by a quick scan."

DISCOVERY CARTS

The survey described carts as follows:
Cyberchase Discovery Carts can be moved about the museum into an area with existing exhibits that relate to math problem-solving and inventions. Included would be interactive demonstration scripts and materials to be used by the museum's interpretive staff with small groups. Segments of *Cyberchase* shows could be screened and utilized.

Of the 32 museums, 53% use carts with their public. Science museums are more likely to use carts than natural history and children's museums. Museum respondents describe how carts supplement their exhibits with additional content and experiences.

Components of carts that are most important to museum respondents include the following:

Exciting attractive appearance so visitors are drawn to it
Graphics, images, photos to clip on as backdrop of phenomena or show characters
Places to hang things
Magnetic area on front of cart for attaching posters or signage
Cart signage viewable from a distance
Cart should be easily maneuverable; easily stored; durable
Outlet strip and extension cord; lighting
Easy-to-clean surfaces
Expandable surface to present things for viewing
Locking storage for materials
Touchable objects; artifacts; interactive materials
"Wow" objects, demos, effects that many can see and experience
Sturdy well-labeled materials
Detailed illustration; concise instructions of the activity;
Training materials, maybe a video demo for training
Script appropriate for volunteers, including background information
Sources of specialty supplies
Ties to curriculum benchmarks

Advice on carts beyond what is listed above includes:

"The presentations from a cart are conversational mathematics or dialogs about science with visitors. As such, "scripts" are pointless and unnecessary. Outlines, FAQs, facts are more useful."
"If certain lighting is necessary, provide a way to achieve this (screening or lighting). Carts may need to be located in areas with insufficient light or with lots of natural light. They are often in noisy environments as well, so if something needs to be heard, it needs to have sufficient volume."
"Make activities and accompanying materials transportable. Keep safety issues in mind. List time requirements for activities."
"Materials need to be accessible and sturdy to withstand many handlers."
"Kids enjoy being able to touch or pick up items that they have never seen or are usually not allowed to touch."
"Nothing breakable."
"Minimal cleanup and not require a great deal of surface space."

"Screening video segments requires the available AV technology to be available. Activities and demonstrations may need to be self-sufficient and not always relay on being paired with a video presentation."
"Carts that would require viewing a segment of *Cyberchase* would not be good as moving a TV around is cumbersome."

EDUCATIONAL COMPUTER GAMES

The survey described a game CD-ROM as follows:
Cyberchase Game CD-ROM would include 40 interactive learning games that are currently available at pbskids.org/cyberchase. Game content covers the matrix of 52 math-related topics that was sent to you in your package. Games vary in playing time from 5 to 15 minutes. The CD-ROM could be used in a computer lab or in a stand-alone kiosk.

Of the 32 museums, 66% use computer games with their public. Science and natural history museums are more likely to use games than children's museums. Museum respondents describe use of computer games both on the museum floor related to specific exhibits and in computer lab settings.

Several respondents explained their reservations about computer games:
"We have some educational software on computers that loosely support the presented content without our exhibits. These computers often freeze-up on a regular basis (even with the best operating systems), and we have been working to remove them from many of the experiences."
"Currently the staff is concerned that computer stations are actually a waste of space because so few people can use a single computer at the same time."
"We only use them when we can monitor them. We have found that computers left unsupervised end up broken. We have found that computer games housed in a kiosk have worked better."
"Visitors need to be able to understand the game within 2 minutes and should achieve some success within 20 minutes, since we sometimes have a 20 minutes time limit [in the lab setting with moderate supervision.]
"Budget constraints limit hardware purchases."

One respondent suggested the following repurposing of *Cyberchase* games:
"I would like to see these games be sequential somehow so that children working through a game are rewarded with clues that send them through the museum to gain more information, something like DaVinci's code. This would require that the CD-ROM be tweaked to be specific for each museum. The idea being that as the children solve a puzzle, they are given clues to solving a puzzle in the museum, which gives them clues to continue on the CD-ROM. This approach would make the CD an integral part of the museum, and at the same time allow for repeat visits. I realize this is more work than *Cyberchase* would likely like to put in, but it is at this point that the usefulness really increases dramatically. Until this level of interaction is possible, *Cyberchase* curriculum could more easily be delivered in the classroom by teachers than in the museum setting.

VIDEO

The survey described video screenings as follows:
Cyberchase Video Screenings of half-hour *Cyberchase* shows could be scheduled in an auditorium or classroom so that visitors can become familiar with the show and be motivated to participate immediately in subsequent activities. The package we sent you includes a matrix listing of the 52 topics available currently in *Cyberchase* videos. A Digit costume could be provided to motivate interest.

Of the 32 museums, 50% use video with their public. Museum respondents describe use of videos in teacher and parent programs or workshops, special member meetings and camp sessions. Museums also use videos within their exhibits to "teach or reinforce a concept." One respondent sees the video in her children's museum as " a nice resource for families seeking some quiet time together in the museum."

Respondents explained their reservations and advice about videos:

"Provide signage and graphics for a program. Invite celebrities or creators of the program – the science and technology of the program. Link to other topics in the museum – screen several on the same day to make it an event with follow-up activities."

"Video needs to be short and dynamic. We have not had great success with stand-alone videos. Programs that involve a live performance/facilitator and video portion work best."

"We try to limit our viewing to 15 to 20 minutes."

"Videos that are short, 15 minutes or less."

"The film segments can be no longer than 30 minutes as the attention span of our target audience [0-8 years] seems to waver beyond that time frame. It would be helpful to provide spots in the film for the instructor to stop the action in order to illustrate a particular point or do an activity relative to that point in the film – especially when working with a younger audience."

"1/2 hour with activity would work best as a program for which people register. Our audience would not do that on a 'drop-in' basis-it's too long and is perceived as too much of a commitment."

"We never accept violent or overly aggressive behavior [in videos]. Most videos we use are factual and show real animals, processes, etc."

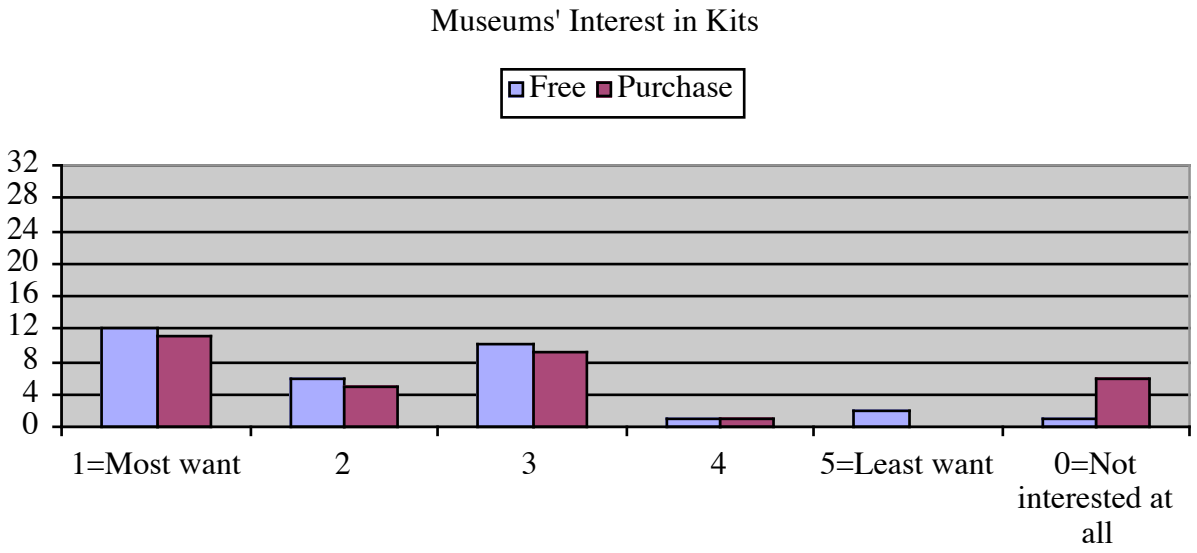
"As the show is available on PBS, and possibly to schools, why would anyone feel satisfied in seeing the video at the museum? Generally our programs are 45 minutes in length, and schools often match this with another hour in the museum itself on a tour to make a two-hour field trip. Casual visitors to the museum will not be keen on watching a video of that length."

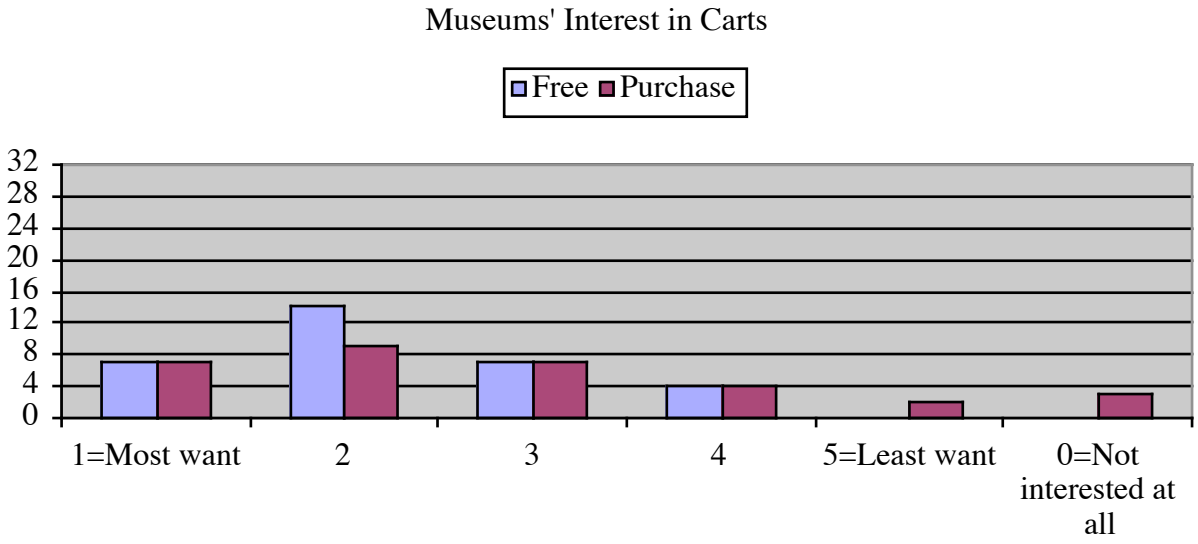
"Access to AV equipment on the floor and even in classrooms is limited."

"Our visitors come to have interactive experiences, not passive ones."

INTEREST IN FREE OR COMPETITIVELY PRICED MATERIALS

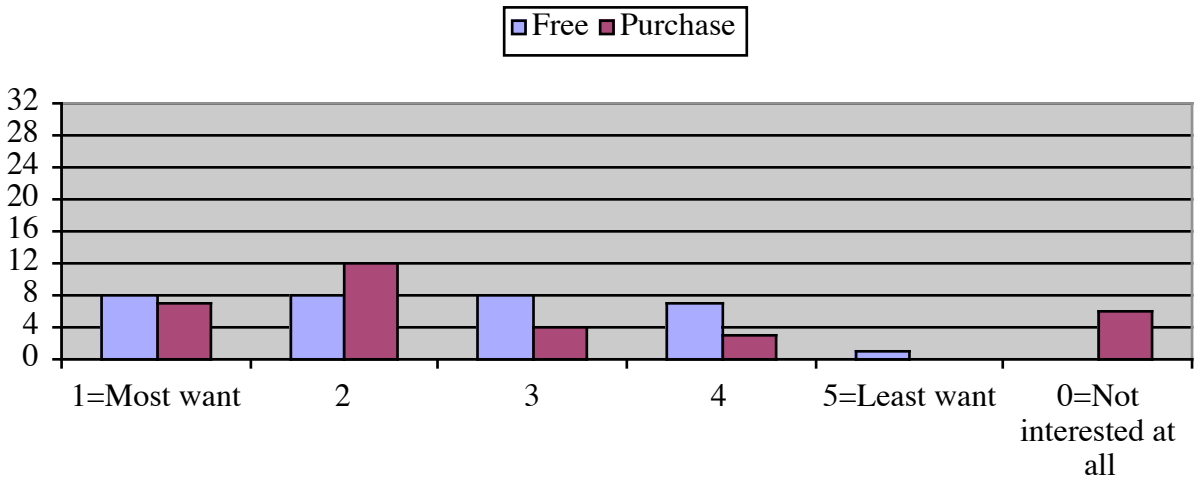
Respondents ranked the five types of materials in terms of their interest in receiving them free of charge and interest in purchasing them at a competitive price, where 1 was used for the most desirable material, 5 for the least desirable. The charts below indicate that kits were of most interest under both conditions; next of interest were carts and boxes; with educational games and video of least interest (see charts below).[2]



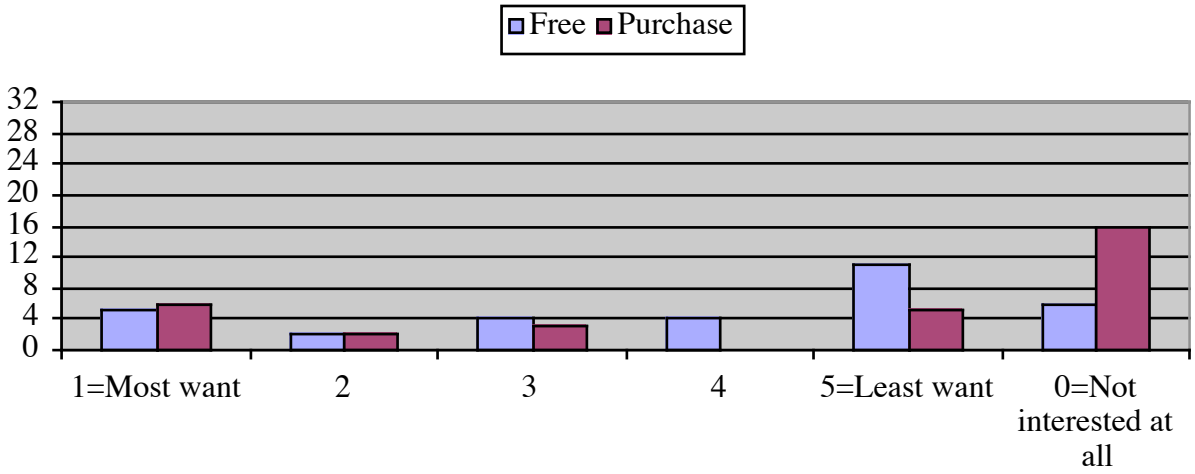


[2] Charts broken down by type of museum are available in the Appendix.

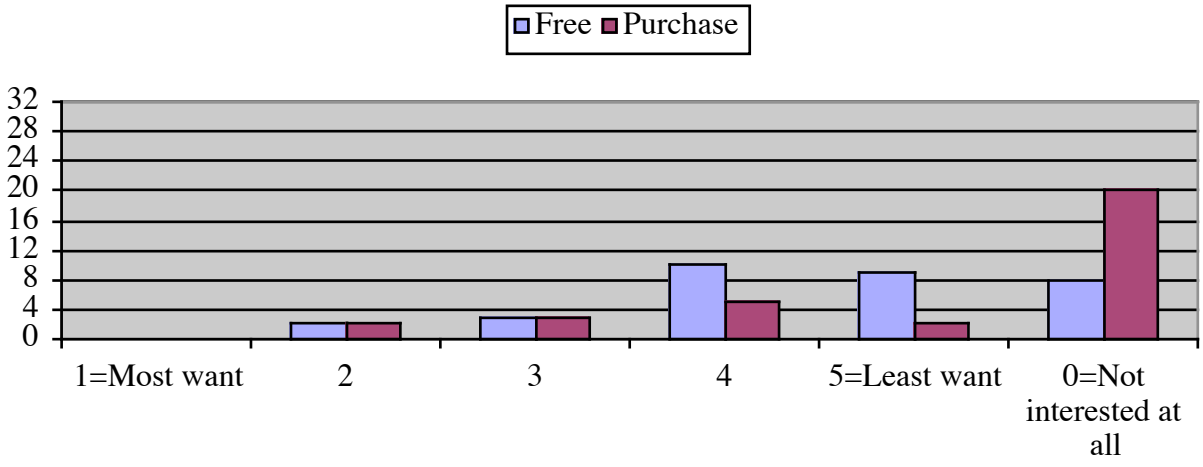
Museums' Interest in Boxes



Museums' Interest in Games

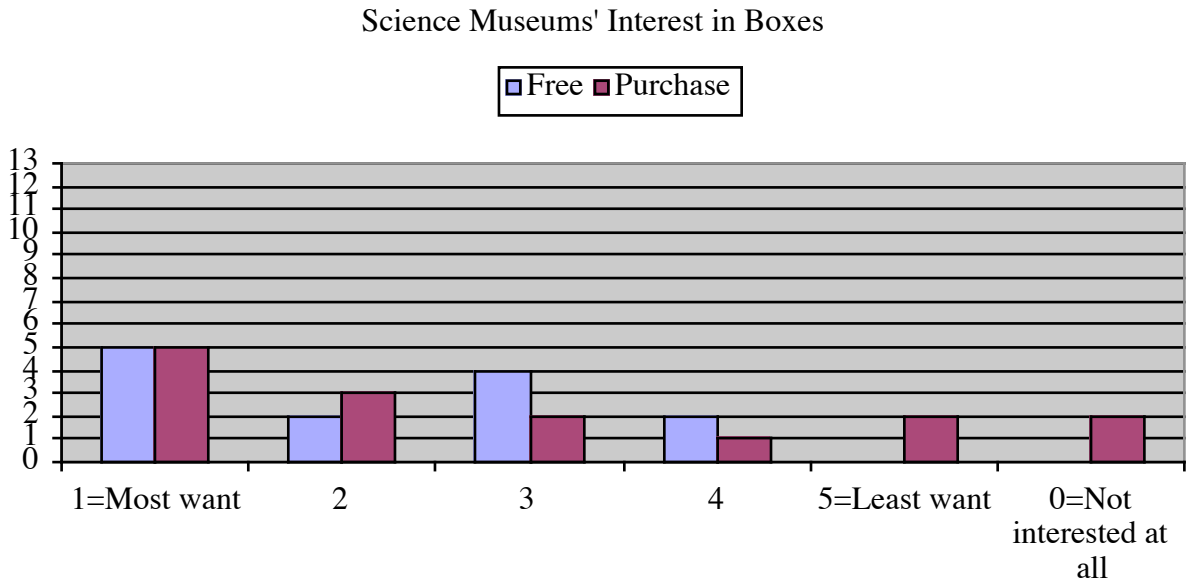


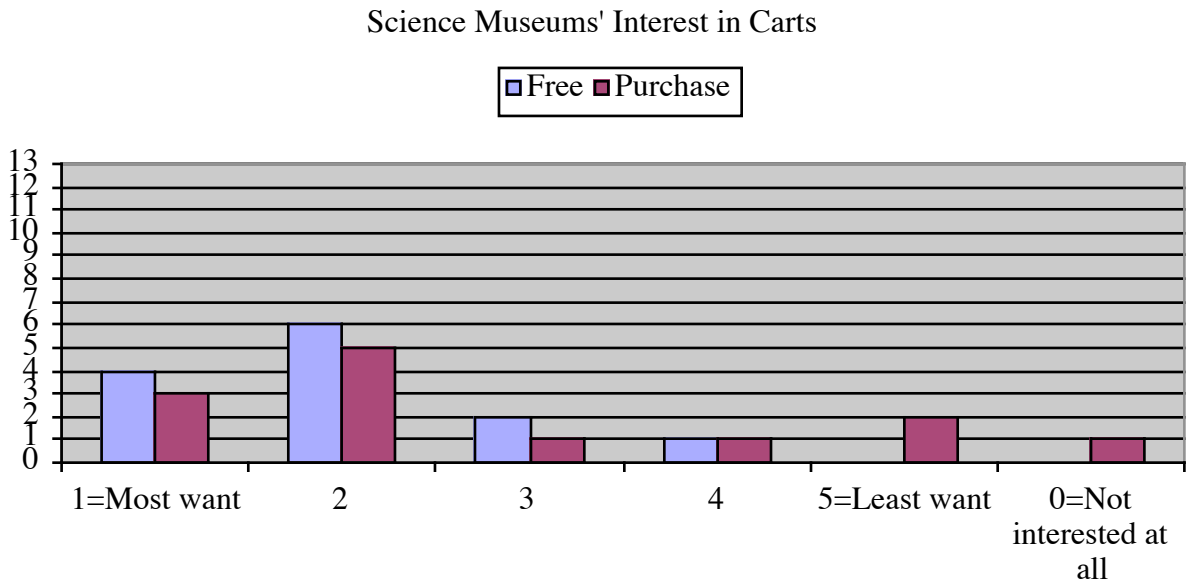
Museums' Interest in Video



APPENDIX

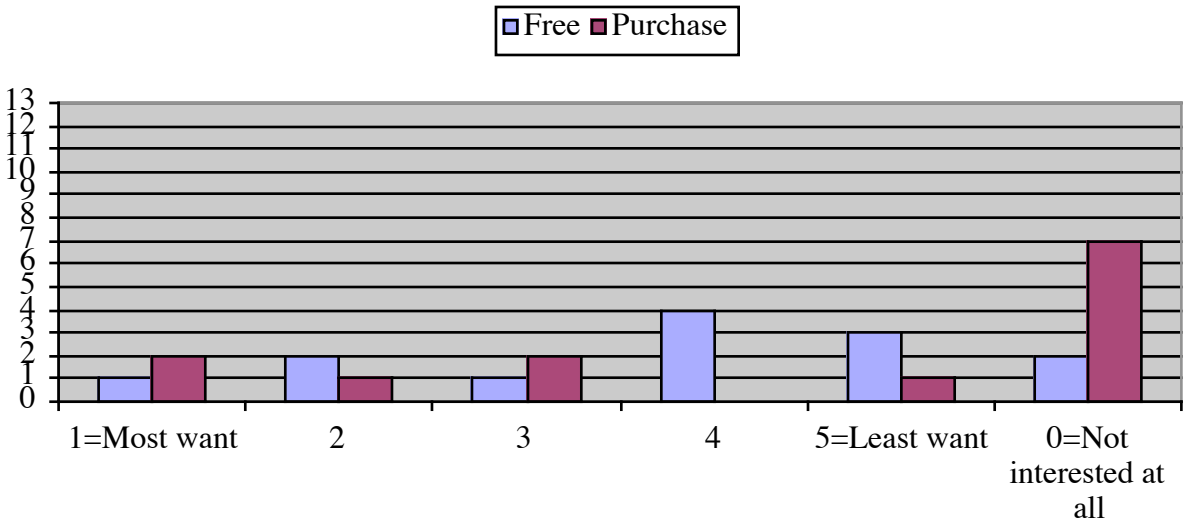
SCIENCE MUSEUMS' INTEREST IN FREE AND COMPETITIVELY PRICED MATERIALS

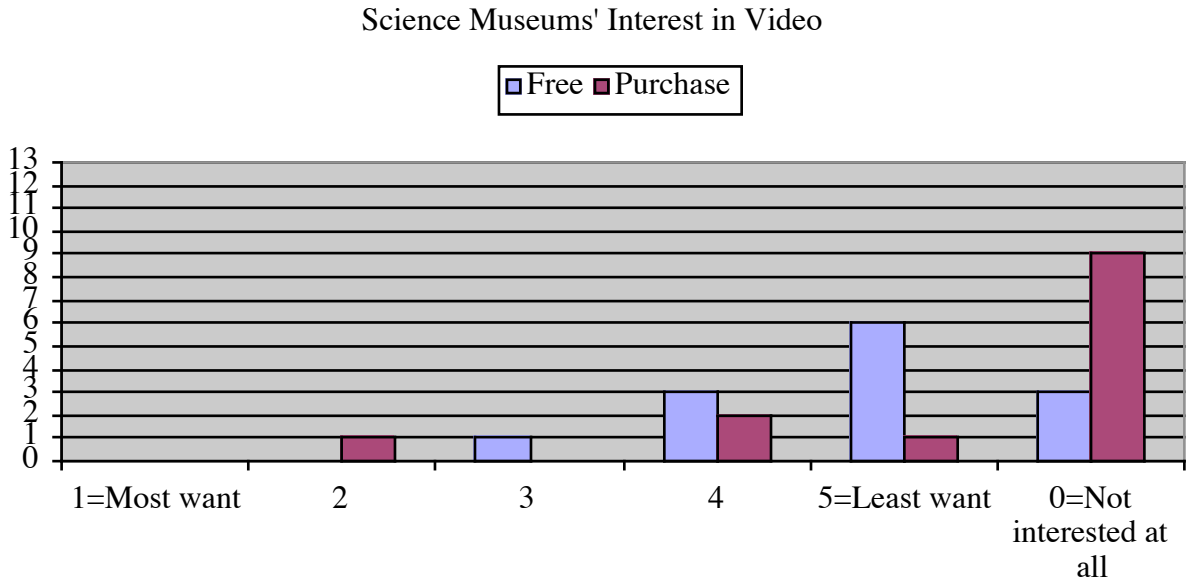




Science Museums' Interest in Kits

Science Museums' Interest in Games




Science Museums' Interest in Video
Free
Purchase
13
12
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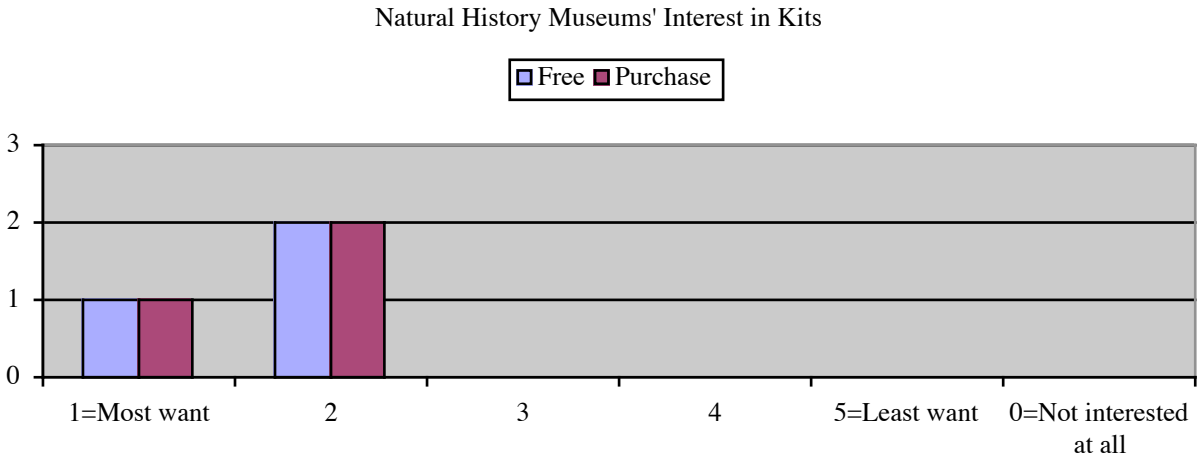
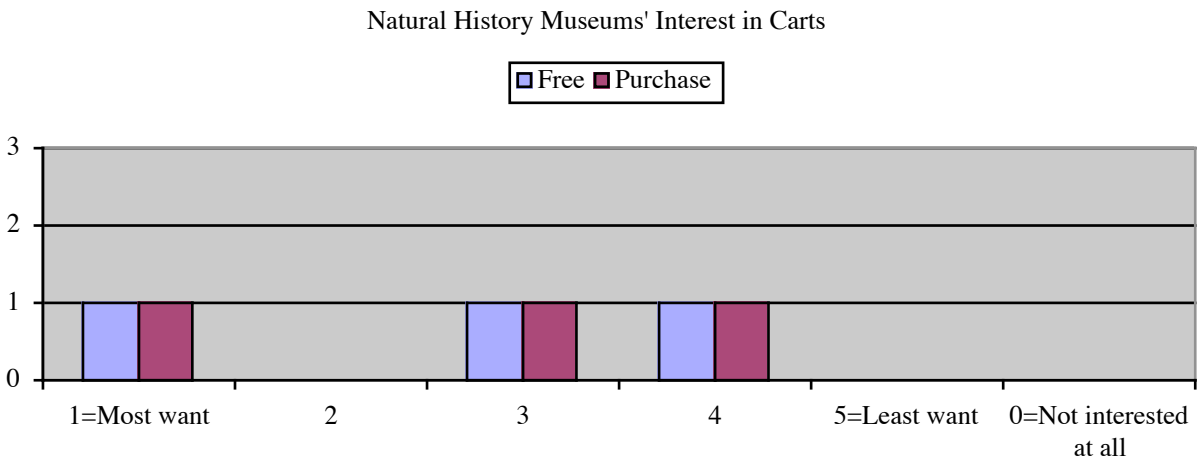
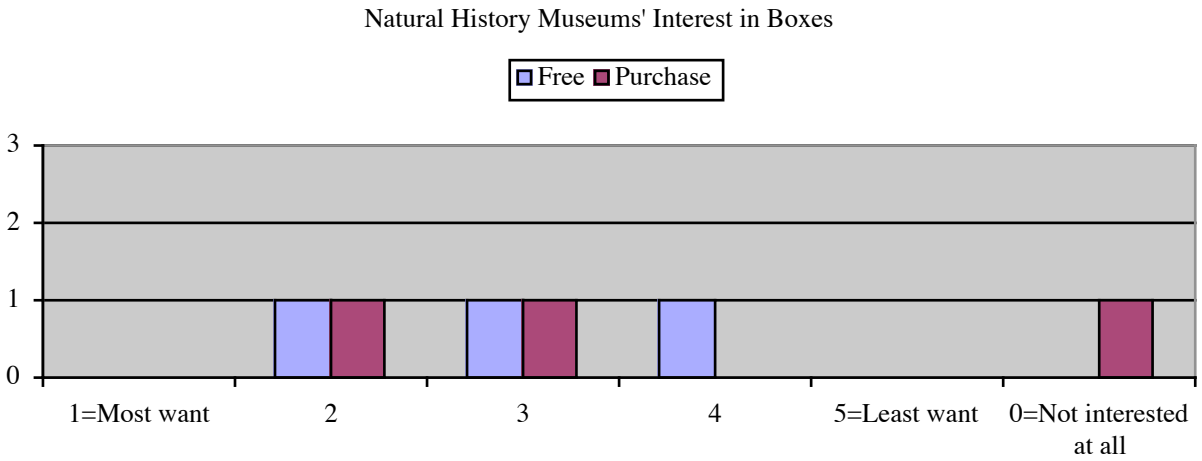
4
3
2
1
0
1=Most want
2
3
4
5=Least want
0=Not interested at all

NATURAL HISTORY MUSEUMS' INTEREST IN RECEIVING FREE AND COMPETITIVELY PRICED MATERIALS

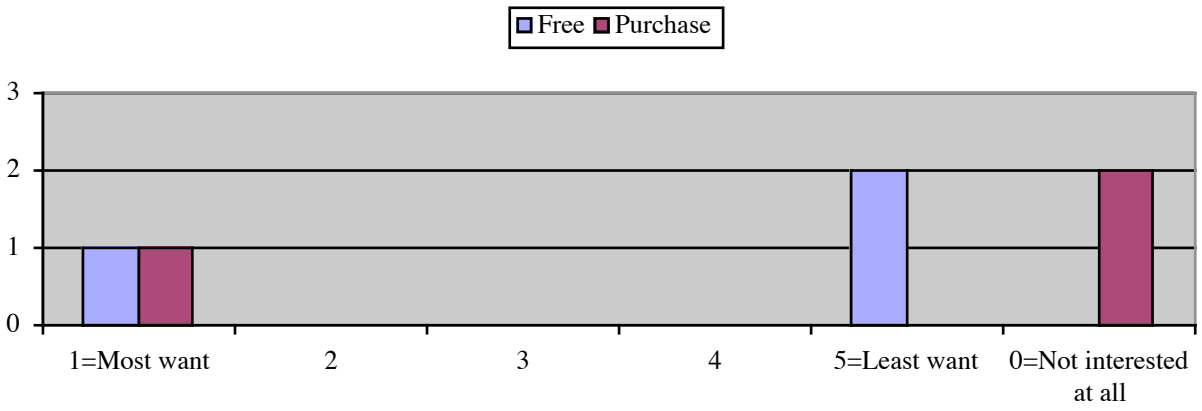




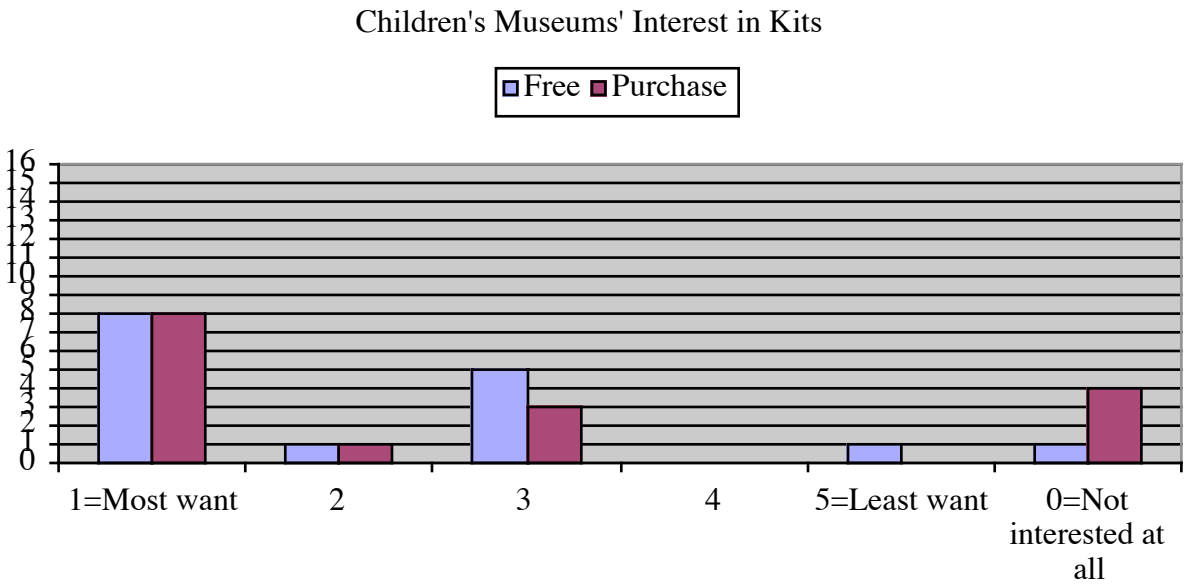


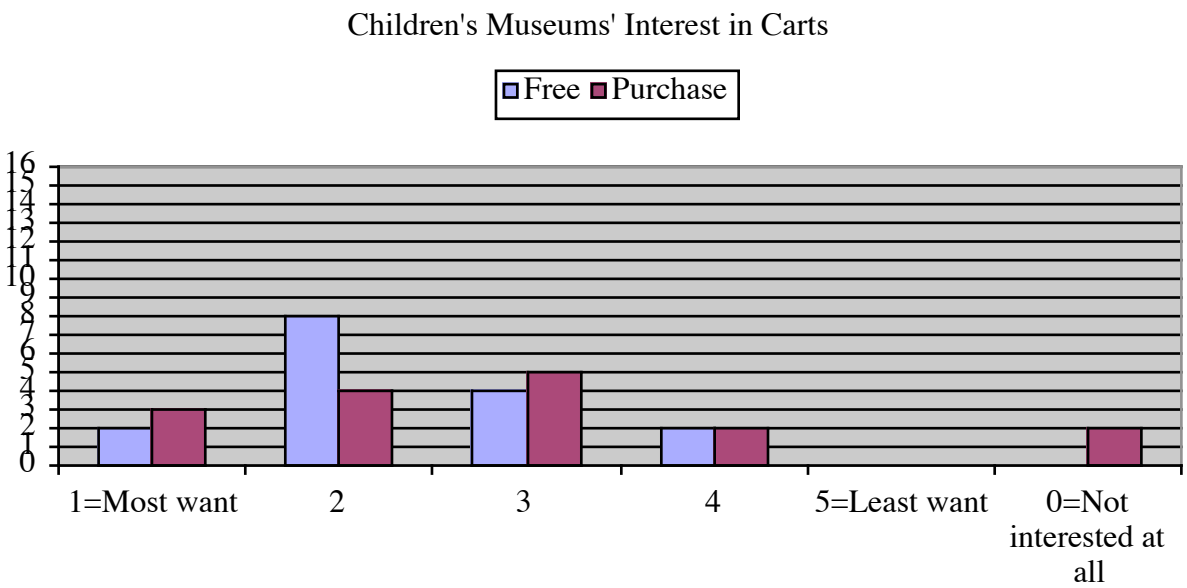
Natural History Museums' Interest in Video

Natural History Museums' Interest in Games



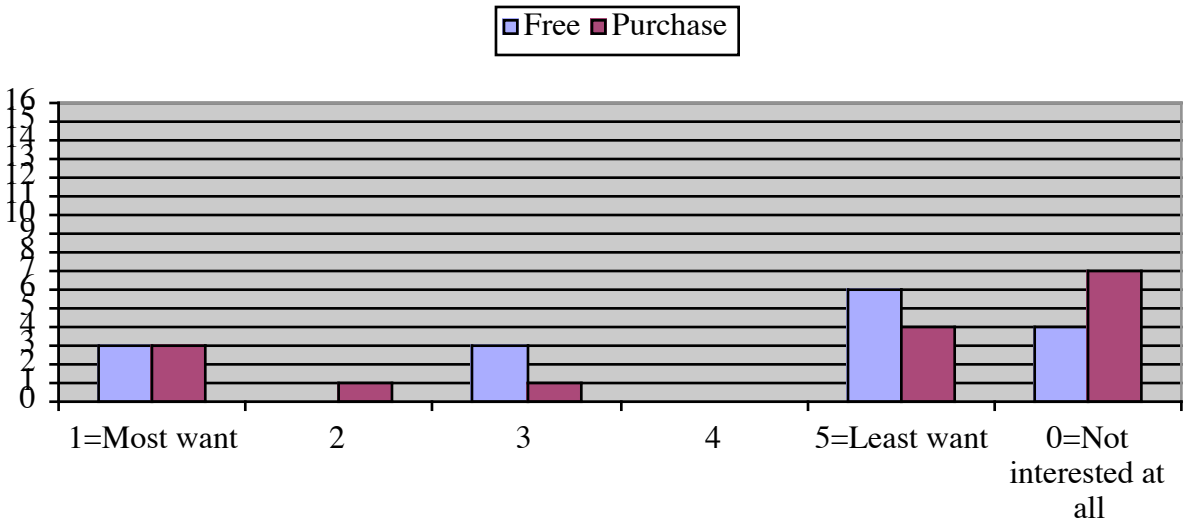
CHILDREN'S MUSEUMS' INTEREST IN RECEIVING FREE AND COMPETITVELY PRICED MATERIALS

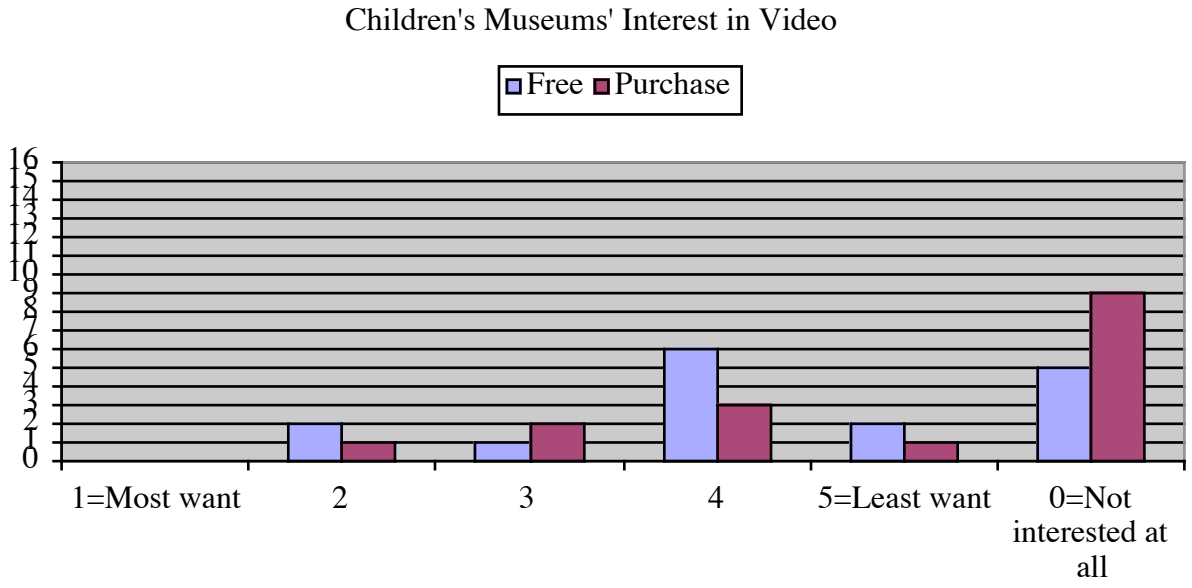




Children's Museums' Interest in Boxes

Children's Museums' Interest in Games




Children's Museums' Interest in Video
Free
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1=Most want
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5=Least want
0=Not interested at all