CONJUNCTION

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ABSTRACT:
A recent conjunction of four Philadelphia area resources will benefit future community visitors observing with the historic Zeiss telescope in the Joel Bloom Observatory atop the Franklin Institute. Graduate students completing their Masters Degree have met the challenge to construct a computer based training solution to the learning needs posed by the Rittenhouse Astronomical Society. The challenge is to assist in the training of the all volunteer observatory staff.

How does an astronomy club, a museum, observatory and a college all benefit through collaboration? The Rittenhouse Astronomical Society (RAS), the Franklin Institute, the Joel Bloom Observatory located on the rooftop of the Franklin, and Philadelphia University joined together for community benefit.

The Franklin Institute recently refurbished the Bloom Observatory bringing the Zeiss 10" refractor back to its true glory serving the public as a community resource. The observatory is staffed by volunteers from surrounding greater Philadelphia area and is open once a month to the pubic for night sky observing. The RAS also uses the observatory during its meetings providing the general public and members more access to the telescope.

One of the challenges that faced the observatory operators and assistants is the need for training of its all volunteer staff. To date, that task falls on the Chief Astronomer of the museum. Derrick Pitts performs that training for the volunteers. As he explains during the training, volunteers need to become very familiar with the competencies needed for the operation of the observatory. They need to develop a comfort level in operating the observatory which until now could only be gained by continued practice in the observatory.

The operation of the observatory for public viewing is not as complicated as one might expect. The recent addition of a computer guidance system and software that interfaces with the telescope allows the operator hands off (totally remote) control of the telescope. What we really need to bring to light is the responsibility of opening and closing the observatory. The task, although very straight forward, must be done correctly or the damage resulting to the Zeiss telescope could be irreparable due to the expense incurred. So how could we build confidence and competence in the volunteer staff? How would the RAS assist it's members, or for that matter, any volunteers that stepped forward and expressed interest in operating the telescope?

The RAS investigated a way that trainees might supplement their hands on observatory training with a review of the key concepts at home. Current trainees were provided a 5 page pictorial guide made available to review what they had practiced. We considered the possibility for continued

training or a review of the training experience to be provided by the internet, or on a CD made available to the trainee.

We proposed that a review of the practical experience based training offered by Derrick would assist perspective observatory operators to gain the competencies and confidence needed. It was suggested early on that by video taping segments of the training process and allowing the trainee to review various steps in the process as needed would be quite beneficial. Could we fund such an effort? Did we have the manpower or expertise in our volunteer organization to put this together? No.

We turned to a local college, Philadelphia University, for the assistance of a design team of graduate students majoring in Instructional Design and Technology. The RAS made a proposal competing with other area colleges and businesses to the students in the program. We expressed our learning needs for the volunteers and invited the team to design a computer based tutorial that one might use to assist in the training of the operation of the observatory and telescope.

The design team accepted our proposal with its challenges and quickly started visiting the observatory on its open community nights to survey the volunteer operators on their background, experience and interest. Members of the team attended the Rittenhouse meetings to meet the members and to survey some interested in telescope operation.

The design team developed and conducted a needs assessment through personal interviews, panel based interviews, and by survey questions. Their on-site observations of the volunteers in action when interfacing with the telescopes and the community assisted in their final needs analysis. The analysis document was compiled and reviewed by the chief astronomer, and RAS board.

Results of the needs analysis and the stated learning needs by the subject matter experts would guide the design team.. The students on the team each take on a real life role that would be involved with the process.. Instructional designer (the plan, the content), graphic designer (the look, the interface, navigation), programmer (coding, the interface, navigation), videographer (director and capture of movie input), and project manager (coordinator and lead contact) make up the team. The responsibilities are established and taken on by consensus of the students. Subject matter experts included Derrick Pitts and officers of the RAS including their observatory liaisons. Mr. Pitts would also provide the training content through the filming of him demonstrating the opening of the observatory, the tasks of aligning the telescope, and the procedure for closing the observatory.

Supplemental pictures, computerized models of the office area and observatory, graphics for the program operation, icons for the observatory, video clips of the process were all developed by the design team. Themes were discussed, storyboarded, adapted, and discarded, all in the development process. Evaluation assessments were designed into the program to assist in understanding of the basic concepts, positions of the telescope, and key points of the program.

Alpha testing is conducted about half way through the process. It is at this point that storyboards have been converted into computer graphics, working modules of the program can be interacted with, and the general skeleton and design of the program are tested with observatory volunteers, or those interested in volunteering.

We attracted a variety of volunteers from our organization at this point to assist in the evaluation of the program. Our alpha test subjects included an instructional design teacher, our lead observatory liaison, a summer observatory operator, a professional instructional designer, a museum employee at the Franklin as computer technician, and an interested novice with no observatory experience. The wide background was to gain valid feedback from many perspectives. Test subjects ranged in age from 18 to 53, a wide age sampling for a wide target audience indicated in the needs analysis.

One of the Alpha test subjects and member of RAS has experience designing computer based instruction. We were all quite impressed with the software that was developed at the Alpha stage and inquired how much it would have cost to develop this program professionally. Kevin Gallen (Risk Management Assoc.-Instructional Designer) informed the group that currently interactive tutorials cost approximately $1000.00 per minute of interactivity that is provided to the user. He estimated the basic training software our team developed would cost approximately $35,000. He also informed us that due to the heavy use of video modules and the software could have a base value possibly $10,000 greater totaling almost $45,000. The time involved, the talent, and production work would all substantially increase the production cost of the program.

Feedback was collected at the alpha testing by written evaluation and interview. Based on that feedback, further refinements and additions are taken into consideration and worked into the software to be included in the final beta version of the software.

Beta testing is the final opportunity members had for input on the final product. The beta evaluation was mailed to selected club members, and those expressing an interest in operating the telescope. The tutorial was made available on line so that members could evaluate the software from any PC with access to the internet. It is at this point that the design team is looking for an final feedback that can be worked into the program.

The last part of the process involves the presentation of the computer based training tutorial by the team to their professors at a Multi-Media Design Expose held at the college. Fellow faculty, college administrators, Rittenhouse members, family and friends were invited to the preview. The evening was quite successful considering we filled the auditorium with not only interested faculty, but other undergraduate students that have an interest in the instructional design program. The students in the design team present the software by giving an overview and demonstration of how it works and the tasks that were involved to make it happen.

Implementation of the project has not occurred at the publishing of this paper. The projected presentation of the software to the RAS membership at large will occur at the June 2008 meeting. To prepare members, recent guest speakers have been invited from surrounding observatories to gain an understanding of how their programs operate and what equipment and training they provide for their observatory operators. After the presentation of the software, the next phase will be the implementation and then subsequent evaluation which is scheduled to take place when the academic year starts again in September of 2008.

The coming together or conjunction of the Philadelphia University, the RAS, the Franklin, and the Bloom Observatory, is expected to yield a trained staff of observatory operators and volunteers to

assist in the mission of the observatory. This conjunction promises to yield a bright future for the visiting public utilizing the telescopes of the Bloom Observatory.

Design Team: Graduate Students of Philadelphia University	Rittenhouse Members Subject Matter Experts, Alpha, Beta evaluators:
Kristy Brown- Project Manager Craig Do'Vidio- Multi-media Specialist Randee Frankel- Development Christina Leon- Instructional Designer Mark Magee- Graphic Designer Joanne Reppert- Multimedia Specialist	Derrick Pitts- Member, Chief Astronomer, Franklin Institute Dr. Milt Friedman- President Ted Williams- Secretary Ruth List- Treasurer Mike Mountjoy- Instructional Technology advisor Dr. Carol Ludolph- Observatory Liaison Dave Walker- Planetarium Liaison Kevin Gallen- Member Dan McCormick- Student Liaison Eric VanAustin- Member