School trip photomarathons: engaging primary school visitors using a topic focused photo competition

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The aim of this study was to explore the potential of photomarathons as a fun and engaging way to support students making connections between what they learn during a museum visit and what they learn in school or other contexts. Sixty primary school pupils aged between six and eleven took part in a photomarathon activity during their trip to the Roman Baths. The children were split into three groups. During their visit each group undertook three one-hour activities, namely: a photomarathon, a hands-on artefact exploration activity with a museum education officer, and a school-group handheld audio tour. For the photomarathon activity the children worked in subgroups of three and, for 15–20 minutes, took photos on three themes around the museum. At the end of the available time the children submitted a set of photos, one photo for each theme. Photo galleries for each theme were then generated and made available on a website for the pupils. The students voted for the best photo in each theme gallery, and a small prize was awarded to the members of each team that took the winning photo. A week after the visit the children were asked a number of questions concerning their visit. The photomarathon was spontaneously mentioned by 41% (23/56) of the children as the best activity in their visit to the Roman Baths, which was more than any other activity they engaged in during the visit. Overall, of the three activities the children liked the photomarathon the best. There were no age differences in how engaging the children found the photomarathon activity and all children regardless of age were able to take photographs.

Keywords: museum learning; school visits; photomarathons; empirical studies

Introduction

Photomarathons are a timed competition in which a group of photographers are given a set of themes to take photos on. At the end of the available time (typically around 12 hours) each entrant submits a set of photos, one photo for each theme in the given order. The judges then choose the best photos and award prizes.

As a school trip activity, a photomarathon can be completed within an hour (including the judging and prize giving). The visiting group of pupils are first introduced to the rules of the competition and the judging process; they are then given cameras and three or four curriculum-related topics to take photos on. After a

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set time limit (typically 15–20 minutes) the pupils return to upload their photos and vote for their favourite within each topic category. By using topics provided prior to the visit by the teacher and/or the pupils, the photos taken during the visit form a personal collection of resources that can be used after the trip as a basis for further class discussion or student research activities.

We were interested to see if pupils enjoy the photomarathon activity and to what extent it can help motivate visitors to engage with museum exhibits. We argue that aligning the competition topics with the curriculum encourages pupils to think about those topics during their trip, and helps them to relate what they learn during the trip to the work they do afterwards in class. This paper introduces the research that motivated the development of the school trip photomarathon activity and the outcomes of a formative evaluation trial, including the design of the activity, the development of the technology used, the feedback received and the subsequent re-development of our photomarathon toolset.

Related work

Class visits to museums are a long established and popular activity for schools. For example, the Roman Baths in Bath had 50,140 visitors in self guided educational groups between April 2009 and March 2010, and a further 9889 visitors in educational groups that took part in a teaching session organised by the Roman Baths.

School museum visits such as these are important because they:

- expose students to subject matter that cannot be covered in the classroom,
- introduce them to resources in their community,
- provide a varied social experience,
- are memorable experiences for the students which can be drawn upon after the visit by the teachers in appropriate learning situations, and
- can offer cross curriculum learning opportunities.

Research on museums has reported mixed findings in terms of knowledge and cognitive gains after visits to museums (Donald 1991; Griffin 2004). However, knowledge gains are not the only outcome of museum visits. Students can also gain in terms of positive attitudes and motivation towards the museum and its subject matter (Falk et al. 2004; Jarvis and Pell 2005; Rennie and McClafferty 1996). These gains are in some ways more important because they not only inspire further study and visits to the museum, but also motivate and engage the students in further school work based on their visit. Considerable research has found that high levels of motivation and engagement in schools are related to higher academic achievement (for a recent review see Ryan and Deci 2009). Further research has shown that post-visit visit activities in the school are important because they help students assimilate new concepts and resolve possible misconceptions (Anderson, Lucas, and Ginns 2003; Anderson et al. 2000). Falk and Dieking (2000) argue that it is only after a visit that the experience becomes relevant and useful.

There has been considerable research on the use of mobile devices to support school visits (see for example Cabrera et al. 2005; Galani et al. 2003; Hsi and Fait 2005; Mulholland, Collins, and Zdrahal 2005; O'Hara et al. 2007; Papadimitriou et al. 2006). This work has moved beyond the audio guide found in most museums,

and developed systems that facilitate exploration, information searching, communication and documentation (Hsi, 2002).

There have, however, been few studies that have tried to bridge pre-visit, visit and post visit learning in the museum and the school. One notable exception is MyArtSpace, which was a service developed to run on mobile phones to support inquiry learning by (Vavoula et al. 2009). The process begins prior to the visit with goal-setting at the school. During the visit the students use MyArtSpace to gather information either through taking photographs or field notes during their school field trip. This information is automatically sent to a website where the students can view and present their work after the visit. The authors report that the service was effective in enabling students to gather information in a museum, and provided resources for effective construction and reflection in the classroom.

Another recent example that supports inquiry learning across contexts is the Zydeco system (Cahill et al. 2010; Kuhn et al. 2010). The system includes an online web component allowing students to define goals, questions and information for their science inquiries. This information is uploaded to a handheld device so that students can photograph, tag and annotate information in a museum. Students can then access their museum work back in the classroom to complete their investigations.

Both of these systems are designed to support inquiry learning, an approach intended to encourage students to explore topics of interest that relates resources and activities to a focused problem or topic under investigation. The aim of this paper is to build on this work by exploring the potential of photomarathons as a fun and engaging way to support students making connections between what they learn in their museum visit and what they learn in school or other contexts.

Formative evaluation trial

Participants

The sixty primary school visitors were divided into three more manageable groups. The first two groups were made up of pupils from two classes with an age range of nine to eleven year olds; the third group consisted of younger pupils, aged seven to eight. Table 1 presents the distribution of pupils, teachers and assistants between the three groups. During the day each group undertook three one-hour activities, namely: the photomarathon, a hands-on artefact exploration session with one of the museum education officers, and a school-group audio tour using individual handheld audio guides.

The session plan for the one-hour photomarathon was as follows:

- Introductions (10 minutes)
  - Introduce the researchers and explain the competition rules and regulations, give each subgroup a camera, and explain how to use the camera (reminding the pupils about their three topics, which are also printed along with the rules on a label attached to each camera).
- Pupils exploration and photo taking (20 minutes)
  - Pupils (supervised by their teacher and the assistants) go around the museum taking photos on each topic.
- Photo uploading (5 minutes)

Table 1. The distribution of pupils, teachers and parental assistants across the three groups undertaking the photo marathon activity during a one day school visit in October 2010.

Group	Start time (duration 1 hour)	Age range	Number of pupils per group	Number of pupils per subgroup	Number of teachers	Number of assistants
Group 1	10:30	9–11	24 pupils in seven subgroups	4 groups of three pupils and 3 groups of four pupils	1	2
Group 2	11:30	9–11	21 in six subgroups	3 groups of three pupils and 3 groups of four pupils	1	2
Group 3	14:00	7–8	15 in five subgroups	5 groups of three pupils	1	4

    - Upload the photos to a computer using three topic folders. Each subgroup selects a photo for each topic, which is placed in the corresponding topic folder.
- Reviewing and judging (15 minutes)
    - Show each topic folder as a photo gallery and ask the pupils which ones they prefer and why (keeping the discussion focused on the specified topic). Before moving on to the next topic, ask the pupils to vote for their favourite (having discussed them for a couple of minutes). The goal is to identify the photograph that best represents the topic (i.e. not the clearest or best composed photo).
- Prizes (5 minutes)
    - Award a small prize (age appropriate) for the best photo in each topic.
- Reset (5 minutes)
    - The group moves on to the next activity while the researchers reset the cameras and computer for the next session.

Resources

A large office was made available in the back rooms of the museum for the photomarathon sessions (see Figure 1). A data projector and screen were used to

Figure 1. The room setting and equipment used for the photomarathon activity.

show the photo galleries and some introductory PowerPoint slides. Canon PowerShot A460 (point-and-click) cameras were used by the pupils. As noted above, laminated labels reminding the pupils of their photomarathon themes and rules were attached to the pupils' cameras.

A printed copy of the PowerPoint slides containing information on the activity and details of the website were given to each teacher (prior to the pupils taking photos), along with a set of small paper leaflets with the web address and password details to enable each of the pupils to access their gallery online after the visit (these were given to each of the teachers at the end of the photomarathon session).

Three computers (two netbooks and a laptop) were used by the authors to upload the photos. The photos were then copied from the two netbooks onto the laptop, which was running a local web server XAMPP. This is an easy to install Apache distribution containing MySQL, PHP and Perl (http://www.apachefriends.org/en/xampp.html). It could generate image galleries for each topic folder. The resulting gallery folders were copied to a publicly available web server at the end of the day.

Formative evaluation

The children completed a pre-test one week before their trip to the Roman Baths, which was a general assessment of their knowledge of the Romans. A week after their visit to the Roman Baths, the children were given a post-test. It consisted of a general assessment of their knowledge of the Romans, which was the same as the pre-test, and an evaluation questionnaire of their experience at the Roman Baths.

The questionnaire consisted of an open ended question asking "what was the best thing about the visit to the Roman Baths?" The next four questions asked the children to rate their visit to the Roman Baths overall, the photomarathon, the audio tour, and the teaching session. The children used a five point 'smiley face' scale which ranged from 'awful' to 'brilliant'. The smiley face scale was developed and validated by Read and MacFarlane (2006) as a means of surveying children in the age group taking part in the study. The children were asked which activity they liked the most and which activity they liked the least. Finally, they were asked whether they found taking pictures easy and whether they had visited the photomarathon website.

Findings

The 18 subgroups took 154 photos in total. On average each group took 8.6 photos (with only one group taking less than three). In the evaluation questionnaire, the children were first asked what they thought was the best thing about the Roman Baths. We noted the number of children who mentioned either: the photomarathon, the audio tour, the teaching session, a general comment about the Roman Baths, a specific comment about the Roman Baths, or lunch.

Figure 2 shows that 41% (23/56) of the children commented that the photomarathon was the best thing about their trip to the Roman Baths, compared to 18% (10/56) who mentioned the teaching session, 11% (6/56) who mentioned the audio tour, 14% (8/56) who mentioned the Roman Baths in general; 12% (7/56) who mentioned something specific about the Roman Baths and 4% (2/56) who mentioned lunch. On this measure the photomarathon was the best aspect of their visit.

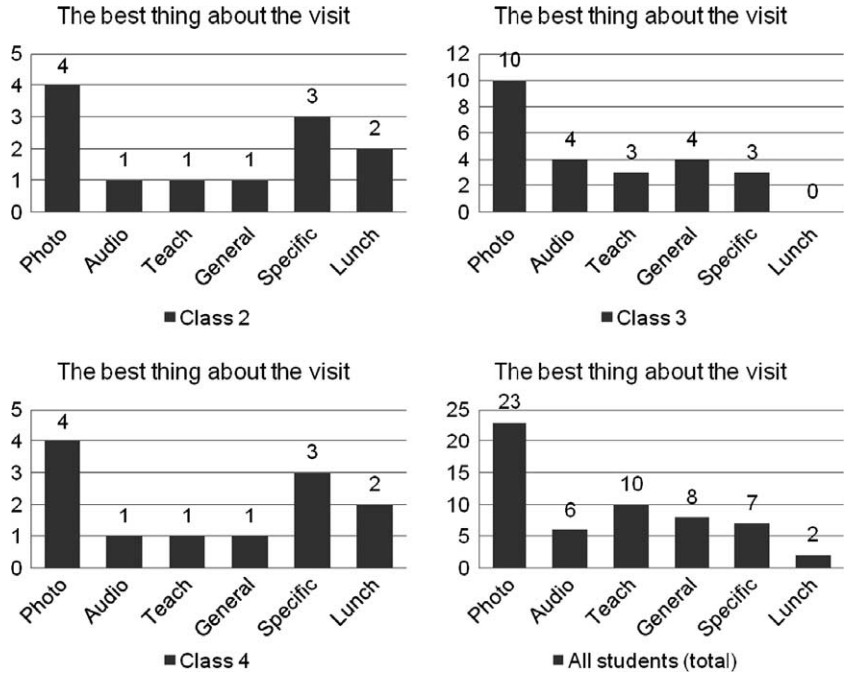

Figure 2. The students' reported best thing about the visit, for each class and total.

The next set of questions asked children to rate their visit to the Roman Baths using a five point smiley face scale.

Figure 3 shows that 64% (36/56) of students rated their trip to the Roman Baths as brilliant, 20% (11/56) rated it as really good and only one child rated it as not very good. There was an age difference, with 83% (10/12) of younger children (i.e. Class 2) rating it brilliant compared to 35% (7/20) of the older children ($\chi^2 = 16.8$, df $= 6$, $p < 0.05$).

Fifty percent of the children (28/56) rated the photomarathon as brilliant, 29% (16/56) rated it really good and only one child rated it not very good (see Figure 4). There was no age difference ($\chi^2 = 3.0$, df $= 6$, $p > 0.05$). Fifty seven percent of children (32/56) rated the audio tour as brilliant, 16% (9/56) as really good, 7% (4/56) rated it not very good and one child rated it as awful. There was no age difference ($\chi^2 = 11.6$, df $= 8$, $p > 0.05$). Fifty five percent of the children (30/55) rated the teaching session as brilliant, 16% (9/55) rated it as really good, one child rated it not very good and one child rated it awful. There was no age difference ($\chi^2 = 9.9$, df $= 8$, $p > 0.05$). Comparing the three activities, the most highly rated was the audio tour followed by the photomarathon and then the teaching session. The differences are very small and not significant.

The children next had to select which of the activities they liked the best (Figure 5 left). Overall, the most popular activities were the audio tour and the photomarathon, both selected by 40% of children (21/53). The teaching activity was selected by 20% of the students (11/53). They were next asked which activity they liked the least (see Figure 5 right). Forty nine percent of the students (24/49) said they least liked the teaching activity, followed by 31% (15/49) choosing the audio tour and 20% (10/49) least liking the photomarathon. A third of the children (19/57) said they had looked

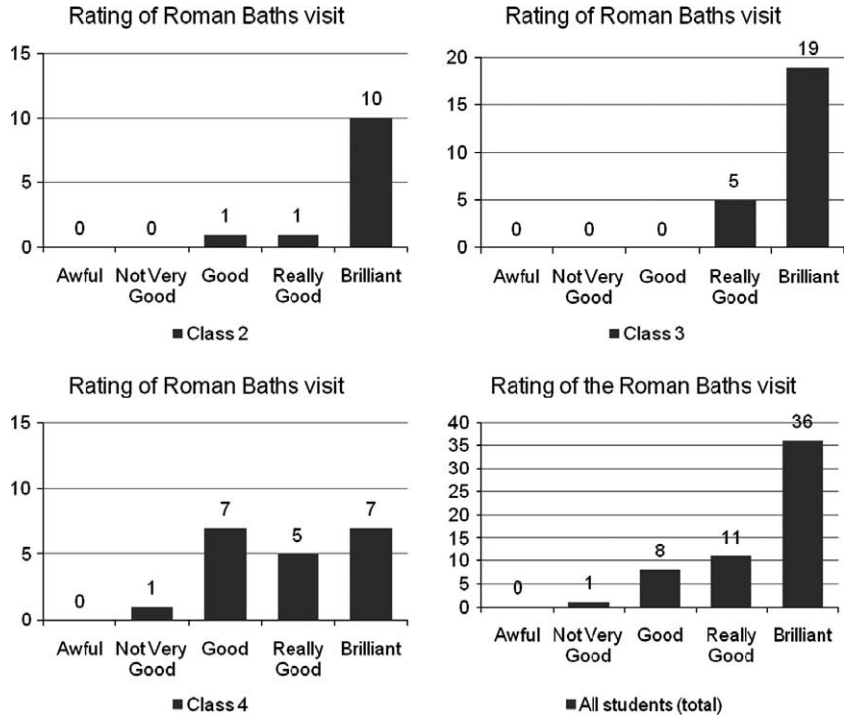

Figure 3. The students' ratings of their visit to the Roman Baths, for each class and total.

at the photomarathon website and 88% of the children (50/57) said they had found the cameras easy to use.

Comparing the children's knowledge of Roman Britain as assessed by the pre and post questionnaire, there were no significant differences in the children's knowledge after visiting the Roman Baths compared to before.

Discussion

The aim of this evaluation was to investigate the use of photomarathons as a way of supporting students making connections between what they learn during their museum visit and what they learn in school or other contexts. The photomarathon was spontaneously mentioned by 41% of the children as the best activity in their visit to the Roman Baths, which was more than any other activity they engaged in during the visit. Fifty percent of the children thought the photomarathon was brilliant, and only one child did not think the photomarathon was good. There were no age differences in how engaging the children found the photomarathon activity and all children regardless of age were able to take photographs. Thus, as an activity the students found it a fun and engaging experience. Unfortunately, we found no significant difference in learning outcome after the visit, which is not unusual (Griffin 2004) and possibly can be explained in terms of the short duration of the visit and the unfamiliar and unusual location (Donald 1991).

There were a number of difficulties that emerged with the photomarathon activity. The timings of each photomarathon session were challenging to manage. The pupils quickly grasped the goal of the competition, they understood the topics,

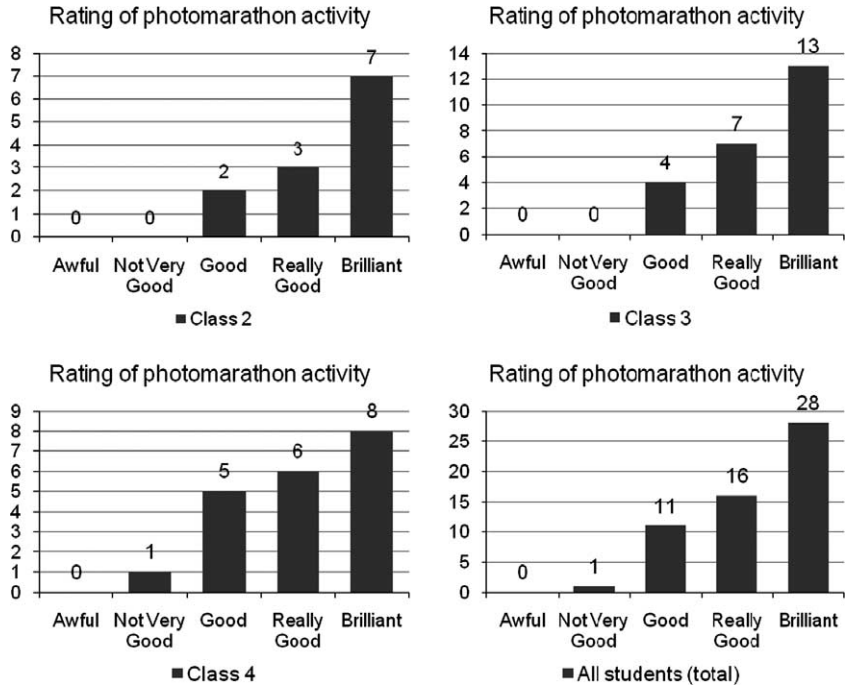

Figure 4. The students' ratings of the photomarathon activity, for each class and total.

and had no difficulty operating the cameras. The photo uploading process took longer than expected. This was partially due to the logistics of asking each group to identify their selected photo for each topic.

The peer judging of photos generally worked well. Each student could vote for one photo in each topic category, but could not vote for their own photos. In cases where the vote was split between entries one of the researchers took on the role of a (television talent show) judge to choose a winner. The teacher for the pupils in the youngest age group suggested after the session that it may also be appropriate to include a small prize for taking part in the competition.

Some problems also occurred regarding the attribution of photos to each group. As identical cameras were used, the automatically generated image filenames were similar for every group. For some of the topics multiple groups had photographed the same or

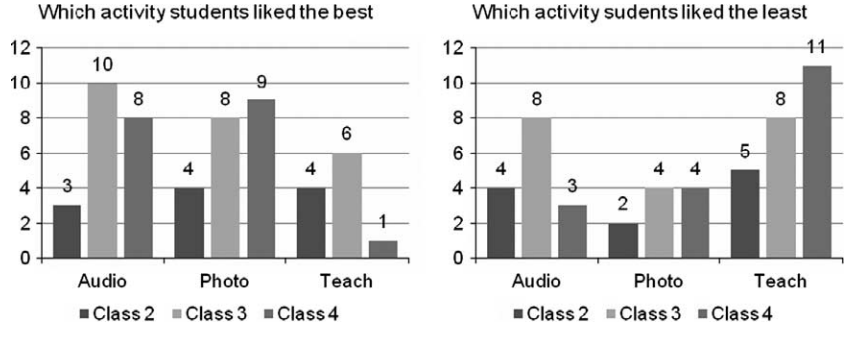

Figure 5. The students' most liked (left) and least liked (right) activity for each class.

very similar objects, resulting in a couple of cases were the attribution of the winning photo was difficult.

Activity revision and toolset re-development

In general, the photomarathon activity went well and the pupils enjoyed it. However, due to the timing and photo attribution challenges discussed above, an alternate means was sought for uploading and labelling photos. A solution has been developed that uses Android mobile phones; a web server, such as the temporary laptop server used above; and a wireless local area network. The photos taken with the camera on each phone can be automatically synchronised onto the local web server over the wireless network (see Figure 6). This approach uses commonly available relatively cheap technology, along with an existing set of free phone applications.

To automatically synchronise the images from each phone, a scaled down web server application (such as kWS) running on each phone will make the photos on each phone's SD card available as a website. A web synchronising program (such as Wget or rsync) running on the local laptop web server is then used to download the images from each phone to the relevant group folder on the web server. As the students return from taking their photos the phones automatically connect to the WiFi network (if only available locally) and the photos are uploaded to the website. Each group can then select their preferred image for each topic and submit it (i.e. drag it) to the corresponding topic gallery. The attribution of photos is handled automatically by appending a group name or identifier to each photo file as it is uploaded to the website.

Conclusions

Critical for the success of Photomarathons is the engagement of the teachers. The teachers in our study were very engaged, and were active in selecting the appropriate themes prior to the visit to the Roman Baths and the follow on activities using the photo galleries in the school. It was also important to discuss the themes with the educational staff at the Roman Baths to ensure they were suitable for the site.

Figure 6. An example photomarathon toolset for collecting photos from a set of Android mobile phones, comprising of a wireless router, a netbook computer and some phones.

The revised design of the proposed system means that the Photomarathons could be an activity ran by the museum or the school. It only requires Android mobile phones with a digital camera and WiFi connectivity, and a network enabled netbook (or laptop) computer. In our study a projector and screen were set up in a room at the Roman Baths, but it would be possible to run the presentation and judging process at the school after the children return from their visit. It is unclear whether it would be more beneficial educationally to run the judging process during the visit or after the visit. After the visit, it would be another way to connect the visit to the museum with the learning taking place at the school. The advantage of supporting the activity in the museum would be that it would have dedicated resources and staff for supporting and running Photomarathons, which would require minimal preparation on the part of the teachers to set up. The flexibility of the system also means that it could be run in non-institutional contexts (e.g. field trips) and visits to locations where it may be difficult to run the judging process in situ (e.g. visits to cities).

Another issue which may be worth exploring is whether Photomarathons are more beneficial as a group activity or an individual activity. Currently, they are a group based activity and research has consistently shown the benefits of group based activities over individual activities (Lou, Abrami, and d'Apollonia 2001). Informal observation of the groups provided evidence for and against this view. Some groups would discuss the themes and have discussion about which images would best illustrate those themes, however other groups would distribute the activity between themselves with each child taking one photograph with little or no discussion. In future research, we are planning to investigate the discussion children have concerning the photographs and whether this is related to their benefits of participating in Photomarathons.

This study has shown that Photomarathons are a fun and engaging activity. Further research is being undertaken to investigate the potential of Photomarathons, using the revised design as a means of successfully linking visits to museums with learning in schools.

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