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Active Learning on Digital Marketing  
for Advertising A University Museum Exhibition

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**Abstract**

On the theme of digital marketing for advertising a university museum exhibition we have completed an instructional project as active learning for bachelor's thesis in conjunction with collaborative learning among three students. The project management consists of the scope management including the products necessary to complete their theses, the time management for nearly ten months from April 2017, the communication management to interact with the operation team of the museum and the human resources management of the three students. We instructed them the operation guidelines of the project and used e-learning courses and textbooks for the students' self-learning tools before starting the digital marketing. As the result, the students completed the project on time that provided them with sufficient information for writing their theses. This was made possible by means of Google AdWords as a core tool of this project with which the students had many findings such as the best target areas, search keywords, advertisement copy messages and devices. This project has proved that this way of data visualization worked effectively as active learning since it could set up clear short-term targets on weekly basis, and the project purpose was successfully achieved.

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*Keywords:* E-learning; Active Learning; Digital Marketing; Google AdWords; Project Management; IT Passport Examination

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**1. Introduction**

Active learning [1] generally defined as any instructional method that engages students in the learning process needs a suitable problem to solve by students themselves. For this problem setting we chose digital marketing as project in which three university students engaged themselves in Google AdWords' [2] listing advertisement. Unlike practices on desk study [3] [4] [5] this project interacted with the actual exhibition of a university museum in Kyoto, Japan. The project included a target setting, negotiations with stakeholders, resource managements and time management for the purpose of concluding their bachelor's theses in the academic year of 2017.

Specifically, in order to help achieve the increase of annual visitors to the Otani University Museum in 2017 from 2016, the students used Google AdWords for digital marketing.

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Based upon their numerical and attribute analysis on the museum visitors of the past, they configured Google AdWords to invite Google users to the website [6] they created for this project. The implementation of the digital marketing included the listing advertisement and running the website of this project. The conventional methods to instruct thesis are normally configured such that each student works on individual theme of their theses without any cooperation works involved. It is difficult for students to manage the pace of writing their theses and this usually results in the last minute boost with unsatisfactory outcomes. It is also difficult for them to work cooperatively since each student works on a different theme.

In order to improve this situation, we set up an active learning project for three students to work collaboratively in the framework of the university's special exhibition from October 13 to November 28, 2017. This active learning with collaborative learning [7] [8] on digital marketing was effective because it set clear action assignments every week that motivated them to solve problems.

## 2. The outline of project

### 2.1 *Self-learning before initiating the project*

We instructed two students to pass the Information Technology (IT) passport examination [9] and to complete the Google digital workshop [10] and a WordPress e-learning course on Udemy [11] as self-learning courses.

#### (1) *IT passport examination*

When students pass the examination, they are qualified as having basic skills and knowledge on Information and Communication Technology (ICT) technologies, management and business strategies, certified by the Ministry of Economy, Trades and Industry. To study to pass this examination, we instructed the students to take a free e-learning course of the past questions on the IT Passport examination. They were successful in the examination after three months of self-learning.

#### (2) *Google digital workshop and Udemy course*

With the completion of Google digital workshop's 26 lessons using videos and quizzes on business opportunities on Internet, students could take the basic knowledge on digital marketing. After they completed all the lessons, they took the final test and were awarded the certificate of the completion. In order to construct the web page using WordPress [12] of open source blog software, they took an e-learning course on Udemy.

### 2.2 *The project on the museum exhibition*

#### (1) *The target of the students' project*

The target is to partly contribute from the students to the increase of annual visitors set by the museum from 6,500 in 2016 to 10,000 in 2017. The three students set up a website to supplement information only on the museum's special exhibition from October 13 to November 28, 2017. The special exhibition that was finished at the end of November was only selected since one month was required to complete their theses before their submission at the beginning of January 2018. The students' target is to increase the visitors only to the special exhibition period of seven weeks.

The special exhibition with the title of "The Higashi Honganji Temple and The Tokugawa Shogunate" showed some 50 historic works of fine art such as the hanging scroll depicting the image of Tokugawa Ieyasu, the first shogun of the Tokugawa period from 1615. For the purpose of digital marketing of this exhibition, the first semester was spent for study period on the digital marketing and the second semester was spent for the project operation period including the operation of Google AdWords and students' website.

#### (2) *The relationship between the project team and the university museum team*

The activity of students' project team was made possible only with the assistance from the museum team to obtain statistical data on the past exhibitions and the information on the target exhibition. The students newly created one website for this project that is different from the official website [13] of the museum. This allowed the students to create their own website at their discretion.

### 2.3 *The improvement in educational efforts*

The project management from the viewpoint of students includes the scope, the time, the communication and the human resources based upon the Project Management Body of Knowledge (PMBOK) [14] but it does not include other knowledge areas.

(1) *The scope management (Fig. 1)*

In order to achieve the target, they decided their scope of the project the analyses of Google AdWords and Google Analytics, updating keywords and advertising messages, and updating their website. We as the project owner worked for students to be able to cooperate with stakeholders such as the member of the university museum team and the sales representative of Google AdWords.

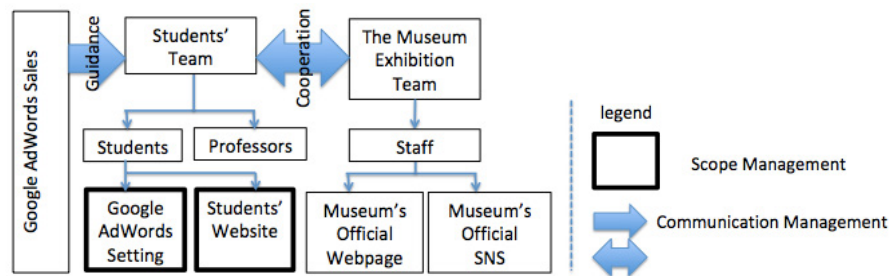


Fig. 1. The relationship of the project

(2) *The time management*

The students used Brabio!, a free web application for Gantt chart [15] with which they can manage tasks on time. They fixed one month in December in writing theses, two months in October and November for operating the website, and Google AdWords analyses and its updating.



Fig. 2. The time schedule of the project

(3) *The communication and the human resources management (Fig. 1)*

We have instructed the students how to write e-mails since students are not familiar with writing e-mails especially to those people who are new to the students. This made them communicate smoothly with the sales representative of Google AdWords and the members of the museum team. In addition we setup a mailing list of the project team and used LINE [16] a texting application and a tool of social networking service. During the exhibition period the students and we had regular weekly meetings on Wednesdays. The students by themselves had regular weekly meetings on Thursdays to reflect the analyses on Wednesdays to Google AdWords and their website.

### 3. Project activities and the results

The students implemented the project according the project framework.

#### 3.1 The basic operation of the project

Based upon the basic operation guideline we instructed as shown in Fig. 3 the students set the target number of the exhibition visitors 3,500 based upon the previous year's 3,000 visitors. Also they conducted a survey by hearing from the museum team about their objectives, the details on the exhibition and the current situation of the museum. Several days before the start of the exhibition on October 13, 2017, they set up their website and parameters of

Google AdWords such as search keywords and advertisement copy messages. Also they made task schedule during the seven-week exhibition.

3.2 The tools for the digital marketing

(1) A website on a rental server

They created a website with the structure as shown in Fig. 4 using WordPress on a rental server. The website included a landing page and other pages on a questionnaire, exhibit artworks, business hours and exhibition period, admission charge and access information.

(2) Google AdWords and Google Analytics for web advertisement and website analysis

They used Google AdWords of a paid web advertisement tool and Google Analytics of a free website analysis tool.

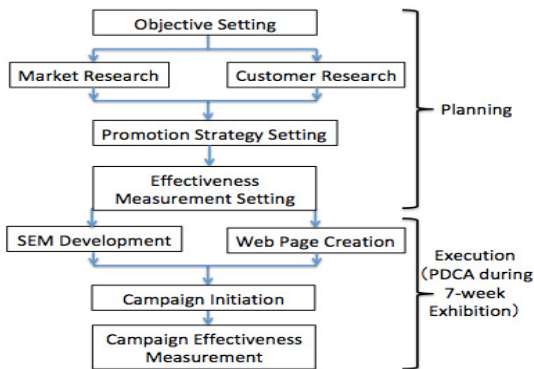


Fig. 3. The operation guideline of the project

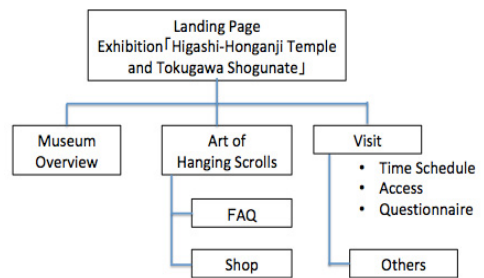


Fig. 4. The structure of the students' website

3.3 The nine-week operation for the exhibition period

The students worked two days on Wednesdays and Thursdays a week as a group work of this project from September 27 until November 28 for Google AdWords settings and the website updates. This form of active learning produced sufficient data on digital marketing for the students to write their theses successfully.

(1) Update of Google AdWords

They set two ad groups of “The Tourists to Kyoto” and “The Tour of Museums”. The clicks of “The Tourists to Kyoto” were 3,694 and that of “The Tour of Museums” were 829. It was learned that keywords within the ad group related with the autumn season and the sightseeing of Kyoto, the famous historical city in Japan, attracts Google users better than those directly related with museums. It was also learned that words related with where and when information in the advertisement caused more postings as the result of the Google web search. Therefore “autumn leave”, “sightseeing” and “cultural day” as the properties of autumn in Kyoto, how to get to the museum, the information on the exhibition period and the word “soon to end” were found more effective for the advertisement postings as the result of web search by Google.

The two most clicked advertisements are verified for significant difference by means of the population ratio of the two groups without correspondence as shown in Fig. 5.

A/B Test	Impressions	Clicks	CTR	Headline 1	Headline 2
A	44,285	1,029	2.32%	15-minute subway ride from Kyoto station	Exhibition “Higashi Honganji and Tokugawa” until Nov. 28
B	28,958	1,111	3.84%	Maple leaves and Tokugawa Exhibit in Autumnal Kyoto	the same as above

Z=11.887 p < 0.0001

Fig. 5. AB Test of Headlines

Fig. 6 shows the number of clicks, impressions and average click cost from October 8 to November 30, 2017. It shows that the students have improved cost-effectiveness of the advertisement in the number of clicks and impressions while the average click cost is decreasing. In total it counts 4,520 clicks out of 221,000 impressions or advertisement postings and it costs JPY34 per click.

For the first two weeks of the exhibition the advertisement areas covered Tokyo but they excluded Tokyo because of the possibility of coming to Kyoto from Tokyo 500 km away even though Tokyo counts many clicks. Therefore the advertisement areas were limited to Osaka, Kyoto, Hyogo, Shiga, Mie and Wakayama prefectures in the Kansai region.

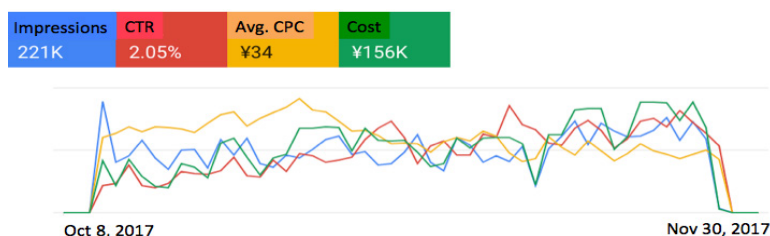


Fig. 6. The use of Google AdWords

## (2) Update of the website

Several modifications to the website were made according to the age group 45-65 who had most accessed to the website among others so that people of the age group seemed to favor the colors and the layout of the website.

## (3) Achievements and reflection of the project

If the project outcome was limited to the scope of Google AdWords activities, it was successful since the advertisements were displayed to the Google website searchers effectively as described in 3.3 (1) above. It is judged unsatisfactory, however, in that the students set the definition of the conversion as the number of responses to the questionnaire in the website and the responses were numbered only 14. It might be more suitable to measure the number of pageviews of the access information to the museum as the conversion. What was more ambiguous lies in the correlation between the number of visitors to the exhibition and the effect of the website. Since no methods were implemented for measuring the correlation, no data was given for this purpose. It turned out, however, that the paid visitors increased by 7.3% in this exhibition period according to the data provided from the museum.

## 3.4 Analysis of data on Google AdWords and Analytics

### 3.4.1 Flow of the digital marketing activities

In addition to the students' activities of (1) and (2) below, there is another activity (3) below by the museum staff for the exhibition.

#### (1) The use of Google AdWords for web searchers

This action invites web searchers into the website of "otani-museum.jp", the students' website.

The museum visitors consist of paid visitors and free visitors of the university students, faculty members, alumni, high school students and others. The target of the advertisement is focused on the paid visitors because Google AdWords played a role for all the people in the area of Kyoto and its vicinity.

#### (2) The use of Google Analytics for the web visitors

Google Analytics analyses the movement of web visitors on the website of "otani-museum.jp".

Though the students define the conversion as the answering the questionnaire, this definition has little with the action of the museum visits by the paid visitors.

#### (3) The existence of the official website and SNS of the university museum

The official website and SNS of the museum also worked for the special exhibition.

Therefore museum's questionnaire filled out by museum visitors didn't indicate what advertisement the visitors checked for coming and that the respondents were also identified as neither free visitors nor paid visitors.

### 3.4.2 Use of Google AdWords

Google AdWords allows for the advertisement targeting by specifying 5W2H as web searchers' attributes.

#### (1) Who

Though there is who-information in age group, sex and income group of Google searchers, 89% of the searchers have not identified themselves. Therefore the students selected all users including unidentified in this selection.

#### (2) When

The students selected all days of the week and all hours of the day from the beginning to the end of the exhibition.

#### (3) Where

The students selected first to include Tokyo and three other big cities in Japan, but after two weeks they excluded Tokyo and the others in consideration for the possibility of real visit to the museum. As the result the 7 prefectures in Kansai region were included for the advertisement postings as shown in Fig. 7.

No.	Pref.	AdWords placement	Adwords clicks	Adwords impressions	Adwords CTR	Average cost per click	Analytics Sessions	Duration of average session	Population (2015 National Cencens)
1	Osaka	Yes	2,932	129,706	2.94%	¥34	2,841	24"	8,839,469
2	Kyoto	Yes	593	37,638	1.60%	¥37	658	2'59"	2,610,353
3	Hyogo	Yes	372	18,877	1.97%	¥34	304	19"	5,534,800
4	Tokyo	exluded	—	—	—	—	202	40"	13,515,271
5	Shiga	Yes	160	8,305	1.94%	¥35	147	1'23"	1,412,916
6	Mie	Yes	133	5,576	2.40%	¥35	104	23"	1,815,865
7	Nara	Yes	110	5,437	2.02%	¥34	86	17"	1,364,316
8	Aichi	excluded	—	—	—	—	46	20"	7,483,128
9	Kanagawa	excluded	—	—	—	—	41	20"	9,126,214
10	Wakayama	Yes	58	2,527	2.30%	¥34	41	17"	963,579
	Total		4,323	208,066	2.08%	¥34	4,470	minute' second"	persons

Fig. 7. The analysis on the basis of prefectures

#### (4) Why

Within the ad group that is defined in the campaign category of Google AdWords, the students defined “The Tourists to Kyoto” and “The Tour of Museums”.

In those ad groups, keywords in Fig. 8 showed the best keywords in the two ad groups of “The Tourists to Kyoto” and “The Tour of Museums”. The search terms as shown in Fig. 9 matched most with the best keywords partially or fully. The search keywords related with “autumnal Kyoto” resulted in more suitable to gain clicks than “museums”.

Keyword	Ad group	Max. CPC	Clicks	Impr.	CTR	Avg. CPC	Cost
Kyoto Autumn_leaf Best_time	Tourisits to Kyoto	auto: ¥43	790	16,348	4.83%	¥33.12	¥26,166
Kyoto Historical_site	Tourisits to Kyoto	auto: ¥43	449	19,474	2.31%	¥35.01	¥15,720
Autum_leaf Sightseeing	Tourisits to Kyoto	auto: ¥43	403	13,250	3.04%	¥26.83	¥10,811
Kyoto Sightseeing Ranking	Tourisits to Kyoto	auto: ¥43	361	17,385	2.08%	¥33.75	¥12,185
Kyoto Autum_leaves_hunting	Tourisits to Kyoto	auto: ¥43	215	3,998	5.38%	¥28.76	¥6,183
Kyoto Exhibition	Tour of musems	auto: ¥43	134	7,306	1.83%	¥38.31	¥5,134
Higashi-Honganji	Tour of musems	auto: ¥43	99	2,801	3.53%	¥41.72	¥4,130
Kyoto Museum	Tour of musems	auto: ¥43	70	4,134	1.69%	¥37.14	¥2,600
Tokugawa_shogun	Tour of musems	auto: ¥43	51	5,103	1.00%	¥38.55	¥1,966
Museum Exhibit	Tour of musems	auto: ¥43	49	4,048	1.21%	¥37.55	¥1,840

Fig. 8. Best keywords in the two ad groups

Search term	Ad group	Clicks	Impressions	CTR	Avg. CPC	Cost
Kyoto Sigitseeing December Autumn_leaf	Tourists to Kyoto	202	2,454	8.23%	¥28.08	¥5,673
Autumn_leaves_in_Kyoto Point_of_interests	Tourists to Kyoto	171	1,517	11.27%	¥28.52	¥4,877
Autumn_leaves_in_Kyoto Best_season	Tourists to Kyoto	159	2,904	5.48%	¥37.89	¥6,024
Autumn_leaves_in_Kyoto Best_time	Tourists to Kyoto	120	1,580	7.59%	¥30.80	¥3,696
Kyoto Autumn_leaf Point_of_visits	Tourists to Kyoto	104	1,004	10.36%	¥27.25	¥2,834
Kyoto National_museum	Tour of Meseums	80	4,188	1.91%	¥38.21	¥3,057
Higashi-Honganji	Tour of Meseums	75	1,413	5.31%	¥41.00	¥3,075
Exhibition_of_national_treasure	Tour of Meseums	55	1,800	3.06%	¥35.44	¥1,949
Tokugawa_Ieyasu	Tour of Meseums	24	1,301	1.84%	¥22.00	¥528
Kyoto National_museum National_trasure	Tour of Meseums	18	321	5.61%	¥37.83	¥681

Fig. 9. Most matched search terms in the two ad groups

### (5) What

Finally the advertisements are posted as the result of web searches on Google if the maximum cost per click that is automatically fixed according to the maximum cost per day and the quality score are satisfied for the posting. The advertisements are either in “The Tourists to Kyoto” or “The Tour of Museums” of the ad group. Fig. 10 shows that ad group of “The Tourists to Kyoto” has caused more impressions and more clicks than those of “The Tour of Museums”. The students have learned that the seasonal attractiveness of Kyoto plays important role in this advertising.

Ad group		Tourists to Kyoto		Description	Clicks	Impr.	CTR	Cost
No.	Headline 1	Headline 2						
1	15-minute train ride from Kyoto	Higashi-Honganji and Tokugawa Shogun until 28 Dec.		Special exhibition of Otani university's museum Group discount is available.	1,029	44,285	2.30%	¥37,411
2	Leaves and Tokugawa in Autumnal Kyoto	Higashi-Honganji and Tokugawa Shogun until 28 Dec.		Special exhibition of Otani university's museum From Oct. 13 to Nov. 28	1,111	28,958	3.84%	¥31,570
3	15-minute train ride from Kyoto	Higashi-Honganji and Tokugawa Shogun		Special exhibition of Otani university's museum Group discount is available.	446	27,537	1.62%	¥19,423
4	Leaves and Tokugawa in Autumnal Kyoto	Higashi-Honganji and Tokugawa Shogun until 28 Dec.		Special exhibition of Otani university's museum 15-minute train rides from Kyoto	540	12,941	4.10%	¥16,194
5	Autumn leaves hunting and Tokugawa in Weekend Kyoto	Higashi-Honganji and Tokugawa Shogun until 28 Dec.		Special exhibition of Otani university's museum From Oct. 13 to Nov. 28	193	8,233	2.34%	¥5,848
Ad group		Tour of museums		Description	Clicks	Impr.	CTR	Cost
No.	Headline 1	Headline 2						
1	Free admission on Nov. 17 and 18	Higashi-Honganji and Tokugawa Shogun until 28 Dec.		Special exhibition of Otani university's museum Free admission only on the two days	199	11,969	1.66%	¥6,261
2	Part 2 exhibit starts from Nov. 7	Higashi-Honganji and Tokugawa Shogun until 28 Dec.		Special exhibition of Otani university's museum From Oct. 13 to Nov. 28	64	4,930	1.30%	¥1,968
3	Recommended for s single journey	Higashi-Honganji and Tokugawa Shogun		Special exhibition of Otani university's museum Memorial lecture on Higashi-Honganji and Tokugawa on Oct. 21	22	1,785	1.23%	¥978

Fig. 10. The most matched search terms in the two ad groups

### (6) How

The students selected all devices of smartphones, PCs and tablets, and also selected the Google search and the search partners for web searchers as networks for advertisement. They didn't use the display network with which advertisement is shown on websites that allow Google advertisements. Fig. 11 shows mobile phones are most effective means for advertisement and Fig. 12 shows that search partners of Google such as AOL and goo are more effective than Google itself.

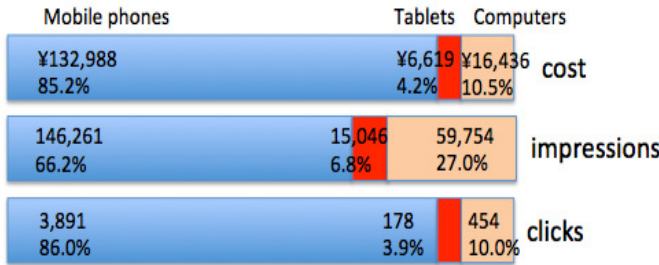


Fig. 11. The devices for advertisements

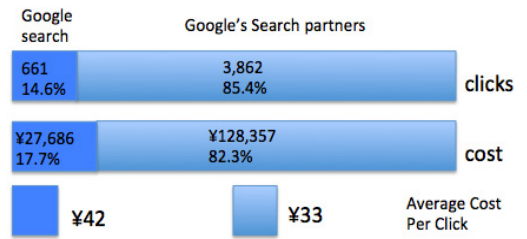


Fig. 12. The networks for advertisements

(7) How much

The project budget allowed us to spent from JPY2,500 a day as a start to JPY4,000 a day at the end of the exhibition. In total we spend JPY156,000 for this Google AdWords digital advertisement. The average cost per click was JPY34 that was judged fair amount.

5. Discussion

We have analyzed the project in terms of the educational effects.

5.1 The information flow and the relationship between tools.

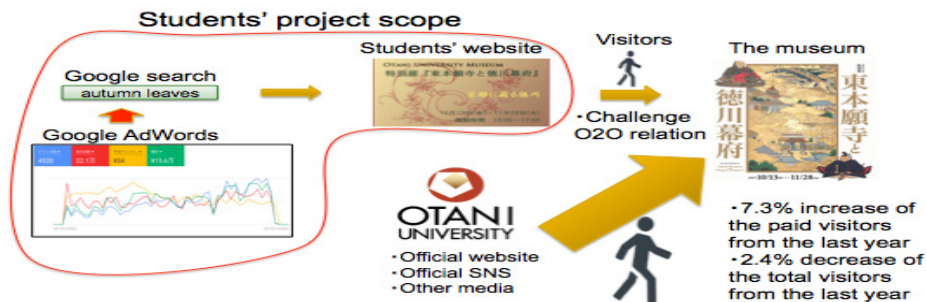


Fig. 13. The information flow of the digital marketing

Fig. 13 shows the information flow of the digital marketing and the relationship among the tools and the final objectives. This shows what was successful and what was deficient and needed improvement for future projects. Since the increase of the museum visitors were not on the website activities, it was difficult to analyze the relation between Google advertisement and real visitors to the museum.

5.2 The responses from the students on this project

The project performance could be defined as follows:

The project performance = students' motivation × capability × team collaboration where:

- Students' motivation = ∑ {visualization of the outcome(the numerical data from Google AdWords), the relationship with other organizations like the museum team and Google AdWords sales representative, suitable learning tools, the project expenses allowed};
- Capability = ∑ {the success of the IT passport examination, the completion of e-learning courses}
- Team collaboration = ∑ {the relationship among the three students}.



The questionnaire filled out by the students after the completion of this project shows in Fig. 14 two of them said that e-learning tools were excellent but one said it was poor. All of them highly engaged in this project since all of them said they spent more than 10 hours a week on this project from the end of September. They said, however, that they felt stressed and unhappy about workload unbalance. The team collaboration was not satisfactory and we should have a time to hear their requests individually and more thoroughly.

Handling Google AdWords was successful although the human resources management needed improvement.

No.	Question	Responses from three students					Average value	Meaning of the Average value		
		Inadequate (Value:1)	Poor (2)	Adequate (3)	Good (4)	Excellent (5)				
1	Effectiveness of e-learning		1				2	4	Good	
2	Work hours per week	Before Exhibit.					3	5	more than 10 hours	
3		During Exhibit.					3	5	more than 10 hours	
4		After Exhibit		1				2	4	more than 5 hours
5	Satisfaction with the project result				1	1		1	4	Good
	Comments from students	Needed one more student on web-creation(1); Lacks in conversion mechanism(2)								

Fig. 14. Responses from three students

### 5.3 Analysis of the educational activities with the evaluation from students

When this educational project is applied to the ARCS model [17][18] of motivational design theories, each element is explained as follows:

(1) Attention: The students paid their attention to the project since it was related with a real project of the university museum. All the students responded that the theme was attractive for them to challenge the project.

(2) Relevance: The students had inherently interests in the theme of digital marketing. Two students increased their interests furthermore by taking e-learning courses.

(3) Confidence: The improvements of numerical data from Google AdWords such as the postings of the advertisement, click through rate (CTR) and click costs encouraged the students for the success of the project. They acknowledged also that they were working in the project with the budget to spend.

(4) Satisfaction: They experienced the basics of digital marketing through the museum project and succeeded in attracting the attentions of web searchers for sightseeing in Kyoto in autumn. This led to their success in the thesis for the bachelor's degree. They were, however, not satisfied with their workloads among three students. This is a challenge for us as the project owner for future projects.

## 6. Conclusion

With the clear target setting of the increase in the University Museum's visitors, students showed strong motivation to accomplish the project. This was made possible by the series of inputs into the students before the start of the project and through the project. First, the inputs before the project were self-learning materials on IT related subject and the digital marketing in general, and specific method to construct webpages that were expected to leverage the ability of the students. Second, the students followed the operation guideline of the project shown in Fig. 3 after the project started. Finally, the students were motivated by the improved and visualized data from the Google AdWords. Especially the students' finding of what search keywords best resulted in most clicks by Google users was the reward for their long work hours. Namely the search keywords of describing seasonal Kyoto, the most historical city in Japan such as "Autumnal leaves" and "Best time" attracted most rather than exhibition related keywords such as "Exhibition" and "Museum".

Though the active learning has many ways of practices in various circumstances [19] [20], it is important to raise the suitable problem and to provide the means for students to solve in which they can keep constant interests throughout the project. In this sense, this project has shown one success case using digital marketing. It also has

shown, however, what needed improvement especially in workload among students and designing the mechanism of Online to Offline visitor movement is a challenge for future projects.

## Acknowledgements

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