SAME TIME SAME PLACE: DO MALL CLASSROOMS EXIST?

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Abstract

This paper seeks to help clarify whether Mobile-Assisted Language Learning (MALL) is primarily an independent self-study activity or whether MALL classrooms exist. The research hypothesised that a large number of users frequently using specific MALL apps, at the same time and in the same city location, may indicate the existence of MALL classrooms. The research makes use of big data, in the form of Google Analytics data, collected from two EFL learning mobile apps. The data was gathered over a five month period, in 2015, from more than 6,000 cities worldwide. The research, in doing so, opens a sociological window into the world of MALL, providing a sample of actual user behaviour. The results strongly suggest that independent study is almost certainly the main form of MALL activity. However, the research also concludes that MALL classroom-driven activity may exist in some cities.

Keywords: CALL; English Language Teaching; MALL; Mobile Learning; TEFL

1. Introduction

Franklin (2011) questioned whether society was at a tipping point, where exposure to mobile learning would literally go viral. While the mobile world has evidently exploded since 2011, mobile learning does still seem to be a work in progress. Almost every adult student and teacher in the developed world, and large swathes of the developing world, are quite likely to have a mobile device. Given this, are mobile devices being used in language learning classrooms? Do Mobile-Assisted Language Learning (MALL) classrooms exist? Or, is MALL solely an independent self-study activity?

Moreno & Vermeulen (2015) noted that while there are as many as 80,000 language learning apps available, very few designed by educators or academics. Kim & Kwon (2012) stated that mobile learning apps offered excellent opportunities for personal learner-centred study, but required improvements in providing interactive collaborative tasks. To some extent Ahmad & Farrukh's (2015) research counters this criticism, as they note the social networking possibilities provided by commercial apps. However, Ahmad & Farrukh (2015) do not really overcome the perception that while apps are wonderful any time, anywhere

independent study tools, they are probably not really suited to the specific context of the communicative classroom. Furthermore, while it is reasonable to assume many teachers and adult students will have a mobile phone in their pocket, it is likely most would rarely, if ever, consider using it as a classroom tool.

This paper analyses the extent to which mobile apps are being used for solo or geo-located group activities, such as classroom learning. It starts from the premises that if MALL apps are being used within a classroom or group settings, then we should find repeating clusters of users from the same cities using MALL apps during the same time periods.

The results could lead to four potential conclusions. Firstly, if no geographical and time based clusters of an app's users are found in the same cities using the app at the same time, then either the WIFI and mobile networks are switched off in all classrooms worldwide, or the app is evidently not being used in a traditional physical classroom setting with traditional shared group activities. In terms of general MALL classroom usage, the data will provide compelling supportive evidence that MALL is not, as yet, a common classroom activity. Secondly, a group of users using the same app, in the same city, at the same time, could be considered a coincidence. Thirdly, if such coincidences are proven to be relatively rare, yet analysis of the results shows repeated occurrences in specific locations with a degree of frequency, then it may suggest a likely level of co-ordination and control. In fact, it might suggest potential evidence of teacher-driven classroom or group activity usage. Fourthly, rather than teacher-controlled activity, the results might actually be indicating viral social behaviour. In the end, it is likely that this research can either strongly support the notion that MALL is an independent study activity or possibly suggest that MALL classrooms have moved beyond the teacher-researcher niche environs and into normal usage.

2. Methods

This is quantitative research, based on Google Analytics data, retrieved from two popular English language learning mobile apps. In a broad cross section of academic fields, researchers have now used Google Analytics as a data source. For example, Crutzen, Roosjen & Poelman (2012) used Google Analytics in their research into public health, Fang (2007) and Hess (2012) into improving library online services, and Hasan, Morris & Probets (2009) into analysing e-commerce sites.

The core data, retrieved from Google Analytics, was for the five month period from July 28, 2015 to December 27, 2015. The data included a large number of cases where the location was not set. It was decided to clean the data, removing these cases, as they could not

provide useful information. The author is the co-app developer responsible for implementing the Google Analytics API and maintaining the app analytic data. The use of Google Analytics for the gathering of data is mentioned prominently in the apps' publicly available privacy statement and end user legal agreement (EULA).

The apps with cleaned data used in this research (see Table 1) covered two different areas of English study and are designed to work with all learning levels from beginner to advanced. The apps were used by about 187,000 users who had roughly 500,000 sessions over the 5 month period mentioned above (Google Analytics, n.d.). It should be stated that none of the apps was designed for classroom usage. However, it seems likely that, given the free content and levelling flexibility, they would be useful to a teacher who had created a mobile classroom environment. At the very least, the apps would have provided solid on-going filler activities for a MALL or blended learning environment. For the purposes of user anonymity, in this study, the niche focus of the apps shall not be stated, the operating system shall not be stated, and the apps shall be referred to as Red App and Blue App.

Table 1. The apps usage over five months

Apps	**Total Users**	**Total Sessions**
Red	99,569	316,695
Blue	87,996	197,708

Peak Hour Units

1 peak hour = 10+ users per city per hour

The unit of ten or more users per city per hour was chosen to represent peak periods of significant usage. The author reasoned that if the unit chosen was too small, it was highly likely that two or three users from a city could, by pure chance, choose a similar time to use the app. Equally, the author reasoned that in wealthier environments, a class size of ten might be possible and it was likely that such students would have their own devices. In more typical classroom environments, it seemed likely that students would share devices in pairs or small groups. Therefore, a class size of 20-40 students might be accommodated by as few as ten devices.

Solo Hour Units

1 solo hour unit = 1 user per city per hour

One user per city per hour is an approximate measure of independent study, although, in some cases, it is possible that several users are sharing one device, but will appear as one user in the data.

The research also involved certain other technical and ethical methodological considerations that have been placed in Notes. In summary, the names of small cities have been shielded from public view, the use of one city in the data required special attention and further investigation, while technically there were some potential irregularities that needed to be explained (see Notes 1, 2 and 3 for further review).

3. Results

An enormous amount of data was retrieved. Both of the selected apps were actually used in every local time slot available during the five month period; that is 24 hours a day for 153 days. Red App (see Table 2) provided 209,470 records for sets of users active in local time and city combinations. It was used in 220 countries and 5,851 cities. Interestingly, it was used as a solo hour unit on 158,979 occasions representing 75.9% of all records. On 550 occasions (0.26%), usage could be defined as a peak hour unit; ten or more users per city per hour. Blue App provided similar raw results. This included 175,310 local time and city combination records. This showed that 82.65% of users were the only user in the city during the hour of use. Peak hour users occurred on rare occasions at 0.06% of times. Blue App was used in 215 countries and 6,424 cities over the period.

Table 2. Hourly location records.

Apps	**Records**			**Cities**	**Countries**	**Time slots (Max 3,672)**
	Total	**10+ users**	**1 user**			
Red	209,470	550	158,979	5,851	220	3,672
Blue	175,310	99	144,898	6,424	215	3,672

Looking at the occurrences of peak hour units for Red App, the data shows that this actually only occurred in 14 cities.[1] Table 3 indicates almost half of these peak hour occurrences were in one city, Addis Ababa, and 84.7% of cases occurred in just three cities, Addis Ababa, Navoi and Yangon. The largest number of users per hour (26) was in La Victoria, but a range of 10-13 users was the norm.

Table 3. Occurrences of 10+ user per hour cities for Red App

City	Frequency	Users Per Occurrence	5 Month User Total	City Population	Country
Addis Ababa	249	10-16	4223	2,646,000[1]	Ethiopia
Ashgabat	19	10-13	2625	1,031,992[2]	Turkmenistan
Bangalore	2	10	1990	4,301,326[1]	India
Caracas	1	10	109	2,104,423[1]	Venezuela
*****	1	11	13	<10,000	USA
La Victoria	7	12-26	161	190,218[2]	Peru
Lagos	5	10-11	3588	21,324,000[2]	Nigeria
Mumbai	1	10	1367	11,978,450[1]	India
Navoi	63	10-18	3608	138,082[1]	Uzbekistan
New Delhi	18	10-11	2644	9,879,172[1]	India
Port Louis	1	10	42	150,353[1]	Mauritius
Quezon City	18	10-12	2635	2,761,720[1]	Philippines
Tashkent	11	10-13	2966	2,137,218[1]	Uzbekistan
Yangon	154	10-16	5,287	5,209,541[1]	Myanmar

Sources:

1. United Nations statistics division - demographic and social statistics (2014).

2. List of towns and cities with 100,000 or more inhabitants (2015).

***** Please see Note 1.

Figure 1 shows the frequency of peak hour units in Addis Ababa. Addis Ababa was selected for analysis due to the high frequency (249 cases) of peak hour units. The figure shows high frequency peak hours occur during daytime regular working hours. There are no

[1] Please see Note 1 for reasons why one city name has been shielded.

outlying cases, usage takes place between 5 am and 9 pm with zero occurrences during the night.

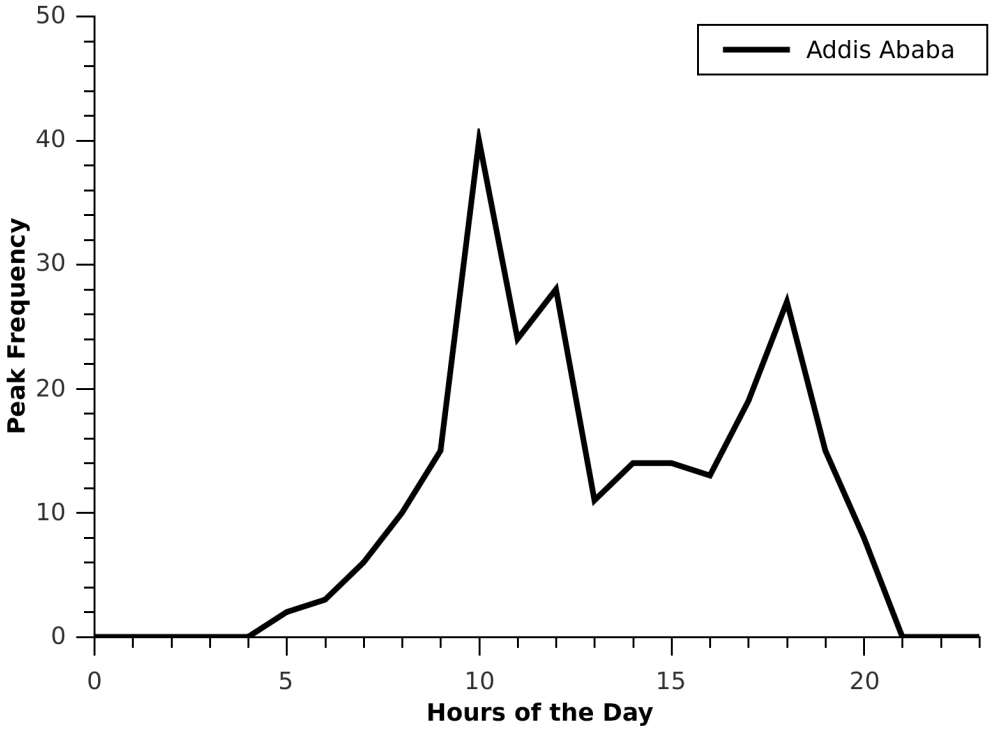

Figure 1. Red App frequency of peak hours in Addis Ababa

Looking at the occurrences of peak hours per city for Blue App, as shown in Table 4, the data indicated that such peaks only occurred in four cities. Over half of these occurrences were in the Uzbek city of Navoi, and more than 90% of cases occurred in Uzbekistan. The largest number of users per hour was 21, but a range of 10-15 users was the norm. Please note the name of one city was withheld (see Note 1).

Table 4. Occurrences of 10+ user per hour cities for Blue App

City	Frequency	Users per Occurrence	5 Month User Total	City Population	Country
Bratislava	2	10	2,225	416,489[1]	Slovakia
*****	5	12-21	30	<100,000	Czech Republic
Navoi	55	10-15	3,616	138,082[1]	Uzbekistan

Tashkent	37	10-15	3,608	2,137,218[1]	Uzbekistan

Sources:

1. United Nations statistics division - demographic and social statistics (2014).

***** Please see Note 1.

When comparing the frequency of peak hours for the city of Navoi for both Red App and Blue App (see Figure 2), there was a similarity in usage patterns. Over the 5 month period, Red App had 63 peak hour units, while Blue App had 55 peak hour units. During the hours of the day, the occurrence or non-occurrence of peak hour units for either app seem to match to a significant degree. For example, there are zero night-time occurrences and the frequent peak usage starts and ends within a range of an hour between each other. The largest clusters of peak activity for both apps are 7 pm and 8 pm.

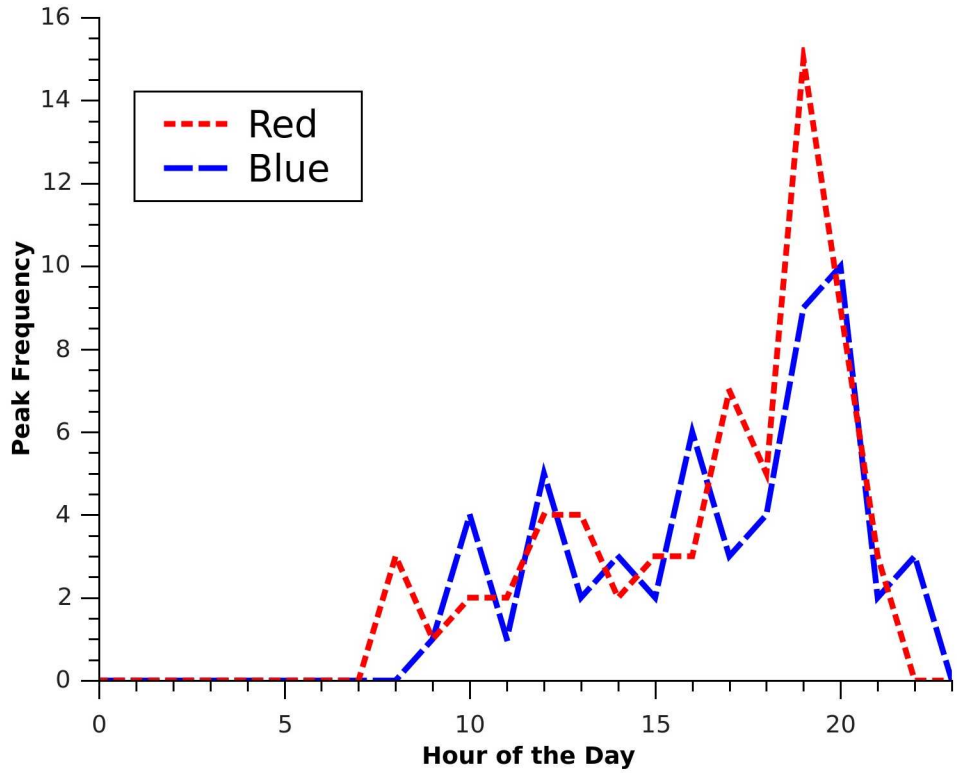

Figure 2. Red App & Blue App frequency of peak hours in Navoi, Uzbekistan

4. Discussion

The results lean towards the idea that the MALL classroom is still in its infancy. The evidence, based on over 187,000 users from an admittedly limited app pool, suggests MALL self-study is the norm, while some tentative conclusions can be drawn in favour of the

existence of MALL classrooms and teacher driven activity. It is quite likely that there are innovative MALL teachers and school districts around the world and promisingly they seem to exist in rather unexpected locations across Africa, Asia, Europe and the Americas.

However, the vast majority of user sessions, 75.9% for Red App and 82.65% for Blue App, were solo hour units and appear quite likely to have been people undertaking independent study. The users were literally the only users or devices in their cities using the apps during that hour of the day, strongly suggesting self-study activity. Indeed, in only 16 cities, and significantly under 0.5% of records, were there suggestions of potential classroom activity. Furthermore, only three cities (Addis Ababa, Navoi and Yangon) showed signs of what might be described long-term frequent activity. Others, such as Caracas, La Victoria, and Port Louis, may possibly have had teachers experimenting with MALL (or at least the two apps). It is difficult to understand how that, for example, 11 out of 13 Red App users in the name withheld American city with a population under 10,000 (see Table 3) decided to use Red App between 9:00 and 9:59 on a Friday morning without some social connection between them. Although there probably is a social connection, it is as likely that these one-off results may be the consequence of viral social media activity as classroom activity.

When we focused on Addis Ababa and looked at the distribution of peak hour unit usage across the day, we clearly saw a daytime pattern. The highest frequency of peak hour units was between 9am and 7pm, an activity pattern that is consistent with school usage. Furthermore, the strongest peak hour unit activity was between 10 am and 1 pm which potentially indicates classroom activity. A second peak occurs between 5 pm and 7 pm, which could suggest homework or after-school club activity.

The city of Navoi presents interesting findings. Navoi has a population of around 138,000 people with approximately 3,600 users of each app. Apparently, devices representing 2.6% of the population of the city of Navoi have used both the Red App and Blue App. The data cannot confirm if it is the same 2.6% of the population using both apps, and consequently around 5.2% of the population could have used the apps. However, devices may have been factory reset, cookies deleted and apps uninstalled and reinstalled, all activities that could inflate the user data (please see Note 3). However, that said, the users of both apps in Navoi seem to dovetail very neatly. Furthermore, a significant proportion of a city population using two specific apps or a high proportion of devices in a city being reset regularly while retaining the same specific educational apps are results not seen in the data anywhere else in the world. Consequently, it is difficult to imagine that in either scenario, it is not connected to organised, institution-orientated, educational usage. However, the density of peak usage, when ten or

more users of both apps were active was in the evening, with peaks at 7 pm and 8 pm respectively. This does not support MALL classroom activity, but could support the activity of library-based Self-Access Language Learning (SALL), which according to Nazarov (2015) is being promoted in the Navoi area, and indeed nationwide by a 2012 Presidential initiative. Moreover, according to Nazarov (2015), schools in Navoi are encouraging learner autonomy and new teaching practices. In this case, the research actually points towards organised, scaffolded, independent study as a form of MALL class or homework activity[2].

It is very interesting that so many of the potential MALL classrooms are in developing nations. Generally, there is seen to be a digital divide favouring the developed world, but, in this instance, it appears that the developing nations may possibly be taking the lead in MALL classroom development. Are the teachers from the developing world the innovators of the coming MALL revolution? While not relevant to the research topic at hand, it will prove an interesting issue for future studies. Equally, the author suspects qualitative MALL fieldwork conducted in Addis Ababa (Ethiopia), Navoi (Uzbekistan), and Yangon (Myanmar) may yield fruitful results.

Finally, if MALL classrooms do exist in Addis Ababa, Navoi and Yangon, then why not London, New York, Paris or Tokyo? Since the results are based on only two apps in a market of approximately 80,000 (Moreno & Vermeulen, 2015), it is very likely that there is a growing community of MALL teachers and it is only a matter of time before they exist in a classroom near you.

Notes

1. Measures to provide anonymity

Several measures were taken to ensure app user anonymity through obfuscation of the data sources. The researcher respects the confidentiality and anonymity of the app users and does not wish to identify specific schools, teachers or students. To be clear, most of the cities highlighted in this research have very large populations in relation to their app user-base, and consequently the researcher believes that no reliable connection could be made between the research and specific app users. However, in an abundance of caution, the names of cities with populations under 100,000 were removed from the findings and replaced with ***** in Table 3 and Table 4. The actual population sizes of these cities were approximated, to prevent identification, to under 10,000 and under 100,000 respectively. Additionally, the researcher has created about 100 language learning apps and will neither publicly confirm nor deny the two titles of the apps, referred to as Red App and Blue App in this study. Furthermore, the author will not confirm the participating apps' operating systems, be that Android, Blackberry, Chrome, iOS or Windows.

[2] Please see Note 2 for details of why Navoi has remained unshielded in this study.

2. Navoi

Navoi, Uzbekistan, has a city population of 138,000 and regional population of approximately one million inhabitants. It is quite possible that some of the regional data has been included in Google Analytics as city data. It is not uncommon for city and regional boundaries to vary based on cultural, political and technical considerations. It is quite possible that this can lead to discrepancies in the presumed size of a population. However, whether Navoi has 2.5-5.2% or 0.25-0.52% of its population using the Red and Blue apps, there are clear signs of potential MALL classroom usage. It seems Navoi is involved in a potentially region-wide MALL and/or Self Access Language Learning (SALL) programme. The researcher, upon investigation, has found that Navoi is publicising its work in the area of self-access facilities and teacher pedagogy (Nazarov, 2015), and this publicly promoted activity provides a logical explanation for the strength of data in the area. The researcher would suggest that the scale of the project would involve tens of teachers, thousands of students and probably school administrative and even city or regional administrative participation. Given the size of the project, individual teachers and students are provided with a high degree of anonymity, their activities are absorbed into the larger pool of collective city-wide data. It is highly unlikely that work on this scale has gone unnoticed at the local and regional level, and therefore this research will only be revealing that which is already known to the local community; the national government is promoting self-access digital language education and consequently some teachers are probably encouraging some students to use mobile or tablet devices to study English. Indeed, this research may provide independent verification of what they have achieved. Since this general SALL activity is publicly being promoted, and this research's findings appear to support their efforts, the author decided to keep the name of the city unshielded. This decision was taken as there is no way to connect any device user in Navoi to the data collected in this study, given the apps themselves, and the operating system, have not been disclosed.

3. Users

The term *user* is ambiguous. According to Analytics Help (n.d.), Google Analytics tags each device with a unique, randomised ID. The ID is considered to reference a unique user. However, the system is not perfect. For example, if an app is uninstalled and reinstalled then the device will be given a new ID and counted as a new user. In addition, one user as counted by Google Analytics could actually be four students working on one device. We are unable to see this form of activity in the data.

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