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The level of student engagement with QR Codes: Findings from a cross institutional survey

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Information Sheet

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I would like to acknowledge all the hard work by individuals across a number of Universities who encouraged students to complete the surveys. Also, thanks to members of the e-learning Team, in particular Vic Jenkins for comments on an earlier draft of this paper.

Introduction

This report is a part of a series associated with the University of Bath's JISC Innovations in Teaching and Learning project based around the potential use of QR Codes in learning and teaching (<http://blogs.bath.ac.uk/qrcode>). It further develops a survey undertaken at the University of Bath in 2008 (<http://opus.bath.ac.uk/12782/>).

In total 2765 people responded to the survey from four UK HEIs (University of Bath, University of Leicester, University of Gloucestershire, and University of Sheffield). The intention was to answer the following questions;

- Do students know what a QR Code is?
- Have they accessed a QR Code on their mobile device?
- How appealing are QR Codes for entering mobile information?
- Would students access learning materials on their mobile phones?

The findings will help inform the appropriate design for effective QR Code based learning activities and campus tours. The findings suggest, when compared to the results of a previous survey;

- students are becoming more aware of QR Codes
- more students have experienced scanning a QR Code on their device
- They find the use of QR Codes to access information very appealing compared to manual entry of information on their phone

- They are not enthusiastic to spend their own money on accessing learning materials on their mobile phones and would prefer to access them on a computer

The methodology

The data was collected through running a generic student survey at the University of Bath, University of Leicester, University of Gloucestershire, and University of Sheffield. The survey ran between 17th November, 2009 and 6th December, 2009. The survey questions are available in Appendix 1.

The responsibility for promoting the survey at the institutional level was devolved to the local contact. At the University of Bath the process involved including an announcement on the institutional VLE and through the student gateway web page. All participants would be entered for a prize draw.

In total 2765 students completed the survey from across the four institutions. The gender division was 51% female, and 49% male. The age breakdown indicated 76% were 18-22, 16% were 23-29 and the rest over 30. It should be noted given the response rate, and the method of promotion there maybe bias in the results due to it being a small, self-selecting sample. The methodology was completely reliant on one collection technique. That said, it does give a very good insight into student experiences of using QR Codes.

The findings

The first set of questions focussed on current awareness and experiences of QR Codes. Some of these questions were re-used from the previous year to enable direct comparison.

When asked if they were aware of QR Codes, the results indicate 39.8% (n=2752) of the respondents knew what a QR Code was. This had increased from the previous year, where only 13.8% (n=1790) said they were aware of QR Codes.

The breakdown by age group suggested there is more awareness within the young age groups. For instance, 42% of 18-22 group are aware, while this dropped to 29% for the 40 or over group. It could be argued these finding would be expected as the media and entertainment industry are increasingly using QR Codes in their promotions campaigns.

When asked if they had actually scanned a QR Code, the responses indicated 9.6% (n=2740) had scanned a code in 2009. This is approximately a five fold increase compared to the previous year when only 2.2% (n=1552) respondents stated they'd scanned a QR Code. In terms of type of action they needed to complete once the QR Code was scanned, the main task was accessing a web site (n=332), accessing static text (n=112) and accessing a multimedia file (n=111). These were very similar tasks to the previous year's findings.

An important consideration is, if they had scanned a QR Code how would they rate the experience? It would be assumed if it was positive, they would be likely do it again and tell others. While if it was negative, there would exist a barrier we'd need to overcome if we were to roll out QR Code based learning activities.

The survey asked respondents to describe the experience. The responses were tagged into positive experiences and negative experiences (see Appendix 2 for the raw data). The findings suggested 62% (n=167) of people described the experience as positive, and 38% (n=101) people would describe it as negative. The following extracts illustrate the wide spectrum of opinion from students. The intention of including these quotes is to give context, not to draw explicit conclusions. From the Wordle image based on their responses, the key terms used to describe the use of QR codes seem to be easy, simple and interesting.

The following are a selection of student replies when asked what they thought of the experience of scanning a QR Code;

- Pointless
- Quite frustrating- the camera doesn't always recognise them, but it's good when it does
- Some are quite useful for storing weblinks without typing them. Although I often find there are compatibility issues between some QR code readers and generators. Also it's quite difficult to get a good picture of QR codes in non-ideal lighting conditions with my phone.
- Underwhelming...single lines of text are all that were available. Though for library shelf codes this is extremely useful
- Unsuccessful, the camera struggled to take the picture and then it was difficult to identify, plus the cost of accessing the internet.
- Pretty painless, load up the scanning app and point and click...
- Pretty simple, not as fast as say a supermarket barcode scanner and regular barcode, but not really cumbersome
- It was brilliant! No need to type in long website address any more and it's just beyond my expectation.
- It was somewhat of a novelty but I think it does have its uses beyond that. It cuts the time it would take to access the website by searching in Google etc. which is always a good thing in this day and age.



A number of questions identified the perception of using QR Codes to access information and enter text onto a mobile device. A hypothetical scenario was presented where they would scan a QR Code as an alternative to entering a web

address using the phone keyboard. The responses indicated just over half the people thought the QR Code option was more appealing (very appealing 20%, appealing 36%) compared to manually entering the information. Only 16% (n=2052) thought it was not appealing (not appealing 9% and not at all appealing 7%). This result implies students see a benefit for using scanning as a means of accessing information and learning activities compared to manual text entry on phones.

An important finding is the results indicate students are becoming more aware of QR Codes and actual use is increasing over time. However, this is not universal across the sample population. Therefore, the design of any learning activity involving QR Codes will still require a high level of support. This technology is not currently ubiquitous. People still need to know, what is a QR Code? What is involved in scanning a QR Code? How do I get the software on my phone?

The next broad area for investigation is around student phone ownership and attitudes to using their phone (and tariff) to access learning materials and complete tasks. This is important as the majority of tasks being set for QR Codes require the student to access web sites, and online multimedia content. This set of questions act as a reality check, “so, the question is, if we build them, will they come and will they engage?”

When asked if they would spend their own money on accessing learning materials on a mobile phone (the question focussed thoughts around the use of their tariff and not usability) the response rates indicated only a 18% thought this likely (5% very likely and 13% likely), while 62% thought it unlikely (24% unlikely, and 38% very unlikely). When asked to explain their answer the predominant theme was; I'd use a larger screen device to access the learning content as it is perceived as free (campus based computers) and the usability is much higher. Given the low level of interest in using their mobile device to access information it is very important to accommodate this within the learning design. In particular, we need to be selective in when to use QR Codes to ensure they are perceived as adding value for the student in completing the task. Otherwise, the lack of enthusiasm from students for using their own tariff may reduce participation and undermine the learning task.

In terms of device ownership it was apparent that 93% had camera phones and 52% owned phones which were wi-fi enabled. Interestingly, 9% of the respondents were unsure if their device was wi-fi enabled. Finally, 39% of respondents' mobile telephone plans included a data tariff / package, while 29% of respondents were unsure if their phone plan included data. This indicates a large number of students tend to own devices which could access QR Codes. However, a significant number of people are unsure about their device, in terms of its capabilities and connectivity. This needs to be accommodated when designing the learning activity. The first stage of an implementation should involve an orientation task, where students find out the capabilities of their device and install a QR Code Reader.

The conclusions

Overall, the survey results suggest student awareness and engagement with QR Codes is increasing over time. Admittedly, in some cases this is from a very low base. From the perspective of the academic practitioner or people organising the campus induction tour it does imply some important lessons. For instance, we can't assume students will know what a QR Code is, what it does and be able or willing to scan it. Therefore, we'll need to ensure appropriate resources are dedicated to student support. From the perspective of the learning technologist (supporting the

staff) we need to ensure the learning design focuses very much on the appropriate use of QR Codes where it adds value to the learning experience over and above other delivery methods.

The recommendations would be to repeat the survey in 2011, and include the use of student focus groups to getting a better understanding of why students are not willing to use their own resource to access content and learning activities on their mobile devices.

Appendix 1: The Survey

2. Are you male or female?

Male

Female

3. How old are you?

17 or below

18-22

23-29

30-39

40 and above

4. Do you know what a QR Code is? (example included in this question).

yes

no

5. have you ever scanned a QR Code on your mobile phone / mobile device?

yes

no

6. If you scanned the QR Code in Question 4 on your phone, what would it want you to do?

7. If you have scanned a QR Code, what type of action(s) did it want you to undertake or complete? (select all that apply)

Access a web site

Access some static text

Access a multimedia file (video or audio)

Send an SMS text to a designated number

Phone a number

Other (please specify):

8. If you have scanned a QR Code, please describe how you found the experience.

9. In terms of entering data on your phone, how appealing is scanning a QR code containing the web address compared to manually entering the address in your mobile phone web browser?

Very appealing

Appealing

Neutral

Not appealing

Not at all appealing

10. Please explain your previous answer

11. Does your mobile phone include a camera?

yes

no

12. Does your mobile telephone plan include a data tariff / package?

yes

no

not sure

13. Does your phone have wi-fi capabilities? In other words, can it connect to the internet using a wireless network?

yes

no

not sure

14. On a scale of 1 to 5, how likely are you to spend your own money on accessing learning materials on your mobile phone?

Please note, I'm interested in your thoughts about using your tariff to access learning materials, not the issue about trying to use them on a small screen device

1 (very likely)

2

3 (neutral)

4

5 (very unlikely)

15. Could you please explain your previous answer

Appendix 2: Raw data: If you have scanned a QR Code, please describe how you found the experience

A annoying as it doesn't offer anything more than just a redirection to a website.

A bit confusing I only did it once, in Japan

A bit disappointing. I expected it to tell me something I didn't already know, but when I scanned one from a webpage it just took me to that webpage, and when I scanned one from my hand cream it just came up with a load of numbers.

A bit fiddly

A bit of a hassle to line it up etc. but after several attempts it worked and the link appeared on the phone.

a bit of a waste of time

A bit pointless and a gimmick

A bit slow, but surprisingly good at resolving a small image.

A bit tedious.

A little fiddly, the only software for my phone is difficult to use

A simple way of accessing information without searching or typing a url.

amazing. It was so quick and easy and paperless :)

An anti-climax

Annoying - focusing is hard

annoying as I needed to download software in order to be able to read it and this wasn't easy to find, as such I have not yet successfully scanned a QR code.

Annoying, usually takes a few tries before it reads
Bit long, had to download an app on my phone, set it up, scan the thing (twice). It took ages, I could have just typed in the URL
confusing at first
confusing, I needed to scan it several times before the camera could accurately detect it.
convenient, dont need to type long site name for websites
convenienv
Cool
Couldnt connect to internet so it didnt work.
decoding takes few minutes and it's quite fun.
Did not work
Didn't work
didn't work
Didn't work
different
Different, bit of a novelty.
difficult to focus
Difficult to get software working on my phone.
disappointing as it didn't work
distance between your phone and QR Code should be about 10-15cm
doesn't always work/ recognise the code.
Doesn't work most of the time. Hard to get the code the correct size for the camera
Easier than entering the URL manually.
Easy
Easy
easy
Easy
Easy
easy
Easy although had to download addition software for my phone
Easy and convenient; no problems occured.
easy and quick
Easy and simple
Easy and very convenient in order to locate books
Easy but was quite hard to find the app for my phone
easy enough
easy enough
Easy enough, run the app, hold it up to the code and it automatic
Easy if it works, but sometimes it does not work with the scanner included in my phone and the text or link wouldn't display properly.
easy if the code is large, very difficult for the scanner to pic it up in low light conditions and it the code is small
Easy to do
Easy to do
Easy to use, and innovative.
Easy to use, bit of a mystery the first time.
easy with the barcodes app on the iphone
easy!
Easy, although buried in phone apps.
Easy, but dependent heavily on SW and HW.
Easy, but in the case of adding bb contacts, not as easy as just typing in the person's pin.
easy, except the website it linked to was in japanese
Easy, fun..its a new technology, feels a bit "space-age"

Easy, interesting
Easy, just use the camera on your phone and the relevant information is displayed.
easy, quite cool.
Easy, Simple
Easy.. not very many web-based applications for it though.
exciting - "oooh new technology!"
Exciting to see things others cant
exciting!
exhilarating
Extremely user-unfriendly.
Fairly easy thanks to Windows Mobile
Fairly easy to scan but more phones need to be equipped with the reading software
for usage to become widespread.
fairly easy wih the app i have on my iphone it automatically will reconise codes with
out the need to take a photo
Fairly easy, albeit odd
Fairly easy, but getting the camera to focus on the code took a little while.
fairly easy.
fast
fast and easy
fast and easy.
Fast, easy, pretty cool
Feel awesome because none of my friends' phones can do it.
Fine.
First time doing it and i was amazed :)
first time was very entertaining having never seen one before - good gimmick. now
beginning to realise their potential
For information it has been interesting, but when it gives no choice to the action or
information about the action it wants you to do, then it becomes annoying.
from wall or some advertisement.
Frustrating, it doesn't always work.
fun
Fun
Fun
Fun and fast
Fun, interesting, different
Fun, quick and fairly amazing!
Futuristic
good
good
good
good
Good, Interesting.
Good. The service works well and is eay to use
Great!
hard
hard to get it to scan most of the time, took quite a few tries. then usually not really
worth it. for a URL, it's just easier to print the URL!!
I found it interesting that I could receive a web link on my phone without typing it in.
However, I did not know beforehand what I would receive.
I found it very easy and self-explanatory. It made it easier because it cut out papers
and everything was just on my mobile phone.
I found that it was easy to use and I able to access the website a lot quicker than if I
had searched for it google.
i had to download some software to my phone for it to work but after that it was easy

I have tried but could not get it to work.
i have tried but i found it difficult, im not sure if my phone supports this technology...
I loved it! Easy to use!
i thought it was a good idea except that my phone had difficulty reading the codes - it took about 5 goes to get it to read properly - probably because it was on a pepsi bottle!
I tried and my phone was too slow and it ended up costing too much to download the reader
I tried the QR Code reader software on my mobile using some codes on the internet. If you know what a QR code is it challenges you decode it. It takes three or four pictures from my phone until a picture is decoded properly but I usually decode all codes I come upon.
interesting
Interesting
Interesting but did not give me a lot of information.
Interesting, in that it seems a strange way of publicising such information, and also how such an image can convey such information. But at the same time quite satisfying that the software on my phone could successfully and rather quickly process the image.
Interesting, saves typing URLs in which I probably wouldn't visit otherwise
Irritating and unforgiving (with the software I used) - if you don't take the photo with the image sensor perfectly parallel to the QR code then it won't recognise it. However when it works (usually after a couple of attempts) it's quite useful, especially if it's a large amount of data.
it didn't work with my phone
it didnt work, said it needed to install some more software (which i did) and then proceeded not to work.
It is easy to scan and save time
It is fairly easy technology to use as long as you are not moving at the time as that can make it difficult to get a clear image.
It is interesting to have to just scan these codes and they open up webpages.
it is quite easy, as long the code is big so the phone camera can pick it up
It is quite exciting!
it is very amazing, take a photo of a picture and the phone can able to recognize it and download the things I want.
it is very interesting
It took a while to read the code, I had to use several photos to manage it.
It was a bit slow as the software on my phone didn't recognise the code at first. Also it took sometime to research software that would work with my phone.
It was brilliant! No need to type in long website address any more and it's just beyond my expectation.
It was easy
it was easy to do, I just placed my phone next to the scanner
it was interesting and fun
It was interesting and fun, I didnt know what the bar code scanning application on my phone was for, so I was also impressed.
It was interesting but not something I'd do every day.
It was like clicking a hyperlink on my PC, only far less helpful since I cannot get the internet connection on my phone to work.
It was novel, but took a little while to get working and ultimately only visited a website
it was pretty cool
it was quite time consuming due to having to download software.
It was rather convenient, allowing me instant access to related materials.
It was relatively easy

It was somewhat of a novelty but I think it does have its uses beyond that. It cuts the time it would take to access the website by searching in Google etc. which is always a good thing in this day and age.

It was very fast and easy

It was very interesting but the final product (a augmented reality application) used a lot of system resources

It was very quick and easy, and allowed you to access special offers and information very easily on the go. I've found this particularly useful when travelling.

It's much easier than typing the full text/link/number.

its novel, but they're used in silly situations where they're pointless

its pretty fast, decodes easily

Just make sure they're big enough for poor cameras

Lighting conditions can sometimes make scanning difficult, especially certain types of artificial light

Little confusing at first, as in 'what is the point?' But it was pretty simple really. Useful

My phone could not utilise QR codes after trying many different applications, some of them managed to recognise QR codes however.

My phone does not have the ability to take pictures or scan QR codes

my phone was too new to be able to use it

new and exciting

nice and quick. Cool at first but then the experience becomes normal..

Not a big deal - I am a telecoms researcher so work with QRs anyway

not brilliant. unreliable and often slower than just entering a URL.

Not entirely sure what it is all about!!!!

Not good, crashed my phone.

not hard

Not particularly exciting.

Not particularly exciting.

Not particularly useful as of yet but does have potential

Not very taxing - only directing the camera on my phone and taking a picture.

nothing happened

occasionally annoying to focus on code

ok

ok but mobile web sites aren't very user friendly and very slow!

ok, can be difficult sometimes

ok, nothing unusual, just scanning a code to bring up some information

on a pepsi can it was hit and miss on whether it would scan

On my iPhone it involves downloading an app, opening the app, taking a photo of the QR code, and then it'll process it. iPhone apps vary in capability; some will only read certain types of data contained within a QR code. For the QR code in question 4 it was a simple enough process however.

pleasant

Pleasantly surprising. I didn't expect this technology for a while yet. Atm I don't think there is a huge need / market for it, but in time, perhaps.

Pleasurable, simple.

Pointless

Pointless

Pointless, you save virtually no time and the software does not always recognise the code, and will have trouble if the code is slightly blurred, it's too small, or the light in the room is bad.

pointless; only seems to be deployed as a novelty currently

pretty cool

pretty painless, load up the scanning app and point and click...

pretty simple, not as fast as saya supermarket barcode scanner and regular barcode, but not really cumbersome

Profoundly non-existent.
quick intriguing
Quick - very quick
Quick and easy
Quick and easy, PROVIDED that you have an internet enabled phone
Quick and simple to use
quick, easy
Quick, very convenient
Quick. Compact
quite difficult due to the fact that the quality of the image is very important for the phone to analyse the code. after a number of times i would be successful to take a decent picture of the code for my phone to recognise.
Quite frustrating- the camera doesnt always recognise them, but its good 2when it does
Quite Interesting
Quite simple. The hardest part is taking a clear photo. But once you have the image scanned it's really simple to go to the webpage
Quite slow
Reasonable. Software is very hit and miss on phones that aren't considered smartphones. I've found BeeTag reader to be the most usable.
Reasonably straight forward, once I had a scanning app.
Relatively straight forward.
Rubbish - camera in iPhone is awful so defeats the point. Many other mobiles don't have decent cameras - in a busy area who is really going to stop and go to the effort of taking a photo and processing it and it and not always working??
Rubbish. Ridiculous tech-fetish overcomplicated gimmick - a pen and a scrap of paper will always be more faster and more convenient than using a phone to decode some arcane symbol.
Save significant time at airport, meaning can check in 15min before departure
Simple
simple and easy
Simple and effective
Simple and effective
simple and straight forward
Simple, although getting the software can be difficult
Simple, as there is an app on my phone for it
Simple, but pointless. I fail to see the use of scanning a QR code to access a URL on my phone, when the QR code is displayed in a real web browser anyway!
simple, found it a bit strange holding my phone up to a lamp post
Simple, quick
Slightly annoying, it can be hard to get the phone to recognise the QR code.
Slow! Potentially meaningless i.e. a computer can do the same thing a lot faster
Some are quite useful for storing weblinks without typing them. Although i often find there are compatibility issues between some QR code readers and generators. Also its quite difficult to get a good picture of QR codes in non ideal lighting conditions with my phone.
Sometimes easy, sometimes code is not recognisable
Sometimes good, sometimes bad. Some QR codes would not work with my scanner, and application was slow at reading codes that would work
Sometimes struggles to recognise it on my phone but far quicker than typing it.
straight forward
That is quick and convenient.
The available software often seems amateurish and buggy.
time consuming and kinda pointless
Time consuming!

Tiresome, the iphone camera isnt good enough to take a proper image of the code. Took a lot longer than just visting the website, but it gives an interesting way of accessing it.

tried but phone camera wasn't good enough

Troublesome, the software on my phone was not the easiest to use.

Typing a long URL on a cell phone's browser is a nightmare. QR codes make it extremely easy

Underwhelming...single lines of text are all that were available. Though for library shelf codes this is extremely useful

Unsuccessful, the camera struggled to take the picture and then it was difficult to identify, plus the cost of accessing the internet.

Used a QR code on my mobile to gain access to a certain area. Very quick response.

Useful

Useful

useful

Useful if the web address to write is long; if it's simple it is faster to type the web address.

useless, effort and not helpful

useless...

using beetagg atm find it hard to capture small QRcode and couldnt find any other freeware thats compatible with my new phone

Usually easy, sometimes they dont scan.

Very difficult - only 1 IPhone application supported University, took about 30 minutes to make it work.

Very easy

Very easy and simple

Very easy most of the time although some codes (on non flat surfaces) can be troublesome to scan - also if they are too small.

Very easy to do, must faster than having to type in the entire webpage entry.

Very easy to use

Very easy!

Very easy! never had any problems!

Very easy, once I got used to how to aim the camera to get a quick result.

Very easy. Phone just picks it up.

Very exciting.

very interesting! Never knew I could do so.

Very quick and efficient. It is a unique and easy way to access a website without typing it in.

Very quick and simple.

Very useful and it saved me a lot of time

waste of time

weird

When it wants me to open a website, I am usually unable to do this unless in a free and accessable wi-fi zone due to expensive wap costs on my phone. In this case, I have usually closed the browser and have been a little displeased with the whole experience!

Wonderful and it's a very easy way to access in a web site.

wonderful!%CEit is quite interesting to scan a code and then find out something amazing

yeah easy and useful