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# **UK Public's intention to engage with academia via online technologies**

## **1. Introduction**

The relationship between science, and academia more broadly, and society as we know it today goes back more than 25 years and consists of three main models: public understanding of science, public engagement, and public dialogue (Pieczka and Escobar 2013). During this time, various changes in mass media coverage of science have taken place. These can be summarised in three dimensions, namely extensiveness, pluralisation and controversy (Schäfer 2009; Pettigrew 2011). Extensiveness and pluralisation refer to the increasing representation of science in the mass media and the increasing diversity of actors and content covered by media respectively, while controversy refers to the media coverage of science being considered as more and more controversial.

Over time, the need for science to legitimise its usefulness for society in media coverage has become more intense, with universities “facing a crisis of relevance” (Hoffman 2016). At the same time, the notion that simplification of complex issues is vital for communicating to a broader audience has become prevalent (Bell 2006; Schäfer 2009). Online technologies (blogs, social networking sites, wikis, YouTube etc.) are used by citizens and interest and pressure groups as platforms for interacting with policy makers, affecting the dynamics of knowledge production (Polino and Castelfranchi 2012). These technologies make it possible for universities and academics to reach the public and communicate research results and scientific issues in an efficient and direct way. They also make it possible for practitioners and other members of the public who are interested in research and science to communicate with the academic community (i.e. universities and academics). Creating opportunities for public dialogue is deemed essential as diffusing research results may not be particularly effective for starting a conversation about research that involves both academia

and the public (Ferlie, McGivern, and De Moraes 2010). However, the factors that motivate the public to engage online with academia are still unknown. The few attempts that have been made so far, focus on how students engage with their institutions online (e.g. Wang, Ki, and Kim, 2017), which is a try to explain online student engagement and not online public engagement. On the other hand, there are many studies that aim to understand how online technologies are incorporated into academic practice and academics' public engagement activities (Veletsianos and Kimmons 2012; Gruzd, Staves, and Wilk 2012; Lupton 2014; Dermentzi et al. 2016; Watermeyer and Lewis 2017). This focus can be potentially justified by the increasing pressure on academics to engage with external stakeholders. Considering that public engagement is a two-way process, though, examining the perspective of practitioners and the public is essential. It can help obtain a holistic view of the factors that affect the success of universities' and academics' attempts to engage with the public online. Such an understanding is of significant importance as a successful engagement process is a prerequisite for establishing quality relationships, in turn making an impact.

The aim of this paper is to study what motivates practitioners and other members of the public to use online technologies for engaging with the academic community and participating in the public research dialogue. It responds to the call for support of public engagement in the UK academic system (NCCPE 2015) and can help academics and universities understand the public and its needs better. We use the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) model as the theoretical basis for our enquiry, testing its ecological validity in the public engagement context. The paper continues with a review of the relevant literature and discussion of the proposed research model and associated hypotheses. Then, we present our methodology and the results of our data analysis. The discussion of the results follows and the paper concludes with the implications of our findings, the limitations of our study and potential directions for future research.

## 2. Literature Review

### 2.1 *Forms of public engagement*

Public engagement is surrounded by definitional ambiguity, since it has multiple meanings and applications in practice (Petersen and Bowman 2012). For example, (Jolibert and Wesselink 2012) have defined stakeholder engagement as the active involvement of various stakeholders (i.e. citizens, businesses, NGOs, policy makers, scientists, the media etc.) in one or more stages of the research process (e.g. research proposal/design, planning, coordination, execution, dissemination, follow-up), by bringing different kinds of input, such as financial or material assets, opinions, knowledge, sharing of facilities or exchange of personnel. According to them, there are two dimensions of communication between stakeholders and researchers, namely “directionality” and “formality”. As far as directionality is concerned, the communication can be either one-way (e.g. through publications, databases, newsletters, videos, brochures, guidelines, websites etc.) or two-way (e.g. workshops, meetings, conferences etc.). Depending on the formality, communication can be either formal, resulting in clearly stated and recorded commitments, or informal, targeting on unofficial information exchange (Jolibert and Wesselink 2012). A more general interpretation of public engagement, on the other hand, suggests that engagement is not necessarily connected to research projects, but includes “*the full range of ways in which university staff connect and share with lay publics*” (Davies 2013). Examples are volunteering activities, participatory social research, public lectures, informal conversations about research, and university open days. Public engagement has also been considered as a compound notion that encompasses public communication, public consultation and public participation. Public communication refers to the information flow from the research group to the public and it is a one-way process. In public consultation, the public responds to the communication initiated by the research group by giving feedback to them. Finally, public participation occurs when there is some degree of

dialogue established between researchers and the public, with information being exchanged between them (Rowe and Frewer 2005).

There are also other areas of debate such the purpose, the planning and the timing of public engagement, who the people that should be involved are and whether public engagement activities should be context embedded or general (Delgado, Lein Kjølborg, and Wickson 2011). Identifying and reaching relevant stakeholder groups is becoming increasingly important as it is a prerequisite of creating an impact outside of academia. According to Bastow, Dunleavy, and Tinkler (2014) impact that is created by an academic or researcher is an auditable or recordable occasion of influence. Public engagement is considered by many academics as an aspect of the broader discussion about impact, which stresses the need for academic knowledge to become '*relevant and accessible to the public*' (Watermeyer 2011). In fact, creating a positive impact is one of the main motivations for academics to engage with the public, along with 'mutual learning', 'material rewards' and 'self-worth' (Butler, Delaney, and Spoelstra 2015). While impact is seen as '*a statement of the value of academic work*', public engagement is considered as the method to achieve it. The two notions are co-dependent and co-informing. For instance, initiatives like the Research Excellence Framework 2014 and the promotion of the impact agenda have justified the need for public engagement and intensified the discussion about it (Watermeyer 2012a).

One of the main challenges that universities and researchers have to face is that science is nowadays significantly 'medialised', with mass media transferring research developments to an audience that is no longer seen as passive. The media's coverage of research is considered to have changed from previous years in terms of extensiveness, pluralisation and controversy. Practically, this means that scientific topics are discussed extensively in the mass media, by many different actors (who are not necessarily scientists), and topics may be evaluated controversially (Schäfer 2009). Scientific issues are also

discussed in tabloids, which increases the risk of inaccurate reporting (Boykoff and Mansfield 2008). On the other hand, the ‘traditional’ journal publications are considered unsuitable for research dissemination as they limit the availability of research and the capacity to reach many different audiences (Watermeyer 2012b).

Not surprisingly, in a social media era, the discussion about research and science has been moved online to a great extent. Universities use online tools, such as instant messaging and platforms that supply digital content (e.g. YouTube, iTunes etc.), in order to engage with students, faculty, alumni and the public (Junco and Cole-Avent 2008; Salas and Alexander 2008). Similarly, students use social media to interact with their institutions, which eventually leads to attachment and identification with their university (Wang, Ki, and Kim 2017). The rapid growth of social media, which enable short and prompt communication, has made online engagement a cost effective solution for sustaining linkages and achieving communication that resembles the usual contact in person (Bastow, Dunleavy, and Tinkler 2014). Apart from social media, other online tools like blogs, Wikis and Massive Open Online Courses (MOOCs) are used for public engagement either by universities or individual academics. Blogs have the potential to change academics into ‘*public intellectuals*’ (Baert and Booth 2012; Nackerud and Scaletta 2008) and enable a more dialogical style of intervention, as academics can now reach publics without the usual mediators that can be found in newspapers, radio and television. Practically, this means that in contrast to the conventional media to which only few high-profile academics were invited, blogs dilute institutionalised hierarchy and give the opportunity to any academic to engage with the public (Baert and Booth 2012; Bastow, Dunleavy, and Tinkler 2014; Mewburn and Thomson 2013). At the same time, this direct relationship with the public enables academics to assess who their audience is and therefore tailor their engagement approaches accordingly (Baert and Booth 2012). Wikis may present a similar opportunity as academics can deduce public

understanding of a scientific topic, by considering how Wikipedia articles are structured, when they were created and edited, and who the users that wrote the articles were (Thornton 2012). MOOCs on the other hand, work as platforms for universities which want to broadcast video and TV content to very large audiences and stimulate interactions (Bastow, Dunleavy, and Tinkler 2014). Finally, even simple online tools, such as websites, can become strong competitive weapons for building online brands and promoting a desirable image to universities' stakeholders (Hayes, Ruschman, and Walker 2009; Opoku, Hultman, and Saheli-Sangari 2008).

Universities that follow online engagement strategies may have to overcome digital divide issues, as there are citizens with whom they need to engage that do not have access to the Internet and do not know how to use it (Daun-Barnett and Das 2013; Richardson 2013). Economic (i.e. education and occupation), cultural (i.e. gender and age), social (i.e. social isolation and social capital), and personal (i.e. individual health and well-being) factors can affect different skills related to information and communication technologies (ICT) self-efficacy and online participation, and although digital skills training is important, there are still some inequalities that have to be addressed separately (Helsper and Eynon 2013). In order to address the challenges that derive from the pluralistic nature of the public, the academic community has to study the needs and the factors that motivate people outside academia to use online technologies in order to engage with them.

## ***2.2 Conceptual Framework***

The Unified Theory of Acceptance and Use of Technology (UTAUT) was proposed by (Venkatesh et al. 2003) after reviewing and comparing the most prominent models in the user acceptance literature. The model examines the acceptance of Information Technologies (IT) in an organisational context, taking into account four constructs that affect behavioural



intention, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. In addition, it incorporates the following moderators that influence the relationships between constructs: gender, age, experience, and voluntariness of use. The model is considered to be quite successful when it comes to explaining users' intention to accept a new technology as it has explained up to 70 percent of the variance in intention.

More specifically, performance expectancy and social influence have been found to have positive effects on intention to use ICT in both voluntary and mandatory tasks. They affect behavioural intention not only in cases like mobile shopping (Yang 2010) or mobile learning (Wang, Wu, and Wang 2009), but also in organisational settings (Gupta, Dasgupta, and Gupta 2008) or in tasks like filing tax returns (Schaupp, Carter, and McBride 2010) and voting (Powell et al. 2012). The effect of effort expectancy, on the other hand, is not particularly clear as there are instances that have been found to be insignificant (Schaupp, Carter, and McBride 2010), or imposed directly on performance expectancy (Yang 2010), indicating that its relation with intention is not always straightforward. Finally, while facilitating conditions have been found to have a positive effect on intention in many instances, like ICT adoption by government departments (Gupta, Dasgupta, and Gupta 2008), mobile shopping services adoption (Yang 2010) and e-file adoption (Schaupp, Carter, and McBride 2010), there are also studies that have chosen to omit the variable from their research model as it did not fit their context or was considered to be too general. For example, m-learning is a relatively new application, so participants in a relevant study were considered to lack the experience required to judge the facilitating conditions of adopting the technology (Wang, Wu, and Wang 2009). Also, in cases where security is a major concern, such as e-Voting or mobile wallets, other variables, such as trust or perceived security, were considered more important than facilitating conditions (Powell et al. 2012; Shin 2009).

*H1. Performance expectancy of online technologies has a positive effect on behavioural intention to use online technologies for engaging with the academic community.*

*H2. Effort expectancy has a positive effect on behavioural intention to use online technologies for engaging with the academic community.*

*H3. Social influence has a positive effect on behavioural intention to use online technologies for engaging with the academic community.*

*H4. Facilitating conditions have a positive effect on behavioural intention to use online technologies for engaging with the academic community.*

The above discrepancies between the results/research models of ICT adoption studies and the original UTAUT model underline the need to take into consideration the context of each study (e.g. organisational, e-commerce, e-government). This need has led to the first extension of UTAUT, in a way that it can be used for e-commerce and explain acceptance and use of technology in a consumer context. In such a context, factors like fun or pleasure may enhance the utilitarian value of a technology and affect usage intention too. UTAUT2 incorporates three additional constructs into the original UTAUT, namely hedonic motivation, price value and habit. The moderators found in UTAUT are used in the revised version too, apart from voluntariness of use, which is not relevant in the case of e-commerce as the use of such applications is always voluntary (Venkatesh, Thong, and Xu 2012).

Hedonism or simply entertainment is one of the reasons why people use media according to Uses and Gratifications theory (Calder, Malthouse, and Schaedel 2009). Not surprisingly, intention to use the World Wide Web has been positively associated with hedonic motivation (Moon and Kim 2001). Similarly, people use Social Networking Sites for pleasure among other reasons, which may derive from exchanging information, interesting new facts or music or video clips (Kim, Sohn, and Choi 2011; Pai and Arnott 2013; Lin and Lu 2011). Even the use of more utilitarian applications, like email, Instant Messaging, tax e-

services or mobile shopping, is positively associated with hedonic motivation (Papacharissi and Rubin 2000; Lu, Zhou, and Wang 2009; Hsu and Chiu 2004; Yang 2010), indicating that the perceived entertainment affects behavioural intention no matter the type of online technology. Indeed, flow experience, which is the outcome of the pleasure and enjoyment that users get from using a system, and hedonic motivation have been found to be influential of adopting an online platform, even in contexts like e-learning (Khan et al. 2017; Moghavvemi et al. 2017).

As far as the effect of habit on internet usage is concerned, according to an older study in the UK, the use of Internet seems to lack purpose and mainly be driven by habit (Hills and Argyle 2003). Habit seems to have a positive effect not only on intention to use the internet, but also on the perceived usefulness and trust attached to websites (Liao, Palvia, and Lin 2006). It is considered as an important factor that explains IS usage (Limayem and Hirt 2003) and in some cases it exerts a moderating effect on the relationship between intention to use IS and continuance behaviour (Limayem, Hirt, and Cheung 2007).

*H5. Hedonic motivation has a positive effect on behavioural intention to use online technologies for engaging with the academic community.*

*H6. Habit has a positive effect on behavioural intention to use online technologies for engaging with the academic community.*

### *Moderating Effects*

Originally, both UTAUT and UTAUT2 suggested that age and gender act as moderators in the model. However, when the use of the Internet is the topic under investigation the findings are inconclusive. Initially, studies suggested that demographics like gender, age, education and race play an important role in how people use the Internet (Howard, Rainie, and Jones 2001; Wasserman and Richmond-Abbott 2005; Weiser 2000). For example, women seemed

to use the Internet mainly for interpersonal communication and education assistance, and were more likely to use email than men, who used the Internet primarily for entertainment and to chat online more often than women (Wasserman and Richmond-Abbott 2005; Weiser 2000). More recent research has shown that these gender differences regarding the use of online technologies tend to disappear. Gender did not have any significant moderating effect on intention to use ICT in government organisations or mobile wallets (Gupta, Dasgupta, and Gupta 2008; Shin 2009). Nevertheless, gender had a moderating role on the effect of social influence and self-management of learning on intention to use m-learning (Wang, Wu, and Wang 2009).

As far as age is concerned, its effect is mainly related to the effort expectancy of using online technologies and social influence. For instance, the moderating effect of age was significant between effort expectancy/ perceived ease of use and behavioural intention in the cases of e-Voting, m-learning and mobile wallets, in such a way that it was stronger for older people (Powell et al. 2012; Wang, Wu, and Wang 2009; Shin 2009). Social influence, on the other hand, was more important for younger people in the case of mobile wallets (Shin 2009), but more important for older people in the case of mobile learning (Wang, Wu, and Wang 2009). This is another example as to why it is important to take context into consideration, as the effects of one variable on using the same technology may differ with the purpose of use.

Sometimes it is not clear whether it is age that influences the perceptions related to ICT use or education level that makes the differences. For instance, a study about the acceptance of Instant Messaging (IM) has found that the influence of perceived behavioural control on the actual use is stronger for high school students than for undergraduates and working professionals (Lu, Zhou, and Wang 2009). This could be attributed to the age, as adults may have more experience with IT than teenagers, but it could also be due to the higher education level that provides a person with more advanced ICT skills. It has been

shown that the higher the educational level of an individual, the fewer problems he or she faces while using the Internet (Deursen 2012) and the greater the range of activities he or she performs online (Hargittai and Hinnant 2008; Hargittai 2010). Differences in the intention to use ICT have also been observed based on the general socio-economic status of an individual (Hsieh, Rai, and Keil 2008). From the above, it is evident that education, which has not been included in the UTAUT model so far, has an influence on behavioural intention, at least in the area of online technologies.

*H7(a-c). Age, gender and education level moderate the effects of the above factors on behavioural intention.*

### **3. Methodology**

#### ***3.1 Sampling and participants' profile***

We used a random sample drawn from a panel of UK residents. Our decision was based on the fact that UK universities have shown a strong interest in public engagement and therefore UK residents are quite likely to have come across the term 'public engagement'. Public engagement has increasingly become an important aspect of the UK's higher education system, with universities in the UK being assessed for their research outcomes through such exercises as the 'Research Assessment Exercise' (RAE) and 'Research Excellence Framework' (REF). The latter, which replaced RAE from 2008, has put greater emphasis on research impact, which refers to the degree to which research outcomes are relevant to society's needs and interests (Murphy and Sage 2014). The ongoing pressure for research impact has motivated UK universities to intensify their attempts to engage with the public, making the UK an ideal field for studying public engagement. After removing outliers and unengaged responses, 241 valid responses remained for our analysis.

Table 1 presents the demographics of our sample. Our sample had a good distribution

among age groups and a balance between males and females (55.6% and 44.4% respectively). Also, most of the participants stated that they have a lot of experience with online technologies (73.0%) and that this experience was a positive one (77.2%) (Table 2).

Table 1. Sample demographics

Characteristic	Number	%
Gender		
Male	134	55.6
Female	107	44.4
Age		
18 – 24	9	3.7
25 – 34	41	17.0
35 – 44	55	22.8
45 – 54	70	29.0
55 - 64	51	21.2
65 and over	15	6.2
Education		
Primary School	9	3.7
High School	28	11.6
Some College	47	19.5
Bachelor’s Degree	68	28.2
Postgraduate/Master Degree	52	21.6
Doctorate	22	9.1
Other	15	6.2
Income		
Below £10,000	7	2.9
£10,000 – £19,999	21	8.7
£20,000 - £29,999	45	18.7
£30,000 – £39,999	47	19.5
£40,000 - £49,999	30	12.4
£50,000 - £59,999	25	10.4
£60,000 - £69,999	19	7.9
£70,000 - £79,999	9	3.7
£80,000 or more	33	13.7
Prefer not to answer	5	2.1

Table 2. Use of online technologies

Characteristic	Number	%
Use OT to interact with academia		
Yes	86	35.7
No	155	64.3
Percentage of online interaction with academia that is work – related		

0-25%	28	11.6
26-50%	65	27
51-75%	64	26.5
76-100%	84	34.9
Percentage of online interaction with academia that is for personal use		
0-25%	86	35.7
26-50%	94	39
51-75%	34	14.1
76-100%	27	11.2
Start using OT for interacting with academic community		
Less than 6 months ago	19	22.1
Between 6 and 12 months ago	16	18.6
Between 1 and 3 years ago	17	19.8
More than 3 years ago	34	39.5
Total	86	100

### 3.2 Data collection and measurements

Our study involved six key variables that are defined as per Table 3. The online questionnaire that was used in the study was constructed by previously validated scales adapted from the literature. The questionnaire was pre-tested on a small number of social media users (30 respondents) to refine the wording, readability and clarity of the measures before conducting the final survey. During the main data collection, participants were asked to think about their potential online engagement with the academic community in order to get information about research and evaluate the various factors for doing so on a Likert scale of 1 to 7.

Table 3. Items and EFA loadings

Construct	Loadings	Reference
<b>Intention (I)</b>		(Brown, Dennis, and Venkatesh 2010)
I intend to use online technologies for interacting with the academic community in order to get informed about research in the next 6 months.	0.944	
I predict I will use online technologies for interacting with the academic community in order to get informed about research in the next 6 months.	0.970	
I plan to use online technologies for interacting with the academic community in order to get informed about research in the next 6 months.	0.935	
<b>Performance expectancy (PE): The degree to which an individual believes that using the system will help him or her to attain gains in job performance.</b>		(Powell et al. 2012; Venkatesh et al. 2011)
Using online technologies for interacting with the academic community ...		
will be useful in order to get informed about research.	0.851	

will enhance my efficiency in getting informed about research.	0.850	
will make the acquisition of information about research easier.	0.973	
will increase the odds of getting informed about research.	0.971	
<b>Effort expectancy (EE): The degree of ease associated with the use of the system.</b>		(Venkatesh et al. 2011)
I believe that using online technologies in order to get informed about research will be a clear and understandable process.	0.539	
It will be easy for me to become skilful at using online technologies in order to get informed about research.	0.828	
I believe that using online technologies in order to get informed about research will be an easy task.	0.992	
Learning to use online technologies in order to get informed about research will be easy for me.	1.020	
<b>Social influence (SI): The degree to which an individual perceives that important others believe that he or she should use the new system.</b>		(Venkatesh et al. 2011)
People who influence my behaviour think that I should use online technologies in order to get informed about research.	1.004	
People who are important to me think that I should use online technologies in order to get informed about research.	0.958	
I would use online technologies in order to get informed about research, because of the proportion of friends and co-workers who use it for this purpose.	0.558	
<b>Facilitating conditions (FC): The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.</b>		(Brown, Dennis, and Venkatesh 2010)
I have the resources necessary to use online technologies in order to get informed about research.	0.869	
I have the knowledge necessary to use online technologies in order to get informed about research.	0.857	
If I need it, a specific person (or group) is available for assistance with difficulties using online technologies in order to get informed about research.	0.513	
<b>Hedonic Motivation (HM): The fun or pleasure derived from using a technology.</b>		(Calder, Malthouse, and Schaedel 2009)
Using online technologies in order to get informed about research will be a treat for me.	0.978	
Using online technologies in order to get informed about research will improve my mood and make me happier.	0.941	
I would like to use online technologies in order to get informed about research when I am eating or taking a break.	0.654	
If I was using online technologies in order to get informed about research, I would not think about other things I might do.	0.755	
<b>Habit (H): The degree to which a user believes that the behaviour is automatic.</b>		(Calder, Malthouse, and Schaedel 2009)
I envisage using online technologies in order to get informed about research as part of my routine.	Removed	
I envisage using online technologies in order to get informed about research being among the activities I do every time I turn on my computer.	0.690	
I envisage online technologies being a big part of getting research news every day.	0.706	
I envisage using online technologies in order to get informed about research helping me get my day started in the morning.	0.869	



Data screening for normality issues and all the values of skewness and kurtosis was undertaken, with results being within the recommended range of  $\pm 2.58$  (Tabachnick and Fidell 2012). We conducted an EFA using Maximum Likelihood with Promax rotation to test if the observed variables loaded together as expected, were adequately correlated, and met the criteria of reliability and validity. After removing one item from ‘Habit’ due to poor loading (below 0.350, which according to (Hair et al. 2014) is the minimum threshold for samples of this size), we found that the value of Kaiser–Meyer–Olkin (KMO) was 0.915. All the other items loaded on each distinct factor (Table 3) and explained 82.73% of the total variance. Also, the factors demonstrated sufficient discriminant validity, as the correlation matrix showed no correlations above 0.700. The reliability of the scales was also tested and the Cronbach’s alphas of all scales ranged between 0.866 and 0.988 (Table 4), indicating very good reliability according to (Fornell and Larcker 1981).

Table 4. Cronbach’s alpha

<b>Construct</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Cronbach’s <math>\alpha</math></b>
Intention	4.08	1.89	0.988
Habit	3.51	1.85	0.948
Hedonic Motivation	3.79	1.62	0.912
Performance Expectancy	4.93	1.44	0.958
Effort Expectancy	4.88	1.32	0.936
Social Influence	3.91	1.58	0.908
Facilitating Conditions	4.80	1.47	0.866

The main analysis of our data was conducted using AMOS 22.0.0. We used Structural Equation Modelling and the two-step approach of (Anderson and Gerbing 1988) to estimate the measurement model separately, prior to the simultaneous estimation of the measurement and the structural model. We also tested construct reliability and validity by conducting CFA using the AMOS software package. As can be seen in Table 5, all the constructs have Composite Reliabilities (CR) above the recommended value of 0.70 and the Average Variance Extracted exceeds the threshold of 0.50 (Hair et al. 2014) and therefore reliability and convergent validity have been established. In addition, the square root of AVE is greater

than inter-construct correlations for every construct; thus, there is discriminant validity among them (diagonal Table 5).

Table 5. Construct Correlation Matrix

	CR	AVE	SI	I	H	HM	PE	EE	FC
<b>Social Influence</b>	0.914	0.782	<b>0.884</b>						
<b>Intention</b>	0.988	0.964	0.548	<b>0.982</b>					
<b>Habit</b>	0.949	0.861	0.626	0.629	<b>0.928</b>				
<b>Hedonic Motivation</b>	0.914	0.728	0.646	0.527	0.791	<b>0.853</b>			
<b>Performance</b>	0.952	0.832	0.552	0.634	0.438	0.566	<b>0.912</b>		
<b>Effort</b>	0.938	0.791	0.423	0.334	0.333	0.426	0.566	<b>0.889</b>	
<b>Facilitating Conditions</b>	0.880	0.713	0.510	0.477	0.229	0.329	0.649	0.711	<b>0.844</b>

As far as model fit is concerned, the following values were observed for our measurement model:  $\chi^2/df = 2.492$ , CFI= 0.951, SRMR= 0.064, RMSEA=0.079. According to Hair et al. (2014) when the number of observations is below 250 and the number of observed variables is between 12 and 30, significant p-values are expected for  $\chi^2$  and a good model fit has been established when CFI is above 0.95 and both SRMR and RMSEA are 0.08 or less. Thus, our measurement model demonstrated a good model fit.

### 3.3 Common Method Bias

We conducted a common method bias test to determine whether our measurement model was affected by a method bias. We ran multiple regression analysis using the composites of the latent factors and found that VIF values ranged from 2.534 to 4.134. Thus, all the values were below the recommended VIF threshold of 5, for covariance-based SEM (Kock 2015; Kock and Lynn 2012). Based on this, we conclude that common method bias is not a serious issue in our study.

### **3.4 Invariance Tests**

Configural and metric invariance tests were also conducted before testing for moderating effects of age, gender and education level.

Gender: The model fit of the measurement models (with the two groups ‘males’ and ‘females’ loaded separately) had an adequate fit ( $\chi^2/df= 1.809$ , CFI= 0.949, RMSEA= 0.058), indicating that the model is configurally invariant. Our measurement model also met the criteria for metric invariance, as the chi-square difference test was found to be non-significant ( $p > 0.05$ ) after we constrained the models to be equal.

Age: We created two age groups, namely ‘Younger individuals’ (< 45 years old) and ‘Older individuals’ ( $\geq 45$  years old). The model fit for age was generally good, with the exception of CFI, which was below the recommended threshold of 0.95 ( $\chi^2/df = 1.933$ , CFI=0.941, RMSEA=0.062). The chi-square difference test was again nonsignificant ( $p > 0.05$ ). Having not established configural invariance we decided not to test for differences between age groups.

Education level: We separated our sample into two groups, depending on whether the respondent had a University degree (i.e. Bachelor, Master Degree or Doctorate) or not (i.e. Primary or High School, Some College etc.). We had configural (although CFI is at the borderline) and metric invariance in this case too, with the model fit being adequate ( $\chi^2/df=1.879$ , CFI= 0.945, RMSEA=0.061) and the chi-square difference test being non-significant.

## **4. Results**

After testing the full hybrid model ( $\chi^2/df= 2.510$ , CFI=0.951, SRMR=0.066, RMSEA=0.079) we obtained the results that are presented in Figure 1.

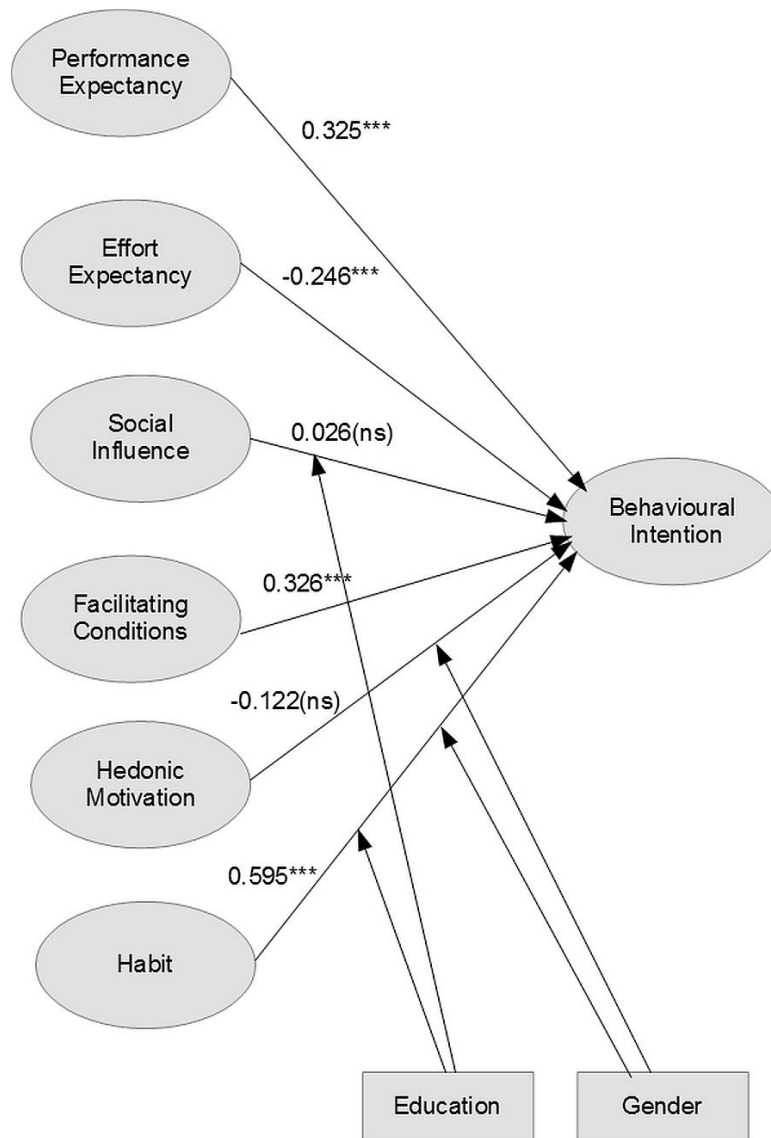


Figure 1. Results

Performance expectancy ( $\beta=0.325$ ,  $p<0.001$ ), facilitating conditions ( $\beta=0.326$ ,  $p<0.001$ ) and habit ( $\beta=0.595$ ,  $p<0.001$ ) had significant positive effects on intention and therefore H1, H4 and H6 were supported. Effort expectancy ( $\beta=-0.246$ ,  $p<0.001$ ) had a significant negative effect on intention and therefore H2 was rejected. Social influence ( $\beta=0.026$ ) and hedonic motivation ( $\beta=-0.122$ ) had non-significant effects on intention and therefore H3 and H5 were rejected as well. The variance explained by the model (direct effects only) was relatively high ( $R^2=0.590$ ), compared to the original UTAUT2, which

explained 44% (direct effects only) and 74% (direct effects and interactions) of the variance (Venkatesh, Thong, and Xu 2012).

As far as moderation is concerned, H7 was partially supported as age did not have any moderating effects on the relationships of the model. However, some significant differences were observed between the two groups based on the education level. More specifically, there was a significant difference in the relationship of habit and intention ( $\Delta Z$ score=-4.335,  $p<0.001$ ) as the effect of habit was significantly positive for individuals that do not have any university degree ( $\beta=0.918$ ,  $p<0.001$ ) and non-significant for the ones that have attended university ( $\beta= 0.139$ ). Also, there was a significant difference between the two groups related to social influence ( $\Delta Z$ score=2.839,  $p< 0.001$ ), which affected intention in the case of individuals without any university degree ( $\beta=-0.332$ ,  $p<0.05$ ) negatively. In the case of individuals who have finished university, the effect of social influence was positive, but significant only at 0.1 level ( $\beta=0.260$ ,  $p=0.085$ ).

Gender also moderated two of the relationships in the model. More specifically, it was found that there is a difference ( $\Delta Z$ score= 4.719,  $p<0.001$ ) between males and females regarding habit, as its effect was much stronger for women ( $\beta= 0.975$ ,  $p<0.001$ ) than for men ( $\beta= 0.136$ , non-sig.). Also, hedonic motivation had a significant negative effect in the case of women ( $\beta= -0.403$ ,  $p<0.05$ ), while its effect on men was insignificant ( $\beta= 0.120$ ). However, this difference was only significant at 0.1 level ( $\Delta Z$ score= -1.939,  $p<0.1$ ).

## **5. Discussion**

The aim of this research was to study the factors that motivate practitioners and other members of the public to engage with the academic community via online technologies. Based on our analysis, habit, performance expectancy and facilitating conditions are the main drivers of the adoption of online technologies for this purpose. These results are reflected in

the attributes of our sample. More than a third of the respondents (35.7%) stated that they already use online technologies for engaging with the academic community and the majority of them (59.3%) have been doing so for more than a year. Hence, it is only reasonable to assume that for many of them engaging with the academic community online has become a habit. This explanation is supported by previous research according to which the more frequent and the more comprehensive a particular IS usage behaviour is, the more likely it is to turn into a habit (Limayem, Hirt, and Cheung 2007). Repeated behaviours may involve following academic and academic institutions on Twitter, reading blogs relevant to one's interest or joining groups on social networks on topics of interest. The direct nature of such engagement mechanisms and the ease with which monitoring can take place can lead to repeated behaviours that effectively become habitual. Past research has suggested that the use of the Internet is not always purpose-driven, in fact it seems that online activities resemble habits as people "are drawn into these activities helplessly and cannot explain why they do them" (Hills and Argyle 2003). As we have not gathered specific information as to how habits are manifested, it is not possible to deduce the users' modus operandi. It may be, for instance, that they follow very active accounts that post a lot of new content or that they are simply scanning for new material. However, this finding highlights the point that academics need to regularly post content relevant to their audiences in order to not just attract, but maintain and reinforce, the engagement and turn habits into relationships. This is also supported by research in social media communications that has shown that interactions, content and long-term commitment affect users' response to a social media message/post (van de Velde, Meijer, and Homburg 2015).

The positive effect of performance expectancy on intention is something that was expected based on the IT adoption literature and it is also in agreement with the demographics of our sample. A relatively high percentage of the respondents (61.4%) stated

that more than half of the time they spend online engaging with academic community is for work-related reasons, so it is only reasonable for them to consider the utilitarian value of such activities. This may also be the reason why, contrary to the study of Venkatesh, Thong, and Xu (2012), we did not find any significant effect of hedonic motivation on intention. As their online interactions are not related to personal reasons (i.e. fun, hobbies, personal interests etc.), they probably do not consider engaging with academics as a task from which they could derive any fun or pleasure.

As far as facilitating conditions are concerned, the majority of the respondents have answered that they have a lot of experience with online technologies (73%) and that this experience has been positive (77.2%). This probably explains the positive relationship between facilitating conditions and intention, as the experienced online users would feel that they have the required skills and knowledge to engage with the academic community online. After all, all that one needs to engage with the academic community online is an internet-connected device and basic computer skills. On one hand this may suggest that the Internet can help expand the scope and reach of engagement, but on the other it can add barriers as even the most basic of facilitating conditions may not be present on the user's side. For instance, this may be true for research related to less affluent groups who are not likely to be regularly connected to the Internet and cannot afford the time and resources to engage with academics. Consequently, the nature of the research undertaken and the intended stakeholders should be taken into consideration so that a more holistic engagement plan can be put in place.

The positive experience with online technologies that many of the respondents have and the fact that online academic engagement is not any different to using any other online technologies may also be the reason why effort expectancy does not have the expected effect on intention. Respondents may have felt that effort related to using online technologies was

not significant. For instance, a negative effect of effort expectancy on intention was also found in a study, about using websites for purchasing air-tickets (Escobar-Rodríguez and Carvajal-Trujillo 2013), indicating that people feel confident about using online technologies these days no matter what the context is. It has also been found that the higher the level of education an individual has, the less Internet skill-related problems he or she faces (Deursen 2012). More than the half of our sample has at least a university degree, which may explain why they do not expect to face any difficulties while using online technologies.

Finally, when it came to demographics age did not have any moderating effects in our study, while gender moderated only the effects of habit and hedonic motivation. This may be due to the familiarity of the public with online technologies that minimises any ‘digital divide’ that may exist between men and women and/or younger and older individuals. This finding is in line with other recent studies that show that there are not many significant differences in Internet usage between the sexes any more (Gupta, Dasgupta, and Gupta 2008; Shin 2009). The effect that gender has on the relationship of hedonic motivation and intention agrees to some extent with the findings of Venkatesh, Thong, and Xu (2012), according to which the effect of hedonic motivation is stronger for men. However, our finding that habit was much stronger for women is in contrast with the findings of the aforementioned study, which found that the effect of habit is stronger for men. More research examining the process by which such habitual usage is formed could shed light on how to attract and maintain users' interest, not just for public engagement but also for other contexts too.

Education appears to moderate the relationships of habit and social influence with intention. This is not the first time that educational level has played a moderating role when it comes to using the Internet. Previous studies have found that people from more privileged backgrounds are better informed about the capabilities of the Internet and use it for a larger number of activities, with many of them using it for more ‘capital enhancing’ activities



(Hargittai and Hinnant 2008; Hargittai 2010). In our case, the effect of habit was significant only for individuals that do not have any university degree, indicating that people from this educational background do not consider engaging with academia to be a conscious decision, but rather an automatic activity that they perform while online among other tasks. Also, social influence had a significant negative effect on intention in the case of people coming from lower education levels, showing that they are less likely to consider engaging with the academic community online due to “peer pressure”. Indeed, it has been found that social capital expectation is linked to social media usage, with users clicking ‘Like’ to share their interests to their network of friends (Lee 2017). People usually have friends and colleagues from more or less the same educational background, so it is less likely for people without a university degree to be influenced by peers from more privileged backgrounds, who, as noted previously, tend to use the Internet for more capital enhancing activities.

## **6. Conclusions**

The present study contributes to our understanding of academic public engagement by examining the perspective of the public. In doing so, our paper contributes to the growing literature of public engagement and helps universities and academics to better understand their target audience. Our results have confirmed the findings of earlier studies about the general use of the Internet, according to which many online activities are driven from the force of habit and associated with the educational level of the individual. Our study also has the important role that performance expectancy plays in the formation of intention to use a technology. In addition, we found that in general practitioners and the broader public feel confident that they have the necessary skills to engage with academia online and some of them already do so. Although more research is necessary to better understand the motivating factors behind the public’s interest and the perceived benefits, our findings suggest that users

have attached a utilitarian rather than a hedonic value to the engagement process.

Considering the important role that habit plays in the public's intention, universities may find it beneficial to formulate engagement strategies that aim to create such a habit. This means that universities should intensify their attempts to engage with the public online and use a greater variety of online technologies (e.g. not just the traditional webpages and social media pages, but also portals, newsfeeds, forums etc.). At the same time, they should try to promote the university's online presence during 'traditional' public engagement activities (e.g. workshops, public lectures etc.), so more and more people are aware that there is an option to interact with the university online and are given the opportunity to try this alternative form of engagement. In addition, universities may adapt their online content in a way that gratifies practitioners' needs. It seems that most of the people that engage online with the academic community do so in order to get information relevant to their professional practice. Universities and academics could try to provide more practical information based on their research findings instead of presenting general or theoretical research findings and organise their online content in a way that helps the public to realise the applicability of their research results in everyday practice. In doing so, the utilitarian benefits that the public gains by engaging with the academic community online will increase and this could spark more interest from the public in research and academic practice.

With regard to this study's limitations, the use of a UK sample may limit the generalisability of the results to other geographical regions. Geography may play a role not just in terms of the users' preferences related to the universities with which they would opt to engage but also with regards to their national higher education culture, which may influence the appetite for online public engagement. Future studies could focus on countries where public engagement is not one of the main goals on universities' agendas and see whether there is a difference in the public's perceptions. Also, the use of an online questionnaire as a

data collection tool may have affected the demographics of the study as people comfortable with using online technologies were more likely to answer the questionnaire. It will be of interest if future studies consider the motivations behind engaging or not with academics online qualitatively.

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