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Lifelong learning and the Internet: Who benefits most from learning online?

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Abstract
This paper uses nationally representative survey data of adults Internet use in Britain to examine current patterns in the uptake of lifelong learning via the Internet. We develop and test a model that accounts for structure, agency and outcomes using structural equation modelling to address two questions: (1) how structure (as measured by age, gender, SES, Education and ACORN) is related to personal and capital enhancing outcomes of learning online; and (2) how agency (as measured by digital skills and engagement with online learning) mediates this relationship. We demonstrate that social structure remains an important factor in understanding patterns of uptake and outcomes of online learning, alongside an individual's agentic behaviours. We suggest that countries such as the UK, which have become overly focused on individual interventions to increase the uptake of lifelong learning via the Internet, are going in the wrong direction. Such interventions have failed in the past, and we suggest that they will continue to do so unless policy makers reconceptualise lifelong learning and the Internet in ways that take social structures into account.

Key words: Lifelong Learning, Internet, Digital, Inequalities, Adult Education, Survey

Background

Lifelong learning has experienced cycles of attention in the policy discourse of many countries since the 1970s. Similar to debates about the "Information Society" in the early 2000s; discussions of the "Fourth Industrial Revolution" (Schwab, 2016) are fueling a recent and renewed interest in the importance of learning across the life course.

Lifelong learning is important for the overall health of society and the individual (eg, Feinstein, Hammond, Woods, Preston, & Bynner, 2003; Hammond, 2004, Horrigan, 2016, Tuckett, 2017). Thus, the current policy focus on how to support and facilitate lifelong learning is much needed. However, research across time and across countries has consistently shown that there are significant inequalities in access to learning opportunities. Those who are better off, with more stable jobs, and with a stronger education background tend to be more likely to learn throughout life (Biesta, 2006; Field, 2006; Goldthorpe, 2016; OECD, 2019).

Practitioner Notes

What is already known about this topic

- Those who are better off, with more stable jobs and with a stronger education background, tend to be more likely use the Internet for lifelong learning.
- Lifelong learning is increasingly reconceptualised by policy makers as something that individuals are responsible for, risking policy interventions that tend to over privilege agency and neglect structure.
- Precisely how we can understand the relationship between agency and structure in relation to lifelong learning via the Internet is underexplored, there is very limited data available to analyse the current context.

What this paper adds

- An up to date, nationally representative survey analyses of the use of the Internet for lifelong learning in Britain, that highlights the following:
- Those who are younger, from higher SES groups and who are more educated report higher levels of digital skills and take up more online learning activities.
- Those who take up more online learning opportunities report more benefits from learning online, both personally and in ways that may be capital enhancing.
- Structural variables, specifically age, gender and where a person lives (as measured by ACORN) directly impact the capital enhancing benefits typically associated with learning online regardless of an individual's engagement with the Internet for learning or their level of digital skills.
- Those who are older, from lower SES, and are less well educated benefit the least from engaging in learning online in terms of the personal learning benefits they achieve and wider capital enhancing benefits they report.
- These trends highlight that social structure and agentic behaviour are important factors in understanding patterns of uptake of online learning and the outcomes people achieve from these activities.

Implications for practice and/or policy

- We suggest that countries such as the UK, which have become overly focused on individual solutions, such as digital skills, to promote the use of the Internet for lifelong learning are going in the wrong direction. Interventions built around the "responsibilisation of the individual" that ignore structural inequalities have failed in the past, and the data presented here suggests that they will continue to do so if they do not take into account wider social structures.
- There is a need to reframe the way lifelong learning via the Internet is conceptualised and supported, to account for a more personal and democratic view, where individuals are supported to learn things that matter to them, and connects individuals with their local communities to support social change.

The Internet and other new technologies are often viewed as an important way to facilitate lifelong learning. Yet, past research has shown that the Internet only reinforces and likely exacerbates these differences (Horrigan, 2016; White & Selwyn, 2012). During this new wave of enthusiasm for lifelong learning these longstanding and historical patterns of digital uptake is tending to be forgotten in popular discourse. There are implicit assumptions that the availability of learning online via the rapid increase in smartphones, the use of "free" platforms such as

YouTube and Google and the proliferation of open courseware (eg, MOOCs) will support lifelong learning online; that all can access and benefit from these opportunities in equal measures.

However, these assumptions lack evidence. At present, survey data such as the Eurostat Adult Education Survey, the Labour Force Survey and PIAAC's Survey of Adult Skills track participation in lifelong learning via a range of modes including the Internet. But the data are typically collected infrequently, and the measures for digital learning are not sufficiently nuanced. There has been very little in-depth analysis of the role of the Internet in the uptake of lifelong learning in recent years and the implications this may have for the individual. Given the current focus on lifelong learning, and the growing interest in the Internet as an important mechanism for "delivering" learning in ways that leads to positive impacts, it is important to explore these issues empirically.

This paper aims to address this gap through using nationally representative survey data from Britain. Before detailing the research questions and approach we first highlight how lifelong learning is currently conceptualised in many countries across the globe, including Britain.

The Internet and lifelong learning: the "responsibilization" of the individual

Over the past few decades, there has been a discernible shift in policy discourse away from learning for personal development, empowerment, inclusion and democratic engagement towards a more economic focus where skills for the job market are paramount (Bélanger, 2016; Tedder & Biesta, 2009). As a result, responsibility for learning is held with the individual as they are the ones likely to benefit economically from engaging in such activity. This deferral of responsibility to individuals is problematic as it excuses the state from its responsibility to its citizens and leads to significant reductions in funding for learning opportunities that are not considered as having sufficient economic value (Biesta, 2006; Field, 2006). Within such debates the explanation for differences in patterns of participation tend to be reduced to individual problems or "barriers" that need to be overcome; with no recognition of the wider structural barriers that may better explain inequalities in the uptake in the use of the Internet for learning and any benefits that may result. This focus on agency and neglect of social structure is well recognised by Education scholars (eg, Allatt & Tett, 2019; Evans, Schoon, & Weale, 2013). Indeed, the problematic "responsibilization of the individual" is well recognised across all policy sectors (Juhila, Raitakari, & Hall, 2016).

The Internet and related technologies are typically positioned within this discourse as a way to provide relatively flexible and cost-effective access to learning opportunities, which once taken up by individuals lead to equivalent benefits for all (Houlden & Veletsianos, 2019). However, affordances of technologies, and its effects are not neutral or the same for everyone (Houlden & Veletsianos, 2019). Research has consistently shown that those who are better off tend to benefit more from using the Internet. This is in part due to existing social structures, with advantaged individuals better positioned to further advance their current position in society via their use of the Internet (Eynon, Deetjen, & Malmberg, 2018; Kvasny, 2006; Van Deursen & Helsper, 2015; Stern, Adams, & Elsasser, 2009).

Thus, to counter the current "responsibilzation" of individuals within this area of policy, there is a need to account for both the agency of individuals and social structure in any model that explains both the uptake and outcomes of lifelong learning via the Internet. We next describe such a model.

The model and research questions

We propose a model for investigating the relationships between agency, structure and outcomes of learning via the Internet drawing on critical realism. Within this model agency and structure

are viewed conceptually and empirically distinct phenomena that are both important in any analyses of explaining social life (Archer, 2003; Sayer, 2000). Structure proceeds agency, and the actions of individuals lead to varying outcomes for the individual and social structures over time. These varying outcomes are because an individual's actions are shaped by social structure but not determined by them (Archer, 2012). Such a model provides a valuable way to equally acknowledge the importance of people's actions and the role of social structure, when often agency is privileged in policy discourse.

In operationalising our model, as structural elements we pose socio-demographic variables that reflect a person's place within the wider social hierarchy. As elements of agency, we include their digital skills (a common focus of policy interventions in this space) and engagement with online learning activities. We then pose two outcomes from learning online, the first related to personal learning outcomes (the satisfaction and well-being that can result from learning), the other more focused on outcomes that may increase a person's social, economic and/ or cultural capital. In essence, we argue that there will be a direct relationship between structure, agency and outcomes, and the direct relationship between structure and outcomes will be mediated through individual's agency. As noted above our broader model also proposes that there is an effect of collective individual actions on social structure, but this part of the theoretical framework is not possible to properly test with this cross-sectional data. Figure 1 provides the conceptual framework for the study. Each stage of the model is explained in more detail below.

Structure

As can be seen in Figure 1, the first group of variables in the model relate to socio-demographics that relate to someone's position in the social structure: age, gender, socio-economic status (SES), educational level and ACORN. Socio-demographic factors have been shown to be related to: uptake of lifelong learning in general (eg, OECD, 2019), uptake of online learning activities in particular (Houlden & Veletsianos, 2019; Selwyn, 2011), individuals' digital skills (Zillien & Hargittai, 2009); and also the ways in which people benefit from Internet use (van Deursen & van Dijk, 2015; Zillien & Hargittai, 2009).

Agency

The second group of factors measure people's agency in relation to Internet use. Here we focus on two constructs: digital skills and engagement with online learning activities. Digital skills are often promoted as a key part of digital inclusion strategies in many countries as a way for individuals to benefit more from their Internet use (Helsper & van Deursen, 2015). As noted above individuals are seen as responsible for improving their life chances through taking up learning

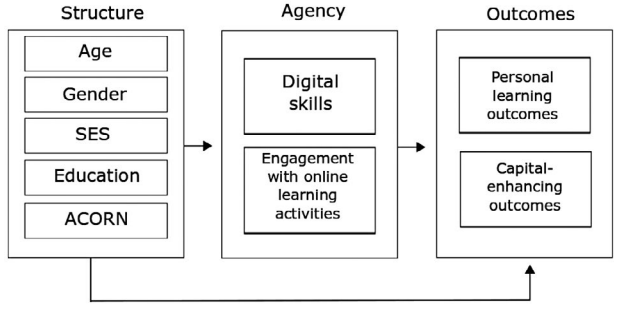

Figure 1: conceptual framework

activities online. There is some evidence that skills and use are related to outcomes (van Deursen and Helsper, 2015). However, this is rarely empirically explored particularly in relation to learning. Due to the well-established literature that indicates a reciprocal relationship between digital skills and uptake of online activities we include this assumption in the model (van Deursen and van Dijk, 2010; Zillien & Hargittai, 2009).

Outcomes

In our third group of variables, we examine two related kinds of outcomes from learning online. The first is "personal learning outcomes" which can be defined as the enjoyment and satisfaction people acquire from learning (eg, Horrigan, 2016). The second outcome is "capital enhancing outcomes" which can be understood as outcomes that are likely to enhance an individual's economic, health cultural and social capital that are often a result of educational activities (Evans *et al.*, 2013; Foresight, 2017).

In statistical terms, we wish to model both the direct and indirect relationships between these three blocks of variables. In terms of direct effects, we anticipate there will be a direct relationship between all three blocks (ie, structure → agency, agency → outcome and structure → outcome). As outlined above, based on previous literature on inequality in access and use of digital resources, we suggest that structure (as measured by socio-demographic factors age, gender, SES, education and ACORN) will have a direct effect on agency (digital skills and engagement with online learning). The level of an individual's digital skills and their level of engagement with online learning will have a direct impact on the outcomes individuals achieve from these activities. Finally, social structure (as measured by socio-demographic factors age, gender, SES, education and ACORN) will have a direct effect on the two learning outcomes as individual's circumstances can have an impact on their individual well-being and on their various forms of capital.

In addition to these direct effects it is important to examine the indirect relationships between these three blocks. We suggest that the direct relationships between structure (social-demographics) and outcomes (personal and capital enhancing) will also be mediated through (ie, have an indirect effect) by an individual's agentic behaviours (digital skills and level of engagement with online learning). Previous work has shown a mediating effect of digital skills on learning outcomes. For example, in a study of older adult Internet users Hofer and colleagues found that the direct positive relationship between online information seeking and life satisfaction was positively and significantly mediated by digital skills (Hofer, Hargittai, Büchi, & Seifert, 2019). In addition, many digital inequalities scholars highlight a "rich get richer effect" that is those, who are better off tend to benefit more from being online (Lutz, 2019; Zillien & Hargittai, 2009).

In summary, using nationally representative survey data of British adults Internet use we plan to examine four relationships:

- The direct relationship between structure (as measured by age, gender, SES, Education and ACORN) and personal and capital enhancing outcomes of learning online.
- The direct relationship between structure (as measured by age, gender, SES, Education and ACORN) and agency (as measured by digital skills and engagement with online learning activities).
- The direct relationship between agency (as measured by digital skills and engagement with online learning activities) and personal and capital enhancing outcomes of learning online.
- How the direct effects between structure (as measured by age, gender, SES, Education and ACORN) and personal and capital enhancing outcomes of learning online are mediated by agency (as measured by digital skills and engagement with online learning activities).

In doing so, we pose two research questions:

1. How is structure (as measured by age, gender, SES, Education and ACORN) related to personal and capital enhancing outcomes of learning online?
2. How does agency (as measured by digital skills and engagement with online learning activities) mediate this relationship?

Method

Sample

This paper uses data from the Oxford Internet Surveys (OxIS). This survey comprises of a nationally representative sample of 1,818 people aged 18 and older in Britain (England, Scotland and Wales). The OxIS interviews were conducted face-to-face in people's homes in the spring of 2019. A two-stage random sampling design was used. First, a random sample of 175 areas in Britain was selected, stratified by region. Then, within each selected area, a random sample of 10 addresses was selected from the UK Postal Address File. The data were weighted according to the UK Census based on gender, age, socio-economic grade and region. For the purpose of our analyses we used a subsample of these participants, namely all 1410 Internet users in the survey. There are some differences between Internet users and non-users. In this sample Internet users were younger ($t_{[541.52 \text{ unequal variances}]} = 27.33$; $p \leq .001$), more educated ($t_{[673.28 \text{ unequal variances}]} = -17.87$; $p \leq .001$), had higher social class ($t_{[1507]} = -10.48$; $p \leq .001$), and were men ($[\chi^2_1] = 6.15$; $p = .013$). These differences reflect known differences between users and non-users of the Internet in digital inclusion research within the UK and across the globe (Van Dijk, 2013; Ofcom, 2019). For further details about OxIS and sampling procedures please see the report by Blank and colleagues (2019).

Measures

Consistent with our theoretical frame we included variables available in the OxIS dataset that have been shown to be important in understanding engagement with the use of the Internet for learning opportunities and an emerging body of work that aims to explore the outcomes of Internet use. Following Figure 1 we included three blocks of variables.

Structure encompassed well-established measures of age, gender, SES, education and ACORN as measures of structural inequalities. Age ($M = 3.76$; $SD = 1.71$) was measured by asking how old someone was based on 8 categories (1 = 18-24, 2 = 25-34, 3 = 35-44 ... 8 = 85+); and gender measured on a dichotomous scale (male, female) with male as 0 and female as 1. Socio-economic status ($M = 0.21$; $SD = 0.99$) was created based on questions relating to the occupation of the chief income earner to determine social grade on a 6-point scale (A highest to E lowest) then z scored and reverse coded for ease of interpretation, so higher values indicate higher SES in the models below.[1] Education ($M = 2.02$; $SD = 0.82$) was created by classifying those with up to secondary school education as "Basic education" (1), those with additional post-compulsory education as "Further education" (2), and those with university education as "Higher education" (3). Finally, ACORN, a geographic measure based on a variety of open demographic and social data sets that provides an alternative to self-report measures of social circumstances was used. The 62 segments were grouped into five ordinal categories (1 highest, 5 lowest, M = 2.92, SD = 1.38).[2]

Agency included two variables. A measure of digital skills and a measure of engagement with learning online. Digital skills were measured via a measure of Internet self-efficacy based on the response to the question "How would you rate your ability to use the Internet?" on a four-point

scale from Outstanding (5) to Poor (2) ($M = 3.89$, $SD = 0.74$). To develop a measure of engagement with learning activities online we selected four items that have been used in past studies that account for the fact that much of adult learning using technology tends to be driven by personal interest (Evans *et al.*, 2013; Selwyn & Gorard, 2004); and could be defined as somewhat more informal in nature (Greenhow & Lewin, 2016; Peters & Romero, 2019). Within the survey, these questions were asked in relation to the frequency with which people carry out these activities online (scale from 1 "never" to 5 "many times per day"). The four items were: using the Internet for finding or checking a fact, completing a school or work project, investigating topics of personal interest, to learn how to do something yourself, like repair something around the house or DIY project ($M = 2.06$, $SD = 0.94$, Internal consistency (Cronbach's $\alpha = 0.80$) and McDonald's $\omega = 0.84$ (giving the ratio of explained to residual variance in the latent construct)).

Outcomes were based on two measures. OxIS asks a number of questions about the frequency with which people have experienced certain outcomes from their activities online (scale from 1 "never" to 4 "often"). We developed two constructs, one related to personal learning outcomes, based on agreement with the statements: how often have you discovered information really important to you, learned something new, found information you didn't think you would be able to find, discovered something that changed your mind on a social or political issue ($M = 1.68$, $SD = 0.53$, $\alpha = 0.71$, $\omega = 0.73$). The second outcome related to capital enhancing outcomes which are likely to arise from learning online. This second construct was developed from agreements with the statements: have you ever saved money, found information that helped improve health, found out about an event through the Internet on a 3-point scale ($M = 1.16$, $SD = 0.43$, $\alpha = 0.68$, $\omega = 0.68$). Other outcomes, such as finding a job, are likely to be important yet could not be included in the model due to the constraints of the survey items available.

Descriptive statistics of the measures used in the analysis are presented in Table 1.

Analytic strategies

We utilised structural equation modelling in R to test our model. In our measurement model, we specified all items to load on their respective constructs, and all latent constructs were allowed to correlate. We then proceeded, based on our theoretical framework (Figure 1), to specify a latent construct path analysis. In this model, the digital skills measure was specified to predict engagement with online learning activities and the two constructs measuring outcomes (personal learning outcomes, capital enhancing outcomes); and engagement with online learning activities was specified to predict the two constructs measuring outcomes. In all three blocks we allowed the constructs to be inter-correlated. Socio demographics measuring social structure

Table 1: Descriptives (estimates from SEM)

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Age									
2. Gender (0 = M, 1 = F)	−0.04								
3. SES	−0.16	0.00							
4. Education	−0.12	−0.02	0.49						
5. Disadvantage (ACORN)	−0.22	0.02	−0.33	−0.23					
6. Digital skills	−0.39	−0.05	0.13	0.21	0.02				
7. Engage in learning	−0.28	0.01	0.21	0.31	−0.04	0.35			
8. Learning outcomes	−0.10	0.04	0.15	0.21	−0.04	0.17	0.47		
9. Capital enhancing	−0.29	0.11	0.14	0.23	−0.08	0.28	0.64	0.57	
M	3.75	53.1%	0.21	2.03	2.92	3.90	2.06	1.68	1.16
SD	1.71		0.99	0.82	1.38	0.74	0.94	0.53	0.43

(ie, age, gender, SES, education and ACORN) were included as covariates in the model, meaning that these predicted each of the constructs. Hence all parameter estimates in the latent path analysis are net of the covariate effects.

Results

We specified a structural equation model (SEM) to account for uniqueness's (measurement error) in latent constructs. We modelled in three steps. In the first model, a measurement model for the latent agency and outcome constructs, we included the three latent constructs (engagement with online learning activities, personal learning outcomes and capital enhancing outcomes); and engagement with online learning activities and digital skills, allowing these to be correlated with each other. This model fitted data reasonably well (raw n = 1410, $\chi^2_{[89]} = 269.57$; $p < .001$; RMSEA = 0.061; CFI = 0.947; SRMR = 0.039). The second model included these four constructs and all structure variables, all allowed to be correlated with each other. Also this model fitted data reasonably well (raw n = 1410, $\chi^2_{[89]} = 389.74$; $p < .001$; RMSEA = 0.057; CFI = 0.932; SRMR = 0.038). The third model, in which directional paths from the structural variables on all agency and outcome constructs were included (see Figure 1) also fitted data well (n = 1146, covariance coverage 0.96 to 1.00, raw n = 1410, $\chi^2_{[89]} = 389.74$; $p < .001$; RMSEA = 0.057; CFI = 0.0.923; SRMR = 0.038). Means of the latent constructs were estimated using effect coding (Little, Slegers, & Card, 2006) implemented in R.

As noted above we aimed to explore both the direct and indirect relationships between structure, agency and outcomes. We first consider the direct relationships between structure and agency, agency and outcomes, and structure and outcomes; and then the indirect relationships between structure and outcomes (personal and capital) as mediated by agency.

Direct relationships between structure, agency and outcomes

Structure and agency

As summarised in Table 2 younger people reported high levels of digital skills $\beta = -0.41$, $p < .001$) and took up more online learning activities $\beta = -0.27$, $p < .001$). Men reported higher levels of digital skills ($\beta = -0.07$, $p < .05$). Those from higher SES backgrounds reported higher levels of digital skills ($\beta = 0.15$, $p < .001$) and more engagement with online learning activities ($\beta = 0.15$, $p < .001$). Those with higher levels of education reported higher levels of digital skills ($\beta = 0.09$, $p < .05$) and more engagement with online learning activities ($\beta = 0.20$, $p < .001$). Altogether structure predicted (R^2) 20.0% of the variance in digital skills, and 17.7% of engagement in learning.

Agency and outcomes

As shown in Figure 2, there is a significant reciprocal relationship between digital skills and engagement with online learning activities. Perceived levels of digital skills is positively related to level of engagement with online learning activities ($\beta = 0.22$, $p < .001$). As hypothesised in section 1, engagement with online learning activities positively predicts personal learning outcomes ($\beta = 0.45$, $p < .001$) and capital enhancing outcomes ($\beta = 0.58$, $p < .001$). However, surprisingly digital skills are not significantly related to capital enhancing outcomes or personal learning outcomes.

Structure and outcomes

As summarised in Table 2, none of the five structural variables (age, gender, SES, Education and ACORN) were directly and significantly related to personal learning outcomes. However, those who were younger ($\beta = -0.08$, $p < .001$), female ($\beta = 0.10$, $p < .01$) reported higher capital enhancing outcomes. ACORN also mattered, with those from higher ACORN groups reporting more

Table 2: Effects of structure on agency (above) and learning outcomes (below)

	B	*s.e.*	*β*	*p*	*B*	*s.e.*	*β*	*p*
	Agency							
	Digital skills				*Engagement in online learning*			
Age	−0.18	0.01	−0.41	***	−0.16	0.02	−0.27	***
Gender	−0.10	0.04	−0.07	*	0.01	0.06	0.01	
SES	0.12	0.03	0.15	***	0.14	0.04	0.15	***
Education	0.08	0.03	0.09	*	0.23	0.04	0.20	***
ACORN	0.00	0.02	0.00		−0.01	0.02	−0.01	
	Outcome							
	Personal learning				*Capital enhancing*			
Age	0.01	0.01	0.04		−0.03	0.01	−0.08	**
Gender	0.04	0.04	0.04		0.08	0.03	0.10	**
SES	0.01	0.02	0.02		0.00	0.02	0.01	
Education	0.04	0.03	0.06		0.00	0.02	0.01	
ACORN	0.00	0.01	0.01		−0.03	0.01	−0.08	*

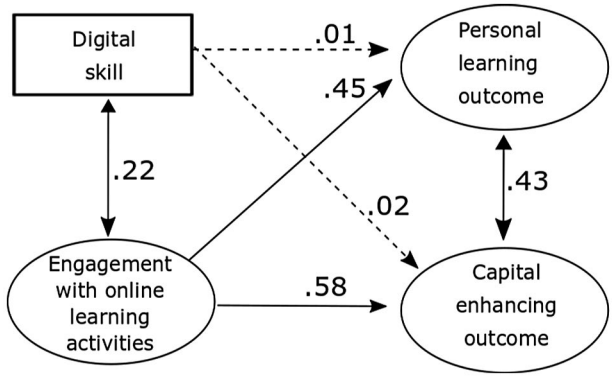

Figure 2: Effects of agency on outcomes

capital enhancing outcomes ($\beta = -0.08$, $p < .05$). Altogether agency and structure predicted (R^2) 22.4% of the variance in personal learning outcomes, and 43.3% of capital enhancing activities.

Indirect relationships between structure, agency and outcomes

As noted above we are interested in how the direct effects between structure (as measured by age, gender, SES, Education and ACORN) and personal and capital enhancing outcomes of learning online are mediated by agency (as measured by digital skills and engagement with online learning activities).

Personal learning outcomes

Digital skills did not mediate any direct effects between any variables in the structure block (age, gender, SES, education and ACORN) and personal learning outcomes. However, there were three important indirect paths from structure to personal learning outcomes via active learning. There was an indirect relationship between age and personal learning outcomes via engagement with

online learning ($\beta = -0.13$; $p < .001$): indicating that older learners' lower engagement with online learning predicted less personal learning outcomes. There was an indirect relationship between SES and personal learning outcomes via engagement with online learning ($\beta = -0.07$; $p < .001$) indicating that lower engagement with online learning of individuals from lower SES predicted less personal learning outcomes. Finally, there was an indirect relationship between education and personal learning outcomes via engagement with online learning ($\beta = 0.09$; $p < .001$) indicating that individuals from higher education, their higher engagement with online learning predicted more personal learning outcomes. Thus, similar to the literature discussed in the review above, there is a "Matthew effect" where the "rich get richer" when learning online.

Capital enhancing outcomes

Digital skills did not mediate any direct effects between any variables in the structure block (age, gender, SES, education and ACORN) and capital enhancing outcomes. In contrast, engagement with online learning was important in mediating the effects of age. As noted above the direct effect of age on capital enhancing outcomes was ($\beta = -0.08$, $p < .001$). This effect was significantly mediated (indirect effect) via engagement with online learning ($\beta = -0.17$; $p < .001$) indicating that older learners' lower engagement with online learning predicted less capital enhancing outcomes. There were also some important indirect paths from structure to capital enhancing learning outcomes that are relevant to our model. There was an indirect relationship between SES and capital enhancing outcomes via engagement with online learning ($\beta = -0.09$; $p < .001$): indicating that for individuals from lower SES, lower engagement with online learning predicted less capital enhancing outcomes. There was also an indirect relationship between education and capital enhancing outcomes via engagement with online learning ($\beta = 0.12$; $p < .001$): indicating that individuals with more education, their higher engagement with engagement with online learning predicted higher capital enhancing outcomes. Thus, in a similar way to personal learning outcomes, there is a "rich get richer effect," where those who are younger, better off and better educated further capitalise on their Internet use.

Discussion

As noted at the outset of the paper, we wished to address two research questions. First to examine how structure (as measured by age, gender, SES, Education and ACORN) was related to personal and capital enhancing outcomes of learning online. And second, to explore how agency (as measured by digital skills and engagement with online learning activities) mediated this relationship. Using a nationally representative survey of Internet use in Britain we have addressed both these questions, by looking at the direct relationships between structure and agency, agency and outcomes, and structure and outcomes; and then the indirect relationships between structure and outcomes as mediated by agency.

In line with other research, our work has shown how a person's position in society impacts their level of digital skills and level of engagement with learning online. Those who are younger, from higher SES groups and who are more educated report higher levels of digital skills and take up more online learning activities. These patterns are consistent with previous work in this domain (Eynon, 2009; White & Selwyn, 2012). As we would expect, those who take up more online learning opportunities are more likely to gain benefits from learning online, both personally and in ways that may be capital enhancing.

However, what we have also shown, that is less well explored, is that structural variables (specifically age, gender and where you live (as measured by ACORN) also directly impact the capital enhancing benefits typically associated with learning online regardless of an individual's engagement with the Internet for learning or their level of digital skills. This could be, of course, that

there are other activities that are relevant to this outcome, not measured by the model. However, it also draws attention to the importance of recognising social structure in accounts of the use of the Internet for lifelong learning. This argument is further supported by the indirect effects we found as part of the analysis. Those who are older, from lower SES, and less well educated benefit the least from engaging in learning online in terms of the personal learning benefits they achieve and wider capital enhancing benefits they report. These trends, taken together with the direct effects we found between structure and outcomes clearly demonstrate that the recent developments in both reach and opportunities for informal learning via the Internet does not level the playing field. Indeed, it appears that in a similar way to research on the relationships between digital and social inequalities more broadly (Lutz, 2019; Van Deursen & Helsper, 2015; Zillien & Hargittai, 2009) the rich continue to get richer in relation to learning online. Social structure remains an important factor in understanding patterns of uptake of online learning and the outcomes from those activities, alongside an individual's agentic behaviours.

These findings support previous studies that have shown a strong relationship between structural factors and uptake of online learning (eg, Houlden & Veletsianos, 2019; Selwyn, 2011). For example, MOOCs; once hailed as the panacea that would address all educational inequalities, have not be realised. Ultimately, those who are already well educated are most likely to engage with MOOCs, thus "enforcing rather than overcoming educational privilege and exclusivity" (Selwyn, 2016, p. 43).

We have also shown that we should not in our call to recognise structure begin to neglect agency–as both entities matter. As Archer argues, through their powers of reflexivity, individuals develop and carry out projects to achieve things in their lives they care about. In doing so, they confront a number of structural factors, such as "life chances, the distribution of resources, the availability of positions, institutional configurations" and objective cultural equivalents (Archer, 2007, p. 88). These structural factors objectively shape the situations that individuals confront when they are activated through the practices of people who are engaging in projects that matter to them (Archer, 2003). However, the ways that the potential powers of objective structures constrain or enable these projects need to be understood together with the individual actions of people. People determine what particular projects and courses of action they want to pursue with some level of awareness of the constraints and possibilities of structures. They have "the personal power to reflect subjectively upon one's circumstances and to decide what to do" (Archer, 2007, p. 11). No potential powers of objective structures are a "foregone conclusion" because via their reflexivity people can "withstand and strategically circumvent" them (Archer, 2003, p. 6). Individuals can look to the Internet to achieving certain goals (Elder-Vass, 2017; Lawson, 2007)–including learning and the personal and capital enhancing learning outcomes that can result.

There are, of course, limitations with the current study, in particular the reliance on cross-sectional data to examine the outcomes of learning online; and the challenges of using secondary data. Although the OxIS data set is likely the best available to examine trends of lifelong learning and Internet use in Britain, we are restricted by the items that are in the survey. In future work, improved measures of digital skills (Silber-Varod, Eshet-Alkalai, & Geri, 2019), a broader array of measures to capture how people might learn via the Internet that capture an array of formal and informal opportunities (Peters & Romero, 2019; Sangrà, Raffaghelli, & Veletsianos, 2019) and how technologies can be used to promote lifelong learning skills such as reflection and self-regulation (Kay & Kummerfeld, 2019); and more sophisticated measures of the outcomes from learning that people can achieve (OECD, 2010; van Deursen and Helsper, 2015) would all be valuable.

Nevertheless, our findings suggest that there is a need to move away from the individualistic and positivistic framing of much of the current discussions of digital inclusion policy where

technology is driving social change, agency is prioritised, and structure is ignored. Our analysis suggests the need to develop interventions to support learning online that have a stronger awareness of social structure. At present, the vast majority of interventions to support lifelong learning via the Internet are targeted at the individual. For example, the focus on improving digital skills is a popular individualistic intervention, yet a number of authors have argued that digital skills cannot nor will be the sole solution due to the need to recognise structural factors (Selwyn & Facer, 2007; Straubhaar, 2012). Indeed, although we are cautious in our conclusions due to the quality of our skills measure, in our analyses digital skills had a positive reciprocal relationship with level of engagement with online activities, but did not have a significant direct or indirect effect on learning outcomes. Structural variables were more important.

If the deployment of technology is not articulated within a wider strategy to facilitate a more equal society those who are better off and better educated will continue to benefit more from learning via the Internet (Roberts-Mahoney, Means, & Garrison, 2016; Warschauer, 2004, p. 209). This echoes the wider critical academic discourse on lifelong learning where researchers have called for a more holistic approach (eg, Biesta, 2006; Papen, 2005). As Tuckett argues in his analysis of English adult and lifelong learning policy, the current policy focus on individual skills needs to be "complemented with one focused on life-wide learning that gives people a voice in shaping their learning; increased control over their lives, and which enables them to shape change, through contesting the inequality ingrained in our current system, to enable them to build together a culture of learning" (Tuckett, 2017, p. 14). Such an approach needs greater recognition of the contextual biographical and longitudinal nature of learning (Evans *et al.*, 2013; Keeble & Loader, 2005), where learning policies are embedded in the local community to support local needs (Tuckett, 2017). In doing so, both agency and structure are recognised and accounted for, and social change, that may tackle inequalities is more likely to occur.

Conclusion

Many countries are committed to making lifelong learning opportunities accessible to all. The use of the Internet is seen as an increasingly important way for people to learn. However, within British policies, as seen in other countries across the globe, the lifelong learning agenda has been reconceptualised from an important democratic, social and personal endeavour, to something that has economic benefits for the individual. This reframing enables responsibility for lifelong learning via the Internet (or via other means) to be the responsibility of the individual, over prioritising agency and neglecting structure (Alheit, 2009; Biesta, 2006; Field, 2006).

Using high quality survey data from Britain, we have demonstrated that not everyone benefits equally from using the Internet for learning, both agency (as measured by digital skills and engagement with online learning) and social structure (as measured by age, gender, SES, Education and ACORN) need to be accounted for in any policies designed to support uptake of lifelong learning via the Internet.

We suggest that in countries such as the UK, which have become overly focused on individual interventions (such as digital skills training) are going in the wrong direction. Interventions built around the "responsiblisation of the individual" that ignore structural inequalities have failed in the past, and the data presented here suggests that they will continue to fail if they do not take into account wider social structures. Despite the limitations of using secondary survey data this paper supports the need for a refocusing of the way lifelong learning with the Internet is conceptualised and supported. It is important to develop initiatives to support the use of the Internet for lifelong learning where the contextual, biographical and longitudinal nature of learning is facilitated and where learning policies are embedded within support at the community level.

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Open Data Statement
The data set used for this study is available to other researchers on request. Please see https://oxis.oii.ox.ac.uk/research/dataset-request/ for more details.

Ethics
Ethical approval to carry out the survey research reported in this study was requested and approved the University of Oxford Ethics Review Committee.

Conflicts of Interest
We, the authors, declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Notes

[1] http://www.nrs.co.uk/nrs-print/lifestyle-and-classification-data/social-grade/

[2] https://acorn.caci.co.uk/downloads/Acorn-User-guide.pdf

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