

RESEARCH ARTICLE

Exploring effective approaches for stimulating ideas-engagement amongst adults in England: results from a randomised control trial [version 1; peer review: 2 approved]

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Abstract

Background: Ideas always have and always will change the world; with ideas-engagement enabling individuals to become more knowledgeable, better able to make good decisions and better positioned to re-align their values in response to new progressive norms and beliefs. Given these potential benefits, of primary interest is how citizens can be most effectively encouraged to engage with new ideas.


Methods: With this study we test the efficacy of two approaches designed to enhance citizen's perceptions regarding the value of ideas-engagement. Specifically, we recontextualise a previously undertaken small-scale randomised control trial designed to stimulate states of either curiosity or pragmatic prospection amongst two randomly allocated groups of respondents. Our target variables involve the importance respondents attribute to staying up to date, as well as to four related attitudinal variables. Our target audience is the voting age population of England.

Results: 515 participants took part in the experiment, with 269 receiving the curiosity stimulating intervention and 246, the prospection intervention. Our findings suggest that, by the end of four weeks, only the intervention designed to promote pragmatic prospection had significantly impacted on the importance respondents attribute to staying up to date. It also positively impacted the value-scores for one of the secondary attitudinal variables (relating to the importance of supporting physical and mental-health).

Conclusions: While this study provides useful insight regarding ideas-engagement, further work is needed. In particular, future studies will require a larger sample, so as to ascertain the impact of these approaches on 'ideas refusers'. Also required is the inclusion of a control group to provide a definitive counterfactual. Furthermore, since positive changes in attitudes towards ideas-engagement also ideally leads to changes in behaviours, questions are also needed to

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examine the sources of ideas respondents subsequently engage with (or not) as a result of these interventions.

Keywords

ideas-informed society; ideas-informed citizens; ideas refusers; experiment; experimental approach; pragmatic prospection; curiosity; ideas engagement

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The ideas-informed society: context and importance

Ideas always have and always will change the world, whether this be via incremental shifts in understanding or behaviour, or from the introduction of revolutionary new ways of knowing and being (Brown *et al.*, 2022a; Hochschild, 2010). To paraphrase Oliver (2021), when life enhancing, life changing ideas have occurred during humankind's history, sparks of inspiration have become flames and these flames have served to positively light up the world. With this in mind, the notion of the ideas-informed society represents "a desired situation in which: 1) citizens see value in staying up to date, and 2) citizens regularly keep themselves up to date by actively engaging with new ideas, developments and claims to truth, doing so both openly and critically" (Brown *et al.*, 2022b: 1). Research and other findings indicate a myriad of beneficial outcomes potentially materialise from 1) and 2) above. These include that: 3) citizens can become more knowledgeable; 4) citizens find themselves better positioned to make beneficial decisions and achieve personal fulfilment, and; 5) citizens can align their perspectives with appropriate societal values (e.g. see Andriano *et al.*, 2022; Brown *et al.*, 2022a; Dijkstra, 2017; Franco *et al.*, 2019; Global Agenda Council on Informed Societies, 2013; González, 2021; Gregová, *et al.*, 2016; Hochschild, 2010; Pinker, 2021). With regards to the last of these (point 5, above), it is the view of the authors that such values are those which are progressive in nature: i.e., values which are informed by the concepts of fairness, equality and both social and environmental justice. Such benefits positively impact society too when 3) to 5) also result in a population generally gaining in areas such as happiness, health, inclusivity and empathy, social, cultural, scientific and political engagement and social and economic productivity (DiMaggio, 1982; Franco *et al.*, 2019; Gregová, *et al.*, 2016; Hochschild, 2010; Lamb *et al.*, 2020; Pinker, 2018).

While in an ideas-informed society, outcomes 3) to 5) may not always materialise, nor always result in behaviours that are commensurate with understanding, the higher the values are for 1) and 2), the more likely this will be the case over the longer term (Brown *et al.*, 2022c). As such, a key goal of research in this area should be to focus on those who neither value staying up to date, nor make attempts to do so; since the presence of these attitudes and behaviours serves to limit the extent to which outcomes 3) to 5) above can be realised (Brown *et al.*, 2022c). Of concern, therefore, are the findings of previous studies which indicate that, amongst the population generally, there are indeed substantive numbers of people who are 'ideas refusers': i.e. members of the public who see little value in engaging with ideas. For instance, findings from a representative survey of some 1,000 voting age citizens in England (Brown *et al.*, 2022a), show that, in response to the question: "How important is it to you to keep up to date with news, current affairs and new developments (such as political, economic and scientific developments)?", 13% of respondents indicated that this was 'unimportant'

to them, with 16% seemingly ambivalent (responding that it was 'neither important or unimportant').

Structural equation modelling of this data further reveals that ideas refusers are more likely to be from a low education background, reside in cohesive communities also possessing low levels of education and have social contacts who are predominantly employed in routine/manual job roles (Brown *et al.*, 2022a). What's more, as well as ascribing low value to ideas-engagement, ideas refusers are also less likely to see value in progressive statements (i.e. outcome 5 above). For instance, the same survey asked respondents to consider the importance to them of a range of topics, including: the importance of inclusion and tolerance; the importance of business practices that are both ethical and sustainable, and the importance of supporting one's own and other's physical and mental health (see Brown *et al.*, 2022a for more detail). Again, a sizable proportion (ranging from 15% to 24% depending on the statement) considered these items to be of no or indeterminate value (findings that are commensurate with other recent studies, for example: Anjeh & Doraisamy, 2022). At the same time, such individuals (as well as the wider communities within which they reside) stand much to gain from becoming increasingly knowledgeable, in a better position to make good decisions and from being more likely to adopt progressive beliefs and norms (further detail here provided in Brown *et al.*, 2022a). Extant structural factors (including an ongoing inequity of geographical mobility) also appear to hinder exposure by members of these communities to factors that might stimulate their engagement with ideas (such as access to high quality education, or to social networks who do place value on engaging with ideas) (Franco *et al.*, 2019; Lamb *et al.*, 2020). As such, there is a clear need to know more about how to close the gap between the ideal (i.e. the actualisation of the ideas-informed society) and the real (i.e. the current situation).

Certain clues on how to bring these ideals to reality emerge from a systematic review which sought to identify interventions, programmes and community-led activities with a central aim of actualising the ideas-informed society and where evidence of effectiveness was at least intimated (see Brown *et al.*, 2022b). The review, which examined a total of 25 outputs (from the 631 originally identified), identified numerous interventions which provided citizens with an opportunity to engage with ideas. These included science cafés, bespoke museum exhibitions, as well as community-based events and festivals (such as the 'Battle of Ideas'). But while it is important that citizens *are able to* engage with new ideas, it is also vital (given the context above) that there are interventions that actively lead citizens to *perceive value* in engaging with ideas (and then, of course, to subsequently act in relation to this perceived value) (European Commission, 2010; Gregová, *et al.*, 2016). Here, the systematic review identified the potential basis for what such an intervention might look like: the possibility latent within

an experiment designed to explore whether either a) stimulating curiosity, or b) stimulating prospective thinking is more effective for increasing workers' use of novel methods when attempting to problem solve.

Curiosity and information seeking

The experiment in question, a small-scale randomised control trial, was conducted amongst a sample of 200 participants working across a range of different industries and companies in the US (see [Gino, 2018](#)). To stimulate curiosity, researchers sent one half of the sample (the curiosity group), a twice weekly text message for four weeks which asked:

What is one topic or activity you are curious about today? What is one thing you usually take for granted that you want to ask about? Please make sure you ask a few 'Why questions' as you engage in your work throughout the day. Please set aside a few minutes to identify how you'll approach your work today with these questions in mind.

([Gino, 2018](#): 50).

The other half (the prospection group) instead received the following twice weekly text message for four weeks:

What is one topic or activity you'll engage in today? What is one thing you usually work on or do that you'll also complete today? Please make sure you think about this as you engage in your work throughout the day. Please set aside a few minutes to identify how you'll approach your work today with these questions in mind. (ibid).

On completion of the trial, the participants in the curiosity group scored higher than those in the prospection group on measures designed to assess the presence of innovative work-related behaviours. For instance, in terms of whether participants had made constructive suggestions for implementing solutions to pressing organizational problems. This finding led [Gino \(2018:48\)](#) to conclude that piquing curiosity can provide the impetus for employees "to seek new information and experiences".

The findings of this experiment thus hint at the role stimulated curiosity might play in promoting behaviours analogous to those required for an ideas-informed society to flourish. In other words, employees seeking out new information and experiences which they then subsequently utilise in the workplace has some comparability to a situation in which citizens see value in, and then engage with, ideas more generally. Nonetheless, the target population of the experiment was different to our own area of interest (i.e. employees in the US, versus the general voting age population in England). Likewise, its target outcomes were also significantly different to those we are interested in (i.e. innovative work-related behaviours versus responses to the primary target variable of: "How important [do respondents regard] keeping

up to date with news, current affairs and new developments?"). Furthermore, as we outline below, it actually seems to be the case that both stimulating curiosity AND stimulating prospection could potentially result in citizens ascribing increased value to staying up to date with ideas and the values related variables. As such, while the experiment detailed in [Gino \(2018\)](#) signposts a potentially promising direction for how to encourage citizens to become ideas-informed (i.e. a text-messaging approach to enhancing citizens' perceived value of ideas-engagement, which should subsequently lead to an increase in citizens' instances of ideas-engagement), assessing its applicability to our specific needs required us to replicate this approach amongst a different population and to ascertain its effectiveness with regards to a different target outcome. This paper thus reports on our attempt to recontextualise the experiment reported in [Gino \(2018\)](#), the resultant outcomes and the implications of our findings. We begin, however, by outlining the potential applicability that both curiosity and prospection have for ideas-engagement.

Curiosity: the wick in the candle of ideas?

Although definitions vary, curiosity is typically depicted as the manifestation of the desire to learn and know (e.g. [Marvin et al., 2020](#); [Zurn & Bassett, 2018](#)). From a psychological perspective, differences in curiosity (with regards to curious thoughts, feelings, and actions) are associated with the global personality trait *openness to experience*. This means that aspects of curiosity feature, in some form or other, in all of the major personality models (including, the 'Big Five' and the 'Five Factors' models of personality: [Silvia & Christensen, 2020](#)). Within these models, curiosity is represented by facets which capture three broad aspects associated with a general motivation to seek out new information. These are: i) variety-seeking (a willingness to explore new environments and new ways of doing things); ii) intellectual curiosity (whether individuals enjoy learning new things, thinking about complex problems, and reflecting on ideas); and iii) intellectual interests (whether individuals engage with and discuss abstract, theoretical, and philosophical ideas) ([Silvia & Christensen, 2020](#)). Further, what it is we are curious about can either be directly relevant to our current situation, or can have no obvious direct purpose. In other words, we can have both instrumental and non-instrumental reasons for our curiosity ([Metcalfe et al., 2020](#); [van Lieshout et al., 2020](#)). While instrumental curiosity serves an immediate purpose goal, non-instrumental curiosity is typically undertaken to: i) progressively reduce uncertainty about the world around us; and/or ii) accrue information that makes us feel good ([van Lieshout et al., 2020](#)).

Although the personality trait, *openness to experience*, tends to be viewed as stable (meaning some individuals are, other things being equal, simply more curious than others), it is also believed that changes in information seeking can occur ([Metcalfe, et al., 2020](#); [Zurn & Bassett, 2018](#)). For instance, under certain conditions, curiosity can be triggered in the moment (this is referred to as *state* curiosity), individuals can become more curious in general (i.e. *trait*

curiosity can increase), and *domain-specific* curiosity (curiosity about specific subject areas) can also evolve over time (Grossnickle Peterson, 2020). To achieve more enduring forms of curiosity, however, (i.e. trait and/or domain-specific curiosity) sustained triggers are required: in particular, what is needed are ongoing mechanisms which promote question-asking and exploration (Grossnickle Peterson, 2020).

Prospecting the future

While piquing curiosity is one potential approach to fostering ideas-related engagement, the second group in Gino's (2018) trial was stimulated to engage in a form of reflection known as 'prospecting'. In other words, Gino sought to encourage individuals to think about the future. Humans make predictions about the near and distant future based on our experiences and learning to date, as well as by using empathetic-type approaches to view the world from the perspective of others (Allen, 2019a; Allen, 2019b). One form of prediction - pragmatic prospection - involves individuals considering future choices and actions that could be made in pursuit of pragmatic (i.e. outcome-focused) concerns; as well as the myriad ways these choices and actions might unfold (Baumeister & Lim, 2021). Thus, as Baumeister *et al.* (2016: 4) argue: "pragmatic prospection [involves] thinking about the future in ways that will assist the process of producing desired future outcomes and avoiding undesired ones".

Pragmatic prospection is viewed as a two-step process: an initial optimistic phase of goal setting, followed by a more pessimistic phase of anticipating how those goals might be actualised (such as considering the problems that might be encountered along the way: Allen, 2019b; Baumeister *et al.*, 2016). Prospection also employs the past as a guide to the future. As such, this means that, in projecting forward, we may be reminded of previous problems encountered, or shortfalls in our abilities to tackle anticipated problems (Allen, 2019b). Correspondingly, repeatedly stimulating prospection by actively tasking individuals with considering future outcomes or goals and what might be required to realise them (i.e. coming up with a plan) using a structured approach, may lead to individuals valuing and potentially investing in resource that might help them realise their desired outcomes (Allen, 2019b; Oettingen & Reininger, 2016). For instance, it may lead to them subsequently ascribing value to the notion of being informed by, and abreast of, a range of ideas and ideas-related know how (especially if the future-related goals in question are grounded in a desire or requirement to be more informed about x or y).

Research questions

Given: i) the possible roles that both pragmatic prospection and curiosity might play in promoting ideas-engagement; ii) the differences between the populations under consideration (the focus of this study being voting age citizens in England); and iii) the different primary target variable under consideration (responses to the question "How important is it to you to

keep up to date with news, current affairs and new developments..."), using a Likert response scale of 1-4) the primary purpose of our study was to recreate Gino (2018)'s experiment in order to test the following four hypotheses:

- H⁰: Neither the intervention to stimulate curiosity, nor the intervention to stimulate pragmatic prospection leads to significantly improved value-scores for the primary target variable
- H¹: The intervention to stimulate curiosity significantly improves the value-score for the primary target variable, but the pragmatic prospection intervention does not.
- H²: The intervention to stimulate pragmatic prospection significantly improves the value-score for the primary target variable, but the curiosity intervention does not.
- H³: Both the intervention to stimulate curiosity, and the intervention to stimulate pragmatic prospection significantly improve the value-score for the primary target variable.

We note above that previous findings (Brown *et al.*, 2022a) indicate that, not only do ideas refusers ascribe low value to ideas-engagement, but they are also less likely to see value in progressive statements. Furthermore, is the suggestion that ideas-informed citizens are more likely to align their perspectives with appropriate societal values. As such, as well as our primary four hypotheses, we also sought to test four further hypotheses relating to the importance respondents ascribe to following secondary target variables: i) "Supporting physical and mental health, that of yourselves and others"; ii) "Seeing corporations and businesses adopt more ethical, responsible and sustainable ways of working"; iii) "Living in a society that is just, inclusive and embracing of all without any barriers to participation based on sex, sexual orientation, religion or belief, ethnicity, age, class or ability"; and iv) "All children and adults having equal access to quality education, regardless of background, geography, or age." These second order hypotheses are as follows:

- H⁴: Neither the intervention to stimulate curiosity, nor the intervention to stimulate pragmatic prospection leads to significantly improved value-scores for the secondary target variables
- H⁵: The intervention to stimulate curiosity significantly improves the value-scores for the secondary target variables, but the pragmatic prospection intervention does not.
- H⁶: The intervention to stimulate pragmatic prospection significantly improves the value-scores for the secondary target variables, but the curiosity intervention does not.
- H⁷: Both the intervention to stimulate curiosity, and the intervention to stimulate pragmatic prospection both significantly improve the value-scores for the secondary target variables.

Method and approach

Ethics

Ethical approval for this project and the survey questionnaire employed was given by the Durham University, UK, School of Education's Ethics Committee. All research was undertaken with the written informed consent of participants.

Our overall approach to recontextualising Gino's (2018) experimental study and testing our hypotheses comprised the following steps:

1. Recruit a representative sample of the general public (further detail below);
2. Conduct a baseline survey, which would enable an initial (pre-intervention) measure of the primary and secondary target variables;
3. Randomly allocate the individuals in the recruited sample into one of two groups: one receiving the curiosity stimulating intervention, the other receiving the prospection stimulating intervention;
4. To stimulate either curiosity or prospection in these groups by sending group members eight short surveys over the course of four weeks. The wording of the surveys intended to mirror that reported in Gino (2018) (as presented above).
5. To conduct an endline survey, which would provide a second (post-intervention) measure of the primary and secondary target variables;
6. To identify and attribute any significant changes to the primary and secondary target variables.

Our specific approach for realising these six steps was to employ a panel survey approach. In other words, recruiting research participants to a panel, thus providing a stable cohort of participants who would complete multiple surveys over the period of the experiment. Rather than create a panel ourselves, we opted to employ the services of Bilendi: a research panel services provider. Bilendi recruits members to research panels, using multiple online sources. These include:

- Search engine optimisation approaches to attract 'walk in' traffic
- Pay-Per-Click link throughs
- Online display advertising
- Direct emails
- Social media advertising
- Social influencers
- Brand loyalty partnerships

To receive surveys, Bilendi members create an account and in doing so provide a full range of socio-demographic

information to ensure surveys are targeted appropriately. Panel members can be contacted up to three times a day, and as a reward for survey completion, members receive 'points;' which are exchangeable for products. It is up to panel members as to whether they take part in any given panel; should a panel member decide not to take part, an equivalent replacement is contacted instead.

Sample

The specific criteria for our panel was that: i) it should provide a sample nationally representative of England, based on age (18+), gender, socio-economic group and geographic region; ii) to be considered valid respondents – i.e. to be eligible for inclusion in our analysis, participants had to have completed the baseline survey, the endline survey and at least five or more of the surveys designed to stimulate either prospection or curiosity. This was to ensure participants were sufficiently exposed to either treatment, so ensuring their possible effects were maximised. The criteria also ensured that both pre and post intervention data was available for analysis; and iii) we required a minimum sample size of 400 valid responses; so as to provide a good basis for identifying statistically significant results when comparing the outcomes of both groups. To incentivize participation, respondents were offered between £5 and £8 in 'points' depending on whether they completed baseline and endline surveys and between five and eight surveys designed to stimulate either curiosity or prospection. Surveys were undertaken according to the following timetable:

1. The baseline survey opened on 7th July 2022 and could be completed by participants until 11th July 2022
2. Phase two surveys (i.e. those with the phrasing designed to stimulate either curiosity or prospection) ran during the period 12th July to 9th August 2022. Here a total of eight surveys – or two per week – were sent to participants the regular intervals. The first survey of any given week was launched on the Tuesday at 9:30am – with this survey available for completion till the following Friday at 12pm; the second survey of a given week was then launched on the Friday at 1pm and available till the following Tuesday at 9am.
3. The endline survey ran from 10th to 16th August 2022.

The baseline survey was completed by some 853 participants and comprised a representative sample of England (within a maximum 5 % +/- variation). Individuals within the sample of 853 were then randomly allocated by Bilendi into two groups: those receiving the curiosity stimulating treatment (n = 425) and those receiving the prospection stimulating treatment (n = 428). By the conclusion of the experiment (mid-August, 2022) 515 respondents were considered valid (as per criteria ii) above). Of these 269 had participated in the curiosity stimulating intervention and 246 had received the prospection Intervention.

Comparison of the sample receiving the two interventions

At this point, it is important to highlight a significant difference between the valid responders in the prospection stimulation and the curiosity stimulation groups, with regards to the primary target variable. Specifically, those participants in the former group who completed sufficient surveys (endline, baseline, and at least five stimulation surveys), initially (i.e. pre-intervention) rated the importance of keeping up-to-date lower ($t_1: M_p = 3.11; SD_p = 0.82$) than participants from the curiosity group ($t_1: M_c = 3.30; SD_c = 0.79; t(513) = -2.695; p \leq .05$). This raises the question as to whether some kind of self-selection occurred during the intervention. The following factors speak against this notion, however. First, there was no significant difference between the proportion of drop-outs in the two treatments (Curiosity: 18.3 %, and Prospection: 21.3 % of the full sample; $\chi^2(1) = 3.017; p > .05$, n.s.). Second, it is not the case that respondents in the prospection group were less committed to the study: this initial low level of importance attributed to staying up to date did not, for instance materialise, in low participation in the intervention. This is evidenced by the mean survey completion for this group, which was 7.66 ($SD = 0.75$). Thus, the internal validity of the reported results appears not to be impeded by drop-outs nor by low participant engagement (Graham, 2009). More likely, therefore is that this difference mirrors the same difference present between the two groups at the initial randomisation stage (although it was not statistically significant at this point). Specifically following randomisation, 38.8 % of the initial sample (of 853) rated the importance of keeping up to date as “very important”, but this level was somewhat higher for the pre-intervention curiosity group (42.4 % of 425 respondents) than for the prospection group (35.3 % of 428 respondents).

Comparison of our sample with previous research

In order to measure our primary and secondary target variables we employed the same survey instruments used in our previous survey of some 1,000 voting age citizens in England (Brown *et al.*, 2022a). However, because of the multiple surveys used within this study (e.g. the intervention survey had to be filled out eight times between the start and the end of the study), we decided to find myriad ways to minimise the burden on respondents. This included reducing the number of Likert answer categories for the question about the importance of keeping up-to-date (as well as for the four progressive values) from five to four. This means a comparison of means and standard deviations between the sample for this study and our previous survey respondents is not possible. Nonetheless, in both studies participants tended to rate statements like “How important is it to you to keep up to date with news, current affairs and new developments” as important or very important, which is expressed in mean values above the theoretical middle of the answer scale (Brown *et al.*, 2022a with five categories: $M = 3.82; SD = 1.04$; current study with four: $M = 3.21; SD = 0.81$). As such, we conclude that, despite changing the Likert scale in this way, the views of respondents in the present survey broadly mirror those from

previous research. Thus, our research takes place amongst a population with similar characteristics as our original study.

The questionnaire

As previously discussed, the wording of the phase two survey questions was intended to mirror both: i) those used by Gino (2018), as well as ii) replicate the approach undertaken by Brown *et al.* (2022a) for the measurement of the primary and secondary target variables. For the full survey used for the project, see *Extended data* (Brown & Gross Ophoff, 2022). We have noted the slight modifications made to the Likert scale employed for ii), above. In terms of i), a small modification was also made to two of Gino’s (2018) survey items to improve their readability. Firstly, a change was made to the second of the two curiosity-related questions. This was re-worded from ‘*What is one thing you usually take for granted that you want to ask about?*’ to ‘*What is one thing you usually take for granted that, thinking about it, you’d actually like to know more about?*’ A change was also made to the second of the two prospection-related questions. This was altered from ‘*What is one thing you usually work on or do that you’ll also complete today?*’ to ‘*What is one thing you usually work on or do that you hope to get done by the end of the day?*’ What’s more, unlike the approach reported in Gino (2018), as well as pose these question to participants, we also asked them to provide responses for each survey received. In other words, every time participants were asked questions such as ‘*What is one topic or activity you are curious about today?*’ or ‘*What is one thing you usually work on or do that you hope to get done by the end of the day?*’, they were then expected to provide a response via an open text response box.

Did the interventions work as intended?

As well as looking at the impact of each intervention, below, it is also useful to verify that each intervention questionnaire worked as intended (i.e. stimulated states desired amongst our respondents). As noted above, to stimulate either curiosity or prospection, intervention group members were sent eight short surveys over the course of four weeks (with the wording of these surveys detailed in earlier paragraphs). From an analysis of the qualitative data that was collected by these surveys, it seems clear that both the curiosity and prospection texts worked to stimulate these specific states amongst participants. For example, data from the last survey sent to the prospection group reveals that 246 responses were provided. These responses present a range of activities and tasks that respondents hoped to have engaged in or completed by the end of their day, including for instance: “managing my stocks and shares portfolio”, “having a smart meter installed”, “staying positive through the day and being careful with my mental health”, “getting to Plymouth for a stand up gig”, “travelling to commonwealth games and spending some time in garden tidying it up”, “exploring a city via a sightseeing tour”, “pruning fruit trees and wisteria in the garden”, “fitness goals”, “walking”, “cooking”. Likewise, there were 269 responses to the last survey sent to the curiosity group. These indicate that respondents were curious

or wanted to know more about a range of topics, including: “China and Taiwan tensions”, “UK inflation and whether interest rate rises will help”, “Climate Change” “How the brain stores so much information”, “How does a television work? How is it that a picture can come through wires?”, “where does my food come from”.

Analysis and findings

Given the ordinal nature of the target variables and our requirement to explore differences in the target variables pre and post intervention, to test the hypotheses stipulated above, we calculated McNemar’s Chi² tests for paired proportions (Elmore *et al.*, 2020). This statistical test is used with paired binomial data: i.e., paired groups (such as individuals before and after a treatment), where variables are dichotomous in nature. Undertaking a McNemar’s test requires a 2 × 2 contingency table to be calculated to indicate how many individuals fall into a given pair of categories (Elmore *et al.*, 2020; Hoffman, 2015). For instance, for the primary target variable for this experiment and the range of our Likert scale from 4 (very important) to 1 (not important), these categories were:

- Responded positively to the question ‘How important is it to you to keep up to date with news, current affairs and new developments...’ both before and after the intervention.
In other words, respondents scored either a 3 or 4 on the Likert scale pre intervention and scored the exact same number on the scale post intervention.
- Responded negatively to the question ‘How important is it to you to keep up to date with news, current affairs and new developments...’ both before and after the intervention.
In other word, respondents s scored either a 2 or 1 on the Likert scale pre intervention and scored the exact same number on the scale post intervention.
- Scored positively higher in their response to the question ‘How important is it to you to keep up to date with news, current affairs and new developments...’ after the intervention.
In other words, respondents increased their score on the Likert scale by at least 1 point post intervention.
- Scored negatively higher in their response to the question ‘How important is it to you to keep up to date with news, current affairs and new developments...’ after the intervention. In other words, respondents decreased their score on the Likert scale by at least 1 point post intervention.

The contingency table for the prospection intervention for our primary target variable (“How important is it to you to keep up to date with news, current affairs and new developments...”) is set out in Table 1, below. The null hypothesis of McNemar’s test is that the row and column marginals of the 2 × 2 contingency table are equal, the

alternative hypothesis is that they are not. In other words, the treatment has no effect on the proportion of people with the positive result under the null hypothesis, whereas under the alternative hypothesis, these proportions are significantly different.

For the contingency table presented in Table 1, Chi² = 5.902 and p = 0.015, indicating that the prospection intervention had a statistically significant positive effect on our primary target variable (the importance of staying up to date) at the 95% level of confidence. Specifically, as can be seen 52 participants (21%) scored positively higher in their response to the question ‘How important is it to you to keep up to date with news, current affairs and new developments...’ after the intervention; thus moving the total number of individuals ascribing positive importance or more positive importance to this question from 159 to 181 (an 8.9 % increase). The contingency table for the curiosity intervention (primary target variable) is provided in Table 2, below. Here Chi² = 0.117 and p = 0.73, indicating that the curiosity intervention had no statistically significant impact on the primary target variable at the 95% level of confidence. Thus, while 37 participants (13.7%) scored positively higher in their response to the question “How important is it to you to keep up to date with news, current affairs and new developments...” post intervention, the total number ascribing positive importance or more positive importance to this question remained more or less static, falling from 209 to 206 (a 1.1% decrease).

Table 3 summarises these results, as well as provides McNemar’s test results for each of our four secondary target variables. Again, as can be seen, the prospection intervention also had a statistically significant positive impact on the secondary target variable “Supporting physical and mental

Table 1. McNemar’s contingency table for the prospection intervention and primary target variable.

	POST positive	POST negative	Row total
PRE positive	129 (52.4%)	30 (12.2%)	159 (64.6%)
PRE negative	52 (21.1%)	35 (14.2%)	87 (35.3%)
Column total	181 (73.5%)	65 (26.4%)	246 (100%)

Table 2. McNemar’s contingency table for the curiosity intervention and primary target variable.

	POST positive	POST negative	Row total
PRE positive	169 (62.8%)	40 (14.9%)	209 (77.7%)
PRE negative	37 (13.8%)	23 (85.5%)	60 (22.3%)
Column total	206 (76.6%)	63 (23.4%)	269 (100%)

Table 3. McNemar's test results for the main target variable and four values variables.

Question	Curiosity	Prospection
"How important is it to you to keep up to date with news, current affairs and new developments (such as political, economic and scientific developments)?"	Chi ² = 0.117 and p = 0.73	Chi ² = 5.902 and p = 0.015
"Supporting physical and mental health, that of yourselves and others"	Chi ² = 0 and p = 1	Chi ² = 5.149 and p = 0.023
"Seeing corporations and businesses adopt more ethical, responsible and sustainable ways of working"	Chi ² = 0.07 and p = 0.78	Chi ² = 0.0084 and p = 0.92
"Living in a society that is just, inclusive and embracing of all without any barriers to participation based on sex, sexual orientation, religion..."	Chi ² = 0.036 and p = 0.85	Chi ² = 0.0118 and p = 0.91
"All children and adults having equal access to quality education, regardless of background, geography..."	Chi ² = 0.103 and p = 0.75	Chi ² = 0.0123 and p = 0.91

health, that of yourselves and others" (Chi² = 5.149 and p = 0.023). Here, 58 participants (23.6 %) scored positively higher in their response to the question "How important is the following topic to you: supporting physical and mental health, that of yourselves and others" after the intervention. This served to move the total number of individuals ascribing positive importance or more positive importance to this question from 182 to 204 (a 9.0 % increase). The figures for the curiosity group remained static, however, at 215 (79.9 %). The full contingency tables for this target variable for both the prospection and curiosity interventions are set out in [Table 4](#) and [Table 5](#). No other statistically significant positive relationships were identified for any other target variable.

The findings of the McNemar's tests thus indicate that, of our seven hypotheses, only H² is fully supported, with H⁶ partially supported (see [Table 6](#), below). In other words, only the intervention to stimulate pragmatic prospection led to a statistically significant and positive improvement in the value-score for the primary target variable, (H²); further only the intervention to stimulate pragmatic prospection led to a statistically significant and positive improvement in the value-score for one of the secondary target variables. The curiosity intervention did not therefore lead to any significant improvement in scores for any of the target variable.

At the same time, however, although the findings of the McNemar's tests indicate that the prospection intervention had a positive impact on both our primary target variable and one of our secondary target variables, it would be inaccurate, at this stage to suggest that the prospection intervention leads to more individuals attributing positive impact to our target variables compared to the curiosity intervention. We now explore this looking both at our primary target variable (the

Table 4. McNemar's contingency table for the prospection intervention and mental health and wellbeing value variable.

	POST positive	POST negative	Row total
PRE positive	146 (59.3%)	36 (14.6%)	182 (73.9%)
PRE negative	58 (23.6%)	6 (2.4%)	64 (26.0%)
Column total	204 (82.9%)	42 (17.0%)	246 (100%)

Chi² = 5.149 and p = 0.023

Table 5. McNemar's contingency table for the curiosity intervention and mental health and wellbeing value variable.

	POST positive	POST negative	Row total
PRE positive	166 (61.7%)	49 (18.2%)	215 (79.9%)
PRE negative	49 (18.2%)	5 (1.8%)	54 (20.1%)
Column total	215 (79.9%)	54 (20.1%)	269 (100%)

Chi² = 0 and p = 1

importance of staying up to date) and the one secondary target variable where positive impact occurred (supporting mental health and wellbeing). Beginning with the former, when our recruited sample was randomly allocated by Bilendi into the two intervention groups, there was (as we previously explained above) a statistically significant pre-intervention difference between the valid responders in attitudes towards the primary target variable (this is presented in [Table 7](#) below). This difference subsequently disappeared post intervention (see [Table 8](#)). Thus, while stimulating prospection

Table 6. Whether hypotheses are supported by the McNemar's test statistics.

Hypothesis		Supported/ not supported
H ⁰	Neither the intervention to stimulate curiosity, nor the intervention to stimulate pragmatic prospection leads to significantly improved value-scores for the primary target variable	Not supported
H ¹	The intervention to stimulate curiosity significantly improves the value-score for the primary target variable, but the pragmatic prospection intervention does not.	Not supported
H ²	The intervention to stimulate pragmatic prospection significantly improves the value-score for the primary target variable, but the curiosity intervention does not.	Supported
H ³	Both the intervention to stimulate curiosity, and the intervention to stimulate pragmatic prospection significantly improve the value-score for the primary target variable.	Not supported
H ⁴	Neither the intervention to stimulate curiosity, nor the intervention to stimulate pragmatic prospection leads to significantly improved value-scores for the secondary target variables	Not supported
H ⁵	The intervention to stimulate curiosity significantly improves the value-scores for the secondary target variables, but the pragmatic prospection intervention does not.	Not supported
H ⁶	The intervention to stimulate pragmatic prospection significantly improves the value-scores the secondary target variables, but the curiosity intervention does not.	Partially supported
H ⁷	Both the intervention to stimulate curiosity, and the intervention to stimulate pragmatic prospection both significantly improve the value-scores for the secondary target variables.	Not supported

Table 7. Chi² tests for the difference in importance attributed to the primary target variable by intervention groups pre-intervention.

	Prospection	Curiosity	Marginal row total
Pre-intervention positive	159 (175.78)	209 (192.22)	368
Pre- intervention negative	87 (70.22)	60 (76.78)	147
Marginal column total	246	269	515 (Grand total)

Chi² = 10.747 and p = 0.001**Table 8. Chi² tests for the difference in importance attributed to the primary target variable by intervention groups post-intervention.**

	Prospection	Curiosity	Marginal row total
Post-intervention positive	181 (184.86)	206 (202.14)	387
Post- intervention negative	65 (61.14)	63 (66.86)	128
Marginal column total	246	269	515 (Grand total)

Chi² = 0.620 and p = 0.431

may have led to a closing of this gap it didn't lead to respondents attributing significantly higher importance to staying up to date to those receiving the curiosity intervention. A not dissimilar picture emerges when comparing the difference in importance respondents attribute to "Supporting physical and mental health, that of yourselves and others". Here, as Table 9 and Table 10 show, scores were not statistically different between curiosity and prospection groups at either the beginning or the end of the experiment. Thus, while the prospection intervention increased the total number of individuals ascribing positive importance or more positive importance to supporting mental health and well-being by nine %, it didn't lead to significantly more individuals attributing positive importance when compared to the curiosity group. We return to the implications of these findings in the discussion section, below.

Discussion

As the science fiction writer, William Gibson, is reported to have observed: "The future is already here. It's just not evenly distributed yet" (Garner, 2012: website). The authors of this paper also believe this perspective is equally applicable to the world of ideas. Ideas always have and always will be generated and harnessed by people to improve their lot in life. But not by everyone. For instance, as the Structural Equation Modelling undertaken by Brown *et al.* (2022a) illustrates, certain groups are less likely to engage with ideas than others. This is despite the potential benefits to such groups of doing so. Of interest then, is how the gap between the ideal and real – between the notion of the ideas informed society and the here-and-now reality of an unevenly distributed engagement with ideas – can be closed. The approach to closing the real/ideal gap we outline in this paper involves reproducing an experiment undertaken

by Gino (2018). Identified in an earlier systematic review which sought to identify interventions, programmes and community-led activities with a central aim of actualising the ideas-informed society (see Brown *et al.*, 2022b), the experiment in question involved a small-scale randomised control trial conducted amongst a sample of 200 participants working across a range of different industries and companies in the US (see Gino, 2018). As noted earlier, those participating in the experiment were randomly assigned to receiving a treatment to either stimulate curiosity or pragmatic prospection. Recontextualised for the situation at hand, our reproduction of Gino's approach utilised the same method but amongst a different target audience: the general voting age population in England. We also focused on different target variables. First, given our aim to prompt citizens to *perceive value* in engaging with ideas, we sought to explore participants' response to the question: "How important is it to you to keep up to date with news, current affairs and new developments (such as political, economic and scientific developments)?"

However, given previous findings have indicated that valuing ideas positively impacts (both directly and indirectly) on whether citizens align their perspectives with appropriate societal values (Brown *et al.*, 2022a); our secondary variables involved responses to the previously explored value statements of:

- [how important is the following to you] "Supporting physical and mental health, that of yourselves and others";
- [how important is the following to you] "Seeing corporations and businesses adopt more ethical, responsible and sustainable ways of working"

Table 9. Chi² tests for the difference in importance attributed to mental health and wellbeing by intervention groups pre-intervention.

	Prospection	Curiosity	Marginal row total
Post-intervention positive	182 (189.63)	215 (207.37)	397
Post- intervention negative	64 (56.37)	54 (61.63)	118
Marginal column total	246	269	515 (Grand total)

Chi² = 2.568 and p = 0.109

Table 10. Chi² tests for the difference in importance attributed to mental health and wellbeing by intervention groups post-intervention.

	Prospection	Curiosity	Marginal row total
Post-intervention positive	204 (200.14)	215 (218.86)	419
Post- intervention negative	42 (45.86)	54 (50.14)	96
Marginal column total	246	269	515 (Grand total)

Chi² = 0.763 and p = 0.382

- [how important is the following to you] “Living in a society that is just, inclusive and embracing of all without any barriers to participation based on sex, sexual orientation, religion...”; and
- [how important is the following to you] “All children and adults having equal access to quality education, regardless of background, geography...”

In both cases, responses to primary and secondary target variables were measured using a four part Likert scale. The points on the scale were: 4) “very important”; 3) “important”; 2) “somewhat important”; and 1) “not important”.

Our findings suggest that by the end of our four-week experiment, the intervention designed to promote pragmatic prospection had had a significant impact on the primary target variable; moving the total number of individuals ascribing positive importance or more positive importance to the notion of staying up to date from 159 to 181 (an 8.9 % increase). This same intervention also served to increase the total number of individuals ascribing positive importance or more positive importance to notion of supporting physical and mental health, from 182 to 204 (a 9.0 % increase). The curiosity stimulating intervention, however, did not lead to a significant change in any of the primary or secondary target variables. As we outline in the literature review, there are myriad reasons why stimulating pragmatic prospection may have achieved to this result. As a process, pragmatic prospection involves individuals considering future outcomes or goals and what might be required to realise them (Allen, 2019b; Baumeister & Lim, 2021; Oettingen & Reininger, 2016). Much of the behaviour we undertake as humans involves making and then carrying out plans (Baumeister *et al.*, 2016): with some three quarters (74.1 %) of thoughts about the future involving planning (Baumeister *et al.*, 2020). Thus, it seems probable that once stimulated to think about future goals, people are also likely to think more about the concomitant need to plan (*ibid*). In turn, a focus on planning is likely to lead people to realise that their plans require a sound basis if they are to succeed (Oettingen & Reininger, 2016); hence one potential reason why stimulating pragmatic prospection seemingly accounts for the increased importance respondents attribute to being ideas informed.

Furthermore, of the four secondary values we asked respondents to consider, “Supporting physical and mental health, that of yourselves and others” is, the one most likely to have a direct impact on people’s abilities to realise their plans. The remaining three being more likely to themselves be impacted as people begin to engage critically with ideas: and since the experiment only ran for four weeks, perhaps this was not enough time for people to fully begin to engage with new ideas in a way that would enable this. At the same time, it is also argued that narrative thought is more fundamental to successful pragmatic prospection than that which is propositional (Baumeister *et al.*, 2016). In other words, people understand their lives as sequences

of meaningfully interrelated events; with these events extending from the past through to the present and, subsequently, reaching into the future (Allen, 2019b). This means the future is viewed as an extension of one’s ongoing story, with specific future events understood in the context of one’s ongoing narrative (Baumeister *et al.*, 2016). Successfully stimulating pragmatic prospection thus requires individuals to see meaning in the future they are being asked to consider. But the importance of narrative thought also means that empathetic pragmatic prospection is more likely to be achieved when individuals find meaning in the narrative of others (this is especially valuable when the ‘others’ in question are from backgrounds different to our own) (Allen, 2019b; Baumeister *et al.*, 2016). As such, pragmatic prospection is more likely to encourage an acceptance of progressive values, such as the secondary variables outlined above, if the narrative relevance and importance of these values is clear (Allen, 2019a; Gonzales, 2021). Thus, given the wording of the prospection stimulating texts (“What is one topic or activity you’ll engage in today? What is one thing you usually work on or do that you’ll also complete today?”) it seems likely that the nature of the intervention was such that it principally encouraged self-focused pragmatic prospection rather than empathetic pragmatic prospection.

It is also possible to suggest why curiosity may not have had any impact on our primary or secondary variables. This is because the type of curiosity our intervention was intended to pique is associated with the solving or the addressing of a specific problem (i.e. the wording of the intervention asked “What is one topic or activity you are curious about today? What is one thing you usually take for granted that you want to ask about?”; Gino, 2018). If people are curious about a specific thing (i.e. exhibit instrumental curiosity), they are likely to seek out specific information in relation to that thing but not go beyond it. In other words, such instrumental curiosity will be specific and not general – it is only state but not trait curiosity that is piqued: with increases in trait curiosity requiring a much more sustained intervention, focused on promoting a general motivation to seek out new information, if it is to materialize (Grossnickle Peterson, 2020; Metcalfe *et al.*, 2020; van Lieshout *et al.*, 2020). This stands in contrast to the idea of pragmatic prospection, which assumes that an individual’s capacity to think about the future is socially situated and so more readily open to manipulation (Baumeister *et al.*, 2016).

At the same time, we cannot yet rule out curiosity as a useful intervention for the promotion of ideas engagement. This is because, although the findings of the McNemar’s tests indicate that the prospection intervention has had a positive impact on both our primary target variable and one of the secondary target variables, pragmatic prospection did not ‘outperform’ curiosity: i.e. our approach to stimulating prospection did not lead to a significant difference in individuals attributing positive impact to our target variables when compared to the outcomes of the curiosity intervention.

The issue here is that, replicating [Gino's \(2018\)](#) in its entirety meant the omission of a control group (i.e. a third group that would receive no intervention whatsoever) in order to provide a counterfactual. Thus, it cannot be ruled out that the curiosity stimulating intervention did in fact have some impact, even if that impact was to lead to no change, since, in the absence of the curiosity-focussed intervention, it is possible that the actual importance attributed to our primary and secondary variables might actually have fallen over the four week period.

There are also questions that have not been addressed by this study. In part, this is due to our relatively small sample size: 515 valid respondents of which 269 had participated in the curiosity stimulating intervention and 246 in the prospection intervention. Also, to the short scale duration and low intensity nature of our approach: a four week-long intervention comprising of two text messages a week. As a consequence, while we have seen some evidence of impact, we do not yet know the extent to which this impact might also apply to 'ideas refusers': those who attribute no or low importance to the idea of keeping up to date. We also do not have an understanding of what behavioural change, if any, occurs as people begin to realise the importance of becoming ideas informed. In other words, do individuals, once having ascribed more importance to staying up to date, then act? And, if so, how do they act? Likewise, what might happen if we altered the length of the intervention or the number of texts? Furthermore, could changes to the wording also help foster more empathetic prospection amongst participants, thus helping foster people's understanding of the importance of the remaining three secondary values?

As such, while this study has provided some useful illumination in terms of how to begin thinking about enhancing citizen's perceptions of the importance of being ideas informed, further work is needed. In particular, any future study needs be larger in size, and perhaps involve higher-value incentives, in order enable the statistically significant analysis of vital sub-sections of the population, such as 'ideas refusers'. An expanded study should also include a control group in order to provide a definitive counterfactual, so as to help ascertain what would have happened in the absence of either intervention. Since we hope that changes in attitude lead to changes in behaviours, questions are also needed to examine the type of ideas 'providers' (or sources of ideas) respondents subsequently engage with (or not) as a result of these interventions, as well as changes in the frequency of engaging with these providers/sources. To build on the analysis undertaken as part of our structural equation

modelling work ([Brown *et al.*, 2022a](#)), such ideas providers/sources are likely to include forms of media, social media, magazines and printed press, as well as social network connections: i.e. friends, family and colleagues. Finally, we might also explore whether changes to the wording of the questions designed to stimulate prospection might alter the types of progressive values respondents ascribe importance to. Thus, as we acknowledge, we do not yet know all the answers here and there is still much to do in this nascent field. Yet, as we have previously argued, given the myriad crises (variously of environmental, economic, social and political natures) currently engulfing western and other societies, it seems more vital than ever that this research is indeed undertaken. Further, that any research is designed with a view to provide concrete steers for how our citizens and societies can both become, and reap the benefits of becoming, truly 'ideas-informed'.

Data availability

Underlying data

OSF: Stimulating ideas-engagement amongst adults in England

<https://doi.org/10.17605/OSF.IO/3R48F> ([Brown & Gross Ophoff, 2022](#))

This project contains the following underlying data:

- Baseline and endline data.xlsx (pre and post intervention survey data for 515 adults, resident in England, aged 18 plus: full data labels provided)

Extended data

OSF: Stimulating ideas-engagement amongst adults in England

<https://doi.org/10.17605/OSF.IO/3R48F> ([Brown & Gross Ophoff, 2022](#))

This project contains the following extended data:

- Survey questions.docx (Full list of survey questions)

Data are available under the terms of the Creative Commons Zero "No rights reserved" data waiver (CC0 1.0 Public domain dedication).

Software availability statement

This project used [Mplus](#), which is a paid for software package. The analysis in this paper can also be undertaken using the programming language alternative is R, however, which is both free and Open Source.

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David Aldridge

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This is a well-conceived and clearly-argued article that is accessible with only an average or baseline understanding of quantitative research methods. It is very successful in my view.

The study replicates (recontextualises, as the authors say, is a good way of putting it) the former study of Gino, adding in some additional secondary variables.

Limitations of the study are acknowledged, for the most part. Actually I have enjoyed reading and thinking about this because I have not encountered a study before where the questionnaire method was *itself* the intervention. I appreciate that this replicates the original Gino study, but it was fun thinking through the ins and outs of that.

Here is one limitation that I think a little more could have been made of. Because of the interesting conflation of questionnaire and intervention through the idea of 'stimulation', I wonder whether the correlations or 'effects' discussed can actually be attributed to 'stimulating' either curiosity or prospective thinking - rather the two groups were asked questions that were intended/ designed to stimulate etc. That is not the same necessarily as actually stimulating the desired traits or activities. The final paragraph - 'we might also explore whether changes to the wording of the questions designed to stimulate prospection might alter the types of progressive values respondents ascribe importance to'- seems to have acknowledged that the questionnaires might not have been particularly effective in achieving their desired effect. Because of the conflation of method and intervention in this study, it seems to me hard to separate out questions of whether the research method (questionnaire) had been effective from questions of whether the intervention (questionnaire) had been effective, so how can questions about whether the questionnaire really achieved its desired effect - stimulation of the desired kind of thinking - really be allowed to emerge as separate considerations? There seem to me to be two relevant questions: whether there is a link between the kind of thinking stimulated and the desired values (which this paper discussed very confidently) and whether the questions themselves, designed to stimulate a certain kind of thinking, really did so (which is sort of skirted around).

There is that short paragraph on whether the interventions worked as intended. Well, certainly answers were provided. But what kind of thinking produced those answers?

NB the Gino article discusses text-messaging, not text-massaging. That is quite an amusing typo.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Is the argument information presented in such a way that it can be understood by a non-academic audience?

Yes

Does the piece present solutions to actual real world challenges?

Yes

Is real-world evidence provided to support any conclusions made?

Yes

Could any solutions being offered be effectively implemented in practice?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Theory of education, philosophy of education, educational research methodology, theory of educational research methodology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 03 January 2023

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Philip Chan 

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This article lays the groundwork for understanding the roles of pragmatic prospection and curiosity in promoting idea engagement. It is important because ideas are generated daily and could change the world, such as making aeroplanes rechargeable, turning deserts into power plants, and Nanobot used to kill off cancerous tumours. This article investigates the potential advantages of encouraging English citizens to engage effectively with new ideas. Four hypotheses are clearly articulated and examined. The literature review on the ideas-informed society, curiosity, and prospecting the future is adequate.

The methodology and methods of this paper are clear. It recontextualises Gino's experimental study with explicit research procedures. This paper has appropriate ethical approval. This study recruited 515 participants, which is a good size. I agree with the authors to propose that a larger sample for the future study is encouraged. The data findings and analysis are clearly presented in the relevant tables. The discussion is thoughtful.

It is an insightful paper that should pass peer review after adding a short conclusion with limitations and future research directions.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Is the argument information presented in such a way that it can be understood by a non-academic audience?

Not applicable

Does the piece present solutions to actual real world challenges?

Yes

Is real-world evidence provided to support any conclusions made?

Yes

Could any solutions being offered be effectively implemented in practice?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: education policy and governance; globalisation; AI in education; Asia as method;

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.
