

The impact of an international component in educating the public using an experimental design

Introduction

Xenophobia, radicalization, anti-intellectualism and populism are all current troubling societal issues - issues that higher education internationalization (HEI), at its best, should aspire to reduce. And yet the impact of HEI on these troubling issues has not been widely studied. This current study addresses this research gap by looking at the impact of an HEI intervention in the context of internationalisation to directly address a particular troubling societal issue - i.e. terrorism.

Internationalisation activities as well as general social outreach activities are widely implemented within higher education and also substantially researched, an extremely comprehensive overview was conducted by (Brandenberger 2012). At the same time there is an equally substantial literature available on research in internationalisation of higher education (e.g., see the literature reviews of Teichler et al. 2015 or Chong 2014). However, within this area, the research on effects and impact is usually centred around the effects of any internationalization activity within higher education (e.g. Brandenburg et.al. 2014/2016) or focuses on individuals (e.g. ibidem; Brandenburg et.al. 2017, Farrugia/Sanger 2017, Yokota 2016, Potts 2018).

While the relationship between internationalisation at higher education institutions (HEIs) and its possible impact on the wider public has been researched¹, research based on experimental evidence in this area is very rare. It seems that so far, research in internationalization of higher education (HE) in general and its impact in particular is more inward than outward looking and the link to society is thus less often made. And yet the authors consider this highly desirable because societies around the globe face serious issues such as xenophobia and radicalization that might be partially solved by using tools available through internationalization in higher education. The aim of this research was therefore, to shed a first initial light on a possible link between interventions using components of internationalization in HE to address societal issues.

The current study attempted to measure an intervention's impact by closely examining its causality. Therefore, it applied an experimental design rather than interviews or cohort survey analysis. Although experimental designs are very common in the social sciences in general including intercultural as well as higher education research², it seems to be extremely rare in research on internationalization of HE - probably due to the conditions set for an experimental design - and accordingly, we could find only one such publication³. The current research attempts to fill this gap.

In sum, we studied an HEI intervention to show what impact our research might have on opinions regarding terrorism using an experimental design with an internationalisation component as the independent variable. The setting consisted of a lecture to two groups of

¹ See e.g. (Ferlie, Musselin, & Andresani 2008), (Yang 2010), (Krause, Coates, & James 2005) or (Caluya, Probyn, & Vyas 2011)

² See e.g. (Carrell & West 2010a and 2010b), (Carrell & West 2013), (Jacob, Lefgren & Sims 2010), (Braga, Paccagnella, & Pellizzari, 2014)

³ For further reading on experimental designs, see (Jagne & Smith-Atakan 2006) and for the problems see (Neuman 2007, 205ff). One example from research on internationalisation is the recently published paper by (Kato & Suzuki 2018) which analysed the effects of random assignment to short-term study abroad on further study abroad.

attendants from the public on terrorism and media led in both cases by an experienced UK lecturer. The control group was co-trained by another UK teacher (hereafter referred to as the “UK co-training group”), while the treatment group was co-trained by a US teacher (hereafter referred to as the “US co-training group”). This set up ensured that the core teaching content of the intervention would be identical for both groups while the international component - the independent variable - was the origin of the co-teacher. The participants were randomly assigned to one of the groups to fulfil the core criterion of an experimental design.

Our main research questions were:

1. *Does the introduction of an international component in terms of an international co-teacher make a difference?* The null hypothesis was that we would observe no difference between the US co-training group (with the US teacher) and the UK co-training group (with the UK teacher) in the post values and no difference in effect size between the pre- and post-assessment.
2. *Does this effect last or is it only short-term, since we only apply a one-off intervention?* The null hypothesis was that we would not see a statistically significant difference between the pre- and the postpost value and no measurable effect size.

Method

Procedure

Since we intended to analyse the impact of internationalisation on the wider public, we decided to offer a training session on ‘Terrorism: perceptions, beliefs and threats in modern society’. Terrorism was chosen as the subject as this was a topic which remains consistently in the news, and consequently was not a subject that participants could easily ignore. Despite the topic’s media saturation since 2001, the public remains relatively under-informed about the nature and impact that terrorism poses to the society in which they live. The decision to select terrorism as the focus of the training session came therefore from reasons of relevance and topicality, as well as a desire to provide some contextualisation on a subject of great concern to many. Whilst this statement does not wish to undermine research which shows that concerns regarding terrorism have fallen in the US since 2001 (see, e.g. Block-Elkon, 2011) it does reflect the fact that opinion polls still show Americans and Europeans view terrorism as either the top problem, or a high priority, as seen in recent Gallup polls (e.g. see Gallup articles by Riffkin, 2015 and Crabtree & Kluch, 2017). It is also a topic in which differences between countries is often debated and we could, therefore, reasonably assume that an international component could make a difference in the impact on the participants.

The decision was made to hold all sessions as close to the centre of the local city centre of Swansea as practical to maximise accessibility. It was also decided to hold the sessions on a Sunday, in an attempt to maximise a cross section of respondents who may otherwise have been working, and therefore unavailable, during weekdays. All training sessions were held at a bookstore, which ably fitted the need for a central and easily accessible venue.

A call for participation began one month before the first scheduled session. There was a need to balance the need to give adequate notice to participants, but not give them so long as to run the risk of the prospective participant forgetting an event over an elongated timescale. The bookstore helped raise awareness of the sessions, which were also advertised via leaflets, posters and word of mouth, as well as various social media outlets. The combination of older and newer approaches to disseminate information about the sessions was deliberately designed to make sure that no age group was either missed or potentially underrepresented by favouring one type of communication over another. It was stressed to each participant that this session

would be designed to further their knowledge of an important and highly relevant subject, but that there would be no attempt to impose any bias, or particular way of thinking upon them.

The training was provided by a UK based lecturer, who tailored aspects of his university-based course on terrorism to better fit a training session for those with no presumed prior knowledge of the subject. Each group was given the same information as the basis for each training session. This information included an attempt to provide some history and context to the subject, as well as presenting the group with the reasons why terrorism now represented such a major topic for news channels and political discourse, especially in the wake of the events of 9/11.

Ten statements were selected for the main survey and each of these statements made clear that the responses should be based on the respondent's own personal beliefs. The researchers opted for statements instead of questions to analyse learning outcome because a statement generates less of a "test" climate and thus less of a feeling of being "evaluated". Therefore, we could avoid test anxiety⁴ which might have otherwise impacted upon the participants. Statements were selected that addressed the extent to which the individual believed the threat from terrorism had altered since 9/11 and the reasons behind such perceptions. The statements were set in such a way that it was counter-intuitive for a respondent to reply the same way for each of them, using reversed scales in some cases. The training then addressed each statement and provided the participant with information that should – as a learning outcome - alter the response towards a lower value, for statements with turned scales, a higher value .

As a counter to a respondent's beliefs about the level of threat, the participant was invited to consider how much they actively sought out information about the topic, and whether they thought the information provided to them, either by the media or their government was fair, balanced and accurate and conveyed a full picture about the nature and level of the threat posed. This invited the participant to consider the extent to which their knowledge was based on accurate information or a sustained investigation into the topic. A low score on statements related to how much genuine knowledge a person felt they possessed of the topic both invited the participant to think further regarding how much their responses were based on a lack of true understanding of the subject, as well as inviting some useful analysis for the post-survey, when all respondents would have been in possession of official statistics on terrorist attacks. As such, official figures allowed the participants an opportunity to assess whether the threat posed was greater or lower than what they had perceived prior to the session.

Once the main teaching portion of the training session was concluded, the participants were then randomly assigned to two groups: but while in one group an additional UK postgraduate student participated as a teacher, in the other a US postgraduate student took part as a teacher. For both, the main aim was to provide examples, interpretations and opinions from the respective society. Here each of the additional teachers followed the same approach, to make sure there was no obvious alteration in stress towards each group. Both additional teachers were of equivalent age and personality in order to avoid the possibility that an extroverted personality clashed with one that was introverted, which could potentially have influenced the audience differently. They were both able to speak from the perspective of growing up in cultures dominated by a post 9/11 terrorist environment. Each of the additional teachers spoke for an identical time and fielded the same questions at the end of the session.

Materials

In order to measure the learning outcomes, we used the 10 items described above. All items were phrased in a way that suggested that the answers are opinions, since participants would

⁴ On the issue of test anxiety and its negative influence on assessment see e.g. (Harleston 1962) or (Al-Khalil 2010)

have to rely on their opinions during the pre-test and it facilitated the answering in the post-test by not generating stress through appearing to run a knowledge test. However, all 10 items referred to concrete teaching content and thus the answers would reflect the learning that could be achieved from pre to post.

We also used the short Big Five Inventory (BFI-15) items for the factor “openness” as a means to be able to identify possible differences in personality between the treatment (US) and the control (UK) group. Such differences could explain differences in learning outcomes.

We decided to use a combined Likert and visual analogue scale instead of pure Likert scale because it is considered superior in result, e.g. by (Grant et al. 1999) and (Funke/Reips 2012) who suggested that usual Likert scales might not always be sensitive enough in all cases of research to capture change, arguing that it takes a stronger decision to move from, for example, “strongly disagree” to “disagree” than it would take to move from 1 to 2:

Figure 1 Visual analogue scale for learning outcome items

Figure 2 Combined Likert scale and visual analogue scale for BFI

To satisfy the needs for an experimental design, we ran two rounds of teaching events and in both cases assigned the interested participants randomly to one of the groups (US and UK co-training group) observing an equal distribution by age, gender, and level of education; in the second round we compensated for any imbalances occurring in the first phase. In addition, we then took out those cases in both groups whose demographic criteria disturbed the comparability (e.g. an overload of young people in one group compared to another) without taking the answers to any question into account.

In order to strengthen the results, we also conducted an additional analysis of the pre-test results on the 10 learning items. We assumed that there were no “groups of questions” which belong together and confirmed that by conducting an exploratory factor analysis which indeed did not yield useful results. We then ran a confirmative factor analysis to identify probably weak items, which did not help to explain the results. For both, EFA and CFA, we applied a principal axis analysis which is stronger than a principal component analysis since it accounts also for possible differences in variance. As a result, 2 items (items numbers 5 and 7 - see Table 1) showed low factor loadings and were removed, 8 items were retained.

Table 1 Principal Axis Analysis learning items

For assessing any differences, t-tests were used. We considered using the Wilcoxon-Mann-Whitney test, which can be appropriate when sample size is small, as it was for the current study. Our data demonstrated differences between the mean and median, but those differences were normally distributed, and we further considered Meek et.al. (2007) who argued that t-tests are better when the basic assumptions of the t-test are met, even if the sample size is small. Since we could assume that the training would not reduce the knowledge of participants, we considered significances on one-tailed t-tests sufficient, with p set at .05. In order to measure the effect size of the training and the international component, we also applied Cohen’s d (small .2 <.5, medium .5 < .8, large >.8).

Participants

After a general lecture, participants were randomly assigned to either the UK co-training group or the US co-training group, based on demographic criteria (age, gender, education level) to assure comparability.

Table 2 Demographics for the US co-training group and the UK co-training group

As Table 1 demonstrates, groups were comparable across a number of demographics.

In order to ensure anonymity, participants received an individual participation code that they wrote on each of surveys they completed. Only the researcher conducting the surveys had a list of names with their corresponding individual participation codes.

We wanted to be sure that both groups did not start off with significantly different levels of knowledge, affecting the learning items, or openness, probably affecting the learning process. The results on the BFI-15 for both the control and the US co-training group show no significant differences, so the participants did not differ significantly in their openness and thus could be expected similarly to react to the educational intervention on terrorism without relevant preconditions.

Table 3 Pre-treatment assessment of BFI-15 Openness and learning outcomes between UK co-training group and US co-training group

We then also analysed the opinions of the participants on the learning outcomes since we assumed that a significant difference in opinions prior to the teaching exercise could explain a possible difference in the post. As table 3 shows, we could also not find any statistical significance on this aspect in any of the tests, meaning that the two groups entered into the teaching exercise with similar knowledge/opinions on the topic.

Results

Relevance of the international component

In the next step, we analysed the results according to the research questions.

The first research question was: *Does the introduction of an international component in terms of an international co-teacher make a difference?*

Given that the UK co-training group and the US co-training group were extremely comparable by three demographic criteria and also showed no significant differences neither in their personality trait of openness nor in their pre-training opinions on the learning outcomes, the null hypotheses as stated above should be confirmed if the international component that differentiated the US co-training group from the UK co-training group would yield no effect:

- 1a. The groups should not differ significantly regarding their post-training result on the learning outcomes.
- 1b. The groups should not show any relevant difference regarding their pre-to-post development.

In a first step, we analysed the difference between the US co-training group and the UK co-training group regarding the learning outcomes in the post test.

Table 4 Post treatment assessment of learning outcomes between UK co-training group and US co-training group

As table 4 shows, we can find highly significant differences between the US and the UK co-training group ($p=.001$). This means that the US co-training group with the American co-teacher showed a significantly higher knowledge level on the learning outcomes after the intervention, i.e. the international component produced a considerably stronger effect.

This means, in answering research question 1a, that the international component makes a significant difference when we compare the two groups.

Next, we wanted to see whether the training as such had an impact on the two groups separately and whether we can see a difference between the groups, signifying relevance of the internationalisation component. We, therefore, first analysed the pre-to-post results for the US co-training group.

Table 3 Pre-to-post and pre-to-postpost assessment of learning outcomes between UK co-training group and US co-training group⁵

We can see in table 5 that the difference is highly significant for all tests and the effect is a large one with a Cohen's d of 0.91, confirming that the training improved the knowledge on terrorism very significantly for the US co-training group, i.e. the one with the international component.

For the UK, we found significant results on the parametric and non-parametric tests and a small effect size (0.43), however close to the threshold for a medium effect size (0.5). This means that the UK co-training group also improved their knowledge on terrorism significantly through the training but considerably less than the US group.

For the entire sample (combining the US and UK co-training groups), we found highly significant differences between the pre- and the post-treatment results on learning outcomes for the whole group and a medium effect size (0.67). This result is a generally important finding beyond internationalisation since it encourages academics in engaging with wider society. The significant improvement for the entire sample seems to be strongly influenced by the US co-training group because the result for the US co-training group is substantially stronger than that for the UK co-training group.

Answering research question 1b: Given that an experimental design allows the argument for causality, the findings seem to prove that the international component was the influential independent variable which caused the US co-training group to experience a very substantial significant learning effect.

Overall, the answer to research question 1 is that the international component makes a significant difference in the education of the public on terrorism.

Long-term effect assessment

We then went one step further and controlled for longer term effects by surveying the participants approximately three months after the event (called the "postpost" assessment) to answer the second research question: *Does this effect last or is it only short-term, since we only apply a one-off intervention?*. The null hypothesis here is that a one-time event such as this training will not have a lasting effect and, thus, we will not see any significant difference between the pre and the postpost value.

For both groups, the t-test showed no measurable significance while the Cohen's d displayed a small effect size of 0.35 (US co-training group) and 0.38 (UK co-training group). However, the effects might be due to the small sample size and thus might constitute a Type I error.

However, the findings for the entire sample (combining both groups) 3 months after the event still show a significantly improved knowledge (t-test $p=.03$) and a measurable if small effect size (0.36).

This might mean that the individual samples were not large enough to show the effect (creating a Type II error). Still, applying the strict method we decided upon, we cannot conclude that the international component had a long-term effect.

Overall, the answer to research question 2 is that no significant long-term effect could be found for either of the two groups individually, but for the combined sample.

⁵ The means differ from the pre-to-post assessment since not all participants (1 less in the UK co-training group and 2 less in the US co-training group) answered the postpost survey and for paired results, only cases with answers in both surveys could be taken into account.

Discussion

The research produced several important findings that can serve the debate on the role of internationalization in general and in solving societal issues in particular quite well.

Firstly, we have seen clearly measurable and significant effects of the training on the sample population as such. This confirms that it indeed makes sense to activate the intellectual potential of a university to educate the public, even though this effect of the training did not last for months after the event, due to the training being a one-off activity. We think that this result itself could have broad implications in current debates on xenophobia, radicalization, anti-intellectualism and populism as current troubling societal issues. We seem to have found conclusive proof that activating the knowledge that is prevalent in HEIs is effective to enlighten the public and counter-balance the insufficient, or potentially misleading, information that people acquire through especially yellow press media. The difference between the short and long term effect also seems to suggest that it might be best to engage in numerous training sessions in order to ensure a long-term impact.

In short, the first main conclusion is that – especially within our specific area of internationalisation in higher education - there might be a strong argument to ask HEIs to engage in such activities in a wider and much more systematic way⁶.

While this is at first an argument for social outreach as such, we also believe to have discovered clear evidence that internationalisation itself can boost the effect of general social outreach. We saw that the group with the international component, the US co-training group, showed highly significant and measurable effects for the pre-to-post assessment and rather unexpectedly even for the long-term assessment, although to a lesser extent. Therefore, we can clearly confirm a significant learning effect for an international(ised) concept. Moreover, we observe a significant difference in the post value between the treatment (US) and the control (UK) group. Since we have set up a carefully controlled experimental design with an as comparable as possible and randomized group assignment and also can confirm that both groups showed no significant differences neither in the pre-training assessment of the learning outcomes nor in the pre-training control of the important personality trait “openness” as a proxy for willingness to learn and change opinions, this study seems to prove causality. In other words, we dare to state that the international component of the education activity for the public was the decisive factor for generating the measurable and significant differences between the two groups of participants.

Thus, the second main conclusion is that we might consider to more systematically activate our international potential to help solve the main societal issues outside the “walls of the universities”,

While being cautious, see the following caveats, we think that the study provided us with clear indications that our various internationalisation activities and assets (e.g. international students and staff, returning mobile students and staff) have enormous potential whose systematic activation could also, as a side effect, reduce the widening gap between the general public and the academia/intelligentsia which seems to be manifested in the anti-intellectualism debate.

The authors want to argue that we need more research to analyse the possible effects on the one hand to prove or reject the findings of this study, but also prospectively find even more powerful ways to use this potential to better inform society. It is not enough to be content with applying internationalisation to the improvement of the institution itself: if we take John Hudzik’s concept of comprehensive internationalisation seriously (Hudzik 2015), it includes the wider public and this study seems to prove that such comprehensiveness would be very effective. A

⁶ In this line of thought, see also Brandenburg et.al. 2019

lot already happens, as Brandenburg et.al. clearly stated in their article in University World News in April 2019, but it needs more systematisation to achieve stronger effects.

Our third main conclusion is therefore that Hudzik's concept of comprehensive internationalisation is true beyond the campus and needs to include the wider public and the major societal challenges of today and the future.

Limitations

This study, at least to our knowledge, is one of the first to have a controlled experimental design for measuring the internationalization's impact, and yet this research has its limitations. One core limitation of this research is that it is possible that the personality or effectiveness of the individual trainers, and/or their co-trainers might have influenced our findings. This limitation could be remedied if future researchers did a US vs. UK co-trainer in US vs. UK cultural contexts - as the current research was only performed in a UK cultural context. Another core limitation of this research is the small number of participants. This limitation could easily be resolved by just repeating the same experiment with more participants, but we encourage future researchers to consider running a comparative project in different countries simultaneously.

Future research could try other research designs. For example, future research could run multiple training events thereby possibly positively influencing the long-term effects of those training sessions - something that our research did not demonstrate. Future research could also run training sessions with international staff from different cultural backgrounds from those used in this research. Future research could also move the independent variable from the training staff to training content (e.g. purely national content versus international content).

Moreover, although we are convinced that one important reason for an unbiased audience was the fact that we deliberately did not invite participants to a seminar on "improving openness" or "becoming more international" but rather addressed a topic that is of interest to everybody, it might nevertheless be also an interesting approach to test whether this really makes a difference in the group structure.

In any case, we consider this research to be a promising first step that seems to confirm internationalization's positive impact on societal challenges such as xenophobia, radicalization, anti-intellectualism or populism. Much needs to be done and this study suggests that it is worthwhile to activate existing competences in the HE system to help solve societal issues.

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Figure 2 Combined Likert scale and visual analogue scale for BFI

Strongly disagree		Disagree a little		Neither agree nor disagree		Agree a little		Strongly agree	
1	2	3	4	5	6	7	8	9	10

Table 1 Principal Axis Analysis learning items

Item	Factor Loading (Rotated Varimax) 1
Full set of 10 items (Cronbach's $\alpha = 0.76$)	
1. I believe that the threat from terrorism since 9/11 has been increasing in the UK.	.69
2. I agree that British laws have been more effective in curtailing terrorism in the UK since 9/11.	.47
3. I feel that stronger laws are needed to reduce the terrorist threat.	.86
4. I believe the media keeps me fully informed about issues related to terrorism.	.80
5. I actively seek out information about issues related to terrorism to more fully understand the issues involved.	.21
6. I feel that terrorism poses a threat to me personally	.41
7. I believe that terrorism has been fueled by British foreign policy.	-.03
8. I believe that terrorism is the most pressing security threat facing western countries.	.87
9. I believe I have an understanding of the type of person likely to carry out terrorist acts.	.42
10. I feel that the threat of terrorism is going to continue to increase in future years.	.57
Optimised set of 8 items (Cronbach's $\alpha = 0.82$)	
1. I believe that the threat from terrorism since 9/11 has been increasing in the UK.	.69
2. I agree that British laws have been more effective in curtailing terrorism in the UK since 9/11.	.47
3. I feel that stronger laws are needed to reduce the terrorist threat.	.86
4. I believe the media keeps me fully informed about issues related to terrorism.	.80
6. I feel that terrorism poses a threat to me personally	.41
8. I believe that terrorism is the most pressing security threat facing western countries.	.87
9. I believe I have an understanding of the type of person likely to carry out terrorist acts.	.42
10. I feel that the threat of terrorism is going to continue to increase in future years.	.57

Table 2 Demographics for the US co-training group and the UK co-training group

	UK co-training Group	US co-training group
Aggregated Level of Education		
non-HE	8	8
HE	9	9
Total	17	17
Age		
<20	1	1
20-39	7	7
40-59	6	6
60 and >	3	3
Total	17	17
Gender		
male	7	8
female	10	9
Total	17	17

Table 3 Pre-treatment assessment of BFI-15 between UK co-training group and US co-training group

	n	Mean	SD	P t-test
BFI-15				
UK co-training group	17	3.94	0.50	.43
US co-training group	17	3.91	0.40	
Pre-test Learning outcomes				
UK co-training group	17	6.14	0.83	.1
US co-training group	17	5.68	1.20	

Table 4 Post treatment assessment of learning outcomes between UK co-training group and US co-training group

	n	Mean	SD	p t-test
UK co-training group	17	5.85	0.86	.001
US co-training group	17	4.76	1.04	

Table 5 Pre-to-post and pre-to-postpost assessment of learning outcomes between UK co-training group and US co-training group

	n	Mean		SD		p	Cohen's d
		pre	post	pre	post	t-test	
Pre-to-post							
UK co-training group	17	6.14	5.85	0.83	0.86	.047	0.43
US co-training group	17	5.68	4.76	1.20	1.04	.0009	0.91
Total sample	34	5.91	5.31	1.04	1.09	.0002	0.67
Pre-to-postpost							
UK co-training group	15	6.06	5.7	0.79	1.08	.07	0.38
US co-training group	16	5.7	5.1	1.28	0.98	.09	0.35
Total sample	31	5.87	5.42	1.06	1.05	.03	0.36