**Article**

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**Title:**

**Undergraduate research as student engagement springboard: Exploring the longer-term reported benefits of participation in a research conference**

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Christopher Little is a teaching fellow and learning developer based in higher education, teaching across undergraduate, postgraduate and post-registration levels. His research interests include undergraduate research, technology-enhanced learning, student response systems and transitions into higher education. Alongside this, he maintains an active research interest in subcultural theory and youth studies.

**Abstract**

**Background**

Undergraduate research can be found in many forms across higher education such as journals, conferences and research placements. It is widely reported that undergraduate research can encourage the development of discipline-specific and transferable communication skills and in some cases, a more complex development of higher-order critical appraisal. Recent studies of extracurricular undergraduate research conferences have also found participants to report a development of self-authorship and an appreciation of the conference as liminal and transformative space.

**Purpose**

This small-scale project investigated whether or not participation in an extracurricular undergraduate research conference bearing no academic credit had an impact on the academic and professional practices of those who participated in it one year since their participation in the conference. The conference occurs annually in June and is open to undergraduates of all levels and disciplines.

**Method**

The qualitative study took place March 2017 and March 2018, over two academic years withcohorts from an undergraduate conference held in June 2016 and June 2017. The investigation adopted an action research methodology and completed two cycles of research, beginning with an online survey and then using focus groups to further explore this data further. With many published studies measuring immediate feedback surrounding conference events, this project contributes investigation over a longer-term period of time.

**Findings and conclusions**

The project found a reported development in communication skills and an enhanced relationship with the concept of ‘research’ and self-authorship. Significantly, students reported that participation in this conference initiative directly led to an increased engagement with additional extracurricular activities. This is a hitherto unreported finding and contributes something new to the growing body of literature surrounding undergraduate research. This conference was consistently noted as a springboard for increased extracurricular engagement by students across all cycles of research.

**Keywords**

Undergraduate research, independent learning, students as producers, undergraduate conference

**Introduction - What is Undergraduate Research?**

Several authors discuss the ‘research cycle’ as only being complete when work is disseminated and shared widely (Caprio, 2014; Spronken-Smith et al., 2013; Walkington and Jenkins, 2008). For undergraduates, this research and dissemination activity can be considered to be achieved through final year capstone projects or dissertations. However, this consideration fails to acknowledge that this activity is completed due to summative assessment and course credit requirements and is rarely disseminated beyond the marker (Garde-Hansen and Calvert, 2007; McGuiness and Simm, 2003). In order to truly give students dissemination opportunities, it is desirable to offer undergraduate students the opportunity to conduct independent research, away from summative demands, and share via the usual academic dissemination routes of journals and conferences.

Undergraduate research can take several forms such as conferences, journals and research placements. These examples of undergraduate research are often opportunities within an assessed programme of study but can also be seen in extracurricular, occasionally external, opportunities such as the annual British Conference of Undergraduate Research (BCUR) and the annual American National Congress on Undergraduate Research (NCUR), both of which have run for many years. In 2016, the first World Congress of Undergraduate Research (WCUR) was held at Qatar University, giving a global impetus to undergraduate research events. The second WCUR was held at the University of Oldenburg, Germany, in May 2019. There is also a growing number of undergraduate research journals covering numerous disciplines for students to use to disseminate their work, enabling them to fully enact the aforementioned cycle of research and dissemination (Walkington, 2014; Walkington and Jenkins, 2008). Establishing a whole-institution undergraduate research culture can be challenging and costly, but organising an undergraduate conference or journal is one way in which an undergraduate research culture may be developed (Garde-Hansen and Calvert, 2007). Regardless of whether the format is conference or journal, assessed or non-assessed, internal or external, the central aims of encouraging students to pursue in-depth inquiry and develop crucial research and dissemination skills remain central to all forms of undergraduate research.

**Literature**

There are a growing number of journal papers investigating the benefits of student participation in undergraduate research conferences. These papers largely group themselves around three common findings with regards to the longer term impact of undergraduate research conferences and will be cited and discussed in turn, below. Firstly, it is widely found that there were reported improvements in a range of skills such as public speaking and networking, for example. Secondly, there were common discussions around the role of the conference space itself in developing student self-authorship. Finally, there were common findings discussing the role of undergraduate research conferences in encouraging a bidirectional relationship with research and fellow researchers.

***Development of interpersonal and communication skills and confidence***

The development of transferable skills have been reported as a key benefit to undergraduate student participation in conferences across a number of studies (Garde-Hansen and Calvert, 2007; Hall, 2015; Hill et al, 2013; Houlden et al, 2004; Mabrouk, 2009; McGuiness and Simm, 2003; Potter et al, 2010; Spronken-Smith et al., 2013; Walkington, 2014; Walkington et al., 2017). These events offer undergraduates the opportunity to practise and develop discipline-specific skills, such as writing abstracts, as well as more generic interpersonal and communication skills (McGuinness and Simm, 2003; Spronken-Smith et al, 2013).

These developments can range from enhanced skill acquisition as above, but they can also have reported positive impacts upon harder to quantify areas such as confidence and feelings. Hall’s (2015) study showed that, through attending an external social work conference, students reported increased pride and self-esteem with regards to their ability to engage in academic discussions with peers, both student and staff. Additionally, students can use events to focus on their own skill development but also to network and take initiative with colleagues and learn from them (Hall, 2015; Potter et al, 2010).

***The conference as borderland space to develop self-authorship***

In their discussion of undergraduate research conferences developing graduate attributes, Hill and Walkington (2016) note that self-authorship is a byproduct of this skill development. Here, they view self-authorship as ‘the ability to know oneself, to know what one knows, to reflect upon it, and to base judgements on it’ (p.224). While their investigation measures a more short-term evaluation of the reported development of graduate attributes via undergraduate research conferences, the authors call to ‘create pedagogic conditions in which students become border crossers’ (p.232). The ability to take one’s disciplinary beliefs and traits and use them to forge a more nuanced understanding of that discipline, and other disciplines, is a key benefit of participation in undergraduate research conferences.

Indeed, this was also found in Walkington et al.’s (2017) study exploring the benefits of participation in BCUR events. This later work found that students were able, through the space of undergraduate research conferences, to communicate their own disciplinary knowledge to fellow delegates, across disciplinary boundaries. This resulted in developments in understanding and communication skills, leading to an increased sense of self-authorship and appreciation of cross-disciplinary and interdisciplinary links. This increase in reported self-authorship is encouraged by the space of the conferences themselves, offering students a common ground between disciplines, levels of study and free from hierarchical structures found in assessed conference opportunities (Garde-Hansen and Calvert, 2007; Hill and Walkington, 2016; Mabrouk, 2009; Walkington et al., 2017).

***Bidirectional dialogue with each other and ‘research’***

The final theme emerging from the literature is around undergraduate research conferences encouraging a more bidirectional form of dialogue, both between delegates and with delegates own relationship to research. Walkington et al. (2017) discuss the evolution of a form of conference ‘citizenship’ whereby a learning partnership forms around a sense of reciprocal respect, interrogation and discussion. This led to students positively challenging each other’s ways of thinking in a supportive manner, as one of their respondents noted: ‘difficult questions move you forward’ (Walkington at al., 2017, p.422). This bidirectionality between participants is noted by Hall as a key element to conference participation being an ‘instrument for non-institutionalised learning and change on a broader level’ (2015, p.838). While both of these studies examine external conferences, the BCUR conference and an international Social Work research symposium respectively, the findings offer an insight into the impact such events can have.

An increased appreciation of the research process naturally leads to a more nuanced and sophisticated appreciation of what ‘research’ is (Potter et al, 2010). A conference setting can provide a risk-free space, away from the determinants and pressures of summative assessments, in which students can explore their conceptualisations of ‘research’. By getting involved in the process of conducting and disseminating research, students gain a greater appreciation of what academics ‘do’ (Hill et al, 2013). More importantly, however, it encourages students to see themselves as part of an academic community of practice and to understand the various integrated stages of conducting and showcasing research.

Hill and Walkington (2016) found that students reported feeling that participation in the BCUR conference had legitimised them as researchers. Here, students felt they could affect change in the academy, and in some instances wider society. By moving their practices beyond the student/tutor classroom hierarchy, undergraduate research conferences had given their intellectual endeavours meaning beyond the classroom. This can be seen to signify a movement from understanding research as a resource for assessment purposes to an appreciation of its contextual ramifications, of its unfinished nature and that they can become shapers of future knowledge.

When one considers the above reported benefits, we may begin to conceptualise such undergraduate research practices as transformative (Mezirow, 1991, 1997). In its purest form, transformative learning is concerned with the facilitation of autonomous thinking and alterations to frames of reference in adult learners (Mezirow, 1997). Furthermore, it should work towards enabling learners to ‘participate more fully and freely in critical-dialectical discourse’ (Mezirow, 2003, p. 62). The previously discussed literature indicates a change of mindset towards fellow delegates, towards research itself and a form of reciprocal dialogue forming that, when combined, embodies the sentiments of transformative learning. Undergraduate research conferences appear to create the necessary conditions for autonomous, critically engaged learning to occur.

Now in its fifth iteration, the extra-curricular undergraduate conference featured in this investigation occurs annually in June, at the end of the academic year and assessment period, taking place in a campus-based university in England. This conference is non-assessed and carries no academic credit whatsoever. The conference was developed by a central learning development unit and, furthermore, it offers students the publication of their abstracts and selected full papers in a special edition of an institutional pedagogical journal.

It is data regarding the first two conference events, held in 2016 and 2017, that will be explored in this paper. The 2016 event was attended by 76 undergraduate students consisting of 44 student presenters and 32 students in the audience. Similarly, the 2017 event was attended by 55 undergraduates, consisting of 25 presenters and 30 audience delegates. Across these two events, an average of 19% of all delegates (Presenters and audience combined) were from Year 1 of undergraduate study, 38% from their second year of undergraduate study, 40% from their third year of undergraduate study and 3% from a small cohort of integrated undergraduate Masters programmes.

Much of the cited research measures immediate feedback surrounding conference events. There is a need for a fuller picture of the reported impact of such undergraduate conferences upon student practices over a longer-period of time. This project examined the self-reported impact of the above undergraduate conference 9 months after the event with two cohorts, one from the 2016 conference and another cohort from the 2017 cohort. This offers a more longitudinal study to the existing field of research. As such, the research questions for this project were:

* What impact does participation in an undergraduate research conference have upon students long-term study practices?
* Does participation in an undergraduate research conference influence any other student practices?

In exploring the above research questions, this small-scale qualitative study seeks to explore data gathered to add to the aforementioned body of knowledge.

**Methodology**

An action research approach was adopted, consisting of two cycles of research in each academic year. Action research is often noted to have a cyclical structure where each cycle feeds into the next (Altrichter et al, 2002; Norton, 2009; Somekh, 2006). Cycle 1 would gather data via an anonymous online questionnaire and it’s findings would then be explored further in focus group sessions (Cycle 2). In order to ensure that the data gathered in this project is as externally reliable as possible, and to establish triangulation, a colleague from outside of the project team reviewed the collected responses and thematically analysed the data using the same processes as the researcher to confirm thematic groupings.

***Ethical considerations***

Prior to commencing this project, relevant ethical approval was gained from the relevant ethics committee of the Higher Education institution where this took place. All previous participants of the two undergraduate conferences in question were contacted with an email invitation to participate in the project accompanied with a project information sheet, detailing the aims and objectives of the project in full, including the intention to publish anonymised findings in external fora such as journals and conferences.

There was no mechanism for gaining explicit consent for the online questionnaire cycle of the project. All participants were informed that the software used here, Google Forms, anonymised all responses at source. Therefore, completion of the questionnaire is considered as implied informed consent, which was communicated to all participants. It was also communicated, via the project information sheet, that withdrawing their data from this stage, once responses were submitted, would be impossible. This was also restated on the questionnaire itself.

The focus group cycles of data collection utilised paper consent forms which confirmed understanding of the project information sheet, voluntary participation, audio recording of the focus group session and for anonymised quotes to be used for dissemination purposes at a later date. The focus groups and recordings were facilitated by a colleague with the researcher not present in these sessions. Prior to focus groups commencing, all participants were informed that in order to remove their data from the project they needed to simply inform the focus group facilitator or project lead researcher and that all electronic and paper-based data would be subsequently deleted or destroyed.

This small-scale project seeks to evaluate the reported qualitative impact of a non-assessed, voluntary conference and reported impact. The project involves entirely voluntary completion of an anonymous questionnaire and participation in focus groups. There is no need for control groups and there is no risk of anyone being unfairly disadvantaged or advantaged. Finally, the conference initiative itself is entirely voluntary and open to all students at the higher education institution. Additionally, all investigations were conducted in accordance with British Educational Research Association (BERA) ethical guidelines (BERA, 2018). The project also received a small grant from the Association of Learning Development in Higher Education (ALDinHE) to fund its investigation in its first year.

***Participants***

The project sought to engage all students who attended the June 2016 and June 2017 conferences and to collect data from these participants in March 2017 and March 2018, nine months after the conference event occurred. This included those students who presented and those who attended as audience delegates. It is worth nothing that many students had graduated since the conferences they had attended and and not all left contact details with the University’s alumni department. However, many graduates were contacted so this study comprises perspectives from this still in higher education and those now in employment or in postgraduate study. In summary, 102 unique students, of a possible 131 students who engaged with the conference, from varying levels/years of study, were contactable and/or still active students at the university, many of whom attended or presented at both conferences. From this sample, the three academic faculties at this particular institution were evenly represented and students came from all academic levels of undergraduate studies from Foundation Year studies through 5-year medical degrees.

***Procedure***

*Cycle 1 - Questionnaire.*

Firstly, an anonymous electronic survey was released to attendees and presenters of the 2016 conference in February 2017, and in February 2018, to presenters and attendees of the 2017 conference. This initial email contact contained a summary of the project and a link to an anonymous 3-item questionnaire. The following questions were asked of participants:

Q1. Has the conference had any impact upon your studies since June 2016/17? [Open response]

Q2. Do you do anything differently as a result of taking part in the conference? [Open response]

Q3. Do you have any other comments about the conference? [Open response]

The questionnaire also indicated how long it would accept responses for, and several reminder emails were sent, as these strategies have been proven to be helpful in combating nonresponse (Fowler, 2002; Fink, 2003; Porter and Whitcomb, 2003).The questionnaire was created using *Google Forms*, which allowed all data to be anonymised at source with the researcher never knowing the details of those who completed the survey. Across the two years of study, the survey gathered 44 responses, yielding a 43% response rate in total. While a higher response rate would undoubtedly have been desirable, sufficient data was gathered to provide saturation to a point where no further new findings were found.

Norton’s (2009) description of thematic analysis was used which comprises of seven stages: immersion in the data as one document; category generation; removal of marginal or overlapping categories; merging of categories to form fuller thematic groupings; check emergent themes, ideally with a colleague to assure inter-rater reliability; link themes and find patterns in the data; finally, present the findings in a narrative structure utilising quotes. Following initial thematic analysis by the researcher, the raw data was given to an interrater, to assure reliability and to triangulate the data, who confirmed the interpretation of the findings, adding an additional layer of dialogic validity. This thematic analysis identified four themes from the questionnaire responses which were then explored in further detail through the focus groups: a generally positive impact upon their studies and/or career; development of presentation skills; development of research skills; increased engagement with extracurricular activities since the undergraduate research conference.

Across the three survey questions, there were just three responses that indicated the conference had no impact upon them in the nine months that had passed since the conference itself. These findings come from a possible 132 opportunities, across the three survey questions, to provide such feedback. As they represent such a small percentage of the total responses, it was deemed not necessary to explore this finding in further detail. Additionally, it is worth noting that one anomalous response was recorded in response to question 2 of the survey. One respondent noted ‘More advertisement’ as their response. This response does not fit the question and prompted a review of the items on the survey. However, one anomalous response indicates high item validity of the three survey questions.

*Cycle 2 - Focus groups.*

Focus groups were employed here to elucidate upon the emergent themes from Cycle 1. In inviting students to the focus groups, the same principles were utilised as in Cycle 1 to encourage engagement (Gillham, 2007; Porter and Whitcomb, 2003). This process gained six participants across two focus group sessions in 2017 and a further single focus group in March 2018, consisting of three students. A larger number of focus group attendees would clearly have been desirable, but significant data was still gained from this group and saturation was reached with this small number.

It is also worth discussing the profile of this sample. Focus group attendees were evenly spread across years 1, 2 and 3 of undergraduate study. Six of the nine focus group attendees were mature students. The range of disciplines covered by these students ensured that each of the three faculties at this university were represented equally across the disciplines of International Relations; Business Management; Psychology; Philosophy; Economics; Adult, Mental Health and Children’s Nursing and Neuroscience. Additionally, seven of the nine focus group attendees presented at the conference. This allowed them to discuss the conference from both presenter and audience perspectives, although a greater balance would have been preferable between presenters and audience members.

Each focus group was audio recorded and transcribed. Consequently, these transcriptions were subjected to transcript and tape-based analysis to provide a rigorous examination of the comments (Onwuegbuzie et al, 2009). Additionally, while Cycle 1 utilised a colleague to confirm the interpretation of the data gathered from the questionnaire was correct, this was not necessary in regard to the focus groups as this cycle utilised focus groups to expand upon previously found themes, not to generate new thematic groupings.

These cycles of data collection and analysis saw responses grouped under four central themes: an unspecified positive impact upon studies or career; the development of presentation skills and personal confidence; the development of research skills and perspectives; an increased engagement with extracurricular activities. These themes will now be discussed utilising data from both cycles of data collection.

**Results**

***General positive impact on studies and/or career***

*‘The conference has definitely had a significant positive impact on my studies’.*

*‘For me the if attraction was, wow, as an undergrad I can have a voice that's heard’.*

Responses discussing the generally positive experience of this undergraduate research conference typically fell into three interlinked subcategories: the value of a mix of disciplines presenting; the conference provided a platform for student dissemination; and, a generally positive and supportive learning environment.

Several participants noted that the conference provided a platform for them to share their research interests, as demonstrated by one student reporting that *‘We just used it as our soapbox didn't we’*. This is linked to the development of presentation skills and confidence, but also ties more into other comments in around a positive learning environment. Students noted that the undergraduate research conference provided a *‘fun learning environment’* and that for *‘those who see academia as a career in particular, this is a kind of low-risk environment to learn and practice your skills’*. A significant aspect of this environment was the multi and interdisciplinary content present where students presented a range of *‘stuff they were interested in, rather than stuff they had to talk about’*. This comment refers to students presenting areas of interest, not necessarily areas that were summatively assessed.

***Development of presentation skills and confidence***

A number of specific comments were gathered regarding the ways in which participants felt their presentation practices and confidence might have changed or improved:

*‘I managed to help my current employer prepare the presenting materials for a conference in Germany since I have learned what it requires to be a presenter’.*

*‘Transitioning say, from a commercial world to an academic world, that's been a journey and there's certainly still a long way to go. But it highlighted that there's more than one way of presenting’.*

One participant, who was an audience member and did not present at the conference, noted that the conference provided a chance to see good practice, modelled by students at her level, and that it provided a *‘fantastic stepping stone, I think, confidence-wise*’*.* Additionally, a prominently noted benefit was that of content management and, specifically, how to tailor a talk for an audience. Learning the pitfalls of including too much content, or content which is perhaps too specialised, proved to be valuable lessons for participants. Here, learners noted the importance and impact of well-paced, passionate, accessible talks upon their future practices.

There were also significant gains in personal confidence with students noting that participation in this undergraduate research conference led to reduced stress when faced with presentation assessments within their programmes, with two students noting *‘if we can do the conference we can do this’.* They noted an increased confidence in their ability to deal with unexpected and challenging questions also increased, which can often come from peers and tutors at the end of summatively assessed presentations. Finally, several students noted that working collaboratively on their presentation led to real growth in their ability to provide constructive feedback to one another and negotiate deadlines and workload-allocation between them.

***Development of research skills and perspectives***

*‘My change in attitude towards research, partly influenced by the conference, led to me do an MSc’.*

*‘The way I've put this this presentation together for this conference [sic] and Qatar [WCUR], those that have worked with me for a long time have seen a difference in the approach that I have’.*

Using the conference presentation as a vehicle for self development, students noted the challenge of exploring a topic with focus and depth, finding a balance between depth and the audience’s knowledge and the challenges of presenting research to other disciplines. The students were keen to stress that presenting to an unknown audience of mixed disciplines led to them ensuring that their research, and consequently their argument, was much more rigorously planned. To this end, this more rigorous approach has been of great benefit to their studies since the conference.

Many students also noted a change in their ways of thinking about research, which has also been found in previous studies of undergraduate research conferences (Hill and Walkington, 2016; Walkington, et al., 2017). This self-awareness and ability to critique one’s relationship to research are evidence of the beginning of a much more nuanced relationship with research and of self-authorship, as one focus group participant noted:

*‘At that point I was still very much using library databases, nursing databases, and for that* [the conference] *I referenced phone calls that I'd made with other professionals, so it widened my research, where I got my research from’.*

The above example shows a more sophisticated understanding of what constitutes ‘research’. This was further discussed with students adding that they now understood that not all research needed to come from primary empirical research and that this secondary research had significant value. Here we can see the beginnings of the development of a new approach from students to building arguments and using evidence that, as one student noted, leads to a *‘completely different mindset’.*

***Increased engagement with extracurricular opportunities***

*‘I have since presented at a symposium, and I am presenting at an upcoming symposium and at a major conference this summer’.*

The above example illustrates the ways in which students used this undergraduate research conference as a springboard to drive further engagement with extracurricular opportunities, a previously unreported finding. Students were more engaged with other opportunities to disseminate their work, but also to engage with additional training courses and experiences. Respondents reported, in both cycles of research, an increased engagement with research fora such as conferences and symposia beyond this conference and their studies. Focus group attendees noted that presenting at the conference had given them the confidence to apply to additional and external events with all presenters who attended the focus groups stating this.

One student had delivered their conference presentation at the inaugural WCUR, while others had since presented at discipline-specific national conferences noting that the undergraduate research conference *‘definitely gave us the confidence to go on and present again, and to be successful as well’*. Furthermore, one participant reported that it had increased their confidence to share knowledge and experience other events on their own, something they previously would not have done:

*‘It's certainly made me feel quite happy about going to these things, and going on my own. I'm quite comfortable doing that now, and maybe in the past would not have gone unless somebody else was, but now I just head out’.*

Adding to this, students noted additional courses and events that they had attended, and even that participation in events like this had given them something of a ‘career boost’ when applying for other courses stating that *‘the reason I got shortlisted was because of the extra academic stuff I'd done’*. In many cases, successfully gaining acceptance into a national or international undergraduate conference was supported by the institution through travel and conference fee funding. However, these statements do allude to the significance of the confidence gained via participation in this institutional conference as key to them going on to apply to other events.

**Discussion**

The study detailed here is small-scale and qualitative in nature, providing analysis of rich data, not quantitative impact. However, this study has found a number of key findings that will contribute to the existing, and quickly growing, field of knowledge, surrounding undergraduate research. Additionally, it may well provide practitioners with further evidence of the benefits of such undergraduate research practices. The above results must now be critically discussed in light of the original research questions.

***What impact does participation in an undergraduate research conference have upon students long-term study practices?***

In this respect, this investigation echoes much of the published literature. It revealed a reported development of student academic and transferable skills such as literature searching, public speaking, networking, amongst others. This confidence was perhaps developed by the supportive and fun environment noted by respondents*.* Within ‘presentation skills’ there is clearly a range of different, and interconnected, skills and abilities which this investigation has shown can be enhanced or improved by participation in undergraduate research conferences such as this. This finding was expected as almost all of the studies investigating undergraduate research conferences found a reported increase in skill development by students (Garde-Hansen and Calvert, 2007; Hall, 2015; Hill et al, 2013; Houlden et al, 2004; Mabrouk, 2009; McGuiness and Simm, 2003; Potter et al, 2010; Spronken-smith et al, 2013; Walkington et al., 2017). Self-reporting, and indeed self-marking, of such skills has been found to be overly positive (De Grez et al., 2012), so such findings should always be understood critically. However, an initiative that encourages student self-confidence and self-esteem can be considered impactful and worthwhile.

Additionally, the conference was seen to provide a space where students can challenge their own disciplinarity and the discipline knowledge of one another whilst beginning to foster a culture of mindset-change and self-authorship. Here, research is used strategically to support conference presentations. However, we also see the emergence of a more sophisticated dialogue with research and discursive thought. This development of a more sophisticated and balanced view of ‘research’ has been found in previous investigations of undergraduate research forms (Hill et al, 2013; Potter et al, 2010; Walkington et al., 2017; Hall, 2015). This critical conception of, and relationship with, research and disciplinary identity stands as a key example of applied critical thinking. Ronnlund, Ledman, Nylund and Rosvall’s (2019) ethnographic study, while conducted in Sweden and not the UK, tells us that critical thinking is a key skill for graduates to have. The authors found real value of conversations which are challenging and inclusive of other backgrounds and discipline perspectives. Simply put ‘students need to learn critical thinking by practising it’ (2). This conference provides a space for this practise, for these conversations to occur and a platform for students to engage with research critically.

While the above development of confidence and various skills are self-reported, and this has been acknowledged, the conference detailed here has been found to correspond with a significant number of Zepke and Leach’s (2010) recommendations for creating educational environments which engage students. Furthermore, by creating a space for students to share across academic levels and disciplines, as recommended by Garde-Hansen and Calvert (2007), we can conceptualise this undergraduate conference as active and impactful learning. Undergraduates often also have a number of factors affecting their ability to have positive learner identities (Lawson, 2014). Therefore, one could begin to see this conference, with its impact upon a number of skills required to be a successful student, as something which works towards developing a sense of not only being an emerging academic researcher, but also as an event which helps to further develop strong learner identities. This undergraduate conference enhances students’ self-belief, provides a challenging and enriching educational experience which promotes working autonomously and with others and that, finally, provides a platform for students to develop their social and cultural capital.

***Does participation in an undergraduate research conference influence any other student practices?***

Significantly, students reported that the confidence gained via participation in this institutional conference made them more likely to engage with further extracurricular activities. Consequent participation in additional conferences, symposia and training courses was influenced and improved by their participation in this undergraduate research conference. We can, therefore, begin to conceptualise such undergraduate research initiatives as examples of social and interdisciplinary learning (Ryan and Tilbury, 2013). Furthermore, by removing assessment criteria, providing a platform for independent inquiry and exposing learners to the disciplines of other students, an undergraduate research experience was created that was learner-centred, participatory, interactive and challenging - all key features of transformative learning experiences (Mezirow, 1997).

This finding encourages further thought around the signposting of additional extracurricular opportunities to students. While students are finding these new avenues of activity independently, this may also be something of a missed opportunity to proactively signpost opportunities to all students who participate in future undergraduate research conferences, given their increased likelihood of extracurricular engagement. However, the findings from this project are significant because there was no signposting of any further opportunities to learners at the undergraduate research conference - they developed a curiosity and initiative, and sought these opportunities out. We can safely infer from the data gathered that this undergraduate research conference played a significant part in encouraging this curiosity and engagement. To encourage this explicitly may unduly influence the findings of future investigations.

Extracurricular activities, such as sports or additional academic or social endeavours, can provide personal enjoyment as well as transferrable skills development opportunities and are generally valued by graduate employers (Stuart et al, 2011; Thompson et al, 2013). However, without strategic forethought and reflection, these activities can be detrimental to academic studies if not properly managed in respect of the students’ academic workloads (Thompson et al, 2013). We also need to consider that this finding of increased engagement may not have been possible for all participants. Importantly, Stuart et al (2011) remind us that, while many students wish to engage in other opportunities, they may not be able to due to other personal commitments such as childcare and employment demands. So, while the self-reporting of increased likelihood of extracurricular activity is an interesting and unreported finding to date, in respect of undergraduate research, it does need to be considered in the terms of the context in which these students exist. There may have been others who would have also reported this finding but for their own personal circumstances.

This increased engagement in further activities is undoubtedly a result of being exposed to a research conference that was supportive and ‘low-risk’. Furthermore, it is a testament to their newly-developed presentation skills and confidence. Therefore, it is easy to see the inherently interlinked nature of the above findings. However, increased engagement beyond the event in other opportunities is not explicitly discussed in previous studies of undergraduate research conferences and offers this study an opportunity to contribute to the sector-wide discussions surrounding undergraduate research.

**Limitations**

Questionnaires can be flexible, convenient, cost effective and easy to complete for participants when designed correctly (Gilham, 2007; Walliman, 2011). Additionally, focus groups can provide an in-depth exploration of topics which can provide rich data sharing real insight into experiences attitudes and perceptions of particular topics (Gibbs, 1992; Morgan, 1997; Powell and Single, 1996). While the findings presented here offer something new to the field, a higher response rate to the survey and larger focus groups would have been desirable. While the project adopts a qualitative approach to data collection and was able to achieve saturation and triangulation, additional responses and data would strengthen the findings of this project.

It is also worth discussing the profile of this sample. The majority of focus group attendees were mature students which may limit the generalisability of the findings. Additionally, seven of the nine focus group attendees presented at the conference. This allowed them to discuss the conference from both and presenter and audience perspectives, but may lessen the representativeness of the findings to non-presenting audience members. Finally, as noted previously, not all students are able to engage with opportunities such as this conference for a range of reasons, from lack of interest through to being unavailable due to childcare or employment demands. Therefore, the sample that this data was gathered from is likely to comprise of those already engaged in additional activity outside of their curricula and perhaps without any additional constraints on their time. However, this challenge exists in any examination of any extracurricular activity. While these factors may influence the generalisability of such findings, all measures were taken to ensure that this sample was as representative as possible and the new finding that this study presents is of value to ongoing discussions surrounding undergraduate research conferences.

**Future research**

In order to gain a richer insight into the learning development of students in relation to participation in conferences, Hall (2015) utilised reflective journals to demonstrate that students gained a deeper understanding of research and their own social work practices. This approach, while potentially time-consuming, can allow participants to draw links between personal, professional and cultural practices (Cutforth, 2013; Hall, 2015) and may shed further light on the value of undergraduate research initiatives. In addition to possibly pursuing reflective learning journals, there may be some scope to utilise or develop an undergraduate research skill development framework, similar to that of Willison and O’Reegan’s (2007). This study was conducted to scope the reported benefits of engagement with such conference initiatives in order to further justify more extensive research utilising a framework such as Willison and O-Reegan’s.

Measures such as the above may afford a richer and more longitudinal analysis of the impact of conducting undergraduate research, and may be considered in future iterations of the project. However, before changing the measurement tool, it is desirable that further research around this particular undergraduate conference be conducted using the same instruments with future cohorts to ascertain whether or not the above findings hold true over time.

As noted in the previous section, the motivations of those students who participated may potentially introduce bias to this data set, as is the case in most studies where data is self-reported. While this challenge is often difficult to overcome, it does also highlight an area of future research that would add something new to the field. While discussing student engagement more broadly, Zepke and Leach (2010) reassert Ryan and Deci’s (2000) dichotomy of intrinsic motivation, participation out of enjoyment or interest, and extrinsic motivation, participation driven by a separate outcome or reward. Further work is needed with regards to mapping the reasons why students engage with conferences which bear no academic credit such as this. Future work may even test the impact of some of Walkington and Jenkins (2008) strategies for further increasing engagement in undergraduate research initiatives. These strategies were updated in 2014 (Walkington, 2014) but future work focusing on co-production of a conference event with staff or inviting submissions from partner institutions and pre-honours students may be areas to explore as this institutional conference continues to grow. Unpicking the reasons why university students seek out and engage with these opportunities would provide a fuller picture of undergraduate research conferences.

**Conclusion**

The students that engaged in this non-assessed, extracurricular undergraduate conference reported gains in their academic and research skills. Significantly, they reported an increased likelihood of engaging with additional extracurricular opportunities. By contributing this new finding to the ongoing academic discussions around the value and worth of undergraduate research initiatives, this investigation provides further justification for those practitioners considering engaging with undergraduate research initiatives, and further vindication to those already engaged in providing undergraduate research experiences for students.

**Funding disclosure**

This work was supported by the *Association of Learning Development in Higher Education* from September 2016 to July 2017*.*

**Declaration of conflicting interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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