

DOES A CONFERENCE ACT AS A CATALYST FOR FURTHER PUBLICATIONS AND COLLABORATIONS? A PILOT STUDY OF A SMALL SCIENCE AND MATHEMATICS EDUCATION CONFERENCE.

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ABSTRACT

Many university academics spend time and money attending national and international conferences each year. This initial longitudinal study seeks to investigate the perceived and actual benefits and outcomes specifically from delegates attending the 2009 UniServe Science Conference. This is a relatively small three day annual conference for science and mathematics educators. Data was collected from an online survey immediately after the event and another survey six months later. This revealed information concerning the demographics of the delegates and sought detail on the synergies and collaborations, articles and grants emerging in the short term from such a conference.

Networking emerged as the main benefit along with the opportunity to find out about new ideas to implement in their own teaching and research. Delegates indicated they had used ideas from the conference and shared these with others. However there was a decline in actual submissions to journals compared with the expectations of delegates immediately after the conference.

Findings lead to alternative formats for conferences and suggest changes to allow maximum benefits for all stakeholders.

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INTRODUCTION

Institutions and individual staff members invest considerable resources in conference attendance every year. For example, this three day conference, including airfares, accommodation, meals and registration fees represents an investment of at least \$800 per delegate in addition to the hours spent in preparation of papers and attendance at the event. The purpose of this study was to determine what delegates considered to be the short term and longer term benefits for themselves, colleagues and their institution as determined by change to practice, implementation of new ideas in research and/or teaching, publications and networking and collaboration opportunities. The results of the survey will influence the format of future conferences with the overall aim of improving outcomes for delegates. We were also interested to learn what were the unique aspects of this conference that attracted delegates and this aspect will be discussed in future papers, once the final survey is completed.

The activity of conferencing is defined by Nadler and Nadler (1987) as "a group of people who come together for a variety of purposes and vary in size and duration".(p.2) Generally delegates attend a conference because they have identified a need to broaden their knowledge by hearing from experts in a particular field, wish to find out recent developments/research, network with people in similar situations and with similar interests, or to share problems and accomplishments (Muir-Cochrane, Lawrence & Zeitz, 1991). In the university sector this has been a well recognised and intrinsically valuable activity for many years.

A literature search identified guidelines and recommendations concerned primarily with the running and organisation of the conference process over the past 30 years (Collins, 1985; McDonald, Neat,

Tanyu, Mason, Taylor-Ritzler, Blanton, & Reeves, 2004; Muir-Cochrane et al., 1991; Nadler & Nadler, 1987; Seadle, 2009); many of which advocated the importance of evaluation. Conference evaluation samples were available on the web, but these also focused on the logistics and aesthetics of the venue. Mueller (1982) questioned whether the evaluation sheets merely gave a 'happiness report' rather than rating the effectiveness of the event, and advocated the distribution of a further follow-up survey six months to a year after the conference to assist with this assessment process.

Further reading identified some research exploring virtual conferencing (Bell & Shank, 2006; Farkas, 2006) as an economic option with respect to both time and cost. In contrast Listservs (electronic mailing lists) blogs and wikis, with a focus on a particular topic and regularly updated, are continuous and therefore current and can provide immediate feedback. Hardesty and Sugarman (2007) carried out a 'Academic Librarians, Professional Literature and New Technologies' survey and 95% of respondents identified Listserv as their main method of keeping abreast with literature in their discipline.

Little was reported on the importance of the outcomes of a conference and how it had benefited the practice of the delegates. The exceptions were the field of academic librarians, who reported generally on the benefits of networking, discipline related information and research and social interactions (MacDonald et al., 2005; Tomaszewski & MacDonald, 2009); and the medical field (Davis, O'Brien, Freemantle, Wolf, Mazmanian & Taylor-Vaisey, 1999). The latter reported on 16 events involving either didactic or interactive sessions, or a mix of the two styles of pedagogy, and investigated whether any change in the delegates' practice was noted. No change in practice was recorded from the didactic sessions, however both the interactive and the mixed sessions showed statistically significant positive outcomes in practice.

THE STUDY

The annual UniServe Science Conference focuses on innovations in science and mathematics education research. Its aim is to provide an opportunity for tertiary science and mathematics educators to come together, share ideas and keep up to date on emerging research. This longitudinal pilot study sought to investigate the effectiveness of the 2009 conference with a view to improving the experience of the 100 plus delegates but more specifically to improve the benefits to teaching and research, hence developing a more productive community. These extrinsic benefits may take the form of collaborations, adopting technologies or pedagogies, or publications. Qualitative and quantitative data was collected from a series of online surveys. In previous years a short evaluation survey was conducted at the conclusion of each conference, which focussed only on logistics and the "feel-good" aspects of the conference. 2009 was the first time a more in-depth or longitudinal evaluation was undertaken.

In 2009 the three day conference included keynote lectures, workshops, seminars and social activities. This format has previously been identified as providing the optimum mix for change in practice (Davis et al., 1999). Delegates were invited to complete an online survey at the conclusion of the conference, and were informed that there would be two further follow-up surveys at six (Phase 2) and 12 (Phase 3) month intervals to assess the further effectiveness of the event as recommended by Nadler and Nadler (1987) but not reported on elsewhere. The online, anonymous survey was developed using 'Survey Methods' software, and access was sent to all delegates using email. It was estimated to take 15 minutes to complete, and included multi-choice and opportunity for extended responses. This paper discusses only the Phase 1 and 2 surveys, as the Phase 3 survey is yet to be distributed.

RESULTS

PHASE 1

The first of the voluntary, anonymous online surveys was sent out by email to each of the 115 delegates during the week following the conference. Questions sought information concerning the logistics and process of the event, but also asked the delegates to predict how their future activities might be influenced and responsive to the experience.

There were 75 responses, 65% of the original cohort, whose demographic is shown in Table 1. Almost half of these delegates had not attended previous UniServe Science conferences, and 70% of

the respondents had been presenters. Over 80% claimed to have attended because it was relevant to their area of research and it had been good in the past.

Table 1: Demographic details of survey responses from the UniServe Science Conference 2009
(Total delegates = 115 Phase 1 N=75, Phase 2 N=37)

Delegate	Total Delegates	Phase 1	Phase 2 (6 months later)	Delegate	Total Delegates	Phase 1	Phase 2 (6 months later)
Male	48	27	10	Academic	98	54	31
Female	67	44	28	General	7	7	3
No reply		4		Student	10	10	4
Age <30		9	3	First attendance Presenter	73	32	13
30-40		14	7				
41-50		20	12				
>50		28	16				
No reply		4					

Concerning the immediate outcomes from the conference, delegates were asked to comment on their likelihood of sharing ideas with colleagues or publishing from their presentation.

- Question: 'What ideas will you take back to your workplace and share with your colleagues?'

From the 75 survey respondents 40 extended answers were received to this question. They gave rise to a range of topics and coding the responses broadly identified that 75% of ideas were related directly to teaching and learning practice whilst 10% highlighted research ideas. Ideas linked with the conference theme of motivation and engagement were mentioned specifically in over 30% of the responses concerning students and once concerning staff colleagues. The keynote lecture on the educational theories on motivation was specifically applauded in 10% of responses. In a further 10% of comments innovative technologies were included as useful tools to be adopted. Generally, two respondents expressed pleasure in the interest shown and advice by delegates, and other comments highlighted the range of ideas and the collaborative nature of the conference.

- Question: Are you considering revising your work and publishing it in an educational research journal?

Responses indicating anticipated outcomes from the conference showed that 39 delegates (n=75) were considering the revision of their presentation with a view to publication within an educational research journal. Of these twelve respondents were able to name the journal likely to be targeted for their work, generally choosing ones that were ranked highly, or through recommendation. There were only two mentions of the UniServe Science publication *CAL-laborate International* and one comment highlighted the lack of journals publishing work on '*chemical education and teaching practice*'. Three noted that their research was ongoing and so not suitable for publication yet.

The value of social networking was highlighted in many responses, and more opportunities for formal networking was requested as an improvement to be adopted at future conferences

For example "a *networking session, where there is time allocated for people to legally sneak away in little groups for coffee and make plans, without missing any talks.*"

"Wanting to keep talking to the people who were there - but I guess we do have to return to work!"

PHASE 2

The second survey was emailed to delegates six months after the conference. The questions mirrored those from Survey 1, although questions relating to the logistics and satisfaction levels were omitted. Questions were tailored to prompt the delegates to reflect on how their recent activities had been influenced by their experience at the 2009 UniServe Science Conference.

There were 37 responses, which is 50% of the original respondents (32% of the original conference cohort) whose demographic is shown in the comparison column of Table 1. Could this reduced response rate be an indication that many delegates do not think about long term benefits from attending a conference and rather just see attending a conference as being a stand-alone benefit of their position?

Two questions asked delegates to comment on their continued contact with other delegates from the conference. The data is summarised in Table 2. About 70% of respondents stated that they had maintained links, many with already established relationships and half of the comments acknowledged the making of new contacts. 40% of respondents acknowledged that collaborations had taken place, several listing existing groups. These figures indicate that this is a positive aspect and that delegates have generally been able to develop and cultivate existing and new relationships. One response indicated that they had *“established a number of contacts to begin collaborative work with Sci Ed”*. Conversely, there was one first-time delegate who commented that *“as a first-time attendee being my first time, I found it quite difficult to actually meet and have meaningful conversation.”* This is one area that can be looked at for improvement at future conferences.

Table 2: Summary of the number of respondents indicating outcomes achieved following the UniServe Science conference 2009 (Phase 1 N= 75, Phase 2, N=37)

Descriptor	Phase 1	Phase 2
I have kept in touch with other delegates from the 2009 conference		25
I have collaborated with other delegates from the 2009 conference		15
I have used ideas/knowledge gained in my teaching		20
I have used ideas/knowledge gained in my research		15
I will/have shared ideas/knowledge gained with my colleagues	40	27
I will/have submitted a revised paper of my presentation for publication	39	4

Three further questions requested delegates to comment on their use of any knowledge or ideas, in the preceding six months.

- Question: Have you used any ideas/knowledge gained from the 2009 UniServe Science Conference in your teaching?

Over 50% of the respondents indicated positively, nine specific examples were cited, two of which included technology tools. Areas particularly mentioned were those of motivating students, improving laboratory sessions with ASELL, and assessment techniques. Two comments identified that insights provided by attendees at their presentation had influenced their practice. One comment was echoed several times in the negative responses *“but this is due to lack of time, not lack of worthwhile material”*.

- Question: Have you used any ideas/knowledge gained from the 2009 UniServe Science Conference in your research?

This question received a positive response from 40% of the cohort. Extended answers revealed a variety of outcomes from the utilisation of theories and ideas to extend personal research, stimulation of new areas of research and grant applications. One comment in this section opined that *“UniServe Science is a bit more ‘show and tell’ than theoretical, so it’s not as useful for research as it is for meeting people”*. However, to illustrate the diversity of responses, another commented *‘Our development and dissemination of teaching strategies under an ALTC grant has hinged critically on input and involvement gained via the UniServe Science conference. Subsequent conferences and teaching fora have gained us only a fraction of the information, interest and engagement offered by the UniServe Science conference’*.

- Question: Have you shared any ideas/knowledge gained from the 2009 UniServe Science Conference with your colleagues?

This question received the largest positive response, from 75% of the replies. From the 18 extended comments five related to introducing new technology and one referred to yet another ALTC grant application. Several delegates related opportunities to present their work and further feedback from the conference to their work colleagues. A further 75% of the responses agreed to recommend the 2010 conference to their colleagues. One comment stated *‘In a discussion of good education conferences UniServe [Science] was mentioned as being a good conference to attend’* and another *‘Highly recommended ...very valuable for both specific content/presentations and as a networking opportunity...’*

One further question involved the extent to which publications had been identified as an important outcome of the conference as it was linked to university funding.

- Question: Have you submitted a revised paper of your presentation for publication?

Of the 26 responses to this question four delegates had already submitted papers to journals within the six months following the conference. One of these had been accepted with minor revisions. The

remaining three authors had been invited to submit revised papers to the UniServe Science publication International Journal of Innovation in Science and Mathematics Education (IJISME) and these were under review. In Phase 1 there had been 39 delegates hoping to submit a revised paper for publication (Table 2).

DISCUSSIONS AND CONCLUSIONS

The extrinsic outcomes of conferences, in line with the literature, are social networks (Muir-Cochrane, Lawrence & Zeitz, 1991) and change in practice (Davis et al., 1999). Due to recent university funding demands, this study also sought to identify journal publications as being a third important outcome.

The main benefits of the 2009 UniServe Science Conference, as described by delegates are the informal and formal networking, synergies and collaborations. These are a key activity of the conference itself, but also clearly extend for the period up to six months. Three grant applications were reported as having been enhanced or initiated by collaborations ensuing directly from the conference. This is an aspect that could be further exploited through providing greater opportunities for formal and informal discussions along these lines during the conference and facilitating ongoing discussion groups.

Teaching has been identified as a key area for changes in practice, and, unlike Davis et al. (1999), the keynote lecture was explicitly mentioned as influencing change. Technologies also featured as a popularly adopted strategy for increasing student engagement. These areas of interest could be further explored during the Ideas Exchange section of the conference and/or workshops providing opportunities for delegates to try innovative technologies and practices. In this regard it will need to be remembered that delegates will have different perceptions of what is innovative, depending on their previous experiences with technologies. These differences are echoed in the following opposing comments from delegates in the Phase 1 survey

"This year, I had the impression that there weren't that many "new" ideas. That may be just because - now, after a few years of attendance - I've heard most of them before." and

"Sharing ideas, relevant, innovative and interesting practices"

The number of delegates who have shared ideas and knowledge gained at the conference with their colleagues is also a positive outcome. Whilst the actual number of delegates who indicated they have shared decreased between Phase 1 and Phase 2 the percent of positive responses, in relation to total number of responses has actually increased. This is most likely a reflection that delegates have had opportunities to hold these discussions with colleagues. It is also an indication that the benefits of the conference reach to a much wider audience than those who actually attend the conference. One way of assisting delegates to share knowledge and information could be to produce a summary document outlining the key points discussed during the conference. The logistics of producing this, including determining who contributes to the development of the document will require further thought.

The most disappointing outcome was the conversion rate of conference papers to journal articles with only four submitted articles identified in the Phase 2 survey, compared with the expected 39 indicated in the Phase 1 survey. This may reflect the relatively short time frame of six months, and supports the implementation of Phase 3 of the study. It is also interesting to note that the successful papers were invited submissions. This suggests that a continuation of a Special conference issue of the journal would be a worthwhile exercise as an invitation to submit appears to provide the necessary motivation to develop a paper.

The final survey, Phase 3, may see some of this balance redressed as work commitments change through the semesters and delegates will have had further time to develop their research and submissions.

It would appear that, for the UniServe Science Conference, there are many benefits of the traditional format mainly due to the social networking involved. All delegates participating in the survey agreed that they would consider attending the 2010 event, which implies that, regardless of constraints of time and expense, the overall experience is seen as valuable.

There are some constraints on the inclusion of any of the suggested changes to the format of the conference.

- The final phase of the evaluation will be completed at the end of September, leaving insufficient time to implement any changes for 2010
- Since the 2009 conference, there has been a change in the team and management structure of UniServe Science which may have some effect on the introduction of these suggested changes. It is though hoped that at least some of these will be able to be implemented in 2011.

Phase 3 of the study will provide further information concerning the longer term outcomes of such an event for science and mathematics educators. Evaluation of this final phase will hopefully provide further insights which will lead to enhancements of the format for future conferences.

Possible areas for further studies include comparisons with larger conferences and their outcomes and comparison of this survey with surveys of future conferences, with enhanced format, to determine whether the changes suggested from the current research do prove to be of long term benefit to delegates.

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