What's the Value of a Doctoral Consortium? Analysing a Decade of LAK DCs as a Community of Practice

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Abstract

Since 2013, the Learning Analytics and Knowledge (LAK) conference has included a Doctoral Consortium (DC), supported by the Society for Learning Analytics Research (SoLAR). Given the LAK25 conference theme of 'expanding the horizons of learning analytics', it is timely to reflect on how well the LAK DC is meeting its objectives of building capacity in the field and developing the next generation. We frame the DC as a structured entry into the LAK community of practice (CoP), familiarising students with the domain of learning analytics, understanding its practices, and building connections with other members. CoPs generate five types of value for their members: *immediate, potential, applied, realised* and *reframing*. This study used a survey of the 92 DC students from the first decade (2013–22), supplemented with scientometric analysis of LAK publications, to address the questions: *What value do students gain from attending the LAK doctoral consortium?* and *Do students gain the same value from face-to-face and virtual doctoral consortia?* Thematic analysis of responses (N=37, a 40% response rate) showed that students gained a wide range of immediate and potential value from the DC, which in many cases also prompted changes in practice, performance improvement or redefinition of success. However, the value reported by a third of respondents who had attended virtually was more limited. We note that, despite the value already offered, the DC could provide clearer routes both to future community engagement and to extending goals that expand the horizons of learning analytics. This paper's contributions are (i) the first systematic documentation of student perceptions of LAK DCs, (ii) identification of ways in which doctoral consortia can be developed in the future, and (iii) specific attention to how virtual DCs can offer greater value for both participants and the host community of practice. The findings related to future development and value do not apply only to LAK but can be generalised to other doctoral consortia.

CCS Concepts

• **Applied computing** → Education; Collaborative learning; • **Social and professional topics** → Professional topics; Computing education; Computing education programs; Professional topics; Computing profession; Computing organizations.

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Keywords

communities of practice, doctoral consortium, immediate value, potential value, applied value, realized value, reframing value, thematic analysis, qualitative research

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1 INTRODUCTION: DOCTORAL CONSORTIA & COMMUNITIES OF PRACTICE

The term 'doctoral consortium' may be understood in a variety of ways [1]. It is used to describe a co-operative arrangement involving Higher Education institutions or departments within the same institution working together to provide training for doctoral students [2]; a multi-day event involving workshops and presentations by experts (similar to the Learning Analytics Summer Institute, LASI); or a one-day event at which doctoral students present and discuss their work with peers and experts. The one-day event is the form taken by the doctoral consortia in this study – those associated with the LAK conferences (the *LAK DC*).

LAK DC events run in parallel with workshop sessions at the start of the annual conference. They typically involve around ten students who, after a competitive application process, receive funding from SoLAR, together with three or four organisers and a set of expert mentors. As outlined in the annual call for applicants, the LAK DC typically provides students with opportunities to present, discuss and receive feedback on their work; network both formally and informally with other participants; and learn about career options in the field. Afterwards, they are expected to participate in the full conference and present at the main evening Poster session. This model assumes face-to-face engagement, but the COVID-19 pandemic resulted in three LAK DCs (2020–2022) moving to an online form of the 'tried and tested format' [3], a change that we discuss in the light of the data presented in this paper.

The objectives identified in calls for participation for all LAK DCs, face-to-face or online, indicate the role of the event in expanding the horizons of learning analytics. Since the 2014 LAK DC, these objectives have included 'building capacity in the field'. Recent calls, including 2025, have added, 'develop the next generation of learning analytics researchers and active members of SoLAR'.

All types of doctoral consortium play a role in *academic socialization*, "the processes through which individuals gain the knowledge,

Table 1: CoP Values –Types of Value Associated with a Community of Practice [9]

No.	Type of value	Examples of this type of value
1	Immediate value: activities and interactions	Fun, inspiration, answers, solutions or help.
2	Potential value: knowledge capital	Resources that might be used in the future: skills, information, connections, tools, or new approaches to learning.
3	Applied value: changes in practice	Making use of knowledge capital by changing a procedure, implementing an idea, or using a tool.
4	Realized value: performance improvement	The change in practice has a positive effect on achieving what matters to the individual or community.
5	Reframing value: redefining success	A shift in the criteria for individual or community success: new frameworks, metrics, strategies or goals.

skills and values necessary for successful entry into a professional career requiring an advanced level of specialized knowledge and skills" [4, p5]. In the case of learning analytics, doctoral students are not simply developing as academics, they are also entering the "global community of researchers, practitioners, and educators" [5] associated with this field of study. More specifically, the LAK DC can be considered a form of legitimate peripheral participation in an international academic learning analytics *Community of Practice (CoP)* [6], which is considered in this paper to be made up of individuals who engage with the LAK conference, the *Journal of Learning Analytics* and/or SoLAR. Wenger's influential work on CoPs identifies three key attributes. The first is shared interest – their *domain*. Members of the community have some commitment to and competence within the domain, and they are aware of what expertise looks like. The second is *community* – membership is not conferred by being co-located or employed in the same role; members interact and learn from each other. The third is *practice* – members do not simply share an interest or possess theoretical knowledge, they are practitioners [6].

Lave and Wenger characterise the significant route into a CoP as being through *legitimate peripheral participation* [7]. This is a stage during which newcomers become familiar with the practices and languages of the group before becoming an active member. Their participation is *peripheral* in that during this phase they may contribute little or nothing to the community, but this lack of contribution is accepted as *legitimate* by others because the newcomer has committed in some way to community membership. Most CoPs include people who can be considered knowledge brokers [8]. They help the process of legitimate peripheral participation by introducing individuals to the ideas, tools, people and history associated with the community.

The LAK DC lists as one of its objectives to *'develop a supportive, multidisciplinary community of learning analytics scholars'* — making this an important form of legitimate peripheral participation within the learning analytics CoP. Specifically, CoPs can offer five types of value to members [9] which this paper will use as a lens through which to make sense of DC participants' experiences and other data sources. These will be referred to as *CoP values* (Table 1) which provide a more nuanced account than the simpler immediate vs lasting distinction used in [10].

1.1 Research questions

Given the LAK25 conference theme of 'expanding the horizons of learning analytics', it is a timely moment to reflect on how well the LAK DC is meeting its objectives, and the scope for making changes going forward. This research study therefore asks the following primary research question:

- RQ1: What value do students gain from attending the LAK doctoral consortium?

In addition, since three recent DCs convened online, we ask:

- RQ2: Do students gain the same value from face-to-face and virtual doctoral consortia?

2 METHOD

2.1 RTA qualitative coding of survey responses

The research focuses on the experiences of the 92 individuals who attended one of the first decade (2013–2022) of LAK DCs as doctoral students. With research ethics approval from University of Technology Sydney, and formal support from SoLAR, each of these individuals was contacted and asked to complete a 23-item survey relating to their experience at the doctoral consortium. Thirty-seven individuals completed the survey, a response rate of 40%. These included at least one participant from each LAK DC: 2013 (1), 2014 (1), 2015 (5), 2016 (5), 2017 (2), 2018 (7), 2019 (4), 2020 (4), 2021 (6), 2022 (2). Respondents had studied for their doctorate in Australia (9), Belgium (1), Canada (2), Germany (1), Mexico (2), Netherlands (2), Norway (2) South Africa (1), UK (6) and USA (11). When they completed the survey, 27 were employed in academia, four were still research students, another three were research students employed in academia, two held non-academic jobs inside higher education (HE) institutions, and one held a non-academic job outside an HE institution.

In the analysis that follows, each respondent has a unique identifier made up of their year of participation followed by a random letter. Of the respondents, two-thirds had attended a LAK DC in person, and a third had attended virtually. Virtual attendees were associated with 2020–22, when the DC was held wholly online due to the COVID-19 pandemic, and from 2013, when a blended session allowed attendance via Skype.

In order to answer RQ1, responses to four free-text survey questions were analysed (SQs 1-4):

SQ1. Looking back, what information/advice was most valuable you received at the Doctoral Consortium, and why?
SQ2. Did the Doctoral Consortium influence your thesis and/or your subsequent research? Please give details.
SQ3. What effect do you feel the Doctoral Consortium has had on your career path? Please give details.
SQ4. Please share any other thoughts you have on the Doctoral Consortium and its outcomes (e.g. on what worked well, limitations/gaps)

Five codes were used for deductive coding using Reflexive Thematic Analysis (RTA) [11], grounded in the five *CoP values* introduced above: *immediate, potential, applied, realized* and *reframing* [9]. Braun and Clarke [11, p1] take care to differentiate RTA from other qualitative coding methodologies which use code-books to support more quantitative content analysis. In contrast, RTA is an example of a class of approaches that "view the practice of TA as inherently subjective, emphasize researcher reflexivity, and reject the notion that coding can ever be accurate—as it is an inherently interpretative practice, and meaning is not fixed within data" [11, p2]. Consequently, the trustworthiness of the analysis is evidenced using qualitative criteria, including fit, applicability, contextualization and evidence [12]. As part of this process, we are making the thematic analysis and associated memos available.

In addition, a thematic analysis of the objectives of the LAK DC was carried out, in order to establish whether any value reported by participants aligned with the stated intentions of organisers. Finally, in order to answer RQ2, responses from those who attended virtually and in person were considered separately.

2.2 Scientometric analysis

We conducted publication analysis of doctoral students participating in the 2014, 2015 and 2016 LAK DCs, in order to investigate whether participants had become part of a learning analytics community of practice. These earlier student cohorts were selected to provide sufficient time for participants attending the DC to build their network and publish within the learning analytics community. The publication dataset for the learning analytics community was obtained by conducting a DOI search in the Digital Science *Dimensions* database (dimensions.ai). These DOIs were acquired from ACM Digital Library LAK proceedings 2011–2024. Following this, author names were disambiguated and visualised as network maps using *VOSviewer* software (vosviewer.com). The doctoral student cohort (2014–2016) and other researchers in the network were assigned distinctive colours to enable observation of change across time. In addition, the publication dataset from Scopus was used to visualise collaboration between a number of LAK DC students as a result of attending the doctoral consortium.

3 RESULTS

We present the findings as a narrative combining qualitative and quantitative evidence. Broader discussion points are then presented.

The co-authorship network of LAK proceedings was produced for years 2011–2020. Each circle or node on the co-authorship network map in Figure 1 represents a researcher, with the node size being indicative of publication volume (larger nodes indicate greater publication numbers). Each line indicates a co-authorship relationship between researchers. Researchers who appear closer to the centre of the map have a greater number of publications and therefore contribute considerably to the community.. The participation of the 2014–2016 LAK DC cohort (N=27, i.e., not just the 11 survey respondents from those years) is shown and differentiated using red nodes.

The engagement of these newcomers is consistent with legitimate peripheral participation. Most of this group of students (red nodes) are situated at the edge of the co-authorship maps at the start (Figure 1a) and are seen to move closer to denser areas of the co-authorship map over time (Figure 1b). It is noted that 2014–2016 LAK DC students were already connected to the community prior to LAK 2014, with three connected to denser areas on the co-authorship network map through their supervisors. Survey respondents from this cohort reinforce this finding — of the 11 respondents from those years, five progressed to senior roles within the learning analytics community, including two members of the SoLAR executive, and two serving as Co-Chairs of subsequent LAK DCs. Eight returned to the LAK conference two or more times, and two others would have returned if they had had access to funding.

A specific co-authorship metric we can derive from this graph is link weight, which counts the number of co-authorship links per author. This is therefore a plausible indicator of how connected into the LAK CoP a student becomes each year. Clearly not all students pursue academic or industry careers that result in LAK publications, as seen in Figure 2, which graphs link weight over the period 2014-2024 for students from the 2014-2016 DCs. However, some attendees developed dense networks within the LAK community and Figure 3 shows three of these. These students' collaborative networks, although unconnected in 2014, have well connected co-authorship networks with link weight of above 10. In addition to the co-authorship of a paper in 2015 by students who had attended the 2014 DC [13], this connection has also facilitated growth of collaboration with researchers in each other's networks. We note that the 2016 cohort co-authorship link weight is different from previous 2014-2015 cohort. This could be due to lower publication numbers in Learning Analytics community attributed to a number of students moving into other areas, which is a point to consider for future work.

We were interested to check for any features that distinguished survey non-respondents, but there was no discernible pattern in the co-authorship link weight metric. We also examined differences between academia/non-academia: of the *total DC participants*, 77% were in academia (73); within the survey's *respondents* (40%, 37 respondents), all but three were from academia (92%, 34 respondents). In contrast, only 67% of the *non-respondents* (37) were from academia, with 33% (18) non-academia. It thus proved harder to engage DC participants outside academia, who were also less likely to be engaged in the LAK community.

3.1 LAK DC objectives analysis

This analysis uses the five CoP values (defined in Table 1) — *immediate, potential, applied, realized* and *reframing* — to consider whether the value gained from DC attendance aligned with the objectives of DC organisers. The focus in this phase of the analysis

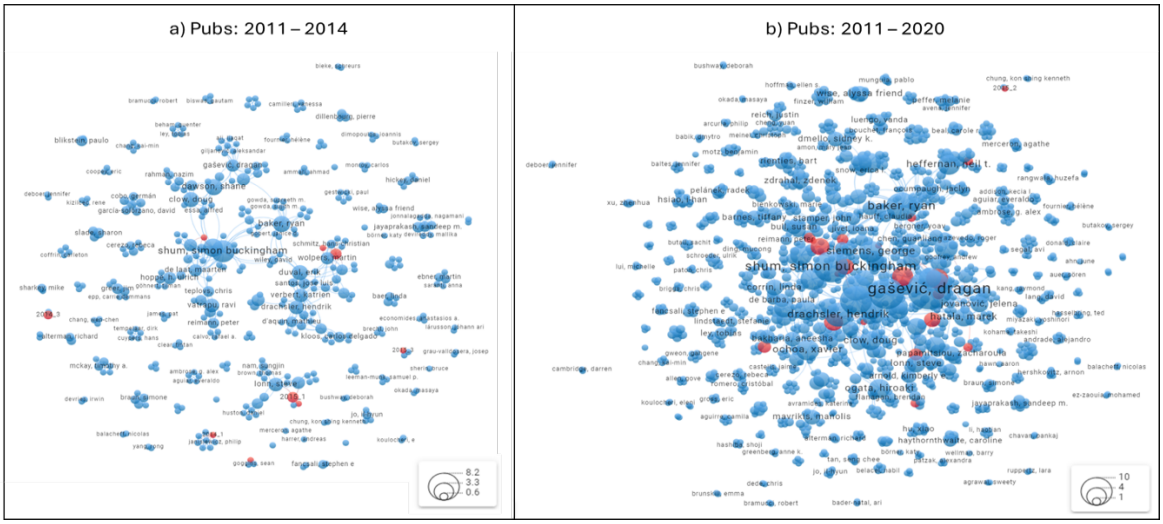

Figure 1: LAK co-authorship as a proxy indicator for legitimate peripheral participation in the SoLAR community of practice. Some DC 2014–2016 participants (in red) move towards more central positions in the LAK proceedings co-authorship network.

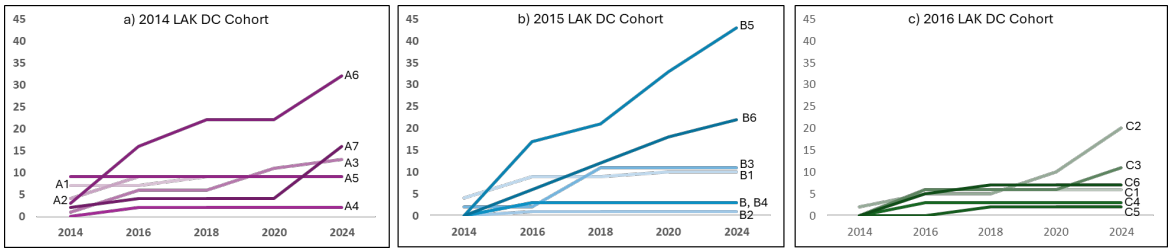

Figure 2: Growth from 2014-2024 in co-authorship link weight for students who attended 2014–2016 LAK DCs.

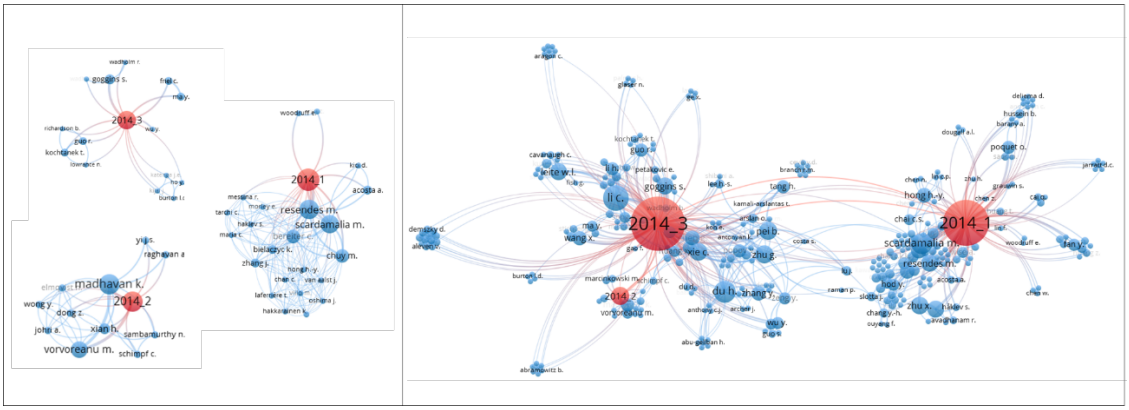

Figure 3: Co-authorship network of three 2014 LAK DC cohort students (in red nodes) prior to (left) and after the 2014 DC (right).

was on the event itself, rather than on later outcomes. Objectives were extracted from all calls for participation for LAK DCs that are still available online, and included not only the labelled objectives within those calls but also statements of intent within the main body of the text. Twenty-one objectives were identified (Table 2).

In relation to the first 18 of these objectives, at least one respondent in each case mentioned immediate value and at least one respondent mentioned potential value gained at the LAK DC. In relation to objective 1 (inspiration), for example, 2019D commented *'In the LAK I get the contacts, reference and inspiration to put the work*

Table 2: LAK Doctoral Consortium objectives, distilled from the calls for participation 2013–22

No.	Type of value
1	Inspire students during their ongoing research efforts.
2	Provide guidance on future research directions.
3	Support emerging scholars in the field.
4	Expose students to a wide range of different analytic approaches, methods, and tools.
5	Provide opportunity to present research in a supportive interdisciplinary and international atmosphere.
6	Provide opportunity to discuss research in a supportive interdisciplinary and international atmosphere.
7	Provide opportunity to present research at poster session.
8	Provide advice and discussion on career development.
9	Support the building of professional networks.
10.	Provide a setting for mutual feedback on current research.
11.	Provide informal opportunities for networking with students and mentors.
12.	Provide feedback in a supportive interdisciplinary and international atmosphere.
13.	Provide feedback from experts in the field.
14.	Provide opportunities for discussion with experts in the field.
15.	Enhance the conference experience through interaction with doctoral consortium participants and mentors.
16.	Engage in discussion about professional issues.
17.	Consider how individual work may impact and intersect with larger learning analytics issues.
18.	Develop a supportive, multidisciplinary community of learning analytics scholars.
19.	Foster a spirit of collaborative research across countries, institutions and disciplines.
20.	Build capacity in the field.
21.	Develop the next generation of active members of SoLAR.

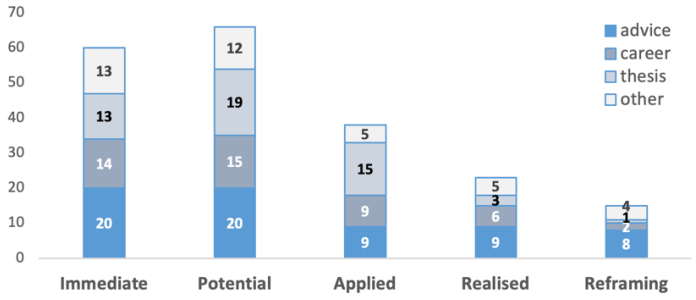

Figure 4: Frequencies of the five CoP values coded in responses to survey questions SQ1-4

together' and 2018D noted *'it definitely inspired ideas for subsequent studies'.* In relation to objective 9 (professional networks), 2018F considered, *'The doctoral consortium is helpful in connecting new LA researchers and supporting us in building a network',* and 2016D stated that *'Networking was essential as I'm not in a CS or learning analytics focused department.'*

The final three objectives as set out in Table 2 (objectives 19–21) have a focus on the future, are largely concerned with the community rather than the individual and were not linked by respondents with either *immediate* or *potential* value. However, the survey question 'Have you collaborated with anyone you first met at the Doctoral Consortium?' revealed that eight respondents had since co-authored papers with LAK DC participants. 2014A stated they had *'co-authored with two peers on a LAK paper in the subsequent year; organized workshops with one peer and one mentor at LAK; co-authored a chapter with one mentor years later'.*

3.2 RTA coding of survey responses

The frequencies of the five CoP values coded in responses to the survey questions SQ1 (advice), SQ2 (thesis), SQ3 (career) and SQ4 (other) are shown in Figure 4. We now examine these responses to each question in detail.

3.3 (SQ1) What information/advice was most valuable, and why?

Of the 37 respondents, 35 answered this question. Table 3 shows two illustrative responses, and the total frequency of the five CoP values coded (see the supplementary dataset for complete table). Italicised text represents the memo associated with the coding in each case and green shading indicates a positive coding. So, for example, the response from 2016B was considered to identify immediate, potential and reframing value but not applied or realized value.

Table 3: Two illustrative responses to *SQ1: What information/advice was most valuable you received, and why?* coded against the CoP five values, with total frequencies from the complete response dataset.

ID	Comment	Immediate	Potential	Applied	Realised	Reframing
2016E	I think the most valuable thing I took away was that people were interested in my work and that not many people were doing work on a similar topic - that helped give me motivation for finishing my thesis. However, it also meant that there was limited advice received because not many people had expertise in my specific topic.	*Motivation and a little advice*	*Motivation*	*Motivation for finishing thesis*	*Motivation for finishing thesis*	*Reconsidered the value of their work*
2016B	Hearing the scope and scale of other people's dissertations was incredibly valuable for affirming that I was doing "enough" Getting presentation and narrative feedback from people external to my space Being connected to doctoral students in my area but in other programs"	*Hearing about others' work and getting feedback*	*Connections to others*	*No evidence they applied this*	*No stated effect on achievement*	*Adjusted their ideas about the scale of PhD research*
Total code frequency from all responses to this question		20	20	9	9	8

Next, we break down the five CoP values reported by the DC students in response to SQ1:

Immediate value At the event, they reported interacting with experts / mentors; discussing methodology and engagement; receiving general and career advice; receiving guidance / explanations; feeling they were in a community, giving and receiving feedback; peer mentoring; networking, and seeing their work valued.

Potential value In terms of knowledge capital, at the event they benefited from feedback and advice from peers and experts; guidance on analysis; career advice; a sense of community as well as a connection to other doctoral students; increased knowledge of and discussion about the field of learning analytics; skills in peer mentorship and the provision of feedback; moral support and motivation.

Applied value Nine respondents identified ways in which they had changed their practice because of the DC. In the short term, it had enabled them to get more out of the wider conference. Some had changed the direction of their research; reduced their research to a realistic scope; built on the experience as they framed their research questions or their dissertation as a whole; or identified the subject that drove their thesis. The DC gave some respondents confidence to move forward and motivation to finish; impacted decisions regarding scholarly community; and enabled them to form networking connections that enabled them to maintain their research agenda. In the longer term, they developed skills they now use when supervising, and gained an intellectual home.

Realised value The DC variously enabled and motivated them to complete their thesis; enabled them to maintain their research agenda; helped them to understand the significance of their work; nurtured interest in learning analytics and membership of the community, and impacted on perceptions and choices related to academia.

Reframing value Eight respondents mentioned ways in which they had redefined success or had been reassured that their current criteria were appropriate. Some had rephrased objectives, shifted their approach, made their work more accessible, set specific goals and set more realistic goals. Others were reassured that the scope or scale of their work was correct and that their work was valuable and should continue. In the longer term, they identified what they needed to do to develop a productive career in academia and identified directions in which to expand their research.

Seven responses specifically mentioned a sense of learning analytics as a community. These included:

- 2015B: 'they helped make the community feel like an intellectual "home" for me. That was a unique and lasting experience for me, and probably significant in nurturing my interest in LA'
- 2021B: 'I was so happy to find a community that said I should keep coming and keep doing my work.'

Several students were prompted to reconsider the value of their research. For example:

- 2017A: 'It helped me take my own work seriously.'
- 2015D: 'I felt my work is valuable enough to be discussed by my peers, and by my mentors.. never had such experience again in any other research avenue in my academic life'

3.4 (SQ2) Did the Doctoral Consortium influence your thesis and/or your subsequent research?

Of the 37 respondents, 29 identified some type of influence on their research.

Immediate value Most (18) of the participants who responded to this question gave answers indicating the DC had immediate value for them. It was an opportunity to share work, receive feedback (variously described as positive/negative, moral, practical, hugely influential), make connections with people who would impact future research, have conversations with colleagues, be mentored by key academics / experts, feel a member of a community, identify references, receive advice on theoretical perspectives, learn how to talk about their research, identify questions to ask, frame goals, lift spirits, feel encouraged, increase motivation and persistence, gain confidence and inspiration.

Potential and applied value In most cases (27), participants identified potential and/or applied value, which in this case were very closely related – the doctoral consortium shifted their thinking or gave them ideas, and they went on to apply those to their research. Variously, they changed their approach to learning analytics; refined their research questions; shifted the direction / focus / framing / goals of their work; changed their method of data analysis; identified a relevant framework or theoretical perspectives; gained the contacts, references, motivation and inspiration to finish their thesis; and gained inspiration for future research. Social benefits were more likely to be framed as having potential rather than applied value. Respondents mentioned their increased understanding of the field of learning analytics and its significance for their work, getting to know key academics in the field, meeting fellow researchers with whom they could connect and collaborate in future, learning to use the correct terminology for the discipline, and identifying as a community member

Realised value There were fewer references to this type of value (5), and some comments noted that value had either not been realised or little value had been realised. One participant did not meet anyone else who was interested in the same subject. For others, the change was small, the doctoral consortium was only a marginal influence, 'nothing major' (2018C). A few were clear about realised value from the event, referring to better focus, better understanding of learning analytics, introduction to a framework that had provided significant value, and 'a profound impact on the direction of my thesis and subsequent work'.

Reframing value In four cases, the doctoral consortium had reframing value – it made participants think differently about what they were aiming for. These students refined their research questions, changed the direction of their thesis, aligned their work with a new framework, shifted their disciplinary focus, or set themselves new goals.

3.5 (SQ3) Did the Doctoral Consortium influence your career path?

Of the 37 respondents, 24 identified some type of influence on their career.

Immediate value Of those who responded to this question, the majority (20) identified some kind of immediate value. Some of this was about seeing their work in the context of others. They could see other students' work, gaining a sense of the size and scope of PhD projects, and they also received advice, close mentoring, insights and expert feedback. The event helped to develop important academic skills such as writing, presentation, reflection, completing a thesis and considering future careers – although only in one case did a respondent phrase these as generalisable skills. Participants emphasised the connections they made, seeing the DC as a networking event where they got to know others doing interesting work, interacted with peers, were introduced to key scholars and LAK committee members, and built relationships with other researchers. Some left encouraged and motivated, with a feeling of belonging to a community, a sense of being part of the discipline of learning analytics.

Potential value Most respondents (21) identified some form of potential value. Relationship building and contacts who could be followed up on were mentioned several times, as was awareness of a learning analytics community / network and a sense of becoming part of that community. Participants received ideas and advice, insights and new ideas. They developed useful skills and were motivated to continue.

Applied value The potential value gained by participants did not necessarily translate into applied value – only 12 respondents referred to putting this value into practice after the event. Most commonly, they followed up on contacts or changed their research in some way, and some considered the doctoral consortium had helped them to finish or defend their thesis. The contacts sometimes led to ongoing friendships or work relationships.

Realised value There were nine instances of realised value. The DC helped some participants to achieve goals associated with doctoral students: being a member of an academic community, writing their dissertation, defending their thesis, completing their PhD, establishing their research, moving on to postgraduate work, finding people to work with, or shaping their career trajectory

Reframing value Seven participants reported reframing value. One changed their objectives, others confirmed their goals or the alignment of their goals, one added a new goal, and two shifted their goals for subsequent work.

3.6 (SQ4) Other thoughts you have on the Doctoral Consortium and its outcomes

There were 33 responses to this question, although some included no information. Overall, this question did not reveal much about value, although it indicated some of the things students were hoping to get from the doctoral consortium. Responses also indicate dissatisfaction with a virtual consortium as opposed to one that was face to face, as well as frustration with a consortium with too many participants. Participants felt these aspects reduced the value for them.

Immediate value Twenty respondents mentioned some immediate value although this was sometimes vague – the event was 'useful' or 'impactful' in an unspecified way. More specific responses referred to mentoring, networking, connecting with other new learning analytics researchers, (expert) feedback, advice from senior researchers, shaping thinking, interaction with senior academics, an opportunity to learn about the field, the culture, the

Table 4: Comparison of the five *CoP values* coded for Face-to-Face (F2F) versus Virtual DC participants

	Immediate	Potential	Applied	Realised	Reframing
F2F	60	66	38	23	15
Virtual	28	30	13	9	13

environment, respect and empathy, the poster demonstration, panels, and peer learning. One respondent's expectation of being able to mull over or exchange ideas was not realised – this was put down to limited time and being online.

Potential value Sixteen respondents mentioned or implied some potential value. In most cases, this was because the immediate value also had potential value – networking, mentoring, [expert] feedback and advice, peer learning, understanding of the community's culture, the ways in which their thinking had been shaped, and experience gained at the poster session. They also came away with knowledge of the field, ways of contributing to it, and ways of developing their careers. Other respondents felt their expectations of what they would take away were not realised. One felt they were not able to build networks and collaborations, partly because of their location (Australia) and partly because they were working in a different area to others. Another felt they could have exchanged ideas, producing both immediate and potential value. A third had expected more opportunities to engage with leaders in the field

Applied value Six respondents mentioned or implied some applied value. The event was useful, impactful or impacted on their career in an undefined way. It shaped thinking and did prompt some networking. On the other hand, one participant had expected to be able to collaborate with others, but this did not happen; another would have liked the applied value of having their paper published in the conference proceedings

Realised value Six respondents implied some realised value. One was grateful for the experience, two felt it had significant career value, others that it came when it was needed, shaped their thinking, or built a network.

Reframing value Four respondents mentioned or implied some reframing value. For them, the DC identified ways of contributing to the field, shaped thinking, changed the arc of a career, and introduced a community to be cherished.

3.7 RQ2: Online versus offline DCs

Overall, there were 80 responses to these four questions from people who had attended the LAK DC face to face, and 40 responses from virtual participants. Table 4 shows the frequencies of CoP values with which these were coded.

The relative distribution of the five CoP value codes looks broadly similar, with *immediate* and *potential* value at similar levels, and *applied* and *realised* approximately half and one third as frequent, respectively. While *reframing* was the least common value for F2F attendees, it was relatively higher for virtual attendees. These are low numbers for statistical comparisons and are influenced by the fact that most of the virtual responses were from the most recent attendees, who had had little time in which to gain applied or realised value.

Respondents shared 11 comments relating specifically to the DC being online, a sample of these are shown below (see full dataset for all):

- 2020D: I attended during a year when everything was online. My experience was quite different from some of my PhD colleagues, who attended in-person in an earlier year. It was great to meet others in the panels, but there was much less opportunity for informal chat and support. I think that's why I didn't stay in touch with anyone.
- 2021B: I REALLY wish I could've been in person. I think some of my answers would've been different if I had been in person. That being said, it came at the time I needed it most, and I'm so glad I did it!

In the discussion we consider how virtual DCs might be improved.

4 SUMMARY OF COP VALUES REPORTED BY DC PARTICIPANTS

Summarising the preceding sections, Table 5 distils the diverse ways in which the five CoP values (as introduced in Table 1) were experienced by LAK DC participants.

5 DISCUSSION AND LIMITATIONS

5.1 RQ1: Value from LAK DCs

Together, the scientometric analysis and the reflexive thematic analysis of the survey data indicate that there is a community of practice associated with learning analytics and the LAK conference. Students at the LAK DC enter as newcomers or as those already on the periphery and, in most cases, become increasingly active members over the next few years. Recent attendees would have had little time to develop their community membership by the time they responded to the survey in 2023, but a focus on participants from 2014–16 shows that the majority subsequently became increasingly engaged community members. This is reflected in the free-text responses – nine respondents made references to LAK as a community, all using positive terms. As 2015D said, 'We all cherish the community.'

More broadly, the networking and interaction made possible by the DC provided a great deal of value. In the context of research and advice, the emphasis was on community support and encouragement. In the context of careers, more stress was laid on networking. Although many participants went on to become active community members, the value of community was typically presented in terms of its immediate and potential value. Future DCs could take the opportunity to identify clear paths into the community — people to contact, opportunities to maintain and build connections, and possible next steps in terms of contributions. Participants could be prompted to identify ways of making use of the potential value

Table 5: How LAK DC participants experienced the five *Community of Practice values*

1. Immediate value	
Academic activities Shared work •Learnt how to talk about their research •Identified questions to ask •Framed goals •Gave feedback •Discussed methodology •Saw work in context of others •Got a sense of PhD size and scope •Developed academic skills: writing, presentation, reflection, completing a thesis •Considered future careers •Shaped thinking •Participated in poster session **Expert support** Feedback •Guidance •Mentoring •Advice •Careers advice •References •Theoretical perspectives	**Community** Connected with other students •Interacted with experts and community leaders •Felt a member of a community •Felt part of the field of LA •Got to know others doing interesting work •Interacted with peers •Received feedback from peers •Built relationships with other researchers •Learned about the field, its culture and environment •Engaged in peer learning **Affect** Saw work valued •Lifted spirits •Felt encouraged •Increased motivation and persistence •Gained confidence and inspiration •Received respect •Received empathy
2. Potential value	
Academic activities The academic activities at the DC meant participants developed important academic skills: related to writing, presentation, reflection, completing a thesis. They also developed teaching skills related to peer mentorship and giving feedback. **Expert support** Mentors' guidance, feedback and advice at the DC shifted participants' thinking and meant they left with ideas about analysis, about references to follow up, theoretical perspectives. In the longer term, the DC inspired ideas for future research, how they might develop their careers, and ways in which they could contribute to the field	**Community** Interacting and building relationships with experts, community leaders and peers at the DC gave participants contacts and networks they could draw on in the future, providing the basis for possible collaborations. Feeling a member of a community and part of the field of LA were connected with increased understanding of the field, and an awareness of the wider community and its culture **Affect** The positive feelings participants experienced at the DC gave them moral support and motivation to continue
3. Applied value	
Academic activities The academic activities at the DC led to some significant changes. These included shifting thinking, changing the direction of participants' research, reframing their dissertation or their research questions, reducing research to a realistic scope, identifying the subject that drove their thesis, changing their method of data analysis, identifying a relevant framework. Participants developed skills that they now use when supervising. **Expert support** Mentors' guidance, feedback and advice at the DC shifted participants' thinking and meant they left with ideas about analysis, about references to follow up, theoretical perspectives. In the longer term, the DC inspired ideas for future research, how they might develop their careers, and ways in which they could contribute to the field	**Community** Interacting and building relationships at the DC helped participants to get more out of the conference and provided a sense of an intellectual home. The DC provided connections that sometimes led to ongoing friendships or work relationships, and that enabled them to maintain their research agenda. It linked them to fellow researchers with whom they were able to collaborate, and connections to key academics in the field. They gained an understanding of how the field of learning analytics had significance for their work. **Affect** The positive feelings participants experienced at the DC gave them the confidence to move forward and the motivation and inspiration to complete their doctorate and defend their thesis.
4. Realised value	
This was considered in relation to what can be expected to matter to a doctoral student – completing their PhD successfully, finding an academic home, and developing their career **Academic activities / expert support** Mentors' guidance, feedback and advice at the DC was 'invaluable' and had 'a profound impact on the direction of my thesis and subsequent work'. 'I get all that I needed to finish my thesis'. The DC led to activities that helped with thesis completion, being directly linked to focusing research, shaping thinking, framing research questions, identifying key areas and frameworks, writing the dissertation, defending the thesis and completing the PhD. The DC also had significant career value as it helped with longer-term decisions about research agenda, perceptions and choices related to academia (including whether to remain in academia), moving on to postdoctoral work, establishing their research, and shaping their career trajectory.	**Community** Interacting and building relationships at the DC gave participants a better understanding of learning analytics, membership of an academic community, and a network of people that enabled them to find people to work with in the future. **Affect** The positive feelings participants experienced at the DC gave them a sense of the significance of their work and the motivation and confidence to complete.

5. Reframing value	
Academic activities / expert support Most reframing value was expressed in terms of goals related to doctoral study. Some participants confirmed their goals or the alignment of those goals. Others shifted their goals / objectives, added new goals, developed specific goals or set more realistic goals. Some changed their research questions, others changed direction, shifting disciplinary focus, aligning with a new framework or making their work more accessible. Looking further forward, they were able to set career goals, identify directions I which they could expand their research in future, and changed the arc of their career.	**Community** The DC helped to identify ways of contributing to the field and introduced a community to be cherished. **Affect** The DC gave confidence by affirming that the scope/scale of work was correct, and by providing reassurance that the work was valuable and should continue.

gained from the DC. While several respondents referred to networking opportunities provided by the DC, none of them mentioned the development of networking skills. Two objectives of the DC are 'Support the building of professional networks' and 'Provide informal opportunities for networking with students and mentors' and these might be achieved more readily by introducing explicit networking strategies, and by preparing participants for the different networking opportunities offered by the LAK conference and community.

Academic activities and expert support at the DC offered both immediate and potential value. In some cases, the effect was much more extensive and long-lasting because attendees gained reframing value. They rethought their goals and redefined success — they sometimes changed their entire research trajectory or career path. The current DC objectives frame long-term change in terms of the community — building capacity and developing the next generation. Relatively little emphasis is laid on an objective that was only included at one DC (2014) – considering how individual work may impact and intersect with larger learning analytics issues. As participants are willing to consider shifts in research directions and objectives, the DC provides an opportunity to share some of the most pressing issues and challenges within the field and to consider the relationship of these with doctoral work in progress. These findings indicate the importance of DC selection criteria, prioritising students who are at an early enough stage in their PhDs to be open to shifting their success criteria in terms of objectives, research questions, routes forward, and career goals.

Although objectives for the LAK DC are framed in very positive terms — 'foster', 'provide', support', 'inspire' — the calls for participation do not draw attention to the positive emotional effects of these events. Many respondents frame the immediate value gained in terms of affect. They realised, sometimes for the first time, the value of their work — they gained motivation, confidence and inspiration. The value was not simply immediate — these feelings had stayed with them for many years and had often been instrumental in their career and research development. This affective response is important to take into account when planning virtual DCs, because participants from 2020–22, who attended online, frequently noted the loss of relationships, interaction and informal connection at these events. They referred to the value they had gained from academic activities and expert support but were less likely to draw attention to any emotional benefits of attendance.

5.2 RQ2: Designing for virtual DCs

RQ2 asked: *Do students gain the same value from face-to-face and virtual doctoral consortia?* The virtual DCs were essentially online simulations of the face-to-face (F2F) events forced by the pandemic, whose design has been documented [3], and which informed the CHI 2020 DC format [14]. As also reported in analyses of the online CHI DC [14] and British HCI DC [10], students certainly appreciated the chance to connect virtually, given the loneliness of stringent lockdowns. Nonetheless, a strong theme in our survey comments confirms that the virtual experience was seen as a severe limitation, something of a disappointment compared to what they had hoped for at a F2F DC. This is hardly surprising, since the pandemic demonstrated compellingly how much we appreciate F2F meetings.

However, virtual DCs make them accessible to students unable to travel due to, for example, carer responsibilities or physical/economic limitations. Moreover, COVID-19 is unlikely to be the last pandemic we will have to endure [15] and, coupled with the high cost of attending international conferences, it merits further consideration to ask how we can improve virtual DCs. While F2F events remain feasible, virtual DCs might run in addition to expand their benefits. Informed by this paper, we propose that the intentional design of virtual DCs to maximise the five *CoP values* (Table 1) could better exploit affordances of the virtual such as the following *(but we also add cautionary notes to some)*:

- Automated transcripts can be consulted, edited and reworked. However, as noted in the CHI DC, whose organisers decided against Zoom recording [14], the DC may feel less safe for students if recorded.
- Online events make it easier for a wider group of academics to drop in/out than might be possible F2F [10]. However, too many newcomers can undermine a closed group who get to know and trust each other.
- While F2F DCs provide greatly valued opportunities for socialising with peers and mentors, online socials remain a challenge, and appear to have failed at both LAK DCs, CHI [14] and HCI [10].
- While increasing accessibility for many, it must be remembered that virtual DCs assume stable Internet and a safe, quiet workspace, potentially very early or late in the day.
- Asynchronous online conversations permit more time for reflective questions, feedback, and inclusion of documents, multimedia and hyperlinks.

- If a virtual DC uses multiple, shorter engagements (e.g., 10 x one-hour weekly slots), participants may have more time to present, or meet in breakouts, than is possible in a F2F session
- If the online DC is running as part of the main conference, provide multiple opportunities/channels for engagement during the conference, or this can remain a lonely experience.
- Students should be involved in re-imagining and co-designing future virtual DC formats [10].

5.3 Limitations

We recognise that some respondents were completing the survey many years after attending the DC, and so details would have faded from memory. The counterpoint to this is that what they did recall might be regarded as salient impacts. The response rate to the survey was 40%, which while a strong rate for survey research, may have resulted in a higher response rate from those who had remained active in the LA community. Section 3 reported on the academia/non-academia difference in respondents/non-respondents. Engaging participants who have either left academia or the DC community, is a challenge that future DC research in any community should bear in mind.

6 CONCLUSION

Previous research into doctoral communities is sparse and, to our knowledge this is the first work to use scientometric analysis in this area, and to use communities of practice as the theoretical lens onto the paper. This is the first systematic analysis of student perceptions of LAK DCs. Its findings offer broader insights for any community convening DCs, including the positive affirmation that DC participants overwhelmingly report, clearer opportunities for community engagement, and specific attention to how virtual DCs can offer greater value for both participants and the host community of practice.

Overall, this study of a decade of the LAK DC has shown that student participants gain significant value from these events. This is not confined to the immediate value gained at the event itself but manifests in many forms and may persist for many years. Considering learning analytics and practitioners as a community of practice enabled consideration of the ways in which the LAK DC acts as an entry point to that community by providing an opportunity for legitimate peripheral participation as well as contact with knowledge brokers in the form of DC organisers and mentors. Using the community of practice model also supported a nuanced consideration of the value offered by these events, which was broken down into *immediate, potential, applied, realised* and *reframing value*. Using these categories revealed possibilities for expanding the horizons of the LAK DC by, for example, expanding on networking skills and opportunities, paying attention to the affective outcomes of the event, and providing more opportunities for consideration of how participants' work impacts and intersects with larger learning analytics issues.

Survey responses from participants in the online DCs demonstrated that, despite the thought that had gone into those events, students had paid a price for moving online. As participants at online DCs in other fields also found, the social aspects of a F2F conference are hard to replicate. This emphasised the importance of moving away from a model that views online DCs as restricted versions of F2F events and instead paying increased attention to the affordances offered by online events, particularly in terms of increasing their accessibility.

Supplementary files

Using the Open Science Framework (OSF), we provide the LAK DC survey questions, coding of survey responses and scientometric datasets (VOSviewer JSON files) as part of this study's dataset to permit detailed exploration: https://osf.io/tq9r2/

References

[1] Chen, F. Research on the doctoral consortium structure of design. In Proceedings of DRS2022 (25 June – 3 July, Bilbao, Spain, 2022). https://doi.org/10.21606/drs.2022.364

[2] Gable, G. G., Smyth, R. and Gable, A. The role of the Doctoral Consortium: an information systems signature pedagogy? Communications of the Association for Information Systems, 38 (2016), 678-711. https://aisel.aisnet.org/cais/vol38/iss1/33/

[3] BuckinghamShum, S. Running an online Doctoral Consortium (blog post). 2020. Available at https://simon.buckinghamshum.net/2020/03/running-an-online-doctoral-consortium/

[4] John C, W., Twale, D. J. and Stein, E. L. Socialization of Graduate and Professional Students in Higher Education. Jossey-Bass Higher and Adult Education Series, San Francisco, 2001.

[5] Kizilcec, R. F. and Davis, D. Learning Analytics Education: A Case Study, Review of Current Programs, and Recommendations for Instructors. In *Practicable Learning Analytics* pp133–154 Springer International Publishing, Cham, 2023. https://doi.org/10.1007/978-3-031-27646-0_8

[6] Wenger, E. Communities of Practice: Learning, Meaning and Identity. Cambridge University Press, Cambridge, 1998.

[7] Lave, J. and Wenger, E. Situated Learning: Legitimate Peripheral Participation. Cambridge University Press, Cambridge, 1991.

[8] Wenger, E. Towards a theory of cultural transparency: elements of a social discourse of the visible and invisible. University of California Irvine, Irvine, 1990.

[9] Wenger, E., Trayner, B. and Laat, M. D. Promoting and assessing value creation in communities and networks: a conceptual framework. Rapport 18, Ruud de Moor Centrum, Open University of the Netherlands, Netherlands, 2011.

[10] Hall, L., Dix, A., Woolley, S., Bond, R., Sim, G. and Flint, T. Reflections on the Doctoral Consortium. BCS Learning & Development, 2020. http://dx.doi.org/10.14236/ewic/HCI20DC.2

[11] Braun, V. and Clark, V. Toward good practice in thematic analysis: Avoiding common problems and be (com) ing a knowing researcher. International Journal of Transgender Health 24: 1 (2023) 1–6. https://doi.org/10.1080/26895269.2022.2129597

[12] Corbin, J. and Strauss, A., 2015. 18: Criteria for evaluation. In *Basics of Qualitative Research*. Los Angeles, Sage 341–368

[13] Chen, B., Chen, X. and Xing, W. 'Twitter Archeology' of learning analytics and knowledge conferences. Proceedings of LAK15. ACM (2015). 340–349. https://doi.org/10.1145/2723576.2723584

[14] Brumby, D., Yatani, K. and Findlater, L. Reflections on planning and running a virtual doctoral consortium at CHI 2020. interactions, 27, 4 (2020), 22–26. https://doi.org/10.1145/340420

[15] Hassan, I., Fernandes, G., Mukaigawara, M. and Sridhar, D. Lessons from COVID-19 must be learned before the next outbreak. Nature Medicine, 29, 9 (2023/09/01 2023), 2171-2173. https://doi.org/10.1038/s41591-023-02377-6