Edinburgh Carpentries Report 2018-2022

History and overview

What is Edinburgh Carpentries?

Edinburgh Carpentries is an initiative aimed at offering training in software development and data analysis skills using an internationally recognised format known as Carpentries training, also known as Software Carpentry, Data Carpentry and Library Carpentry. EdCarp was first established in the University of Edinburgh and the primary target of its training are researchers and staff of academia. Overtime EdCarp has cultivated ties with other higher education and research institutions in Scotland, and offers training also to the workforce outside academia. The Edinburgh Carpentries meet City Region Deal Data Driven Innovation Programme KPIs for Talent within the DigiTech non-credit-bearing activity category as monitored and reported by the Bayes Centre on behalf of the College of Science and Engineering.

Carpentries and Carpentries-style

The Carpentries is an international collaboration to teach researchers the software development and data science skills essential to their work. It is an active, inclusive, diverse community of learners, instructors, lesson developers and workshop organisers who promote and model the importance of software and data in research. They collaboratively develop openly-available lessons and deliver these lessons using evidence-based teaching practices. See The Carpentries website for more information.

For the purpose of this report, it is sufficient to know that EdCarp offers both official Carpentries workshops, featuring official lessons from the the three official programmes, Software, Data and Library Carpentry, and **Carpentries-style workshops**, with lessons developed in line with the Carpentries model and following their templates, but not (yet) included within the official programmes. These Carpentries-style lessons are normally hosted in public repositories like the Carpentries Incubator.

History

The present short overview does not do justice to the outstanding involvement, commitment and contribution that EdCarp has attracted by so many people within and outside the University of Edinburgh. It has been a great space for collaboration in an environment attentive of values such as inclusivity, accessibility and diversity.

Edinburgh Carpentries was established in 2018, thanks to an agreement between Sean McGeaver (Computing Manager of the School of Physics and Astronomy) and Neil Chue Hong (Director of the Software Sustainability Institute, EPCC) to invest resources in support of computational training at the UoE. Victoria Dishon (College of Science and Engineering), David Fergusson (Manager of Digital Research Services, IS), Lisa Otty (Centre for Data Culture and Society), Robin Rice (Manager of Research Data Management, IS) and Edward Wallace (School of Biological Sciences) joined the project and ensured their support. Giacomo Peru (Project Officer of SSI, EPCC) was given the mandate to lead the initiative.

Support included staff time and financial support (for example to pay for the Carpenties membership).

People

Overtime, EdCarp attracted participation from many Schools, Departments, Centres and groups of the University of Edinburgh, as well as from Heriot Watt University and Strathclyde University in Glasgow. Here is a list of some of the main contributors: from the Bayes Education Team: Teresa Ironside, Kirsten Phimister, Fraser Pullar; from the Centre for Data Culture and Society, Lucia Michielin, Lisa Otty; from the Edinburgh College of Art: Geoff Lee, Matthew Hamilton; from EPCC, Mario Antonioletti, Evgenij Belikov, Neil Chue Hong, Johnny Hay, Robert Nagy, Giacomo Peru, Juan Rodriguez Herrera, Chris Wood; Institute of Genetics and Cancer: Graeme Grimes, Alison Meynert; from IS - Digital Research Services: Tahira Akbar, David Fergusson, Jennifer Harris, Eleni Kotoula; from IS-Library Services: Francesca Baseby; from IS - Research Data Management: Robin Rice, Jen Daub; from the School of Biological Sciences: Lora Boteva, Sara Buonomo, Gina Pegu, Edward Wallace; from the School of Chemistry: Antonia Mey; from the School of Geological Science: Magnus Hagdorn, Chris Hill; form the School of Physics and Astronomy: Sean McGeever, David McKain; from the School of Health in Social Science: Lucie Wöllenstein; from Heriot Watt: Gabriele Matilionyte; from the National Library of Scotland: Sarah Ames; from Strathclyde University: Bailey Harrington; Steven Ford. This is just to mention some of the people who have given a contribution to the support, strategy and operations. We cannot name here one by one the multitude of instructors and helpers, both volunteering and paid.

EdCarp Programmes

Volunteering

EdCarp started operating and still operates within the traditional model promoted by the Carpentries, based on the volunteering effort of organisers, instructors and helpers offering in-person workshops to staff and students of the University. Workshops were in-person before Covid-19 and are gradually returning to be in person. Typically, workshops would span over two full days, offering a coherent package of lessons (Software, Data or Library Carpentry). In certain cases, a workshop could span over a different arrangement of days, like, for example, a whole training week, or four half days over one or more weeks. A comprehensive list of workshops offered within this programme can be seen on the EdCarp website.

During the years of EdCarp's activity, requests for training have come from everywhere in the University where computational training is regarded as a fundamental need for research. Matching the demand with the available capacity has been a case by case negotiation, with some recurring challenges:

- Ongoing need for leadership
- Availability of instructors and helpers
- Availability of training spaces
- Capacity of organisers dealing with logistics, registrations, enquiries
- Availability of easy-to-use infrastructure

- Availability of funds for offering lunches

The passage from in-person to remote training resulted in the shifting of some of those challenges. Most importantly, it became easier to source instructors and helpers, because these were no longer bound to a physical location, while they could simply connect remotely from everywhere. Instructors and helpers could now be easily found everywhere from the UK and abroad. This radically altered what traditionally was the greatest challenge for EdCarp and Carpentries training in general, which is sourcing qualified instructors in the absence of a sufficient local pool (a situation that in Edinburgh has now improved thanks to the benefits of the Instructor Training – see below).

On the other hand, the experience of an online workshop is very different compared to in-person, the communication more difficult, and the overall mental strain for participants higher than for in-person workshops.

The extended experience of running remote workshops, had also an effect in making our approach more flexible in terms of how to plan the sessions. The predominance of a two-days workshop format gradually gave way to flexible workshops, split in half day sessions and sometimes distributed over more than a week.

DUSC (WFD-DC)

In Autumn 2019 we were approached by the Bayes Education Team with an offer to organise Data Carpentry courses within the portfolio funded with the Scottish Funding Council Upskilling Fund. This was a game changer opportunity because, for the first time, EdCarp had a chance to get structural funding to operate its core business. The Upskilling Fund is allocated to Scottish higher education institutions to upskill and reskill the Scottish workforce. The UoE is one of the largest recipient of this fund and the Bayes Education Team is the unit which manages the fund within the UoE, supporting and offering a wide portfolio of credit and non-credit bearing courses in the field of digital data. Courses are free for those who meet the eligibility criteria set by the SFC. The courses are developed, maintained and delivered by different providers within the UoE. These providers are allocated funding and coordinated by the Bayes Education Team. The main part of the funds are given to the providers in form of fee waivers, which means that the provider receives a set amount of fee waivers as many eligible students they enrol.

In the first year of the SFC Upskilling fund, EdCarp was funded, in addition to the delivery of Data Carpentry courses, for the development of new course materials. This additional funding was used to develop two brand-new Carpentries-style courses, an Introduction to Statistics with R[1] and Introduction to Machine Learning with Python[2]. These courses have been delivered as part of Ed-DaSH, which is a good example of cross-pollination between separate projects.

EdCarp has received this funding from the BET in academic years 2019-20, 2020-21, 2021-22 and 2022-23. The funds have been used to hire coordinators and to pay for the time

[1] This course comprises three lessons: Statistical thinking for public health, Simple linear regression for public health, Multiple linear regression for public health.
[2] This course comprises four lessons: Introduction to machine learning, Tree models, Neural networks and Responsible machine learning.

of instructors and helpers. The coordinators have been hired on a consultancy basis and have changed every year.

In spring 2020, the first edition, like the rest of the world we had to suddenly switch from in-person to remote event delivery. We delivered seven workshops between March and June, with the coordination of Lucia Michielin.

In spring 2021, we reduced the number of workshops to three and we delivered them between March and May, with the coordination of Bailey Harrington.
In spring 2022, we repeated the delivery of the same three workshops of the year before with the coordination of two PhD students, Gina Pegu and Lucie Wöllenstein, who had been tutors in the previous edition.

While the data of the ongoing DUSC courses of the spring 2023 edition are not included in the analysis of this report, we would like to highlight that this year's edition is showing excellent performance so far, with courses oversubscribed and the lowest no-show rate ever seen. We have enrolled the first fee-paying participants (i.e. participants who don't meet the fee waiver eligibility criteria but are willing to pay the course fee). This spring, we are running the same three online Data Carpentry courses as in 2022 and 2021, plus, for the first time, an in-person Introduction to Statistics course, developed with SFC Upskilling funding 2020. Another noteworthy aspect of this year's edition is that, for the first time, there is continuity in the coordination team, as Gina Pegu and Lucie Wöllenstein are still in the coordination team, joined by Serena Sias, who is lined to be the coordinator also for the autumn 2023 and spring 2024. This continuity is important because it eliminates the effort of training new coordinators, and allows us to focus on improving the efficiency of the workflows, maintain and improve the infrastructure and ultimately improve the quality of the delivery.

Mindful of our successes, for the academic year 2023-24, the BET wants to double the offering of our courses, even though a reduction in the overall SFC Upskilling is foreseen. The plan is to run the same four courses of spring 2023 (three online Data Carpentry plus one in-person, either Introduction to Statistics and/or Introduction to Machine Learning) in the autumn 2023 and in the spring 2024.

Ed-DaSH

In 2020 the DaSH call was published by UK Research and Innovation. DaSH is the shorthand for "Innovation Scholars: Data Science Training in Health and Bioscience". The UoE submitted a proposal led by Alison Meynert, Principal Investigator, with input, among the others, from Edward Wallace, Neil Chue Hong and Giacomo Peru. The proposal was shaped up as a training programme leveraging the field knowledge brought in by the Investigating team, with knowledge in the field of computational biological science, and the delivery capacity of EdCarp. The proposed project, named Ed-DaSH was funded and run for two years between mid-February 2021 and mid-February 2023. The project's team had members coming from the IGC, EPCC, SBS, the School of Mathematics and the DataLab. More information on the Ed-DaSH website.

The grant funded the development of a new set of lessons in 'omics-related tools, statistics, computation, and research data management, along with cycles of workshops offering those lessons. In addition to the lessons developed within Ed-DaSH, the project delivered the

Introductions to Statistics and the Introduction to Machine Learning workshops developed within the SFC-funded first edition of DUSC (WFD-DC-2020).

The first six months of Ed-DaSH were employed for the development of the new lessons. The development teams developed a total of five new lessons covering the width of the project's remit. During the development semester, a website, soft infrastructure, and GitHub-based project workflows have also been created, which then underpinned the delivery for the remaining duration of the project.
During its three semesters of delivery, from September 2021 until February 2023, Ed-DaSH delivered 33 workshops – a rather impressive number involving a massive effort from the delivery coordination team.

Organisational Structure

Lead

EdCarp has a lead, Giacomo Peru, whose remit has been that of orchestrating the contribution and participation of everybody involved, matching requests with EdCarp capacity, procuring and coordinating collaborations and support. The lead has been the primary point of contact for new requests of training, the chair of the Steering Committee and a rotating chair of the Organising Committee.

Steering Committee

The Steering Committee is composed of members of Edinburgh University and one representative from the National Library of Scotland, with an interest in supporting Carpentries training and able to advise on strategy and to commit support in the form of human or financial resources. Giacomo Peru has been the chair until Alison Meynert's takeover in spring 2023

Organising Committee

The Organising Committee is currently formed of members of Edinburgh University and Strathclyde University. The members are active in organising, teaching and helping at workshops. The Organising Committee meets monthly or bi-monthly and rotates the chairing.

Capacity building and membership to the Carpentries

EdCarp has subscribed a paid membership to The Carpentries twice, with funds from the SoPA, IS, SSI and Ed-DaSH. The membership has enabled EdCarp to build a local pool of certified instructors by running local Instructor Training workshops. In the absence of a paid membership, ongoing access to Instructor Training seats is currently offered by the SSI via its membership. Local instructors are especially important for in-person workshops, whereas online workshops can source instructors from everywhere. Beyond certified instructors, the local community of EdCarp is rich of helpers and non-certified instructors, that is, people with good knowledge of the tools and skills taught at the workshops, independently from the Carpentries format.

Challenges and going forward

Community, leadership and coordination

EdCarp may be considered a community with the purpose of developing and providing training in a certain remit. The community aspect of EdCarp (and of Carpentries training more generally) is certainly grounded in the spontaneous involvement of its members, who share an interest in cultivating, developing and promoting this training activity. However, it has been clear throughout the life of EdCarp that this communitarian drive needs leadership and coordination in order to achieve its purpose. Leadership has been until now ensured by the SSI via Giacomo Peru's time. Coordination has been offered by the Organising committee and by the DUSC's coordinators and by the Ed-DaSH delivery team.

EdCarp is now an asset of the University of Edinburgh and beyond. In order to maintain this asset and to nurture it, we imagine a future where

- leadership is coming from a lead acting as liaison between the Steering Committee and the Organising Committee;
- a stable coordinator who can provide consistent support to the Organising Committee and can coordinate the delivery of EdCarp programmes, under the direction of the lead and the Steering Committee;
- an efficient Organising Committee, that can rely on support form the coordinator and guidance from the Steering Committee.

Funding

An ideal scenario would be one where EdCarp has structural funding for:

- hiring a coordinator with a regular employment contract. So far we have been able to channel some support to Edcarp as a whole from DUSC and from Ed-DaSH, but this has necessarily been a side benefit subordinate to the delivery of the two programmes;
- paying instructors and helpers time. This would ensure that EdCarp's capacity for delivering training would be less dependent on volunteering effort and therefore would allow for more reliable, consistent and coherent yearly offerings, which could be planned in advance with synergy between the Steering and the Organising committee.

Next report

We aim to keep this report a living document and we plan to issue a second version focusing on:

- updated stats
- analysis of costs and business model
- impact of EdCarp.

Data analysis

General attendance

According to https://edcarp.github.io/Ed-DaSH/workshops and https://edcarp.github.io/workshops/, Edinburgh Carpentries has delivered a total of 82 workshops between September 2018 and February 2023. All bar two recorded at least the number of registrations/attendees.

We consider one workshop a coherent event of variable duration (length), comprising one or more lessons and matched with one URL in the format https://github.com/edcarp/yyyy-mm-dd-xxx.

As outlined above, the courses were delivered within three separate EdCarp programmes:

- Edinburgh Carpentries volunteering programme (referred to as EdCarp in the attendance analysis)
- Edinburgh Data Science Training in Health & Bioscience (referred to as Ed-DaSH in the attendance analysis)
- Workforce Development Data Carpentry (WFD-DC), funded by the Scottish Funding Council and now renamed Data Upskilling Short Courses (referred to as WFD-DC in the attendance analysis).

Table 1 shows the number of workshops, days of teaching, registrations and attendees per programme.

The EdCarp volunteering programme offered workshops from the three official Carpentries: Software Carpentries (SC), Library Carpentries (LC) and Data Carpentry (DC).
WFD-DC (DUSC) offered workshops featuring mainly lessons from the Data Carpentry curricula with some inset from Library Carpentry.
Ed-DaSH offered Carpentries-Style workshops with lessons mainly developed within the project itself.

Table 2 shows the number of workshops per length in days. The length of workshops varied from one half day to four full days. A half day was considered <=4 hours. A full day was any amount of time >4 hours. The traditional Software or Data Carpentry workshop is two full days. This length was often split over several consecutive days or several separate half/full days in different weeks. In five workshops, both registrations and attendees were recorded separately for each session of the workshop, instead of being recorded once for the whole duration. In this report, we consider these as a single workshop, as they have a singular workshop URL. For these, the number of registrations and attendees of the largest session was considered. Three of these were workshops that spanned over various days in different weeks.

55 out of the 82 courses took place online (table 1). Online delivery of courses was introduced, as we all know, due to the Covid-19 pandemic. It is likely that going forward the two ways, in-person and online, will co-exist. Hybrid delivery has not been tried yet.

Table 3 shows registrations and attendees by lesson and programme. Each workshop covered a range of different lessons. Some workshops covered several lessons, while others focused on a single topic.

No-show & cancellation rates

Based on the data we have, there was an average 20% no-show rate for the three programmes. Some workshops did not record the attendance and so their registrations and attendance numbers are the same (see Table 4). Ed-DaSH presents a no-show rate of 8%, the lowest by far. This is also due to the introduction of a £50.00 deposit for registrations, which is only returned to the student if they attend a significant part of the course.
The highest no-show rate was for the WFD-DC programme, 36%, excluding DUSC 2023 (see Table 4). This was 19% higher than for the EdCarp volunteering programme. This programme, funded by the Scottish Funding Council and recently renamed Data Upskilling Short Courses (DUSC), is primarily for individuals who are part of the Scottish Workforce. One explanation for the high rate of no-shows may be that participants attending the WFD-DC courses, which were free and aimed mainly at people in the Scottish workforce, did so as part of their regular working day. As a result of these participants' regular working commitments it may be that the courses were subject to more cancellations and no-shows than usual.

EdCarp volunteering programme attendance in detail

The EdCarp volunteering programme has offered workshops from the Software, Data and Library Carpentry curricula. Table 3 shows a breakdown of the attendance by lesson. EdCarp workshops primarily had attendees from the University of Edinburgh (UoE). Figures 1-4 give a breakdown of UoE attendance of these workshops by college and school. Table 5 shows the overall numbers per college and year for EdCarp workshops. The largest group of attendees (69.0%) comes from the College of Science and Engineering (see Figure 1). Table 6 provides the split between staff and students. These statistics are based on 14 of the 38 delivered EdCarp workshops, as these were the only workshops with such granular data. The data comes from two different sources: Eventbrite.co.uk and the University of Edinburgh's internal events.ed.ac.uk platform.

WFD-DC attendance in detail

The WFD-DC (Workforce Development Data Carpentry, now called DUSC) has offered 13 workshops over 3 years (2020-2022). See above for an overview of the 2023 edition, whose data are not included in this analysis. No data on the gender of the attendees were taken in 2022. The data on gender (Figures 5 & 6) reveal that more females attended the WFD-DC workshops in both 2020 and 2021. Attendance by employer data was cleaned to ensure granularity by only using the employers that appeared at least two times.

Ed-DaSH attendance in detail

Ed-DaSH offered 33 workshops with a total of 505 attendees at Ed-DaSH workshops between September 2021-February 2023. 205 (41%) of these completed the Ed-DaSH

survey. This data was cleaned using OpenRefine and used to create the statistical summary charts in figures 11-14. Figure 11 shows attendance by University, showing that most attendees came from the UoE (61.5%). 5.9% came from the Roslin Institute, which is part of UoE. Figure 12 shows the breakdown of Colleges of all UoE and Roslin Institute attendees. The College of Medicine and Veterinary Medicine (MVM) was the largest group at 71.3%. Figure 13 shows the breakdown of job roles of all 205 surveys, with the largest group being PhD Students (55%). Figure 14 shows bioinformatics was the most common research field of attendees (26%). Job roles and research fields were edited based on entries to create more informative higher level categories.

Summary stats

Number of workshops
Edinburgh Carpentries has delivered a total of **82 workshops** between September 2018 and February 2023. 27 were in-person, 55 were online.

Attendees
Total recorded number of attendees is 1456.

No-show rate
20% average no-show rate
8% Ed-DaSH
36% WFD-DC
17% EdCarp

Distribution of attendees by UoE College
The number of attendees per UoE College, for those workshops where it was recorded is as follows:
CAHSS: 41
CSE: 323
CMVM: 117

Split of attendees between staff/students
The split of attendees between staff/students, for those workshops where it was recorded is as follows:
Staff: 160
Students: 334

WFD-DC attendance breakdown by gender (2020 and 2021)
Female: 79
Male: 58

WFD-DC attendee breakdown by sector (2020, 2021 and 2022)
Public: 37
Private: 32
Academia: 28

Tables

Table 1: summary statistics by programme

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Programme	Workshops	Days	Online	Registrations	Attendees
Ed-DaSH	33	88	33	546	505
EdCarp	38	73	9	1322	935
WFD-DC	13	33	13	284	183
Grand Total	**82**	**194**	**55**	**1939**	**1456**

Table 2: number of workshops per length of day

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Programme	0.5	1	1.5	2	2.5	3	4	Grand Total
Ed-DaSH		3		14		7	9	33
EdCarp	3	7	1	19	2	4	2	38
WFD-DC				7		5	1	13
Grand Total	**3**	**10**	**1**	**40**	**2**	**16**	**12**	**84**

Table 3: attendance by lesson

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Programme	*Programme or Carpentry*	*Lesson*	Sum of Registrations	Sum of Attendees
Ed-DaSH	Ed-DaSH	Command Line, Conda & Nextflow	10	10
		Command Line, Conda & Snakemake	20	19
		Conda	26	24
		FAIR	48	44
		High-dimensional Statistics in R	147	138
		Introduction to Statistics in R	103	97
		ML in Python	65	57
		Nextflow	80	75
		Snakemake	47	41
Ed-DaSH Total			546	505
EdCarp	DC	Command Line, Cloud Computing, Data Wrangling and R for Genomics	105	77
		Command Line, Cloud Computing, Data wrangling for Genomics	44	31
		OpenRefine	17	14

		OpenRefine, R & SQL	32	28
		Spreadsheets, Data Organisation & R for Genomics	48	35
		Spreadsheets, OpenRefine & R	62	54
		Spreadsheets, Openrefine, Python & SQL	48	38
		Spreadsheets, OpenRefine, R & SQL	186	103
	DC Total		542	380
	LC	RegEx, Spreadsheets, OpenRefine, Shell, Python & R	25	19
	LC Total		25	19
	SWC	Git	116	72
		Git, Shell, Python & R	33	30
		Python	58	44
		Shell	41	37
		Shell & Eddie	36	31
		Shell & Python	51	44
		Shell, Git & Python	420	278
	SWC Total		755	536
EdCarp Total			1322	935
WFD-DC	WFD-DC	R, RegEx & SQL	44	29
		Spreadsheets, OpenRefine & Python	120	74
		Spreadsheets, OpenRefine & R	79	54
		Spreadsheets, OpenRefine & SQL	41	26
WFD-DC Total			284	183
Grand Total			**2152**	**1623**

Table 4: no-show or cancellation rate by programme

Table 4: no-show or cancellation rate by programme		
Type	no-show Rate	cancellation rate
EdCarp	17%	21%
WFD-DC	36%	N/A
Ed-DaSH	7%	N/A

Table 5: EdCarp's UoE attendees by college and year

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UoE College	**18/19**	**19/20**	**20/21**	**Total**
CAHSS	14	10	17	41
CMVM	48	53	16	117

CSE	147	117	59	323
Total	209	180	92	481

Table 6: EdCarp attendance breakdown by staff and students

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PersonType Breakdown	**18/19**	**19/20**	**20/21**	**Total**
staff	54	85	21	160
student	159	96	79	334

Table 7: WFD-DC attendance breakdown by gender

Table 7: WFD-DC attendee breakdown by gender			
PersonType Breakdown	**2020**	**2021**	**Total**
Female	58	21	79
Male	43	15	58

Table 8: WFD-DC attendee breakdown by sector

Table 8: WFD-DC attendee breakdown by sector				
Person type breakdown	**2020**	**2021**	**2022**	**Total**
Public	13	9	15	37
Private	28	1	3	32
Academia	22	4	2	28

Charts

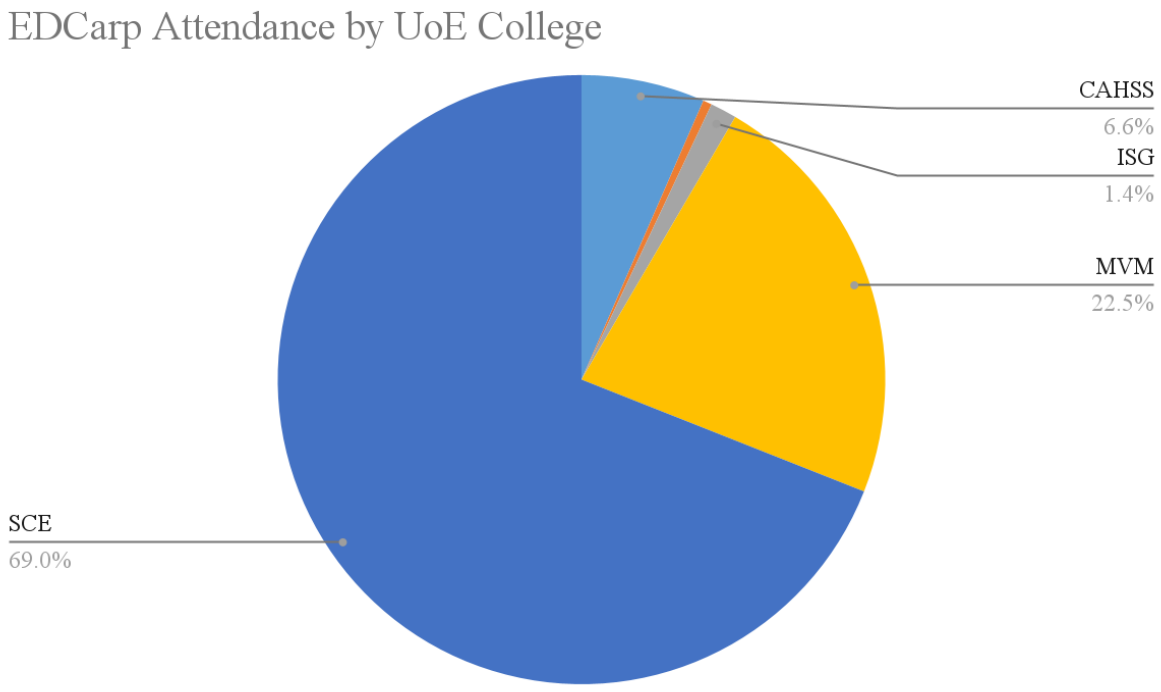

Figure 1: Overall UoE EdCarp Attendance by UoE College

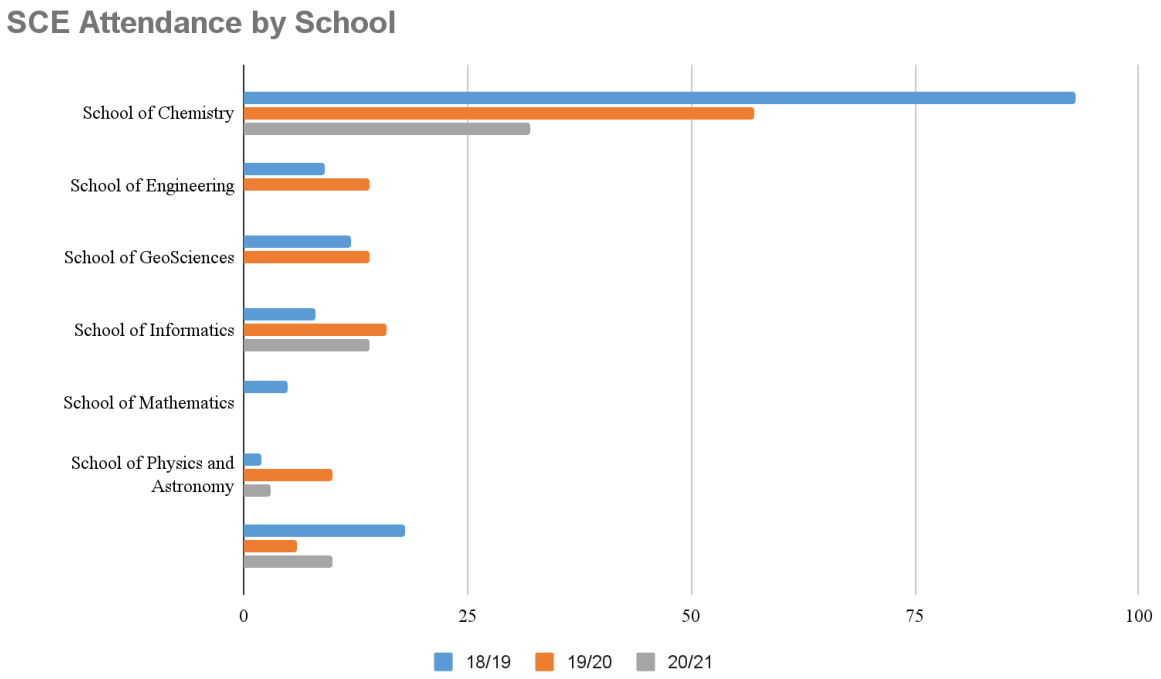

Figure 2: Overall EdCarp Attendance by SCE School

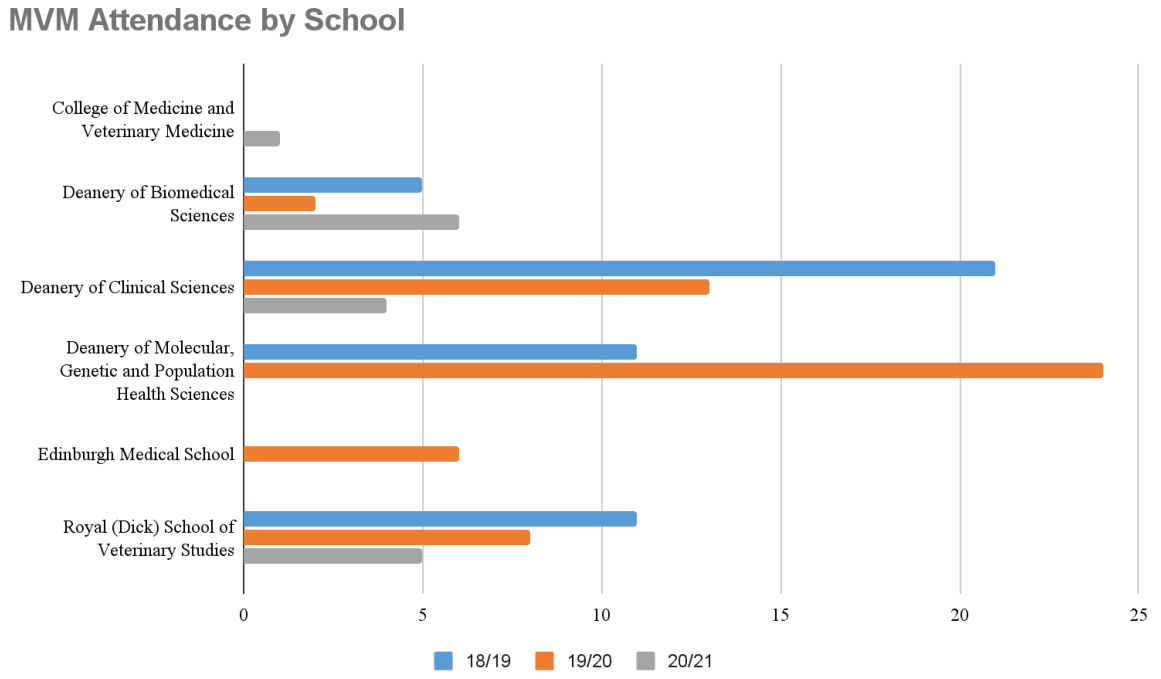

Figure 3: Overall EdCarp Attendance by MVM School

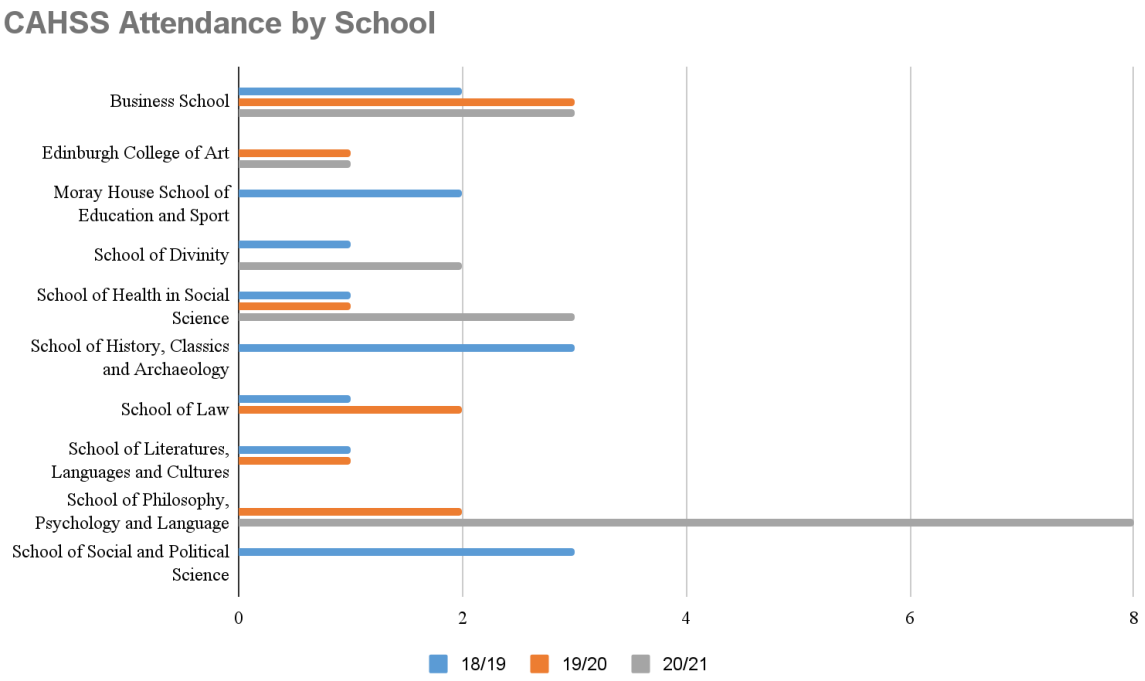

Figure 4: Overall EDCarp Attendance by CAHSS School

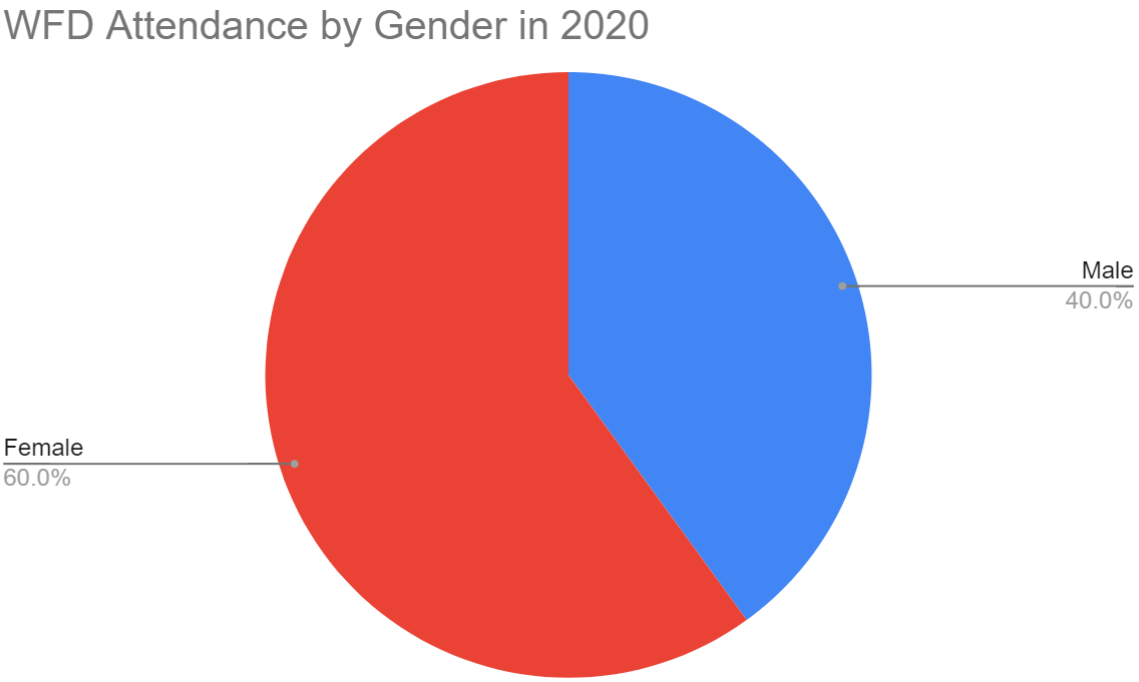

Figure 5: WFD-DC attendance by gender 2020

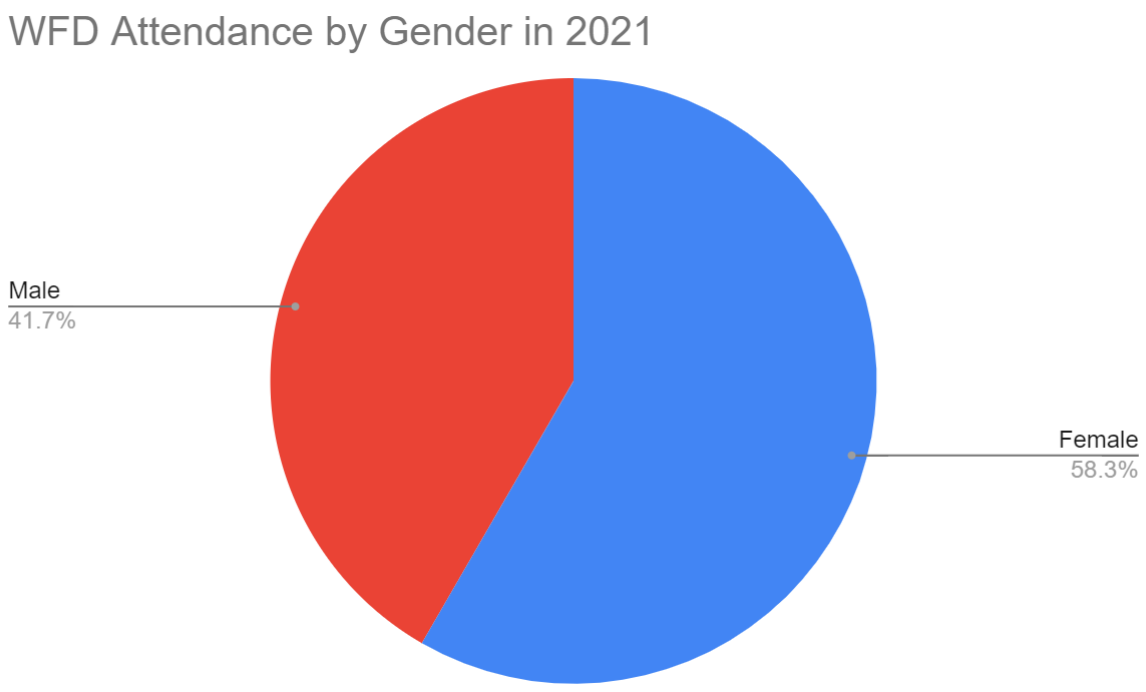

Figure 6: WFD-DC attendance by gender 2021

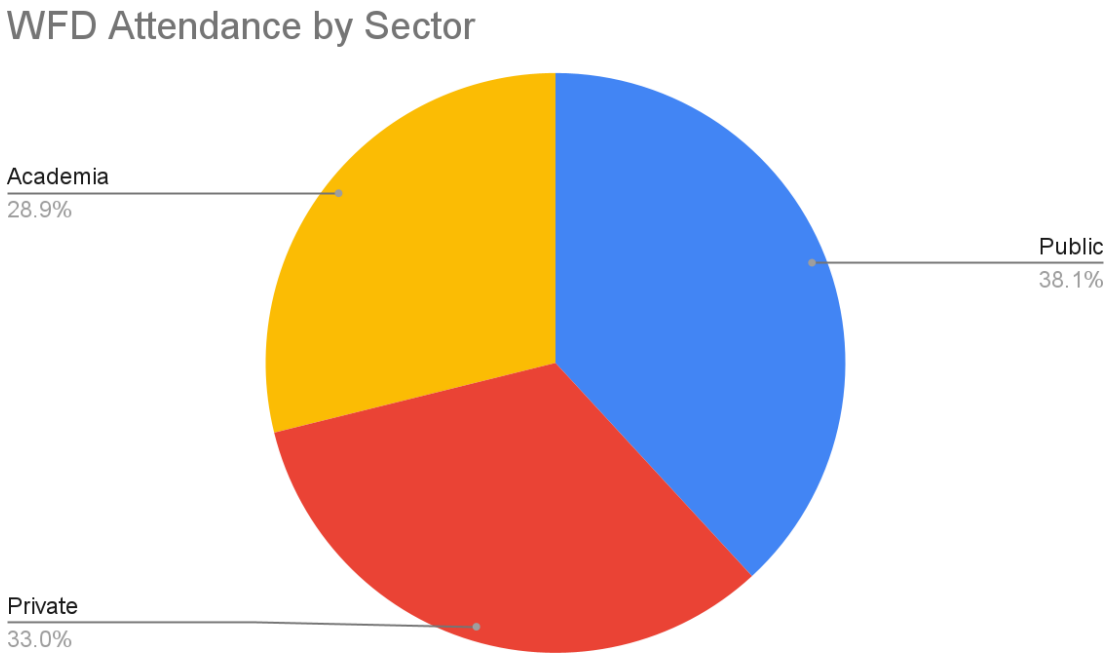

Figure 7: Overall WFD-DC attendance by sector

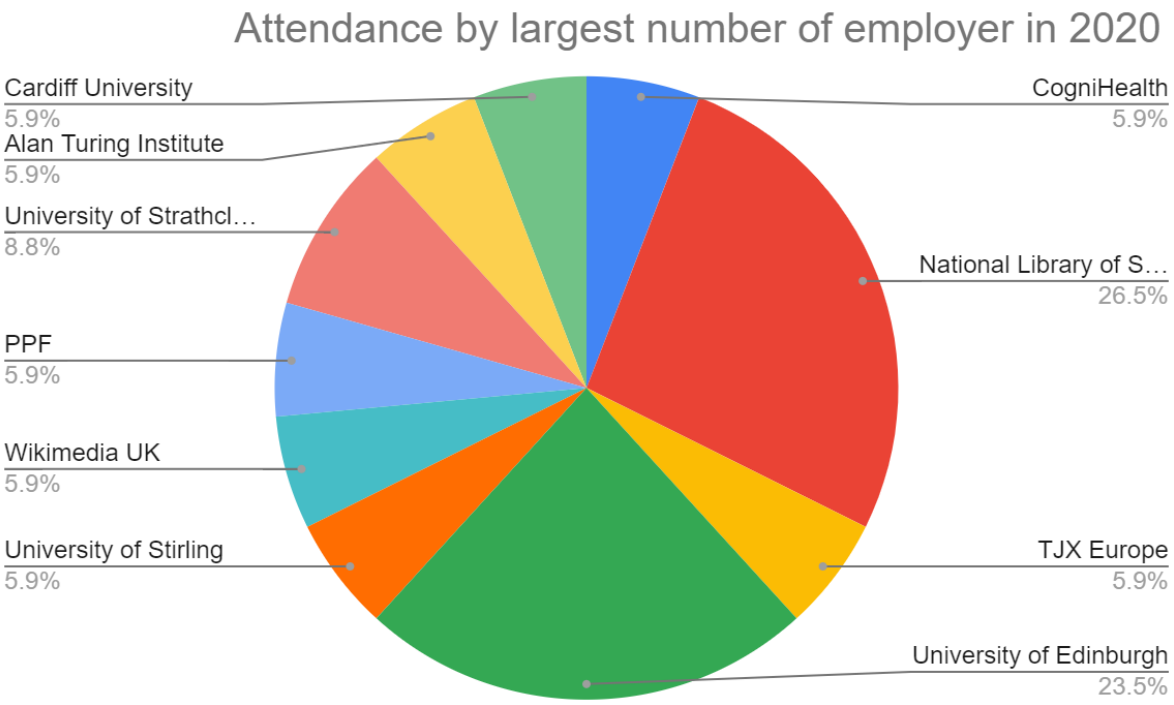

Figure 8: WFD-DC attendance by employer 2020

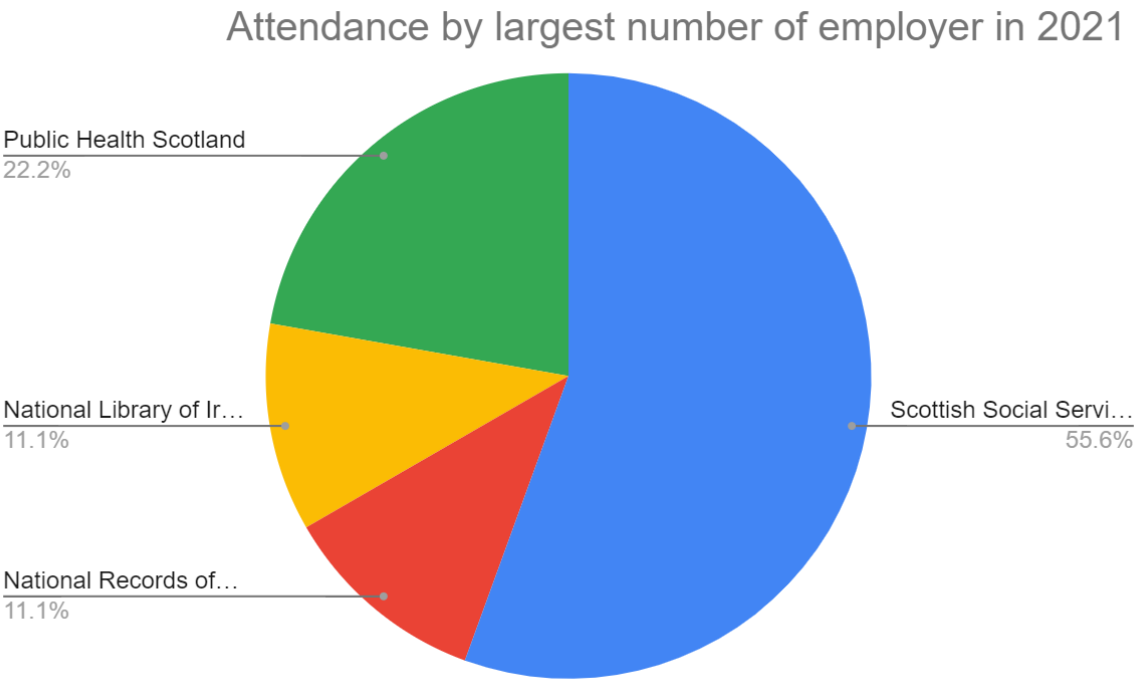

Figure 9: WFD-DC attendance by employer 2021

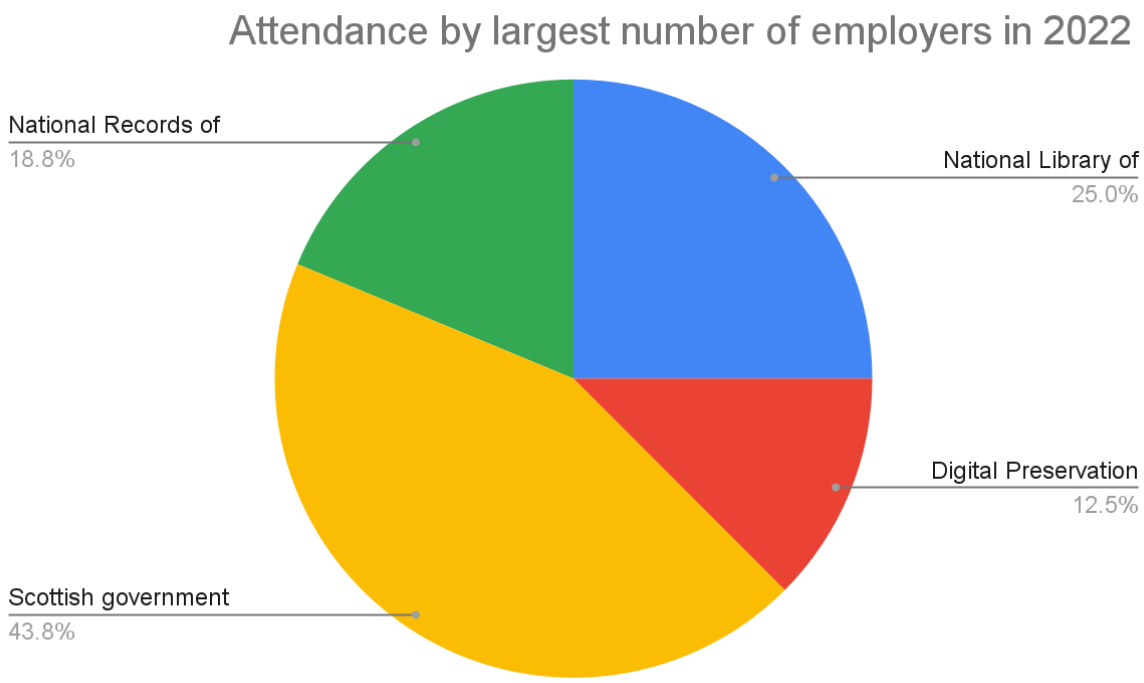

Figure 10: WFD-DC attendance by employer 2022

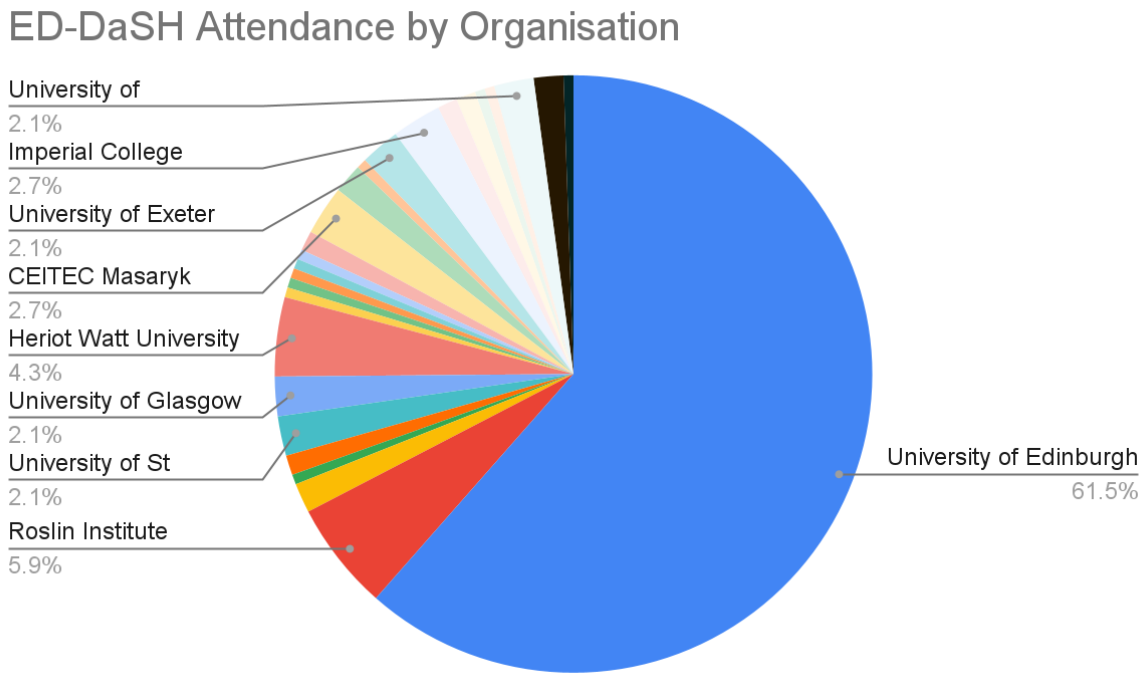

Figure 11: Overall Ed-DaSH Attendance by University

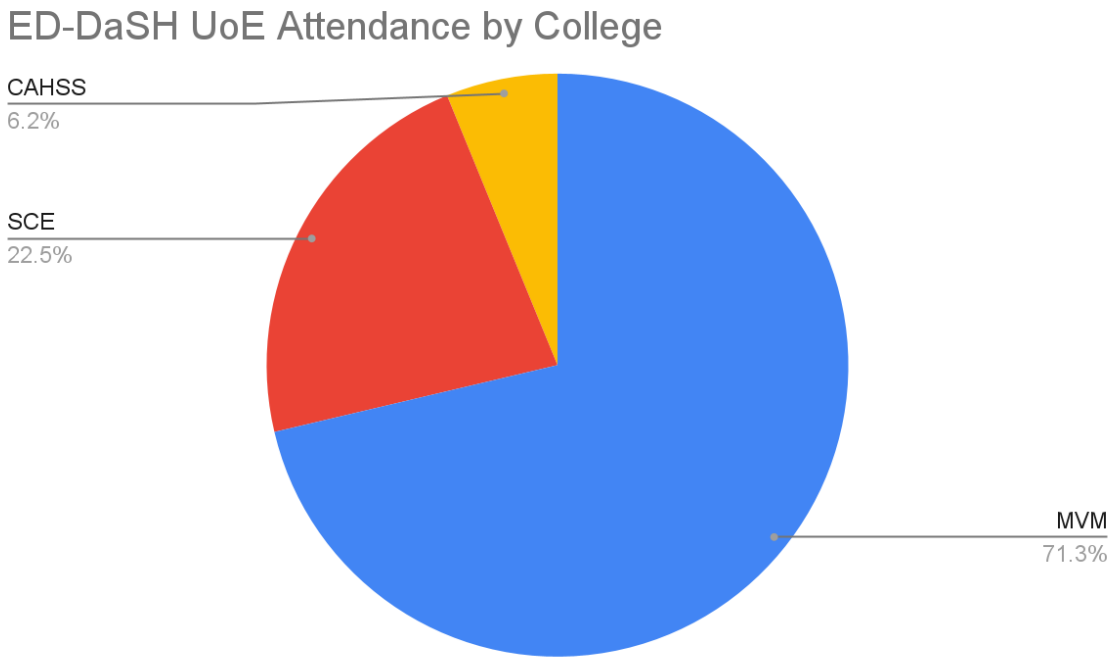

Figure 12: Overall UoE Ed-DaSH Attendance by College

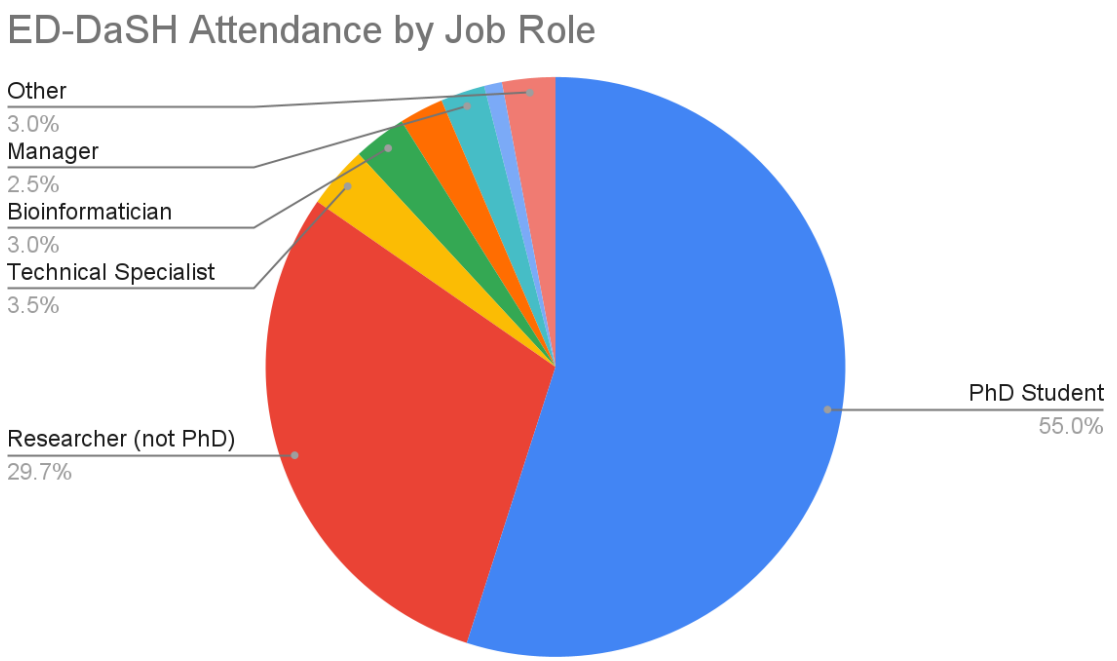

Figure 13: Overall Ed-DaSH Attendance by Job Role

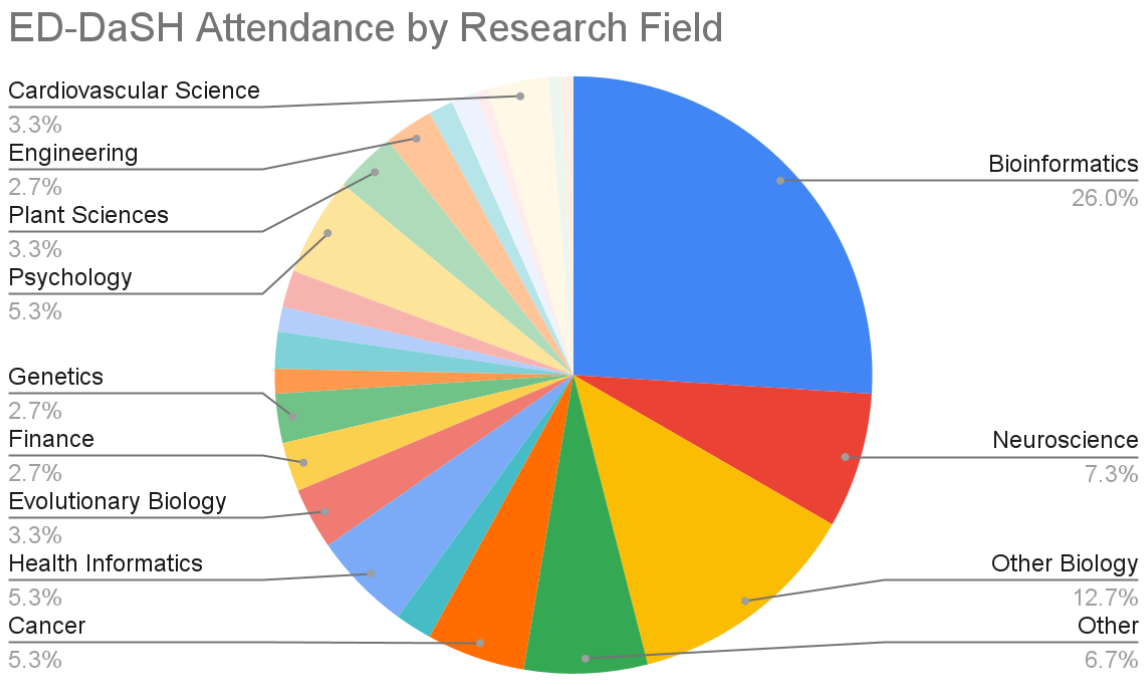

Figure 14: Overall Ed-DaSH Attendance by Research Field

Glossary and acronyms

BET: Bayes Education Team
CAHSS: College of Arts, Humanity and Social Sciences
CMVM: College of Medicine and Veterinary Medicine
CSE: College of Science and Engineering
DUSC: Data Upskilling Short Courses
Ed-DaSH: Edinburgh Data Science training programme for Health and BIosciences
EdCarp: Edinburgh Carpentries
HW: Heriot Watt University
IGC: Institute for Genetics and Cancer, formerly IGMM.
SBS: School of Biological Sciences
SoPA: School of Physics and Astronomy
SSI: Software Sustainability Institute
UoE: University of Edinburgh
WFD-DC: Workforce Development Data Carpentry (2019-2022) is the former name of the DUSC programme

Authors

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