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Which competencies do *they* want to learn? Instructors' priorities ranked by department

Abstract

Universities support their teaching staff to develop contemporary teaching competencies, yet institutional priorities may not align with those of staff. This study examined open texts from 863 teaching staff from 16 departments at a research-intensive university to discover self-identified teaching competency needs. Five universal priorities were identified (student engagement, course development, specific teaching methods, assessment, and student diversity) however departmental variations also emerged. These findings can inform the strategic planning of professional development, balancing evidence-based practices, institutional goals, and departmental contexts.

Keywords

higher education professional development, self-identified teaching competencies, departmental differences, educational development, faculty development

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Aber was wollen *sie* lernen? Selbst-identifizierte Prioritäten von Dozierenden unterschiedlicher universitäre Departemente

Zusammenfassung

Universitäten unterstützen Lehrkräfte neue Lehrkompetenzen zu entwickeln, doch institutionelle Prioritäten stimmen nicht immer mit den von den Lehrenden selbst identifizierten Lernprioritäten überein. Diese Studie analysierte offene Texte von 863 Lehrkräften von 16 Departemente einer forschungsintensiven Universität, um selbst identifizierte Bedürfnisse hinsichtlich Lehrkompetenzen zu untersuchen. Fünf Kompetenzen wurden als universelle Prioritäten ermittelt: studentisches Engagement, Kursentwicklung, spezifische Lehrmethoden, Bewertung und Diversität der Studierenden. Während das studentische Engagement in allen Fachbereichen an erster Stelle stand, zeigten sich bei anderen Kompetenzen bedeutende Unterschiede zwischen den Departementen. Diese Ergebnisse deuten darauf hin, dass effektive Weiterentwicklung einen Ausgleich zwischen evidenzbasierten Praktiken, institutionellen Zielen und fachbereichsspezifischen Kontexten erfordert.

Schlüsselwörter

Hochschulische berufliche Weiterbildung, selbst identifizierte Lehrkompetenzen, Unterschiede zwischen den Fachbereichen, Lehrentwicklung, Hochschulentwicklung

1 Introduction

The skills needed by university graduates in a changing world are evolving rapidly, and higher education institutions (HEI) need to ensure students are ready for future workplace demands. While some of these demands are knowable, some are not. Therefore, HEIs must update curricula to include non-disciplinary skills (such as communication, project management and self-management) (Thomas et al., 2016) as well as 'future skills' so that students can be as prepared as possible for the future. Future skills are defined by Ehlers as skills that are required in situations 'without the security of prior experience' (2022, p.13). These include ambiguity competence (managing uncertainty) or learning literacy (the ability to direct one's own learning) (Ehlers, 2022). Simultaneously, HEIs are faced with the challenges of an increasingly large and diverse student population, while technological and digital advances such as generative artificial intelligence (GenAI) are impacting how those students learn (Dissertori, 2024). To keep pace with these developments, teaching staff will be expected to acquire the corresponding specific contemporary teaching competencies, but institutional expectations and priorities may not align with what teaching staff themselves identify as their primary learning needs and goals.

This misalignment is particularly pronounced at research-intensive institutions because university teaching staff are appointed based primarily on research skills and publication history, rather than on teaching experience (Bélise et al., 2024) and research success does not necessarily translate to teaching competence (Hattie & Marsh, 1996). Therefore, instead of deliberately seeking professional development on contemporary teaching skills, teaching staff may identify professional development needs related to more generic teaching competencies, such as engaging students, developing courses, and designing assessment rather than specific institutional development goals (Brown et al., 2025). Additionally, their own stage of development is relevant. Early-stage teaching staff tend to be more focused on themselves and on surviving teaching, only later shifting their focus to student learning (Hughes et al., 2023).

Our theoretical framework underpinning this research, pedagogical content knowledge (PCKs), explains that teaching competence is never separate from disciplinary knowledge, but that the combination of disciplinary knowledge and teaching competence forms a 'special amalgam' (Shulman, 1987, p 8) which is seen for example when teaching staff need to decide *what* to teach (van Dijk et al., 2022). Therefore, discipline has a tremendous impact on what and how instructors teach. Disciplinary background forms the primary professional identity of teaching staff (Jenkins, 1996) and influences whether they adopt teacher-oriented or student-oriented teaching approaches (Bélise et al., 2024; Lindblom-Ylänne et al., 2006; Stes & Van Petegem, 2014). Since disciplinary background influences teaching content and teaching approaches, some speculate that professional development should be discipline-specific not cross-disciplinary (Bostock, 2022; Hott & Tietjen-Smith, 2018; Jenkins, 1996; Orr et al., 2019) even suggesting that these are more effective (Andrews et al., 2019). This would impose significant costs for universities if every discipline had customised professional development programmes.

Since departments cluster similar disciplines together, they become important locations 'of natural activity' for teaching staff (Knight & Trowler, 2000, p.81), a more pragmatic approach may be to consider departments, not disciplines, the focus of professional development activities. Departments are an important context as it is where colleagues become key sources of informal learning (Knight et al., 2006) but also where norms can vary greatly (Shadle et al., 2017) and significantly affect individual practices (Lund & Stains, 2015) and perceptions (Kálmán, et al., 2020). These departmental contexts can either support or create resistance to implementing teaching approaches acquired from professional development (Bolander Laksov et al., 2022; Kálmán, et al., 2020, Thomas et al., 2011), influence resource allocation decisions (Bélise et al., 2024) and define the scope of influence teaching staff have (Merkt, 2016). Understanding how teaching competency priorities vary by department could reveal whether departmental differences are substantial enough to warrant specialised professional development of teaching competencies despite resource constraints.

An additional element to consider when creating professional development for teaching staff is evidence-based teaching strategies. Research demonstrates that student learning improves when teaching staff develop student-oriented approaches (Trigwell & Prosser, 2020), invest in systematic course design (Levinsson et al., 2024), and deepen their understanding of learning processes (Hoffman et al., 2024). However, these research-validated concepts may not align with the competency development priorities that individual teaching staff themselves identify within their specific departmental contexts. This creates a strategic challenge for educational developers: how to design professional development that simultaneously meets evidence-based best practices (such as student-oriented approaches that positively impact learning), institutional expectations to develop contemporary teaching competencies (e.g. digitalisation of education, GenAI integration, project-based education), as well as the individual and collective needs that emerge from diverse departmental contexts.

One option may be to develop professional development based on the explicitly expressed needs of teaching staff. This assumes that the curiosity of teaching staff will naturally include a tendency towards contemporary teaching competencies which has remained untested until now. While meeting the needs of teaching staff has proven effective for engaging participants and increasing satisfaction in professional development (Muammar & Alkathiri, 2022; Thomas et al., 2016), this approach risks limiting development to areas in which teaching staff are conscious of their development needs while neglecting areas where their needs are unknown to them. Understanding how teaching staff from different departments already identify and prioritise teaching competencies could inform more strategic approaches to professional development that bridge institutional goals, evidence-based practices, and departmental realities. Therefore, the question this article aims to answer is, which teaching competencies do teaching staff identify as a learning priority and how do these differ according to department?

2 Methodology

2.1 Data collection

This study analysed open-text statements from 863 participants across 16 departments over a period of seven years (2014–2021) at a world-leading research-intensive university specialising in natural sciences and engineering. Unlike typical needs assessments that rely on pre-selected survey items limiting respondents to ranking predetermined options (e.g. Behar-Horenstein, 2014 and Bellows & Weissinger, 2004), this study used open-text responses to capture participants' self-identified needs in their own words. At the beginning of each professional development programme participants were prompted to document personal learning goals or questions that related to teaching and learning in their online course page. Data came from three professional development programs designed around distinct teaching roles: professors (Prof), who hold full course responsibility; senior scientific staff (Snr), who have substantial teaching loads; and doctoral teaching assistants (PhD), who's teaching usually involves facilitating exercise classes within existing course structures. Ethical approval was granted under the project number 2022-N-88.

The total numbers of participants from each programme and their distribution across departments are shown in table one. The category of 'other' refers to research institutes in the university domain:

Department	Prof	Snr	PhD	Total of each department	% of total
Architecture (ARCH)	1	11	41	53	6.1
Civil Environmental and Geomatic Engineering (BAUG)	7	14	57	78	9.0
Biology (BIOL)	5	9	14	28	3.2
Biosystems Science and Engineering (BSSE)	1	5	5	11	1.3
Chemistry and Applied Biosciences (CHAB)	9	14	33	56	6.5

Earth and Planetary Sciences (EAPS)	2	9	31	42	4.9
Humanities, Social and Political Sciences (GESS)	2	16	21	39	4.5
Health Sciences and Technology (HEST)	13	22	26	61	7.1
Computer Science (INFK)	9	4	53	66	7.6
Information Technology and Electrical Engineering (ITET)	7	9	48	64	7.4
Mathematics (MATH)	4	4	16	24	2.8
Materials (MATL)	0	11	14	25	2.9
Mechanical and Process Engineering (MAVT)	13	8	51	72	8.3
Management, Technology and Economics (MTEC)	3	9	30	42	4.9
Physics (PHYS)	8	6	59	73	8.5
Environmental Systems Science (USYS)	10	27	57	94	10.9
Other	0	6	28	34	3.9
Total	95	184	584	863	100.0

Table 1: Distribution of participants by programme, department and academic role.

2.2 Data analysis

A “quantitative analysis of qualitative data” (Kuckartz, 2014, p. 3) was conducted using MAXQDA software. The analysis proceeded in two phases. First, qualitative coding: statements were inductively analysed to identify recurring teaching competencies mentioned by participants. To ensure reliability, 10 % of statements were independently coded by a second researcher with no involvement in program design or delivery. Codes were compared, disagreements resolved through discussion, and definitions documented in a coding manual. Second, quantitative analysis: code frequencies were calculated to determine prevalence of competencies within and across

departments. Each competency was counted only once per participant statement, regardless of multiple mentions. Of the 863 statements, 97.5 % were successfully coded with at least one competency.

The university where this research occurred has a strong natural science focus, therefore most departments would fall into the category of 'hard' science as opposed to 'soft' science, terms first defined by Biglan in 1973 but which are still in use today (Simpson, 2017). Except for two departments (GESS and MTEC), all others are considered 'hard' science departments.

3 Results

3.1 Overall results

The analysis of all 863 participant statements on what they wanted to learn during professional development revealed five dominant categories of teaching competencies:

1. *Student engagement* (52 %): enabling active participation, interaction and motivation for learning.
2. *Course development* (29 %): conceptually designing and practically planning courses.
3. *Specific teaching methods* (26 %): acquiring new, specific didactic techniques.
4. *Assessment* (18 %): designing both summative (graded) and formative (non-graded) assessments.
5. *Student diversity* (14 %): managing student differences such as cultural background, disciplinary knowledge or competence levels.

Analysis revealed both similarities and notable variations in teaching competency priorities across departments (table 2). While fostering student engagement ranked first across all departments, prevalence varied considerably, from 34.8 % of INFK participants to 63.9 % of PHYS participants, almost a 30-point spread. Course development varied between 19.4 % (PHYS) and 46.4 % (BIOL). Specific methods ranged from 10.4 % (Other) and 36 % (BSSE). Assessment also showed up differently: 0 % (MATH) and 28.8 % (INFK). Student diversity ranking began at 7 % (Other) and at most 23.8 % (EAPS).

A further noteworthy point is that some departments indicated 0 % interest in certain categories, for instance participants from EAPS did not indicate evaluation of teaching, nor did MATH participants indicate one of the overall top five ranked competencies (assessment). Not prioritising a category is not necessarily an indication of lack of interest, as absence of a particular priority may indicate sufficient existing expertise. In addition, the sample sizes of certain departments are represented by fewer than 30 participants therefore they may be too small for reliable comparisons. Interestingly, even though the timespan during which the data was collected included the COVID-19 pandemic, the categories ‘tools’ and ‘online/blended learning’ were lowest on the list of top ten priorities.

There are distinct departmental profiles in teaching competency priorities. While all departments prioritised student engagement, only USYS had the same top five ranking as the overall sample. Five departments shared the same top five, but ranked in different order (CHAB, GESS, INFK, ITET, MATL). Others showed unique patterns. For example, ARCH, BIOL, EAPS, HEST, MATH, and OTHER ranked ‘acquiring theoretical didactical knowledge’ in their top five and ‘teaching evaluation’ was ranked top five by only four departments (BAUG, BSSE, MATH and Other). Five departments (BSSE, MATH, MAVT, MTEC and PHYS) ranked ‘conducive learning environment’ in their top five, a competency that didn’t appear in the overall top five rankings.

The two departments (GESS and MTEC) which had been categorised as ‘soft” science departments did not illustrate noteworthy patterns. Due to the strong interdisciplinary nature of each department, it was decided not to further cluster the departments into the additional Biglan categories of applied or pure and, life or non-life.

Department	N	% Total	Student Engagement	Course Development	Specific Methods	Assessment	Student Diversity	Theoretical Input	Conducive Environment	Teaching Evaluation	Tools	Online/ Blended
ARCH	53	6.1	35.8	30.2	28.3	13.2	13.2	17	7.5	3.8	1.9	9.4
BAUG	78	9	47.4	24.4	28.2	21.8	6.4	7.7	2.6	10.3	6.4	3.8
BIOL	28	3.2	53.6	46.4	17.9	21.4	14.3	14.3	3.6	7.1	10.7	7.1
BSSE	11	1.3	54.5	18.2	36.4	9.1	9.1	0	9.1	9.1	0	18.2
CHAB	56	6.5	44.6	26.8	12.5	16.1	19.6	7.1	3.6	8.9	5.4	3.6
EAPS	42	4.9	57.1	26.2	23.8	23.8	23.8	11.9	7.1	0	4.8	9.5
GESS	39	4.5	56.4	30.8	28.2	12.8	20.5	5.1	5.1	7.7	10.3	2.6
HEST	61	7.1	45.9	41	24.6	9.8	16.4	9.8	6.6	6.6	4.9	3.3
INFK	66	7.6	34.8	27.3	24.2	28.8	16.7	3	6.1	3	3	1.5
ITET	64	7.4	62.5	21.9	31.3	10.9	14.1	7.8	9.4	6.3	9.4	4.7
MATH	24	2.8	50	29.2	16.7	0	12.5	16.7	16.7	12.5	4.2	4.2
MATL	25	2.9	56	20	36	28	16	12	12	4	12	12
MAVT	72	8.3	56.9	27.8	34.7	16.7	9.7	6.9	12.5	6.9	9.7	4.2
MTEC	42	4.9	40.5	33.3	21.4	11.9	14.3	7.1	11.9	4.8	0	7.1
PHYS	73	8.5	63.9	19.4	22.2	22.2	11.1	8.3	9.7	5.6	2.8	8.3
USYS	94	10.9	46.8	31.9	22.3	18.1	14.9	7.4	9.6	2.1	6.4	3.2
Other	35	4.1	57.3	27.6	10.4	17.2	7	22.3	0.8	15.1	0.8	0

Table 2: Top ten categories mentioned by participants according to department, in percent

3.2 A closer look at the category ‘specific teaching methods’

To ascertain if teaching staff displayed an intrinsic interest in teaching competencies related to future skills, the category of ‘specific teaching methods’ was examined in more detail. 159 people expressed interest in a specific teaching method. The top five methods mentioned were ‘working with questions’ (47 %), ‘discussions’ (21 %), ‘collaboration or group work’ (17%) and ‘project- or problem-based education’ (15 %). (Statements containing either project-based or problem-based priorities were categorised together as it was unclear if the distinction was known to the participants.)

3.3 Limitations of results

Data was collected prior to the widespread adoption of generative AI which might have influenced the category of 'tools' to feature more prominently, however the timespan did include the rapid shift to online learning forced during the COVID-19 epidemic. The data comes from voluntary participants from one institution which may limit generalisability. Interpretation of statements from non-native English participants was at times challenging. Finally, self-reported needs at program entry may not reflect actual development priorities that are out of scope, such as relating to tenure applications or balancing workload expectations (Hott & Tietjen-Smith, 2018) or ones that emerge over time as teaching staff gain more experience (Thomas et al., 2011).

4 Discussion

This paper began by asking what the teaching competencies are that university teaching staff want to learn and how they may vary according to departmental context. The results show that overall, the teaching staff at this university share similar interests in specific competencies, namely, engaging students, developing courses, assessing students, acquiring specific teaching methods (such as working with questions) and managing student diversity. This was relatively consistent across all departments regardless of categorisation of 'hard' or 'soft' science. In addition, we were able to show that the top priorities of the participants in our study vary across departments. This adds to existing literature that recognises the importance of departmental context (Knight et al., 2006; Shadle et al., 2017; Lund & Stains, 2015) and highlights the potential of tailoring professional development activities to the specific needs of departments.

There was some mention of teaching methods (project-based learning, group work) which could support future skills development; however, these needs were framed in terms of teaching staff's own development needs, not in terms of supporting student's future competencies. This absence suggests that staff are not yet using such

terminology in relation to their own development. Whether is due to an absence of awareness, interest or deliberate exclusion from the context in which the data was collected is unknowable.

The priorities indicated by teaching staff partially reflect the priorities identified in the institution's educational strategy. The university identifies challenges such as more diverse students, rising student numbers, digital advances, continuous performance assessment and project-based education in its vision for teaching and learning (Dissertori, 2024). The priorities of teaching staff overlap with regards to student diversity, performance assessment and project-based education (to a lesser degree). Teaching high enrolment classes, for example, did not rank in the top ten list of priorities, contrary to the findings of Thomas, et al. (2011) in any department.

Some best practice principles for university teaching such as designing courses (Levinsson et al., 2024), and student engagement (Freeman, et al., 2014) were present in the priorities of teaching staff. However, some competencies, such as designing courses, should additionally be differentiated according to teaching roles as these dictate the competencies required (Brown et al., 2025). Future research could examine differences between learning priorities of teaching staff differentiated by Biglan's categories, or by discipline, subject-area or other categories as well as investigate factors contributing to these differences.

When professional development focuses on meeting expressed needs of participants, the participant satisfaction is likely to be high (Muammar & Alkathiri, 2022**)**. However, this approach risks missing out on addressing important emerging factors, such as future skills, evidence-based knowledge about teaching and student learning, or specific goals expressed by institutional strategies. Therefore, a careful balance between meeting participants' expressed priorities and institutional goals must be considered.

We recommend that this can be achieved by using an integrated approach. Professional development programmes for instructors of university instructors should deliberately dovetail the competencies expressed by teaching staff as priorities with those identified as institutional priorities or good-practice recommendations within

professional development literature. This would enable those designing the programmes to build on the intrinsic motivation of teaching staff, while achieving institutional and educational development objectives that are beyond the purview of instructors. For example, creating a professional development programme that focuses on how GenAI can support course development would elegantly meet participants' expressed needs as well as institutional priorities in an authentic manner. A further example is that educational developers could build on instructors' interest in group work and project-based education by incorporating relevant future skills such as cooperation and communication.

This research reveals both commonalities and departmental variations in the priorities of teaching staff for the development of their teaching competencies. While teaching staff across departments share core interests, their specific priorities differ according to departmental contexts. Rather than adopting a one-size-fits-all approach, institutions should consider departmental contexts when planning development initiatives for teaching staff, while also strategically balancing participant-expressed needs with institutional priorities. This way, universities can create professional development opportunities that builds on teaching staff's own priorities and while simultaneously advancing institutional goals.

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