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Keywords: Content analysis, Higher education, Latent class analysis, Teaching excellences, Teaching needs.
From good practices to needs for improvement: Implications for staff development in higher education

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1 Introduction

Nowadays, higher education institutions are called to re-think their educational approaches to provide graduates with hard and soft skills required by the labour market and by the social community.

In the document *Fostering Quality Teaching in Higher Education: Policies and Practices* (Hénard and Roseveare 2012), OECD recalls the urgency of supporting the quality of teaching through the total commitment of countries and universities. The *High Level Group on the Modernisation of Higher Education* (2013) emphasizes the need of a strategy aimed at enhancing the quality of teaching and learning, and identifies as a goal to be achieved by 2020 a recognized/certified pedagogical training for the whole academic staff. In the recent *Paris Communiqué* (EHEA 2018), European Ministers confirmed a formal commitment to promoting and supporting cooperation for fostering innovation in learning and teaching practices, by promoting national and European initiatives for pedagogical training and continuous professional development of higher education teachers.

In the Italian context, academic community and careers are still mainly research oriented, whereas teaching is often considered as a duty which does not affect career developments and does not require specific preparation, as it happens instead for research with doctoral and post-doctoral programs. Despite this cultural delay due to a long cultural tradition based on research and content delivery, it has to be noticed that in recent years the attention and interest towards teaching and staff development have increased. This is due mainly to two phenomena: the use of new indicators established by ANVUR - National Evaluation National Agency for the Evaluation of Universities and Research Institutes - in the process of evaluation and periodic accreditation of the courses and institutions, focusing on quality teaching and support provided to professors to improve their teaching performance. Secondly, the 635/2016 Ministerial Decree instituted for the first time a three-year planning with funds for institutions to improve several areas; one of these areas is staff development and quality of teaching, so universities can submit projects and get funding to support local activities devoted to developing teaching competences.

Besides these two strategic and institutional top-down aspects, a few bottom-up initiatives emerged in recent years in several universities. The University of Padua was pioneer in implementing a first pilot project (Felisatti et al. 2017), then followed by other institutions (Felisatti and Serbati 2018; Serbati et al. 2018), which organized local and spontaneous activities. The pilot project was aimed at analyzing teachers’ current practices, needs and beliefs and then developing training activities to foster innovative teaching activities within the institution. This example was then followed by a network of seven Italian Universities (University of Bari, Camerino, Catania, Florence, Foggia, Genoa, Turin), located in different geographical areas and having various dimensions (according to the number of students and teachers), which used the same approach and the same research instrument to investigate the state-of-art of quality teaching as well as of emerging needs for staff development in Italy, with the aim of establishing a national systemic approach sustained by research and scholarship. Staff development in Italy, with the aim of establishing a national systemic approach sustained by research and scholarship.
2 The debate around good teaching practices: an overview

What is meant by ”teaching” and/or ”teacher” excellence? What is good or effective teaching? How quality in higher education could be defined? An extensive literature exists around these questions trying to develop frameworks or taxonomies for a shared understanding of what constitutes good, excellent, effective or quality teaching in higher education. Although widely found in most countries’ policy documents, concepts of excellence, as well as the ones of quality, are subject to debate: a clear and agreed consensus still lacks on the way these concepts are defined and operationalized in relation to teaching and learning.

In fact, different understandings of teaching excellence in higher education abound and the literature suggests it is an ambiguous term in the sector (Gunn and Fisk, 2013). Also about the term quality, some scholars regard it primarily as an outcome, others as a property. Quality is a broader term used with different meanings, referring, for example, to individual student performance, the outputs of an educational program, the student learning experience or the teaching provided. The Quality Assurance Agency (QAA) defines ”academic quality” as ‘describing how well the learning opportunities (the provision of teaching, study support, assessment and other aspects and activities that support the learning process) available to students help them to achieve their award’ (QAA, 2018). In relation to this definition, some researchers argue that Quality Teaching can never be fully grasped and appraised, since the conceptions of quality teaching happen to be ”stakeholder relative”: students, teachers or evaluation agencies do not share the definition of what ”good” teaching or ”good” teachers is (Henard and Leprince-Ringuet, 2008).

However, over the past three decades, a great deal has been written on what constitutes ”good teaching” in higher education (Duarte, 2013). The literature (Biggs, 2004; Bonwell and Eison, 1991; Brookfield, 2006; Chickering and Gamson, 1987a; Devlin and Samarawickrema, 2010; Light and Caikins, 2008; McKeachie, 1994; Prosser and Trigwell, 1999; Ramsden, 2003) stresses that ”good teachers” or ”best teachers” have empathy for students, they are generally experienced teachers and most of them are organized and expressive. They expect 'more' from their students and they favor objectives that 'embody the kind of thinking and acting expected for life' (Bain, 2004, p.17). ”Excellent teachers” have passions: for learning, for their field, for teaching and for their students. ”Effective teaching” has been broadly understood as teaching that is oriented to and focused on students and their learning. Moreover, there are two broadly accepted components of highly effective university teaching: on one side, it requires a set of particular skills for cultivating relationships based on openness and trust in students. On the other side, the effective teaching is a ”never completely satisfied” (Bain, 2004): these teachers evaluate their own efforts and make appropriate changes, they are learners and 'constantly trying to improve their efforts to foster students’ development, and never completely satisfied with what they had already achieved’ (Bain, 2004, p.20).

As a result of their two-year research project based on a wide review of empirical evidence, Chickering and Gamson concluded that successful faculty in undergraduate education includes the following pedagogical principles in their work: i) encouraging contacts between students and faculty; ii) developing reciprocity and
cooperation among students; iii) using active learning techniques; iv) giving prompt feedback; v) emphasizing time on task; vi) communicating high expectations; vii) respecting diverse talents and ways of learning (Chickering and Gamson, 1987a,b, 1991). These Seven Principles of Good Practice in Undergraduate Education have been used widely as guides to the improvement of university teaching.

Nevertheless, research also demonstrates that “good teaching” depends on what is being taught and other situational factors (Hénard and Leprince-Ringuet, 2008). Young and Shaw (1999) point out that consensus in a definition of good teaching may not be possible because teaching effectiveness depends on characteristics such as type of subject, class size, student ability and assessment practices, among other contextual factors. All university teaching takes place in a context, including a disciplinary context and, clearly, such disciplinary and other contexts vary enormously across departments, faculties and institutions, with consequential influence on what might be understood as effective teaching.

Moreover, the variety of teaching approaches, definitions and principles discussed in these works is itself indicative that teaching in higher education is a complex endeavor, because it involves much more than what happens in a classroom or on-line. For instance, it includes planning, attention for the context, content knowledge, being a learner, and above all, reflective approach towards teaching and learning (Trigwell, 2001). The teacher must ensure that course design, selection of teaching and learning opportunities and assessment processes foster students’ learning and critical and creative thinking. Learning requires opportunities for practice and exploration, space for thinking or reflecting ‘in your head’ and for interaction with others and learning from and with peers and experts (Frey et al., 2009).

As stated in the Report to the European Commission on Improving the quality of teaching and learning in Europe’s higher education institutions, teaching and learning in higher education is a shared process, with responsibilities on both student and teacher to contribute to their success. Within this shared process, higher education must engage students in questioning their preconceived ideas and their models of how the world works, so that they can reach a higher level of understanding. The best teaching helps students to challenge their preconceptions, and motivates them to learn, by putting them in a situation in which their preconceived ideas do not work - and in which it matters to them that it does not work and in which they come to see themselves as authors of answers, as agents of responsibility for change. That means that students need to be faced with problems which they think are important. They need to engage with new questions which are bigger than the course itself, which have relevance to their own lives, and which provoke a lively participation far beyond simply getting through assessment or exams (EU, 2013).

In addition, some authors point that significant shifts in thinking and teaching practice are important as a mark of good teaching, like: attempting to enter into the students’ perspective; paying close attention to student feedback and acting on it; becoming familiar with the literature on pedagogical strategies and effective learning. However, the most important aspect seems that, although these elements are relevant for a good practice, what seems to identify excellent teachers is that this process continues throughout their career: they never stop thinking in detail about how to be better teachers, and listening and responding to their students.
Section 3 Needs analysis and staff development

(Trigwell, 2001; Brew, 2007) adds that teaching excellence is about importance of progressively integrating research and teaching and encouraging a culture of inquiry to improve student outcomes and experience.

As showed, numerous attempts have been made to identify these characteristics, using a variety of theoretical perspectives, but there is no universally accepted definition of effective university teaching (Paulsen, 2002; Trigwell, 2001) (Johnson & Ryan, 2000) so that Skelton (2005, p.11) affirm that it is a contested concept. This is due mostly to the complex nature of teaching and to the heterogeneity of approaches, together with the need to take context into account and discuss the role of the university in the society when defining excellence (excellence is at the heart of debates about what the contemporary university stands for and what it is attempting to achieve, Skelton, 2005, p. 257). The idea of ”teaching excellence” as a monolithic concept capable of being reduced to a set of outcome indicators is questionable. We suggest a need for a more nuanced understanding (Skelton, 2005; Wood and Su, 2017) which recognizes the ethical and relational aspects of the concept viewed through different lenses and understood and enacted in different ways by different individuals. This understanding is at the basis of fostering change process: before trying to foster change, a higher education institution should previously consider what it currently regards as teaching excellence and review how the institution works (Skelton, 2005). More pedagogical research needs to be undertaken to support teaching and learning in higher education (Stierer and Antoniou, 2004; Yorke, 2000).

Based on these premises and in accordance with (Nixon, 2007, p.22) when he says that Excellence is a process of growth, development and flourishing; it is not just an endpoint, our study has focused on the professional academics’ perspectives about what is ”good” in their own experience and practice (and what deserves attention and improvement) in order to sustain staff development initiatives.

3 Needs analysis and staff development

Higher education institutions face challenging transformation in the age of network, such as changing roles in academia, growing focus on student success, changing nature of teaching and learning (Beach et al., 2016).

In this changing landscape, it becomes crucial for higher education institutions to equip their employees with knowledge and skills required to be competent in their job roles (Dierdorff and Surface, 2008).

Therefore, staff development initiatives in universities are important strategies to support professors’ continuous growth and learning, not only in United Kingdom, Australia and United States, where there is a long faculty development tradition, but all over the world. These programs not only contribute to institutional strategic initiatives (Austin, 2011) and public institutions accountability, but also offer concrete and relevant support for teaching quality improvement.

In the study carried out by Postareff and Lindblom-Ylanne (2008), university teachers were interviewed in order to capture the variation in descriptions of teaching: researchers identified four broad categories of teaching, namely the teaching
process, the learning environment, the conception of learning and the pedagogical development. It is interesting to notice that professional development was mentioned by teachers as one key point in their description of teaching. Academics with a learning-focused approach to teaching were keen to develop their own teaching and declared to make efforts in this direction. Some professors who still maintain a content-focused approach to teaching showed less interest in improvement. However in general a pedagogical reflection and awareness seemed to represent an important element to better foster students’ learning.

Sorcinelli et al. (2006) argued that one model of educational development would not be appropriate across all institutions because local needs, factors and priorities should be taken into account. Authors provided broad recommendations for educational developers: promoting professional preparation and development; informing practice with scholarship; aligning training action with institutional missions; linking individual and institutional needs; considering carefully context matters and organizational culture; recognizing faculty diversity and to involve everyone in developmental initiatives.

As in industrial training world, one key element in designing educational development activities is to address both organizational needs, consistently with the academic vision, and individual needs, avoiding offering the same solution to diverse needs (Naris and Ukpere 2009).

The recent report by The Higher Education Academy “Shifting landscapes. Meeting the staff development needs of the changing academic workforce” (Locke et al. 2016) investigated motivations, careers, and staff development needs of academics in relation to their career progression and the balance of teaching, learning support, research and other university duties. Using case studies of different universities across UK, authors collected qualitative data and draw some common emerging themes. With regard to needs assessment and analysis, it was clear the importance to carefully tailor staff development programs on individual needs, with targeted support at appropriate time, rather than proposing formal in-house or external initiatives. The latter seem to be interesting moments for networking, but they risk to be interpreted as a bureaucratic requirement for progression, unless they meet specific needs, such us the development of key skills in using technology. Interviewees highlighted that opportunities to receive constructive specific feedback or support for the portfolio preparation are very relevant as they offer concrete support for personal improvement. Sharing current good practices and discussion with peers was seen as a crucial activity by participants, who focused attention on the importance of good communication to promote initiatives and to balance them with other academic duties.

One key finding of this HEA report is that staff development should be a partnership between institutions and individuals, because if staff perceives it as a requirement, the risk of resistance or low attendance will increase (Di Napoli 2014). The importance of rigor and accountability of teaching and learning calls for training activities aligned with institutional strategies. However, a culture of teaching excellence as growing and continuous process, as described above, requires a direct involvement of academics’ voices.

Despite a large amount of literature regarding staff development, the phase of
needs assessment and analysis is relatively under-theorized.

As Rae (1997) stated, staff development needs analysis is required in many diverse situations, such as for new staff hired in the institution, for current staff when new tasks are introduced or when specific problems have to be solved, for specific teachers in a perspective of continuous improvement of their practices and methodologies. Wisker (2003) highlights also that a needs analysis can focus on different elements. Indeed, the aims of carrying out this assessment can be: gathering a description of job specific requirements; understanding what the employees think they need to improve; understanding the skills needed to undertake the job. Often the objective of the needs analysis can be to acknowledge the gap between teachers’ skills and those required by the job as well as to gain an idea of the activities that can be implemented to fill this gap. One example of the latter is presented by Roberts (2018), who investigated staff perceptions regarding the current and future roles of distance educators, their competencies and needs of training required. This study was carried out using a quantitative web-based survey asking participants to rate the importance of different teachers’ roles from a common list, to provide their perception of their own competencies in each of the roles and lastly to identify roles where they perceive that they required further training.

According to Wisker (2003), intuitive analyses that educational developers used to carry out in the past before designing programs are not anymore sufficient: more structured strategies to gather teachers’ needs should be implemented. If a program aims at having impact on practice, a plan to collect information at the required level should be designed and carried out. This may require time and resources, but the investment in this phase is worth as it assures a better tailored program and a real institutional involvement. In this way, the priority of the university could be matched with perceptions, beliefs, needs expressed by staff and the program could really be integrated in staff daily life and perceived like part of a shared culture and strategy.

As in industries, several data collection instruments can be used, such as interviews, focus groups, questionnaires, documentary analysis, depending on specific targets, periods and topics.

As Neal and Peed-Neal (2010) stated, the most used method of needs analysis is needs assessment or interest assessment survey. Authors recommend using online survey with two to five questions in order to have good and reliable response rates, using simple language, asking only for information relevant for program goals setting, avoiding tendentious sentences and including always open-ended questions. Other possible forms to gather information about staff needs are workshop evaluations, where participants can express their preferences, and focus group, useful to collect more in depth-information possibly at school or departmental level. Individual interviews and observations are also useful tools for detailed information, although they are more time-consuming.

Surveys and other needs assessment instruments offer important insights in teachers’ wants and needs, however, it is unlikely that they can fully represent the institutional culture. The suggestion is therefore to combine quantitative and qualitative data, as well as to collect informal information about interactions, conversations, gather comments from individuals and groups to integrate data collected
Accurate gathering of staff needs helps to setting appropriate objectives of training actions; once precise objectives are set; appropriate formats and methodologies are chosen. Workshops, individual consultations, classroom observations, orientations, grants, faculty fellows, teaching circles, faculty learning communities can be offered to staff (Lee, 2010). Formal and informal forms of development can be combined (Thomson, 2015) in a holistic strategy, which embraces all possible actions that can improve teaching and learning.

4 Research design

4.1 Research context

This research focused on the Italian scenario and involves a group of Italian universities. As in the rest of the world, Italian higher education system is facing new challenges related to a changing population of students and the need of evidence-based accountability of research outputs, as well as of teaching success and therefore students learning outcomes and achievements.

In Italy, educational development is a new emerging field aimed at supporting professors in providing the best educational experience for their students. In 2013-2015 the University of Padua carried out a pilot project with the purpose of analyzing teachers’ current practices, needs and beliefs and then developing training activities to foster innovative teaching activities within the institution: this represented the first experience of this type in the country.

During the initial research phase, a questionnaire was designed and administered to all academics in the university; the instrument, composed by 1-7 point Likert scale items (Felisatti et al., 2017), included also a final section with three open-ended questions. The open-ended questions were aimed at exploring specific aspects of teaching, namely (Aquario et al., 2017):

- the excellence and innovation adopted by professors in their teaching activity;
- the critical aspects encountered in daily practices;
- the type of support perceived as necessary to enhance teaching and learning.

After this experience, the interest on staff development at national level grew and seven Italian Universities (University of Bari, Camerino, Catania, Florence, Foggia, Genoa, Turin), located in different geographical areas and having various dimensions (according to the number of students and teachers), administered the questionnaire to their own staff with the aim of guiding institutional decisions on continuing professional development actions (Felisatti et al., 2017).

This paper focuses on academics’ answers to the above-mentioned open-ended questions of the national computer-assisted web interviewing survey involving staff of the seven Italian universities.
4.2 Research questions

The research aimed at gathering staff voices regarding their perspectives about what is good in their own teaching experience and practice, the kind of problems they face and what deserves improvements as well as the type of support they would like to receive for further development. As stated above, researchers interpreted excellence as a process of growth aimed at making tacit good practices explicit, and collected information about the major criticalities that represent an obstacle to achieve this excellence. Moreover, since staff development initiatives are not yet established in Italian context, it was important to gather information about the preferred kind of support that professors are likely to receive in order to improve the quality of their teaching.

The scope of the data collection was to offer a clear picture of the national and local state-of-art, to inform policies and initiatives and to sustain local and inter-institutional staff development initiatives.

Therefore, the research questions of this study may be summarized as:

- What good practices do university teachers declare to implement in class?
- What are the major problems that staff faces in daily teaching experience?
- Which kind of support do teachers desire to improve their teaching?

4.3 Participants

The study involved 7,278 professors who received the computer-assisted web interviewing survey; 4,289 completed the main questionnaire, with a response rate of about 59% (min 46%, max 74%): this value shows a growing interest on teaching matters and the desire to sharing experiences, opinions and thoughts about critical aspects and needs.

However, respondents considered in study were 3,250, because 1,039 teachers provided very general comments (often unrelated to dimensions investigated) to the open-ended questions. Table 1 reports the main demographic and institutional characteristics of the final sample.

Women were more likely to answer than men, and a clear negative gradient by age appeared (the younger, the higher): the response rate moves to 68% for respondents aged from 30 to 45 years, to 31% for teachers older than 70 years.

Data show that mainly assistant professors and professors with temporary positions responded (temporary positions = 62.9%, assistant professor = 64.4). Associate professors (59.1%) and full professors (50.7%) responded to a lesser extent. No particular elements emerge with respect to the institutional position.

4.4 Methodology

4.4.1 Content analysis

Academics’ answers to the above-mentioned open-ended questions were analyzed by content analysis in order to explore the presence of certain words or concepts within
Table 1: Summary of the main characteristics of the teachers, both in the whole population and in the final sample

<table>
<thead>
<tr>
<th>Teachers’ characteristic</th>
<th>% in the population</th>
<th>% in the final sample</th>
<th>Total response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>40.0</td>
<td>43.7</td>
<td>64.3</td>
</tr>
<tr>
<td>Male</td>
<td>60.0</td>
<td>56.3</td>
<td>55.3</td>
</tr>
<tr>
<td><strong>Academic Role</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary positions</td>
<td>9.1</td>
<td>9.7</td>
<td>62.9</td>
</tr>
<tr>
<td>Assistant professor</td>
<td>29.5</td>
<td>32.2</td>
<td>64.4</td>
</tr>
<tr>
<td>Associate professor</td>
<td>36.8</td>
<td>36.9</td>
<td>59.1</td>
</tr>
<tr>
<td>Full professor</td>
<td>24.6</td>
<td>21.2</td>
<td>50.7</td>
</tr>
<tr>
<td><strong>Age Class</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-45</td>
<td>22.5</td>
<td>26.1</td>
<td>68.4</td>
</tr>
<tr>
<td>46-60</td>
<td>49.9</td>
<td>51.1</td>
<td>60.4</td>
</tr>
<tr>
<td>61-70</td>
<td>26.6</td>
<td>22.2</td>
<td>49.3</td>
</tr>
<tr>
<td>over 70</td>
<td>1.0</td>
<td>0.5</td>
<td>31.0</td>
</tr>
<tr>
<td><strong>Institutional role</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>89.0</td>
<td>88.9</td>
<td>57.9</td>
</tr>
<tr>
<td>No</td>
<td>11.0</td>
<td>11.1</td>
<td>58.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
<td>100.0</td>
<td>58.9</td>
</tr>
</tbody>
</table>

texts or sets of texts through the software Atlas.ti, which is a computer-assisted software package designed to facilitate the qualitative analysis of textual data (Coffey et al., 1996; Kelle, 1997; Milesi and Catellani, 2002; Friese, 2014). Atlas.ti coding process begins with the selection of text quotations considered relevant to the research and with the creation of a ”code”, a label that is linked to selected pieces of data. In this research this process was carried out both inductively and deductively following a recursive and iterative path.

Then the 'Family Manager’ function was used to group the codes under themes through the creation of Pre-codes and Code Families. These could be defined as object containers, allowing to include the codes into categories (Pre-codes) and wider dimensions (Families). Code Families were identified using the three main dimensions investigates, namely excellences, critical aspects and needs; Pre-codes were created grouping codes belonging to the same wider theme.

In the next step, the Network building function was mainly used. The 'Network View’ function helped the researchers to explore the complex phenomena, creating the linkages and assigning relationships between the identified themes/codes/quotations (Rambaree and Faxelid, 2013).

This process was realized by a researchers’ team in each involved University and coordinated and supervised by the Padua research unit. Inter-rater reliability
was guaranteed by independent analysis carried out by researchers and coding comparison towards agreement.

4.4.2 Latent class analysis

The latent class (LC) modeling is a forceful way to classify units in latent (unobserved) subgroups or segments (Vermunt and Magidson, 2004). According to the topic under investigation in this paper, this solution allows to identify meaningful subgroups of profiles depending on the different combinations of teaching practices and needs. Indeed, these subgroups (or classes) set up the categories of a categorical latent variable: units within the same LC are homogeneous according to certain criteria, while individuals belonging to different LCs are dissimilar from each other in some ways (Collins and Lanza, 2010). The latent class approach is a model-based solution, different from some traditional analyses for clustering, such as principal component or cluster analysis.

Originally introduced by Lazarsfeld (1950) to explain respondent heterogeneity in survey response patterns based on dichotomous items, the latent class analysis has been strongly formalized, extended and further developed (Goodman, 1974; Vermunt and Magidson, 2003). This approach has been applied to investigate several phenomena in the social, behavioral and health sciences, including educational data. Since the pioneering work by Aitkin et al. (1981), LC and latent trajectory classes’ analyses are frequently used in related areas such as K-12 education (Bowers and Sprott, 2012; Faggiinger Auer et al., 2016; Hickendorff et al., 2009; Ing and Nylund-Gibson, 2013) and higher education research (Denson and Ing, 2014; Pastor et al., 2007; Weerts et al., 2013). However, almost all of these contributions focus on the student performances and only a less extent teacher styles or practices (Campbell et al., 2017).

For each teacher \( i \) (\( i = 1, ..., n \)), let \( y_{il} \) denote the observed reporting item \( l \) \((l = 1, ..., L)\). In particular, \( y_{il} = 1 \) if individual \( i \) reports a valid answer in a code family \( l \), and \( y_{il} = 0 \) otherwise.

The vector notation \( Y \) and \( y \) is used to refer to a complete response pattern. Let \( X \) represent the latent variable and let \( C \) be the number of latent classes. The probability of obtaining a certain response pattern \( y \), \( P(Y = y) \), is a weighted average of the \( C \) class-specific probabilities \( P(Y = y | X = x) \):

\[
P(Y = y) = \sum_{x=1}^{C} P(Y = y | X = x) P(X = x)
\]

where \( P(X = x) \) is the probability of belonging to LC \( x \).

Within each LC, the \( L \) manifest variables are assumed to be independent: this is the basic assumption of most LC models and usually referred to as the local independence assumption (Hagenaars and McCutcheon, 2002). Formally:

\[
P(Y = y | X = x) = \prod_{l=1}^{L} P(Y_l = y_l | X = x)
\]
Combining equations (1) and (2), the final model can be defined as:

\[
P(Y = y) = \sum_{x=1}^{C} P(X = x) \prod_{l=1}^{L} P(Y_l = y_l | X = x)
\] (3)

The conditional response probabilities are modeled through logit specifications.

The posterior membership probability, that is the probability of belonging to LC \( x \) can be obtained by the Bayes rule:

\[
P(X = x | Y = y) = \frac{P(Y = y | X = x) P(X = x)}{P(Y = y)}
\]

and it is used to assign individuals to latent classes. The most common classification rule is the modal assignment.

Model parameters can be estimated by maximum likelihood (ML), obtained by an adapted EM algorithm (Vermunt, 2003), which has been implemented in the LatentGOLD 5.0 software (Vermunt and Magidson, 2013).

Choosing the final number of classes to profile the analyzed sample is not trivial and usually follows a stepwise procedure: the model with one LC is first estimated, then the number of LCs is increased one by one, until a good model fitting is reaching and the last model improves the previous one. Once estimation of the model has been completed, a large set of measures and statistics is available to evaluate model fit, even if they often lead to conflicting conclusions.

The first set includes standard measures, such as the information criteria (BIC, AIC and CAIC are the most used indicators).

A second group of indicators is based on classification statistics, such as Classification Errors, Entropy R2 and Standard R2.

A third measure lies on the Bivariate Residuals (BVR) estimates. As explained above, a key assumption in any LC analysis is the local independence and BVRs are a way to detect whether this assumption is violated. BVRs are conceptually similar to the Modification Indices in the structural equation modeling approach: low values of BVRs indicate good model fit, while large values identify correlations between the associated variable pairs, that have not been adequately explained by the model. As a consequence, violation of the local independence assumption could lead to a poor fit model (Vermunt and Magidson, 2013). In the current literature, there is not a general rule to assess the smallness of a BVR (Oberski et al., 2013), even though Van Kollenburg et al. (2015) suggest the value of 3.84 for each pair as a benchmark. There are different solutions for solving violation of this assumption: i) increasing the number of LCs; ii) allowing for direct relationships between the associated items; iii) increasing the number of the latent variables underlying the theoretical framework.

In our work, another important model indicator is the LC size: classes too small (i.e. grouping a reduced number of people) are difficult to be used in practice, in particular if the aim of the researchers is to design some academic processes tailored on the real needs of these teachers. Moreover, when the number of LCs is large, it is likely that some segments do not show so strong distinguishing features. According to our sample size, we believe that segments cannot have a size lower than 3%, which means a number of teachers approximately equal to 100.
5 Results

5.1 Results from qualitative content analysis

Table 2 shows the distribution of the Pre-codes that are related to the three analyzed code Families. Compared to the total number of mapped codes (\(N=12,078\)) the proportion of reported excellences is 42%, of critical aspects is 32%, of needs is 26%.

Investigating the code Family grouping all "Excellences" reported by the respondents, Table 3 describes the Pre-codes and their frequencies, while Figure 1 presents a map that disaggregates the Pre-codes in the related codes, reporting the frequency for each code in brackets.

### Table 2: Distribution of the mapped codes Families: Excellences, Critical aspects and Needs

<table>
<thead>
<tr>
<th>Family</th>
<th>N</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellences</td>
<td>5,130</td>
<td>42%</td>
</tr>
<tr>
<td>Critical aspects</td>
<td>3,812</td>
<td>32%</td>
</tr>
<tr>
<td>Needs</td>
<td>3,136</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12,078</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Table 3: Distribution of the Pre-codes for the reported Excellences

<table>
<thead>
<tr>
<th>Pre-code</th>
<th>N</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship with extra-university context</td>
<td>137</td>
<td>3%</td>
</tr>
<tr>
<td>Attention towards students</td>
<td>946</td>
<td>18%</td>
</tr>
<tr>
<td>Teachers’ features</td>
<td>264</td>
<td>5%</td>
</tr>
<tr>
<td>Teaching in class</td>
<td>2,753</td>
<td>54%</td>
</tr>
<tr>
<td>Use of English (language)</td>
<td>39</td>
<td>1%</td>
</tr>
<tr>
<td>Use of students’ ratings about teaching</td>
<td>39</td>
<td>1%</td>
</tr>
<tr>
<td>Use of technologies</td>
<td>952</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,130</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The largest Pre-code identified was "Teaching in class", which referred to a variety of methodological and instructional choices undertaken by professors while practicing their daily activity in class. For instance, the most frequent excellence reported by participants was 'the continuous update of disciplinary knowledge and course contents'. An example is:

"Course syllabus has to be more and more in line with those taught at foreign universities. Every year, I try to change the lessons by introducing new topics and new links with everyday life to convey basic concepts of the subject I teach, to avoid getting bored and boring my students."

As for the Pre-code "Relationship with extra-university context", quotations were
Figure 1: Maps of the codes and the corresponding Pre-codes belonging to the family of reported excellences

grouped into a main code, named 'study visits and contacts with professionals and/or enterprises'. For example, a participant said that:

\[I\text{ always try to interact with subject experts in order to foster students’ ability to apply theoretical notions to real-life situations.}\]

Another important Pre-code identified was related to the "Use of technologies", which represents nowadays a key element in which universities are researching and investing, as stated in the Recommendation n. 11 by the [High Level Group on the Modernisation of Higher Education (2013)]. As an example, we quote below one sentence written by one professor participating to the survey:

\[I\text{ make extensive use of the "Studium" online platform to share not only study materials (especially about multimedia supports) but also to use distance learning activities and provide a service to students and students who cannot attend classes.}\]

Researchers created a Pre-code named "Attention towards students", which indicated answers with a specific focus on teacher-students relationship, with the aim of engaging students in the teaching activity as well as caring about their learning experience. The large majority of codes in this family refereed to the students’ active involvement, as showed by the next quotation:

\[I\text{ usually promote constructive and critical interaction with the students aimed at stimulating them to develop a personal way of reasoning and thinking, on the basis of which they can discuss each other and with the teacher.}\]

Another frequent Pre-code regarded the "Teacher’s features", namely his/her personal skills and attitudes, as shown in the next quote:

\[I\text{ have a specific attitude towards empirical teaching, that is teaching through research, reflection and small groups activities to develop the ability to work in a team.}\]

Moreover, participants highlighted some of their most important professional skills,
such as:

First of all, it is important the scientific update on the topics I teach, and then enhancing the knowledge of the recent developments and perspectives about the teaching methodologies and strategies.

Finally, two minor Pre-codes created concerned the "Use of English (language)" in lessons and the "Use of students' ratings about teaching" in order to improve the quality of teaching and learning process.

Table 4 describes the Pre-codes and their frequencies grouped in the code Family "Critical aspects". The total of critical aspects' codes was 3,812 and four Pre-codes were created.

Table 4: Distribution of the Pre-codes for the reported Critical aspects

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students' features</td>
<td>1,530</td>
<td>40%</td>
</tr>
<tr>
<td>Teacher' features</td>
<td>393</td>
<td>10%</td>
</tr>
<tr>
<td>Organizational aspects</td>
<td>1,875</td>
<td>49%</td>
</tr>
<tr>
<td>Teaching evaluation</td>
<td>14</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,812</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 2: Maps of the codes and the corresponding Pre-codes belonging to the family of reported excellences

As highlighted by Figure 2, most codes belonged to the Pre-code "Organizational aspects", that includes difficulties linked to inadequate spaces and equipment, high number of students in the classrooms and lack of a real interaction among course units. For instance, a teacher said that:

The inadequacy of computer and technical equipment in the classroom and the lack of maintenance of the classrooms do not facilitate and do not contribute to promote positive conditions for learning.

while another said:

The heterogeneity of the students’ population (especially in relation to their knowledge and skills) would require differentiated paths that unfortunately cannot be implemented due to the great number of students.
Another aspect reported by participants concerns some “Students’ features” that, according to the respondents, contribute to define a critical situation, like poor motivation, attendance, interest and interaction in class, and, most important, the lack of basic disciplinary knowledge at entry level. Two teachers said:

*Partial engagement of students. I would like to be able to motivate a larger number of students.*
*In a large number of cases, the students don’t show interest towards the discipline contents.*

The last investigated Family focused on professors’ needs for improvement. Table 5 describes the Pre-codes with their frequencies about this matter. The total of codes is 3,136 distributed into 5 Pre-codes.

**Table 5: Distribution of the Pre-codes for the reported Needs**

<table>
<thead>
<tr>
<th>Pre-code</th>
<th>N</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>University - community relationship</td>
<td>99</td>
<td>3%</td>
</tr>
<tr>
<td>Training/educational courses</td>
<td>407</td>
<td>13%</td>
</tr>
<tr>
<td>Contextual factors</td>
<td>1,703</td>
<td>54%</td>
</tr>
<tr>
<td>Technological aspects</td>
<td>232</td>
<td>8%</td>
</tr>
<tr>
<td>Human and financial resources</td>
<td>695</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,136</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Figure 3:** Maps of the codes and the corresponding Pre-codes belonging to the family of reported excellences

Figure 3 summarizes graphically the needs reported by participants. The highest number of answers was coded as a “Contextual factor”: participants reported that the most relevant aspects that drive attention are those associated with the physical context like better classrooms and equipment.

Another aspect which appeared as a relevant element for improvement consists in having more funds and resources for teaching activities. According to some professors, there is not enough support staff, therefore they often face alone the challenges above mentioned. In fact, for instance they ask for:

*More tutors in the classroom for laboratory activities.*
*Training activities with older and more experienced students.*
Team sharing and work with other colleagues and with experts in teaching methodologies.

This latter aspect is also confirmed by codes belonging to the ”Training/educational courses” Pre-code. Some professors explicitly declare that they would like to participate to staff development programs to learn how to teach better and to deal with issues related to teaching and learning. The area of teaching and assessment methods seems the most desired, as shown below:

I’d like to participate to training seminars about teaching topics (design instructional methods, classroom management, learning assessment, teaching activities, technologies, etc.).
Training courses to make teaching more effective.
It would be interesting to listen to the opinion of experts in communication issues.
I think the frontiers of learning and teaching are endless and we have the right / duty to explore them to combine traditional teaching methods with innovative ways of learning ... and vice versa.

A second area perceived as crucial is the efficient and competent use of educational technologies, as, for example:

Technical support in the use of e-learning advices and support for the use of multimedia platforms.
Support for online management of student learning assessment and self-assessment questions.

Minor relevance was given to the aspects concerning the ”University-community relationship”: some professors hope to have the chance to increase study visits, as well as more seminars with professional guests.

5.2 Results from latent class analysis

According to the classification provided by the qualitative content analysis, for each teacher we created as many dummy variables as the Pre-codes. However, this leads the definition of some variables with a very low sample size, as highlighted by Tables 3, 4 and 5. For this reason, in the Excellence family we grouped the pre-codes ”Relationship with extra-university context”, ”Use of English (language)” and ”Use of students’ ratings about teaching” in a unique and more generic ”Other excellences”. In the Critical Aspects and Needs families we could not pool answers, since we observed only one Pre-code (”Teaching evaluation” and ”University - community relationship”, respectively) having a limited size. Therefore, we included in our LC analysis five variables regarding Excellences (”Attention towards students”, ”Teachers’ features”, ”Teaching in class”, ”Use of technologies” and ”Other”), three variables on Critical aspects (”Students’ features”, ”Teacher’ features” and ”Organizational aspects”) and four involving Needs (”Training/educational courses”, ”Contextual factors”, ”Technological aspects” and ”Human and financial resources”).

Several LC models are then estimated on this set of indicators. The information
criteria (Table 6) suggested very different solutions for the model specification (large
numbers of LCs according to AIC3, low numbers of segments looking at BIC and
CAIC indicators). However, the differences across all estimated models - within each
information criteria - were very low: for instance, the CAIC value increased by only
2.37% from model with 4 LCs to the one with 15 LCs. The classification statistics
suggested the model with 3 classes (Table 7). However, all models with low numbers
of LCs (i.e. until 9) suffered from very high values of BVRs: in such cases, the local
independence assumption is hard to be assumed, therefore equation (2) might be
no longer valid and it is likely we estimated something different from the model in
equation (3). Increasing the number of LCs helped in reducing the value of BVRs,
but it did not solve the problem at all (Table 7). At the same time, as soon as the
number of LCs exceeded the value of 10, one (or more) cluster with a small size
appeared in the corresponding estimated model (apart from just one case).

Table 6: Model fit according to information criteria and LC sample size

<table>
<thead>
<tr>
<th>LCs</th>
<th>Direct effects</th>
<th>AIC3</th>
<th>BIC</th>
<th>CAIC</th>
<th>Small size groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>-</td>
<td>-7065.78</td>
<td>-23469.78</td>
<td>-26694.45</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-7392.34</td>
<td>-23729.89</td>
<td>-26941.89</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-7501.09</td>
<td>-23772.52</td>
<td>-26971.52</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>-7573.02</td>
<td>-23778.32</td>
<td>-26964.32</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-7617.13</td>
<td>-23756.31</td>
<td>-26929.31</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-7653.43</td>
<td>-23726.49</td>
<td>-26886.49</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>-7698.42</td>
<td>-23705.36</td>
<td>-26852.45</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>-7725.47</td>
<td>-23666.28</td>
<td>-26800.28</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>-7859.60</td>
<td>-23769.89</td>
<td>-26897.89</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>-7752.72</td>
<td>-23627.41</td>
<td>-26748.41</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>-7823.70</td>
<td>-23678.05</td>
<td>-26795.05</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>-</td>
<td>-7758.72</td>
<td>-23566.62</td>
<td>-26674.62</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>-7883.47</td>
<td>-23676.77</td>
<td>-26781.77</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>-</td>
<td>-7749.47</td>
<td>-23491.92</td>
<td>-26586.92</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>-7867.72</td>
<td>-23605.07</td>
<td>-26699.07</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>-</td>
<td>-7763.27</td>
<td>-23439.58</td>
<td>-26521.58</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>-7806.67</td>
<td>-23477.90</td>
<td>-26558.90</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>-7756.79</td>
<td>-23366.98</td>
<td>-26435.98</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>-7796.38</td>
<td>-23396.40</td>
<td>-26463.40</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>-</td>
<td>-7746.27</td>
<td>-23290.34</td>
<td>-26346.34</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: "small size" means a cluster size lower than 3%

Therefore, according to all of these thoughts and the interpretation we can pro-
vide to each cluster, we opted for the solution with ten LCs and four direct ef-
cfects: (Excellences)Teaching in class & (Excellences)Attention towards students;
(Excellences)Teaching in class & (Excellences)Teachers’ features; (Excellences)Use
Table 7: Model fit according to classification statistics and BVRs

<table>
<thead>
<tr>
<th>LCs</th>
<th>Direct effects</th>
<th>Classification error</th>
<th>Entropy R-squared</th>
<th>Standard R-squared</th>
<th>Total BVRs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>-</td>
<td>0.054</td>
<td>0.7969</td>
<td>0.8323</td>
<td>814.48</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>0.026</td>
<td>0.8939</td>
<td>0.9230</td>
<td>534.58</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>0.054</td>
<td>0.8886</td>
<td>0.8885</td>
<td>344.36</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>0.064</td>
<td>0.8552</td>
<td>0.8552</td>
<td>261.51</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>0.105</td>
<td>0.8094</td>
<td>0.7923</td>
<td>198.77</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>0.134</td>
<td>0.8084</td>
<td>0.7725</td>
<td>157.08</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>0.145</td>
<td>0.7966</td>
<td>0.7466</td>
<td>144.55</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>0.155</td>
<td>0.7871</td>
<td>0.7350</td>
<td>119.48</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>0.233</td>
<td>0.7069</td>
<td>0.6217</td>
<td>38.36</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>0.157</td>
<td>0.7928</td>
<td>0.7327</td>
<td>82.71</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>0.144</td>
<td>0.8084</td>
<td>0.7532</td>
<td>42.20</td>
</tr>
<tr>
<td>11</td>
<td>-</td>
<td>0.170</td>
<td>0.8021</td>
<td>0.7297</td>
<td>67.96</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>0.232</td>
<td>0.7050</td>
<td>0.6178</td>
<td>32.29</td>
</tr>
<tr>
<td>12</td>
<td>-</td>
<td>0.202</td>
<td>0.7600</td>
<td>0.6684</td>
<td>64.60</td>
</tr>
<tr>
<td>12</td>
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<td>0.247</td>
<td>0.7202</td>
<td>0.6098</td>
<td>28.21</td>
</tr>
<tr>
<td>13</td>
<td>-</td>
<td>0.219</td>
<td>0.7508</td>
<td>0.6510</td>
<td>55.43</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>0.201</td>
<td>0.7755</td>
<td>0.6801</td>
<td>35.54</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>0.190</td>
<td>0.7730</td>
<td>0.6916</td>
<td>45.70</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>0.207</td>
<td>0.7429</td>
<td>0.6555</td>
<td>31.33</td>
</tr>
<tr>
<td>15</td>
<td>-</td>
<td>0.285</td>
<td>0.6990</td>
<td>0.5621</td>
<td>45.03</td>
</tr>
</tbody>
</table>

Table 7 reports the main results, that is cluster size (classes are descending ordered) and the individual probability of reporting each occurrence, conditional to belong to the LC. Table 8 shows the main features of the teachers belonging to each LC: since individual covariates were not introduced in the model specification, this table reports the percentages of each teacher characteristic on the basis of the ex-post assignment of the individuals to the LCs.

Although the large number of retained LCs, it is interesting to note the evidence of a certain amount of homogeneity among clusters in terms of their size: the largest comprises less than 18% of teachers, while the smallest is close to 4%. In line with the sample composition, all classes but one (the eighth) are prevalently composed by men. Moreover, only one class (the tenth) is characterized by people with a very low probability of reporting innovative practices in the teaching activity. Therefore, clusters mainly differentiated each other because of the different role played by
| Cluster | Size (per cent) | 1.78 | 1.17 | 1.27 | 1.57 | 1.4 | 1.6 | 1.9 | 2.3 | 2.6 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---------|----------------|------|------|------|------|-----|-----|-----|-----|-----|---|---|---|---|---|---|---|---|---|
| 1       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 2       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 3       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 4       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 5       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 6       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 7       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 8       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 9       |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |
| 10      |                |      |      |      |      |     |     |     |     |     |   |   |   |   |   |   |   |   |   |

Table 8: Cluster size and the conditional probability of reporting each occurrence.
Table 9: Distribution of the main features of the teachers belonging to each LC

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Women</th>
<th>Age class</th>
<th>Academic role</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Up to 45</td>
<td>46-60</td>
</tr>
<tr>
<td>1</td>
<td>45.1</td>
<td>26.3</td>
<td>53.9</td>
</tr>
<tr>
<td>2</td>
<td>42.8</td>
<td>21.4</td>
<td>46.6</td>
</tr>
<tr>
<td>3</td>
<td>42.2</td>
<td>20.8</td>
<td>52.7</td>
</tr>
<tr>
<td>4</td>
<td>42.8</td>
<td>22.9</td>
<td>54.7</td>
</tr>
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contextual elements in the requested support and criticalities.

More specifically, LC1 is the largest class and is characterized by teachers with also a medium probability of reporting criticalities to organizational features. This cluster basically groups teachers who have not a clear and strong opinion regarding excellences, weaknesses and needs. They recognize to have some good teaching practices (such as - following respondents most frequent answers - continuous update of disciplinary knowledge and course contents; practice and theory interaction; classroom teamwork; case study analysis and discussion; link of course content to real word events; invited stakeholders during classes) and, at the same time, they report some organizational criticalities (some respondents say, for instance, that they find rooms and infrastructure not functional, due also to the large amount of students during classes; another problem is the matching of modules, in order to avoid overlapping and to design an appropriate progression of knowledge during the academic pathway), but no clear pictures appear. This could be the result of a low teaching experience. Indeed, this class is mainly composed by young people, with a very large proportion of assistant professors or teachers having one among the new Italian temporary positions.

LC2 and LC3 are similar since they are characterized by teachers with very high probabilities of underlying criticalities towards students’ features and behaviors. Both clusters demonstrate a quite discrete self-evaluation of their own excellent teaching practices, by describing several activities they do in class (as mentioned in LC1), such as disciplinary knowledge and course contents and various teaching methods aimed at actively involving students; at the same time, they declare to face strong problems related to students’ features and weaknesses, such as lack of knowledge at entry level, low motivation, attendance and interaction in class, as well as students’ heterogeneity. These classes are very similar also according to individual features of their members (LC2 includes teachers a bit older than the
ones in LC3), other than in sample size. The main difference between them is the role played by the need of contextual support. Indeed, only teachers of LC2 are seeking for help in dealing with some organizational issues, such as availability and equipment of infrastructures and rooms, coordination among different courses, more funds to improve quality of teaching and support to organize interactive workshops and laboratories.

To some extent, LC4 is similar to LC2, both on the side of self-report excellent teaching practices and the side of challenging contextual variables. However, teachers in LC4 tend to blame organizational issues rather than blaming students, therefore they stress a lot the need of organizational support, with specific focus on rooms and infrastructure. The different age/role composition of the professors between the two clusters might explain this finding. Indeed, teachers in LC2 are much older than teachers in LC4, therefore, while in LC2 the proportions of full and assistant professors are quite identical, in LC2 assistant professors are nearly the double of the number of full professors.

LC5 is characterized by teachers with high probability of mentioning criticalities on organizational issues and requested support on human resources. Like LC4, teachers belonging to this class express some criticalities related to organizational issues, such as the already mentioned inadequacy of infrastructures and rooms, lack of coordination among different courses and lack of funds to improve quality to teaching; differently from LC4, they declare a strong need of support such as assistants, mainly for lab activities, and tutors to support students’ individual study. This cluster shows the largest proportion of men.

As a common trend already described in previous clusters, also professors belonging to LC6 highlight to practice some excellent teaching activities. Again, organizational issues remain the area which they require more support for. This result does not surprise if we observe that this cluster is composed by young individuals (about one third of them are younger than 46 years), with the largest proportion of teachers working according to the new Italian temporary positions.

LC7 is the only cluster where professors express very strong criticalities about themselves, since they recognize their own difficulties to engage students, a lack of training in teaching and of collaboration with colleagues, as well as a very high bureaucratic workload. This class includes a very low fraction of full professors and the largest proportion of associate professors.

The last three LCs are very similar according to the (small) size, but highlight very different patterns in the collected answers.

LC8 is the only group characterized by teachers with not trivial probabilities for almost all occurrences. It is worth noting that it is the only class: with a very high probability of reporting innovative practices in the teaching activity; being mainly composed by women; showing the smallest proportion of teachers older than 60 years and having temporary positions. These teachers show strong successful teaching practices, but, at the same time, also declare a moderate ability to use technologies in their teaching activity, such as use of multimedia devices, videos, blended-online activity and so on. They express some criticalities related to organizational issues (as in other previous clusters).

LC9 groups professors declaring a strong need of support and assistants. At the
same, similarly to LC3, they highlight to face strong problems related to students’ features such as lack of knowledge at entry level, low motivation, attendance and interaction in class, students’ heterogeneity. About one third of the teachers belonging to this class are older than 60 years (differently from the previous cluster) and less than 20% of them are younger than 45 years; the proportion of full professors is the highest among all classes, just as the proportion of assistant professors is the lowest.

The smallest class (LC10) shows unique features, being characterized by teachers having high probability in reporting ability to teach with technologies, as well as a very low probability of mentioning successful teaching practices. They also highlight moderate problems related to the contextual factors. However, looking at the main features of the teachers belonging to this class, no particular evidence appears.

### 5.3 Limitations

Even if the response rates were rather good, the total number of collected questionnaires in each university involved in the project was not so large. Therefore, in order to guarantee some in-depth analyses, we preferred to create a pooled sample of teachers coming from all universities. This does not allow to take into account some peculiarities (in terms of organization, management, size and so on, both at the course and at the university level) of each institution. However, most of these organizational characteristics are regulated by the same national acts or laws.

Then, our sample may suffer from some forms of self-selection: first, teachers agreed (or not) to participate to the survey; second, they agreed (or not) to answer to the qualitative section of the questionnaire at the end of the main interview; third, they provided comments that were truly related to the dimensions under investigation. It is likely that the final sample is composed by the most motivated or critical teachers from the different universities.

Yet, in order to perform the latent class analysis, some Pre-codes were grouped among the Exellences to create the "other" variable, while for the Needs and the Critical aspects families two very small size categories were just deleted. However, given the smallness of all of these categories, findings and conclusions should not be affected by these choices.

In the end, we need to remember that data are based on self-reported answers: teachers describe excellences, needs and critical aspects according to their personal view and feeling, but, on the other hand, this is crucial in the participatory approach that characterizes the research design.

The present research open for possible further analysis as well as further research developments. On the first hand, the data collected are suitable to be processed within each institution, by focusing only on answers from local academics. Moreover, cross-institutional analysis could deepen other variables, such as professors’ perspectives and opinions according to disciplines, academic roles, ages and gender. On the second hand, face-to-face in depth-interviews and focus groups could integrate the collected data, investigating specific issues and allowing to clarify and detail codes and categories that emerged.
6 Discussion and conclusions

As mentioned, it is hard to universally define the concept of "teaching excellence" (Paulsen, 2002; Trigwell, 2001) (Johnson & Ryan, 2000), due mostly to the complex nature of teaching and to the large variety of approaches. In line with Wood and Su (2017) and Skelton (2005), this research offered some insights on the key elements of the multidimensional concept of "teaching excellence" (Paulsen, 2002; Trigwell, 2001) (Johnson & Ryan, 2000), identifying a kaleidoscope of aspects that academics declare to be drivers for excellent teaching practices.

In order to do that, the researchers selected a participatory approach; in fact, literature shows that the staff development needs assessment phase is relatively under-theorized. However, some authors recommend to try to understand and address both organizational needs, consistently with the academic vision, as well as individual ones (Naris and Ukpere, 2009). Therefore, direct involvement of academics’ voices through a survey represented an important opportunity to get teachers’ points of view, in order to promote and widespread excellent practices and to support the solution of critical issues and the development of areas of improvement.

The most frequent category emerged from content analysis under the declared excellences referred to the action of teaching in class, followed by the use of technologies and a specific focus on students’ needs. However, we cannot forget teachers’ features as well as the relationship with extra-university context. With regards to critical points, the major problems concerned the organizational aspects (rooms, timetable, integration of different modules, etc.), as well as students’ features (lack of disciplinary knowledge, low attendance and interaction) and, as a minor aspect, teacher’ features. In the case of needs for improvement, once again the contextual factors appeared to be very problematic, together with a desire for more human and financial resources as well the need of training/educational courses.

Content analysis, as well as latent class analysis, allowed researchers to design a multi-level action plan, taking into account three different stages: an institutional level, an inter-institutional one, and a national one.

The discussion among researchers belonging to all the universities participating to the survey lead first of all to the following activities to be implemented at micro-level in each institution:

- providing university management with a specific report on emerged elements to address criticalities on organizational aspects highlighted specifically by professors belonging to LC4, LC5 and LC8; it is unlikely that all problems identified could be immediately solved by the institutional leaders, however the awareness of academics’ perceptions about the most crucial ones may help to map and therefore to focus on those which are more urgent. Moreover, requests for further support in terms of human and financial resources (i.e. LC5 and LC9) could also become more explicit and possibly stimulate an answer from the university management, thank to specific reports elaborated on the basis of this research;

- in a similar way, providing students services with a report with specific information about major students’ problems underlined mainly by professors in
LC2, LC3 and LC9; this might help services to plan actions such as increase first year support and guidance, improve integration among modules and avoid contents overlapping, develop tutoring initiatives (Zabalza, 2002) with senior students and among different study programs;

• establishing formal and informal opportunities (i.e. face-to-face meetings and/or online repositories) for sharing existing excellences and good practices. Within this approach, faculty learning communities (Cox, 2004) and mentoring initiatives and networks (Yun and Sorcinelli, 2007) could be developed as chances to discuss emerging issues, identify strategies to be applied in their own and/or other contexts and modeling practice for (junior) colleagues. These could involve, for example, teachers belonging to all classes, with specific attention to those in LC8, who appear as champions of teaching and can represent guides or mentors for other, as well as those in LC10, who appear to be expert in the use of educational technologies;

• designing and implementing local staff development programs, seminars and workshops to address emerged key needs (i.e. teaching methods, students’ engagement, etc) and establish centers and services devoted to this purpose. It seems clear that professors are not quite aware of their development needs in the field of teaching: indeed, in no latent class academics show high probability to express their training needs. In fact, this could be explained by the cultural tradition of our Country, in which research outputs still play a major role for careers and the attention to teaching results has begun to emerge in the last years. Institutions can anyway promote initiatives to address these implicit needs, with the aim also of raising awareness about these possibilities for improvement. More specifically, LC1 appeared to be composed by teachers who have not a clear and strong opinion regarding excellences, weaknesses and needs, being mainly unexperienced young professors: this group could be involved in entry-level staff development programs, devoted to develop key teaching skills (Austin, 2003), as well as orientation programs devoted to present resources available, organizational aspects, key services, student life and functions and to clarify responsibility and duties.

Professors grouped in LC7, who showed very strong criticalities about themselves can benefit of workshops and activities with focus on teaching, learning and assessment methodologies, strategies for students’ engagement and other specific aspects of the teaching practice.

At a meso-level, with the aim of optimizing efforts and resources, joint initiatives organized by two or more universities in the same geographical area could be promoted. Some inter-institutional activities could be, for example:

• formal and informal opportunities can be implemented also by involving professors belonging to two or three institutions, offering initiatives for sharing discussion in the same subjects or at interdisciplinary level. This activity might be very useful, for example, for academics included in LC2, LC3 and
LC9, who tend to blame the students for all aspects related to inefficient teaching or difficulties in teaching; a sharing of opinions in different contexts can allow further reflection on that as well as the identification of possible solutions not considered before;

- designing and implementing inter-institutional training, workshops and peer observation sessions [Race et al., 2009] on emerged key needs and topics which encounter common interest in more than one institution, possibly using a joint budget and involving academics from different universities with similar interests (i.e. for teachers in LC1 and LC7).

At a macro-level, the research already achieved important results such as:

- raising awareness about the teaching role, related competences and how they can be developed and improved, in an Italian context with major focus on research outputs and still limited initiatives for professional development;

- developing a shared language among all professors, not only those belonging to education area, but also to all professors from different disciplines. Another document also contributed to this achievement: in 2017 ANVUR - National Evaluation National Agency for the Evaluation of Universities and Research Institutes - published the "Guidelines for teachers’ professional development and strategies for the evaluation of teaching quality in the University” produced by the study group “QUARC_Docente” (Qualification and recognition of the academics teaching competences in the university system). This document is a tool that intends to offer universities support in identifying developmental strategies and systemic models, aimed at the enhancement of the relationship between teaching and research, as well as at the recognition of teaching competences;

- developing a common instrument to map excellences, critical aspects and needs of academics using a participatory bottom-up approach; this can be a starting point for improvement strategies and benchmarking;

- establishing a national university network [Sorcinelli et al., 2006] for educational development. This represents a major outcome of the research. The establishment of the Scientific network ASDUNI (Italian Association for the promotion and development of teaching and learning at the University[^1]), aims at organizing, promoting and supporting research, seminars, internships, courses, pilot projects, conferences, publications and anything useful for the development and dissemination of educational development and for the enhancement of teaching and learning assessment in higher education. At the moment, the network collects academics belonging to the institutions participating to the research, but the aim is to expand it at national level, open to international contacts and networks.

[^1]: www.asduni.it
Although results are based on self-reported answers from a self-selected sample, elements identified in these subgroups are now guiding institutional choices to offer educational development initiatives: universities are designing and proposing local or joint programs which try to value current innovation and meet real needs emerged. This experience represents a bottom-up attempt to identify hidden key needs for improvement as well as implicit good practices, in order to share them with all the involved actors in the university context. The research has given the opportunity to highlight these elements and this could create an increase of teachers’ motivation to attend staff development offers. Moreover, it represents an integrated systemic initiative using research to inform practices, promoting a shared culture of teaching and learning in higher education, that is critical for the vitality of the academic environment, as well as a scholarship approach with the aim of valuing teaching and identifying appropriate tailored strategies to improve it.

References


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