Accreditation in higher education: does disciplinary matter?

Quality assurance in higher education has developed and has been totally reformed in the last decades. In particular, in Italy the AVA system (Autovalutazione, Valutazione e Accreditamento, in English self-evaluation, evaluation and accreditation) was used in 2016 to verify the performance of 118 randomly selected university Study Programmes (SPs).

This study investigated the relationship between quality performance (AVA evaluation) and discipline areas with the aim of understanding the 'quality mechanism' thus determining whether some disciplines perform better in quality assurance processes.

A strong correlation between technical/engineering SPs and good quality assurance results was found, probably because quality expertise is particularly developed in these disciplines. The creation, for each university of an expert's unit constituted by professionals with a technical/engineering mentality to monitor and improve quality, is therefore recommended.

Keywords: quality assurance; accreditation; self-evaluation; study areas; Italian higher education system

Introduction

Educational quality as procedure

Quality assurance in higher education has been reformed and developed worldwide in the last decades such that research and teaching in higher education is increasingly a global concern (OECD, 2009) (Filippakou, 2008) (Shah & Do, 2017).

In most European countries, higher education institutions (HEIs) focused their attention on performance, goal orientation and cost-efficiency, as market and quasi-market systems

adopting managerial and governance systems from the private sector (Tommaso Agasisti & Catalano, 2006) (Teelken, 2012), (Frank, Kurth, & Mironowicz, 2012).

This transformation began with the New Management (NM) and New Public Management (NPM) models introduced in the UK in the 1980s, although the first evaluation systems of the Study Programmes (SP) were present in those years in the Netherlands, France (van Vught & Westerheijden, 1994) (Torabian, 2018) and Denmark (van Vught, Franciscus A. & Westerheijden, Donald F., 1993). The spread of these management models has greatly impacted HEIs.

According to Deem et al. (Deem et al., 2007), universities have changed from 'communities of scholars' into 'workplaces', and those systems, which had been almost far from autonomous, "have become subjects of and targets for the 'audit culture' (Shah & Nair, 2013) (Shah, 2013) and related 'transparency regimes'".

As a consequence of the new approach to public management, the need to control and reduce public expenditure in the HEI sector has contributed to the spread of a research and teaching evaluation approach (Turri, 2012). The rise of the European Higher Education Area (EHEA) aimed at allowing mutual recognition of HEIs and at facilitating mobility among institutions, as well as at permitting the comparison of quality assurance systems.

In 2005, the first draft of the Standards and Guidelines for Quality Assurance in Higher Education in the European Higher Education Area was formulated and approved by the Ministers responsible for higher education (ESG) (*ESG_3edition-2.pdf*, n.d.). The guidelines, made up of 23 non-binding standards, represented an important development for quality assurance in European higher education (Kohoutek, 2014). The main goal of the ESG was that of creating a shared background of standards and procedures for quality assurance in education systems, as well as having a suitable peer-review system for

accreditation agencies. HEIs began, therefore, to adopt quality assurance and accreditation systems (Stensaker, 2011).

In many European systems, the frameworks for quality assurance in higher education can be defined as a multi-stage procedure (Bornmann, Mittag, & Daniel, 2006) (Green, 2013), similarly to what happens in industrial quality assurance systems (Srikanthan, 1999) (Lundquist, 1997). Multi-stage procedures normally begin with a self-evaluation of the implemented quality system (Asif, Awan, Khan, & Ahmad, 2013), followed by an external evaluation conducted by peer reviewers. External evaluation may require recommendations to be implemented and assessed in order to generate a continuous improvement. In higher education, accreditation is intended as official validation of quality assurance compliance by dedicated control institutions (Lundquist, 1997). Normally, accreditation is based on an external evaluation process aimed at controlling the achievement of certain quality standards necessary to achieve accreditation (Van Berkel & Ynand Wijnen, 2010) and, basing it on the national framework reference, it can lead to specific consequences in financing, such as the public financing or even the licence to provide education programmes (Haakstad, 2001).

However, over the years, quality assurance has been difficult to apply correctly and has been criticised for several reasons: firstly, the process-oriented nature of quality assurance systems is not easily applicable to HEIs; secondly, academics consider quality assurance and accreditation systems as something forcefully imposed and not useful (Cardoso, Rosa, & Stensaker, 2016) and finally, many biases have been detected in the accreditation systems. In particular, those biases could be due to the different nature of the SPs.

The role of disciplines in quality assurance

Quality assurance and accreditation schemes aim to achieve only minimum requirements. Their applicability in the Education sector, where the output is the students' preparation, has been criticised because it has somehow shifted the attention from quality practices to formal rules and routines (Mårtensson, Roxå, & Stensaker, 2014; Van Berkel & Ynand Wijnen, 2010).

Quality assurance imposes several bureaucratic requirements which academics must undertake beyond their normal activities. For this reason, quality procedures are seen with hostility by academics who find them unfair, overly bureaucratic and energy-consuming (Cheng, 2009; Van Berkel & Ynand Wijnen, 2010).

In addition, many biases have been related to accreditation systems, such as the subjectivity of the evaluators (Bergseth, Petocz, & Abrandt Dahlgren, 2014), or the reference framework (Cook, Butcher, & Raeside, 2006). Bergseth et al. (2014) which compared the ranking lists of different evaluation institutions in Sweden. They ascertained that, even if the two results were comparable, there would be no significant agreement between institutions, furthermore, evaluation scores differed significantly from one another. Time also plays an important role, because evaluation procedures of the same systems tend to become stricter or less strict over time. Cook et al. (2006) presented an adjusted model which considered factors such as the evaluation year, the size of the Department and the subject to revisit the scores of Quality Assurance Agency (QAA) from 1996 to 2001, in order to explain the link between these parameters and a sort of inflation rate of assessment outcomes in the United Kingdom. Szanto (2004) revealed that both the uneven quality of the evaluators and the change of procedures and requirements negatively affected the accreditation procedure in Hungary (Szanto, 2017).

Among the factors which can affect quality assurance and outcomes, disciplinary measures play an important role. As Becher (1989) points out, disciplines can be seen as tribes, each with their own identity and culture. Each discipline develops specific competences which characterise the SP and differentiate it from others. Some studies (Biglan, 1973; Friedrich, Prøitz, & Stensaker, 2016; Muller, 2009) have investigated those differences. In particular, Biglan divided disciplines into hard pure, soft pure, hard applied and soft applied discipline fields of study, depending on the presence of a paradigm at the bottom of their culture, and on their level of real-life application. These categories do not only specify the discipline, but also influence/determine the cognitive style of its members (Biglan. 1973), which is described by psychologists as the way individuals think, receive information, and approach problem solving (Carey, 1991; Kozhevnikov, Evans, & Kosslyn, 2014).

Many authors studied how disciplinary affiliation can influence academics' perceptions of quality assurance systems (Kekäle, 2000) on teaching (Neumann, 2001; Ylijoki, 2000). The aim is always to verify how belonging to a more "procedural" type of discipline can influence the quality of academic work. The findings of the studies are inconsistent especially when undertaken in engineering and medical settings.

Cardoso (2013) surveyed Portuguese academics regarding their level of agreement on five quality assurance aspects (objectives, purposes, priorities, parameters in relation to the institutions' operation, and parameters in relation to the results of the institutions' activities). He discovered that academics from the medical and health sciences agreed the most, while those from the engineering field agreed less. Similar results have been obtained by studying academics' perception of Finnish and Greek quality assurance systems (Ursin, Papadimitriou, & Dean, 2009).

What if disciplinary affiliation did not only affect quality assurance perception, but also its performance? Quality assurance, at any level of application, requires a "Plan, Do, Check, Act" approach (Deming, W.E., 2000), which is typical of some academic disciplines, such as management economics or engineering. Considering that quality management is, in most national frameworks, performed by the teaching / academic staff, it is easy to hypothesise that disciplines with strong expertise in process management / quality systems can have a higher performance during evaluation procedures.

For these reasons, this study focuses on the relationship between disciplinary affiliation and accreditation results . A deeper knowledge of this mechanism could in fact help both those who create and those who must apply quality guidelines, which should be calibrated in a disciplinary area.

Educational quality in Italy

In Italy, the evaluation of HEIs has changed since 1993, with different national agencies, evaluation purposes and techniques (Rebora & Turri, 2011; Turri, 2014). The actual quality assurance scheme was designed by the National Agency for the Evaluation of Universities and Research Institutes (Agenzia Nazionale Valutazione Universitaria, ANVUR). The so-called AVA system (Autovalutazione, Valutazione e Accreditamento) entails three steps known as self-evaluation, evaluation and accreditation. This system became compulsory in 2013 and involves all organisational levels within the different institutions (Universities, Departments, Study Programmes) and all teaching and administrative staff (Murmura, Casolani, & Bravi, 2016). Study programmes (SPs), the focus of this research, are responsible for teaching quality. They fulfil quality assurance requirements following national and institutional (Athenaeum or University) guidelines, quality steps and detailed documentation of their activities. Institutional guidelines are set

and monitored by an audit committee, which is unique for the whole institution.

The quality procedures which every SP develops internally are externally evaluated through the accreditation process, which is compulsory both for starting and already existing HEIs and SPs. This means that starting HEIs must achieve an initial accreditation before the beginning of their activities, while for already existing HEIs and SPs the initial accreditation has already been considered reached.

The initial accreditation must in any case be followed by a periodic accreditation, which gives HEIs and SPs official recognition for a period of five years in accordance with the Ministry of Education, University and Research (Ministero dell'Istruzione, dell'Università e della Ricerca, MIUR). Accreditation is given by the National Agency for the Evaluation of Universities and Research Institutes (Agenzia Nazionale Valutazione Universitaria, ANVUR) after the evaluation of special Evaluation Committees (Commissioni di Esperti della Valutazione, CEV).

The CEVs are nominated by the ANVUR (DM 47/2013, artt. 3- 4), which identifies the components in the Experts Register for the evaluation of different sections. In particular, ANVUR selects system experts for the evaluation of University central offices, disciplinary experts and student volunteers to assess SPs requirements, and telematics experts for additional requirements in Telematics Universities. The CEV's coordinator is a non-teaching, official or ANVUR collaborator. At the head of each CEV there is a President, who is an expert of evaluation systems and presides over the procedure.

CEVs judge SPs in two phases: a documental evaluation and an on-site evaluation of the compliance to quality assurance procedures. According to the first schema (AVA1, see Table 1), the evaluation of SPs was based on five indicators referring to (see second column of Table 1):

- Educational needs;

- Expected and checked learning results;
- Incoming and outgoing SPs;
- Student's experience and
- Employment support.

The quality indicators were further divided into sub-indicators, each referring to single aspects of the main indicator (see last column of Table 1). For example, for the first indicator "educational demand", the three sub-indicators selected were: 1. Consulted parties specifying the types of third parties consulted (the so-called "social partners"); 2. Consulting method that refers to the means used for the consultations (meetings, survey…); and 3. Definition of needed functions and competencies which identifies the clarity of the SP target.

In this context, evaluations refer to the methods in which things are undertaken, namely planning, implementing, forecasting, monitoring and adjusting actions.

Accreditation occurs when the CEV's evaluation on the indicators is positive. The judgement is formulated through an algorithm which considers the single evaluation of each of the five indicators (and its sub-indicators), which is based on an A B C D score system, where A means "approved as excellent practice", B "approved", C "approved with recommendation", and D "not approved". If the SP is approved (A, B or C), it has the authorisation for educational provision. If it is not approved (D), it will be cancelled (if still existing) or it will not proceed. Many research activities revealed that the actual evaluation system, both for research and teaching, did not succeed in providing universities with a governance tool for improvement (Turri, 2014), rather they resulted being an instrument for the reallocation of government funding (Rebora & Turri, 2011).

Aim of the study

The aim of this study was to investigate the relationship between quality performance (AVA evaluation) and discipline areas with the aim of understanding the 'quality mechanism' and to determine whether some disciplines perform better in quality assurance processes. This study did not seek to evaluate the utility of a quality assurance system for HE, nor did it create a "compliance ranking list" of educational areas.

Methods

Population

In Italy there are 96 universities with 4300 SPs (www.anvur.org). In the first accreditation experience, ANVUR chose 14 Italian universities with 14 different evaluation committees (one for each institution). Each university must accredit 10% of its SPs (5% chosen by the University and 5% by ANVUR). In total, 118 different SPs were then evaluated. The SPs number was chosen in order to obtain the best representativeness on disciplinarity, course level (bachelor, master, …) and students' careers. Total and sub-indicator scores were published on the ANVUR's website (www.anvur.org) and are freely available. All procedures performed in the study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

This analysis included all 118 SPs from the 14 Italian universities, evaluated by 14 CEVs in the first accreditation cycle from 2014 to 2016.

The CEVs evaluations are composed of a text (in Italian) and a table containing the indicator scores and the final scores. The text explains and comments on given scores.

Data are freely downloadable from the ANVUR website.

As previously stated, the possible scores are: A, B, C and D. A means "excellent", B "pass", C means that a problem may arise if some corrections are not inserted, while D means that there are problems which cannot be easily solved. This scoring system is used for both single indicators as well as the whole SP.

Each sub-indicator receives a mark from CEVs, then the rules explained below assign a mark to each indicator (AQ5.A, AQ5.B, AQ5.C, AQ5.D and AQ5.E) and finally the same rules are applied to obtain the final mark.

The rules used to assign the marks are:

- If a D is present, final mark is D
- If there is at least a C not balanced by an A, the final mark is C
- If all the Cs are balanced by As or only Bs are present, the final mark is B
- If no Cs are present and there is at least an A, the final mark is A

In this study, A or B are considered as "positive scores", and C and D as "negative scores", albeit C and D have different meanings. This decision stems from two considerations: firstly, the final goal of an SP is to achieve at least a good (B grade) or an excellent (A grade) quality level, and so it makes sense to group those marks as the "desirable" ones. Secondly, fortunately, very few SPs considered in this study received a D (only 1 as final score, 17 Ds in total in the sub-indicators). For these reasons, C and D scores were grouped in the following analyses.

SPs were also divided into 5 study areas, based on similarities as regards teaching and disciplines. These 5 categories were Maths, Physics and Natural Sciences (MPN), Engineering and Architecture (Eng), Medicine and Life Sciences (Me), Law, Economics and Social Sciences (LES) and Human Studies (H). Table 2 shows the discipline areas

used in this research. Cognitive style using Biglan's characterisation (Biglan, 1973) and SP numbers (see Table 2). Biglan's characterisation of MPN is paradigmatic, putting together both applied (Biology, Geology and Agricultural) and non- applied (Maths, Physics) disciplines. ENG is both paradigmatic and applied, MED is applied but mixes applied (Medical, chemistry) and non-applied (Psychology), LES is non-paradigmatic but applied, while H is non-paradigmatic and non-applied.

Statistical analysis

Data were analysed with SAS/STAT® Software. Chi-square tests were performed to determine the statistical significance of differences between groups (confidence level: 95%, i.e. the difference was significant if $p < 0.05$).

In order to assess the different types of probability of good performance (A or B marks) of the study areas compared to ENG (reference study area), the Odds Ratios (ORs) with a 95% Confidence Interval (CI) were estimated using a logistic regression model. It can be useful to specify that an OR = 1 means that the study area has the same probability of good performance compared with ENG; OR >1 or OR<1 mean that the study area has a higher or lower probability of good performance compared with ENG, respectively.

Results and discussion

This section provides a comparison between the percentage of good results (A or B scores) in the different areas. The two macro-areas (MPN+ENG versus the others MED+LES+H) were also distinguished in order to separate the most applied cognitive styles from the other ones.

In Table 3 the results are reported. Only statistically significant comparisons are reported and commented below.

As far as total scores are concerned, the first evaluation cycle uncovered many critical areas in HEIs and SPs. Only 30.2% of SPs had a good result and only 3.3% (4 SPs) had an A, while only 1 SP received a D (0.08%). In general, most of the SPs (66.42%) received a total score of C, meaning that there were problems in quality assurance which needed to be solved. However, ENG areas of SPs had a significantly better performance (59.1% of SPs received an A or a B) compared to other SPs (23.7% in average received A or B, p value = 0.03). The ORs are all significant and between 2.97 and 5.04, i.e. being ENG gives between 3 and 5 times the possibility of having a positive score.

AQ5.As: Educational demand

The AQ5.A indicator refers to the way in which SPs define the educational demand, i.e. the quantity and the quality of investigations concerning future work for students (training, consultations with firms /services…). To accomplish this sub-indicator, the academic staff must build a solid network with all possible stakeholders, paying attention to their representativeness of the job market. The evaluation is mostly related to how this network is organised and how information is collected. Table 3 shows that scientific and technical disciplines have a better performance. In particular, as regards the stakeholders consulting (sub-indicator A1) of the macro-area MPN+ENG (85.7% of good scores) which is significantly better (p-value = 0.0049) than MED+LES+H (68.4%) with no difference (p-value = 0.1471 > 0.05) between MPN (80.0%) and ENG (90.9%). This result is confirmed by OR = 2.76 (95%CI: 1.02-7.45) which shows that MPN+ENG has more than twice the chance of having a positive score compared to MED+LES+H. The reason could be the ease in identifying the reference job market compared with the other study areas.

AQ5.A2 is more related to the consulting methods: the chi-square test and the ORs highlighted a significant difference at the disaggregated level: ENG (86.3%) is

significantly better (p-value = 0.0124) than the others (41.2% in average), reaching also a very high OR (between 7 and 12). This result is due to the familiarity of technical SPs with procedures.

AQ5.B: Expected and checked learning results

The indicator AQ5.B evaluates the general coherence between educational demand and the specific learning results, knowledge and competence.

AQ5.B4 involves the way in which evaluation methods are described and notified to the students. This is related to some form of standardisation of information among teaching courses and sharing information about courses and exams. A significant difference between areas (p-value = 0.0181) is shown. In this case, LES is the area with the highest scores (72.7%), followed by ENG (63.6%). As ORs show, being an ENG SP is not an advantage in this part. On the contrary, LES has an advantage compared to MPN (OR 4.95, 95%CI 1.49-16.38), MED (OR 4.33, 95%CI 1.34-13.92) and H (OR 3.85, 95%CI 1.22-12.09). Normally, these SPs have a large number of students and therefore have to develop efficient communication systems.

AQ5.C: SP incoming, path and outgoing

The indicator AQ5.C deals with the problem-solving skills of SPs. AQ5.C1 is related to the detection of problems, in particular from the data analysis. This means collecting information from data with a certain level of reliability . For this sub-indicator, scientific and technical study areas perform better than other SPs, especially ENG, showing greater analytical skills (85.7% of good evaluations, 100% in case of ENG) with respect to the other areas (p-value = 0.0111), in particular LES (66.6%). The result is significant for the chi-square test and is confirmed by the OR, even if in general, all SPs revealed good analytical skills, except from SPs in LES (only 66.6% of good evaluations). In particular,

the SPs in Law have the worst performance (55.5% of good results), while the Economics and the Social Sciences SPs are just below the average of 80.5% (70% and 71.4% of good results respectively).

AQ5.C.4 is related to the management processes of planning, implementing and monitoring, including goals setting and action reviewing. Moreover, in this case, the best performance is given by ENG SPs, while the worst result from Psychology (25%) and Law (33.3%) SPs. It is interesting to note that no 'A' was reached in this sub-indicator, while 2 'Ds were assigned (Geo-Biology SPs). The ORs also confirm that ENG SPs have higher possibilities (more than three times) in achieving good results for this sub-indicator, probably because of its procedural nature which consists of planning, implementing and monitoring activities. The low performance of the other discipline areas means that a great deal of work must be done as regards this point for the future.

AQ5-D: Student's experience

AQ5.D aims at evaluating how students' opinion are considered in the SP's quality system. In order to become more aware of students' opinions, there should be a specific procedure for collecting and sharing complaints and suggestions (D1), a dedicated place and moment to discuss and solve them with students (D2), an objective way to measure progress (D3). For the AQ5.D indicator in general, professional skills contribute to the performance of SPs: engineers and clinical doctors are used to measuring their progress in a structured way (e.g. machine efficiency, health status of the patient…).

Scientific areas are significantly better in D1 (69% of MPN+ENG vs 48.6% of MED+LES+H, p-value = 0.0329). In particular, ENG has a higher probability of having a positive result compared to LES (OR 5.23, 95%CI 1.54-17.67). ENG SPs have the best performance (77.2%), while LES have the worst (39.4%). ORs for this sub-indicator

show that an ENG SP has twice the probability of achieving good results compared with MPN and 5 times compared with LES SPs.

In D2 the difference between the two macro-areas is still present (p-value = 0.0465), although, grouped per area, we can see that MED (90.4%) is comparable with ENG (86.3%) and MPN (90.0%), while LES is the worst one (39.4%). However, 2 ENG SPs reached an 'A' as opposed to all others. Moreover, OR of MED vs the other areas and only MED vs LES was significant (OR 6.17, 95%CI 1.22-31.05).

As regards D3, there are no differences between the two macro-areas (p-value = 0.1455) but ENG and MED (90.9% and 90.4% respectively) are significantly different from the others, in particular LES (51.5%). ORs confirm a higher probability for ENG SPs as opposed to other study areas having good results in the evaluation.

AQ5-E: Employment support

With regard to AQ5-E, i.e. employment support, no differences can be seen. In general, this aspect has received good scores in all areas: 70.3% in average has a good score in E1 and 86.4% in E2.

Conclusion

Other studies already investigated the disciplinary effect of SPs as to compliance with quality standards and procedures. However, a comparison with our study was not possible. For example, Canning (2005) highlighted the challenge of assessing the quality of multidisciplinary and interdisciplinary teaching and research in the UK, concluding that quality assurance in higher education must be strictly connected to the disciplinary nature of the identity of academics (Canning, 2005). This type of analysis was not

possible in our data.

Friedrich et al. (2016) found that humanistic and social studies tend to be less compliant and more abstract compared with scientific and technological studies (Friedrich et al., 2016). This can be confirmed with our results, although parameters and indicators are not equal in the two studies.

In conclusion, the results of this research confirm that it is easier for some discipline areas to achieve accreditation. SPs belonging to paradigmatic and applied disciplines tend to perform better than others in the accreditation process. These are mostly technical (ENG) or scientific (MPN) SPs. This trend can be observed at the final as well as at the single sub-indicator level.

Accreditation, in this framework, is a quality standard check of SPs conducted by an external evaluation committee, based on relevant documentation and on an in-situ audit. This evaluation concerns the way in which a quality system is implemented and documented more than standard of quality, and it is implemented by the academic staff of each SP. This method generates much criticism because quality assurance implies a great deal of work which the academic staff are not willing to do in many cases. Furthermore, the academic staff do not necessarily have any quality management experience or background. SPs familiar with processes and systems could have an advantage on a formal level (how the SPs achieve compliance to processes) because of their educational background, without necessarily having a better performance at a more substantial level (what an SP really does to implement quality).

Different solutions could be implemented in order to overcome this gap among the many different areas. One is the enhancement of central experts' units, at a university level, for internal quality assurance, such as existing Quality Oversights, together with a shared value system and a general participation in all activities related to quality.

Another could be to draw up at a national level, and to follow at a single University level, some guidelines on the quality application in the different SPs which facilitate the understanding of the requests or the overcoming of the problems for each disciplinary area. Just as in an industry, guidelines have been drawn up for the application of the more general ISO 9001 for the application in specific productive sectors (ISO 9001 - Guidelines for use by the chemical industry, ISO 9001 guidelines for food and drink industry…). In this way, this would enable academics to achieve accreditation with an instrument which could respond to their specific requests or difficulties.

Limitations

Some limits of this study must be considered. First of all, the available data include only 14 Italian universities. However, these institutions were selected by ANVUR in order to test the accreditation system, so they should represent all the Italian Universities in a good way.

Secondly, the AVA system is designed to change in the next accreditation round (AVA2) and new sub-indicators will be considered. However, the process is still the same and our results could be easily transported on AVA2.

Finally, even if each CEV were to receive a specific training before the evaluation procedures, they would be different for each SP, so there may be differences in evaluations.

Future research

In the future, research should be undertaken to determine the correlation between the discipline background of CEV's evaluators and the outcome of accreditation, as suggested by Bergseth et al., 2014.

In 2015 the European model was revised and new guidelines (ENQA, 2015) and a new

version of AVA and indicators were created, changing also the evaluation system. Therefore, a repeat analysis on the accreditation results following the new rules, aimed at comparing the two systems, is warranted.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Fondazione CRT under Grant RF2016.0756

References

Agasisti, T., & Catalano, G. (2006). Governance models of university systems—towards quasi-markets? Tendencies and perspectives: A European comparison. *Journal of Higher Education Policy and Management*, *28*(3), 245–262. https://doi.org/10.1080/13600800600980056

Asif, M., Awan, M. U., Khan, M. K., & Ahmad, N. (2013). A model for total quality management in higher education. *Quality & Quantity*, *47*(4), 1883–1904. https://doi.org/10.1007/s11135-011-9632-9

Bergseth, B., Petocz, P., & Abrandt Dahlgren, M. (2014). Ranking quality in higher education: guiding or misleading? *Quality in Higher Education*, *20*(3), 330–347. https://doi.org/10.1080/13538322.2014.976419

Biglan, A. (1973). The characteristics of subject matter in different academic areas. *Journal of Applied Psychology*, *57*(3), 195–203. https://doi.org/10.1037/h0034701

Bornmann, L., Mittag, S., & Daniel, H. D. (2006). Quality assurance in higher education - Meta-evaluation of multi-stage evaluation procedures in Germany. *Higher Education*, *52*(4), 687–709. https://doi.org/10.1007/s10734-004-8306-0

Canning, J. (2005). Disciplinarity: A barrier to quality assurance? The UK experience of area studies. *Quality in Higher Education*, *11*(1), 37–46. https://doi.org/10.1080/13538320500074931

Cardoso, S., Rosa, M. J., & Stensaker, B. (2016). Why is quality in higher education not achieved? The view of academics. *Assessment & Evaluation in Higher Education*, *41*(6), 950–965. https://doi.org/10.1080/02602938.2015.1052775

Carey, J. M. (1991). *Human Factors in Information Systems: An Organizational Perspective*. Intellect Books.

Cheng, M. (2009). Academics' Professionalism and Quality Mechanisms: Challenges and Tensions. *Quality in Higher Education*, *15*(3), 193–205. https://doi.org/10.1080/13538320903343008

Cook, R., Butcher, I., & Raeside, R. (2006). Recounting the scores: An analysis of the QAA subject review grades 1995-2001. *Quality in Higher Education*, *12*(2), 135–144. https://doi.org/10.1080/13538320600916726

Deming, W.E. (2000). *The New Economics for Industry, Government, Education*. Retrieved from https://mitpress.mit.edu/books/new-economics-industry-government-education-second-edition

ENQA. (2015). *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)*. https://doi.org/isbn 952-5539-05-9

ESG_3edition-2.pdf. (n.d.). Retrieved from https://enqa.eu/wp-content/uploads/2013/06/ESG_3edition-2.pdf

Filippakou, O. (2008). Quality Assurance and Quality Enhancement in Higher Education: Contested Territories? *Higher Education Quarterly*, *62*(1/2), 84–100. https://doi.org/10.1111/j.1468-2273.2008.00379.x

Frank, A., Kurth, D., & Mironowicz, I. (2012). Accreditation and quality assurance for professional degree programmes: comparing approaches in three European countries. *Quality in Higher Education*, *18*(1), 75–95. https://doi.org/10.1080/13538322.2012.669910

Friedrich, P. E., Prøitz, T. S., & Stensaker, B. (2016). Disciplining the disciplines? How qualification schemes are written up at study program level in Norwegian higher education. *Teaching in Higher Education*, *21*(7), 870–886. https://doi.org/10.1080/13562517.2016.1184138

Green, D. (2013). Quality Assurance in Western Europe. *Quality Assurance in Education*. https://doi.org/10.1108/09684889310046149

Haakstad, J. (2001). Accreditation : the new quality assurance formula ? Some reflections as Norway is about to reform its quality assurance system. *Quality in Higher Education*, *8322*(908812199). https://doi.org/10.1080/1353832012004510

Kekäle, J. (2000). Quality assessment in diverse disciplinary settings. *Higher Education*, *40*(4), 465–488. https://doi.org/10.1023/A:1004116205062

Kohoutek, J. (2014). Analysing instrument mixes in quality assurance: the Czech and Slovak Accreditation Commissions in the era of mass higher education. *Quality in Higher Education*, *20*(1), 83–102. https://doi.org/10.1080/13538322.2014.890773

Kozhevnikov, M., Evans, C., & Kosslyn, S. M. (2014). Cognitive Style as Environmentally Sensitive Individual Differences in Cognition: A Modern

Synthesis and Applications in Education, Business, and Management. *Psychological Science in the Public Interest*, *15*(1), 3–33. https://doi.org/10.1177/1529100614525555

Lundquist, R. (1997). Quality systems and ISO 9000 in higher education. *Assessment & Evaluation in Higher Education*, *22*(2), 159. https://doi.org/10.1080/0260293970220205

Mårtensson, K., Roxå, T., & Stensaker, B. (2014). From quality assurance to quality practices: an investigation of strong microcultures in teaching and learning. *Studies in Higher Education*, *39*(4), 534–545. https://doi.org/10.1080/03075079.2012.709493

Muller, J. (2009). Forms of knowledge and curriculum coherence. *Journal of Education and Work*, *22*(3), 205–226. https://doi.org/10.1080/13639080902957905

Murmura, F., Casolani, N., & Bravi, L. (2016). Seven keys for implementing the self-evaluation, periodic evaluation and accreditation (AVA) method, to improve quality and student satisfaction in the Italian higher education system. *Quality in Higher Education*, *22*(2), 167–179. https://doi.org/10.1080/13538322.2016.1220695

Neumann, R. (2001). Disciplinary Differences and University Teaching. *Studies in Higher Education*, *26*(2), 135–146. https://doi.org/10.1080/03075070120052071

OECD. (2009). *Higher Education to 2030, Volume 2, Globalisation*. https://doi.org/10.1787/9789264075375-en

Rebora, G., & Turri, M. (2011). Critical factors in the use of evaluation in Italian universities. *Higher Education*, *61*(5), 531–544. https://doi.org/10.1007/s10734-010-9347-1

Shah, M. (2013). The effectiveness of external quality audits: a study of Australian universities. *Quality in Higher Education*, *19*(3), 358–375. https://doi.org/10.1080/13538322.2013.852300

Shah, M., & Do, Q. T. N. (2017). *The Rise of Quality Assurance in Asian Higher Education*. Chandos Publishing.

Shah, M., & Nair, C. S. (2013). *External Quality Audit: Has It Improved Quality Assurance in Universities?* Elsevier.

Srikanthan, G. (1999, June). *Universities and Quality - A World View*. 10. Manchester, UK.

Stensaker, B. (2011). Accreditation of higher education in Europe - moving towards the US model? *Journal of Education Policy*, *26*(6), 757–769. https://doi.org/10.1080/02680939.2010.551785

Szanto, T. (2017). Programme Accreditation in Hungary: Lessons from the Past, Plans for the Future. *Quality in Higher Education*, *10*(1), 59–64. https://doi.org/10.1080/1353832242000195888

Teelken, C. (2012). Compliance or pragmatism: how do academics deal with managerialism in higher education? A comparative study in three countries. *Studies in Higher Education*, *37*(3), 271–290. https://doi.org/10.1080/03075079.2010.511171

Turri, M. (2014). The new Italian agency for the evaluation of the university system (ANVUR): a need for governance or legitimacy? *Quality in Higher Education*, *20*(1), 64–82. https://doi.org/10.1080/13538322.2014.889429

Ursin, J., Papadimitriou, A., & Dean, D. R. (2009, April 16). *Views on Excellence in American, Finnish, and Greek Universities*. Presented at the AERA Annual Meeting 2009: Disciplined Inquiry: Education Research in the Circle of

Knowledge. Retrieved from https://research.utwente.nl/en/publications/views-on-excellence-in-american-finnish-and-greek-universities

Van Berkel, H., & Ynand Wijnen, W. (2010). Accreditation in the Netherlands -Does accountability im prove educational quality? *Research in Comparative and International Education*, *5*(1), 88–97.

Ylijoki, O.-H. (2000). Disciplinary cultures and the moral order of studying – A case-study of four Finnish university departments. *Higher Education*, *39*(3), 339–362. https://doi.org/10.1023/A:1003920230873

.

Table 1 Schema of indicators and sub-indicators

Indicator code	Evaluation topic	Description of the indicator	Sub-indicator code	Description of the sub-indicator
AQ5-A	Educational demand	How educational demand is formulated (including how stakeholders are engaged)	A1	Consulted parties
			A2	Consulting method
			A3	Definition of needed functions and competences
AQ5-B	Expected and checked learning results	How educational demand is translated in learning results of the SP and of the teaching courses	B1	Required or recommended incoming knowledge
			B2	Coherence between educational demand and learning results
			B3	Coherence between teaching courses and learning results
			B4	Learning evaluation
AQ5-C	SP incoming path and outgoing	How SP monitors and solves problems	C1	Data analysis and interpretation of problems
			C2	Detection of the causes
			C3	Detected solutions
			C4	Evaluation of the implemented solutions
AQ5-D	Student's experience	The way in which Students' opinions are considered	D1	Notification of students' opinions
			D2	Students' complaints
			D3	Reception of students' opinions
AQ5-E	Employment support	What SP does to foster students' employment	E1	Educational process efficacy
			E2	Activities for employment support

Table 2 Summary of our database

Group	Cognitive style (Biglan, 1973)	Total number	Study area	Partial number
MPN	Paradigmatic, mix applied non-applied	20	Science	4
			Geology and Biology	9
			Agricultural science	7
ENG	Paradigmatic, applied	22	Architecture	6
			Engineering	16
MED	Mix paradigmatic non-paradigmatic, applied	21	Chemistry	5
			Medical	12
			Psychology	4
LES	Non- paradigmatic, applied	33	Law	9
			Economics	10
			Political and Social Sciences	14
H	Non- paradigmatic, mix applied non-applied	22	Literature	12
			Foreign languages	6
			Education	4

Table 3 Percentage of positive evaluations by macro-areas and areas. OR of ENG vs others

Areas	% of A or B	p-value	OR (95%CI)	Areas	% of A or B	p-value	OR (95%CI)
Final score				**C4**			
MPN + Eng	41.8%	0.0381		MPN + Eng	83.3%	0.0152	
H+LES+Med	23.6%		2.97(1.20-5.97)	H+LES+Med	61.8%		3.08 (1.21-7.85)
ENG	59.1%	0.0308		Eng	95.4%	0.0574	
MPN	23.8%		3.89(1.08-14.00)	MPN	70.0%		8.99(0.97-82.95)
Med	23.8%		4.76(1.29-17.47)	Med	61.9%		12.91(1.44-115.4)
LES	24.2%		4.65(1.47-14.63)	LES***	60.6%		13.64(1.63-114.0)
H	22.7%		5.04(1.38-18.44)	H	63.6%		11.99(1.34-106.6)
A1				**D1**			
MPN + Eng	85.7%	0.0049	2.76(1.02-7.45)	MPN + Eng	69.0%	0.0329	
H+LES+Med	68.4%			H+LES+Med	48.6%		2.35 (1.06-5.20)
Eng	90.9%	0.1471		Eng	77.2%	0.0472	
MPN	80.0%		2.50 (0.40-15.43)	MPN	60.0%		2.26 (0.59-8.65)
Med	71.4%		4.00 (0.70-22.66)	Med	57.1%		2.55 (0.68-9.54)
LES	63.6%		5.71 (1.13-28.79)	LES	39.4%		5.23 (1.54-17.67)
H	72.7%		3.75 (0.66-21.15)	H	54.5%		2.83 (0.77-10.43)
A2				**D2**			
MPN + Eng	61.9%	0.0545		MPN + Eng	88.1%	0.0465	
H+LES+Med	43.4%		2.11 (0.98-4.57)	H+LES+Med	72.3%		2.82 (0.97-8.16)
Eng	86.3%	0.0124		Eng	86.3%	0.0342	
MPN	35.0%		11.76(2.55-	MPN	90.0%		0.70 (0.10-4.71)
Med	38.1%		54.06)	Med****	90.4%		0.66 (0.10-4.45)
LES	45.4%		10.29(2.29-	LES	66.6%		4.11 (1.01-16.75)
H	45.4%		46.25)	H	72.7%		2.37 (0.51-11.04)
			7.60 (1.87-30.73)				
			7.60 (1.73-33.34)				
B4				**D3**			
MPN + Eng	50.0%	0.6810		MPN + Eng	78.5%	0.1455	
H+LES+Med	53.9%		0.85 (0.40-1.81)	H+LES+Med	65.8%		1.90 (0.79-4.58)
Eng	63.6%	0.0181		Eng	90.9%	0.0049	
MPN	35.0%		3.25 (0.91-11.50)	MPN	65.0%		5.38 (0.96-30.05)
Med	38.1%		2.84 (0.82-9.79)	Med	90.4%		1.05 (0.13-8.24)
LES*	72.7%		0.65 (0.20-2.09)	LES	51.5%		9.41 (1.88-46.89)
H	40.9%		2.52 (0.75-8.52)	H	63.6%		5.71 (1.05-31.07)
C1							
MPN + Eng	85.7%	0.0111					
H+LES+Med	75.0%		3.16 (0.99-10.03)				
Eng	100.0%	0.0522					
MPN	80.0%						
Med	80.9%						
LES**	66.6%						
H	81.8%						

* LES vs MPN: OR 4.95, 95%CI 1.49-16.38; LES vs MED: OR 4.33, 95%CI 1.34-13.92; LES vs H: OR 3.85, 95%CI 1.22-12.09.

** Law 55.5%; Economics 70%; Social Sciences 71.4%

*** Law 33.3%, Social Sciences 25%

**** MED vs LES: OR 6.17, 95%CI 1.22-31.05